An analysis of Knowledge Processing based Mobilisation and Distribution for Intelligent Enterprises

Vasile MAZILESCU [1]

Abstract

This paper presents a deep analysis of knowledge, as the basic pillar of the intelligent enterprise and of many other Intelligent Economic Systems. In this respect I emphasize that it is essential to realize that Knowledge Management is both a cultural and a technological provocation. We might say that the cultural aspect is a priority. Any system designed to support these challenges must extend far beyond the technological boundaries and take into account the people who will use it and contribute to its success. Our work demonstrates the main aspects and strategic advantages of knowledge representation, processing based mobilisation and distribution in the long process from integrating information and applications to automate knowledge worker functions. Developing systems that incorporate knowledge within organizations differs significantly from other systems, because it is absolutely necessary to associate operational interpretations with the information, in order to transform them into knowledge useful in various acts of decision.

Keywords: *Knowledge Processing based Mobilisation, Knowledge Distribution, Intelligent Economic Systems, Competency Management, Knowledge Management Systems.*

JEL classification: C68, C83, D83

Introduction

The most important motivation of this research is that the new economy must use the collaborative possibilities in open networks to produce and disseminate knowledge, based on Knowledge Management (KM). As the pillars of this collaboration are Information Communication Technologies and a series of transformations at the cognitive values, social organization and behaviors levels. Creating and sharing knowledge are intangible activities, that can neither be led nor monitored, and people cannot be required to do these. Knowing is apparently rooted in people's minds, through their experiences and skills. While some knowledge is explicitly acquired in electronic format or traditional documents, most do not reside in such sources. This share forms the tacit aspect of knowledge. Any part of knowledge formalized, captured and explained can be easily converted in different forms that allow searching and reusing it. Alvesson & Karreman (2001), Bierly &

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[1] **Vasile MAZILESCU**, Dunarea de Jos University of Galati, Romania,
    E-mail: vasile.mazilescu@ugal.ro

Daly (2002), Lin & Huang (2008), Vaccaro, Parente & Veloso (2010). This knowledge is then reconverted into tacit knowledge that is learned and absorbed by others in the organization. As long as a job security depends on what we know, on our skills and level of understanding – it makes us, in most cases, to be more sceptical in sharing basic knowledge, critical and exclusive, as well as its understanding, with other people, either directly or through various technologies, such as databases or business systems. Braganza, Edwards and Lambe (1999), Haas & Hansen (2007), Keskin (2005). Knowledge has the highest value in terms of human contributions and the highest significance in various decision acts. They are very difficult to manage because their source is the human brain and mind. There are differences between information and knowledge also with technological implications. Technological implications imply that computer systems can handle electronic information, but not electronic knowledge. Business systems are loaded with information, but not with knowledge, whereas the latter are information combined with experience, are contextualized, interpreted and reflected. A higher form of reasoning embodied in action is the wisdom, characterized by knowledge combined with learning. Managers and experts must use and understand a series of knowledge in order to reach some information or data. One of the reason the knowledge-type resource is a difficult concept is that the processes involving knowledge are usually recursive in development, dynamic and often discontinuous. Mazilescu (2011). In knowledge acquisition, encoding and transfer of all processes for which are created systems that incorporate knowledge (business processes, technical, economic, diagnosis applications, etc.) there are a number of cycles. Choi & Lee (2002), Fischer & Ostwald (2001), Flanagin (2002), Grant (1996). Defining and understanding knowledge can be based on a number of approaches, ranging from the philosophical and ending with a pragmatic one, the synthesis of Knowledge Management Systems (KMSs). Mazilescu (2011), Parsons & Saunders (2004), Schwarts (2006).

Most economists and business theorists appreciate knowledge as a vital resource for competitive advantage of the modern business. Civi (2000), Hall & Goody (2007), McKeenZack & Singh (2006). The key link between information and knowledge is based on the observation that knowledge is actionable information. If it can be used for doing what we intend, then the information becomes knowledge. Knowledge are unclear, partially structured or unstructured, vague, intuitive, hard to communicate and difficult to articulate in words or different illustrations, and a large part of them are not stored in databases, but in the minds of the people working in the organization. We find them in connections, conversations between people, insights based on experience, in people's kindness to compare situations, problems or solutions. Only a tiny part of the tacit knowledge comes to be formalized in data, books, documents or presentations, the rest remain in people's minds. There is nothing wrong in this situation, except that if a person leaves, the knowledge leaves with it (more or less). By contrast, information remains whether or not a person leaves. Much of knowledge organization is created during an act of collaboration and action, so that the collaborative efforts are essential in a KM initiative, like in

Knowledge Based Systems (KBSs) development and implementation. Choi, Yew & Lin (2006), Pee & KanKanhalli (2009). Based on Polanyi's works, Nonaka highlighted *tacit* and *explicit* knowledge at organizational level. Nonaka (1994). *Tacit knowledge* is rooted in action, experience and specific contexts, consisting of cognitive and technical elements. The cognitive element refers to individual mental models, consisting of mental maps, trust, conceptualization and viewpoints. The technical part consists of practical experience and skills for solving well contextualized problems. An example of tacit knowledge refers to those which allow classification of the best clients. *Explicit knowledge* can be articulated, codified, communicated and processed by natural language or in a symbolic manner. Such knowledge is, for instance, specified in user manuals of technical products in the form of facts, rules and heuristics. A fact is a statement, refers to a particular feature of an object and is assigned a certain truth value. A rule is a cause-effect relationship and can incorporate in its structure various types of knowledge. A heuristic is a rule based on experience. Some knowledge considered as tacit can be transformed into *explicit knowledge*, creating a group of knowledge called implicit.

Theoretical knowledge is build up of empirical knowledge through analysis and synthesis, deduction and induction, generalization and particularization. Knowledge does not exist outside of an agent. In this way, they are the result of a cognitive process, set in motion by the inputs of new stimuli. We can assert that the information is converted into knowledge if it is processed in the mind of an agent (human or artificial), and knowledge becomes information if it is synthesized and presented as text, graphics, words or other symbolic forms. A major implication of this view on knowledge says that, in order to reach a certain comprehension of the data or information, an agent must manage a certain amount of knowledge. DeTienne, Dyer, Hoopes, & Harris (2004), Sivaraman & Kamath (2006), Storey & Barnett (2000). Another significant implication of this manner to define knowledge is that the systems designed for knowledge integration and management within the organization must be recognized as different from other types of computer systems, by relating them with various semantics and appropriate processing mechanisms. In order to define the concept of knowledge mobilization, important for the development of Intelligent Economic Systems (knowledge-enterprises, virtual organizations, KBSs), we will present some knowledge characteristics, as they occur in practice, in the synthesis and use of Organizational Knowledge Management Systems (OKMS). Knowledge consists of concepts available in information processing and in controlling various activities of social action. Holsapple & Jones (2004), Kebede (2010), Tseng (2008). They can be of various types: meta-knowledge (assumptions on which are based different knowledge from research, gained through observations and experimentation), practical or operational (characterize the work methods), actions (specify the manner in which are done certain things), descriptive (who, what, when, where), strategic (characterizing the whole context of action), learning (between people and about problems). A very important example is a Business Process Management System that includes methods, techniques and tools to support design, use, management and analysis of

operational business processes involving people, organizations, applications, documents and other sources of knowledge. Business processes prescribe the order in which activities have to be executed. On top of that, there are many other business rules that should be met by the execution of business processes. Business rules can be required by any stakeholders, such as management, government (by law), shareholders and business partners (clients and suppliers). Business Process Management can be considered an extension of classical systems based on workflow management. A business process is a set of activities that follows a logical flow, resulting an output, to specify the tasks to be fulfilled to achieve a business objective. Inputs and outputs may be facts and / or information, and the transformation can be performed by human actors, machines, or both. Although an organization's business processes can be tracked separately, by integrating them is obtain value-added which, long term, leads to positive results, a good control over the resources involved and over the environment in which it operates. Petri networks are tools of business process modelling. One of the advantages of using Petri networks for modelling workflows is access to many analysis techniques based on Petri networks. Accuracy, applicability and efficiency of business processes supported by systems based on workflow management are vital to any organization. There are three types of analysis: (1) validation, testing whether a workflow behaves as expected; (2) verification, determining the accuracy of the network flow; (3) performance analysis, evaluating the ability to meet the requirements, taking into account the time, levels of work and resources. Validation can be done through interactive simulation: are analyzed a number of cases to see if the system behaves properly. For verification and performance analysis, are used advanced analysis techniques specific to Petri networks, such as invariants, reachability trees, coverage graphs analysis, etc. The multitude of available analysis techniques shows that Petri networks can be seen as an independent environment (solution) between the design of a process' definition through workflows and the analysis of the resulted workflow. Sivaraman & Kamath (2006).

This paper is organised in four sections. After the research motivation presented in the current section in connection with other relevant works in this area, we analyse in Section 2 the concept of knowledge mobilization as an effective organisational tool to manage knowledge and to create competencies. The competencies are strongly related to knowledge, and the extent to which new knowledge becomes expertise is an important element for the increase of the competencies. Whatever the other possible knowledge definitions and interpretations are, the main purpose from our perspective is to understand what knowledge represents within the organization and their associated processes and products. Section 3 point out that without knowledge distribution there can be no organisation. The fundamental condition of organizations' existence is the relentless knowledge accumulation and dissemination. The knowledge processes or cognition are activities that support the self-perpetuation of the organizational networks. Maturana & Varela

(1987), Mazilescu (2011). Section 4 presents some short conclusions and after, the references.

1. The mobilization knowledge process and creating competencies

The principles that guide human activity, starting with the research and ending with the discovery of viable social actions, are: knowledge lie in people's minds, with effects that relate to subjectivity, temporality, space, transformation, knowledge inherently have a mobilizing capacity for the person who creates them and therefore all those who interact with it, mobilizing knowledge creates value and allow people to obtain results, knowledge use leads to their enrichment, collaboration and participation mitigates some differences between knowledge through employment, the used knowledge creates responsibilities, their use having a number of implications. The mobilization process is based on the following activities Schwarts (2006):

- identification of the situation (problem, case, opportunity);
- obtaining information (about situation and the associated context);
- understanding the situation (using concepts required for information processing);
- developing a theory (associating a content to the context);
- practical use of the knowledge thus obtained (how to use what we learned);
- action (the actual implementation);
- obtaining, interpreting and correlating results (for application in possible new situations);
- analysing feedback information (to observe if it is necessary to resume the activities, specifying some adjustments, etc.).

1.1 Important challenges for the acceptance of OKMSs

The OKMS' acceptance is a very difficult problem, since these systems are often abandoned or, in other cases, partially exploited and do not lead to the organizational performance expected. Some of these knowledge management challenges have a sociological nature and influence how people perceive and use a number of deployed systems. The literature related to KM mentioned many times that the effectiveness of KM processes and systems is strongly influenced by the organizational culture. Alavi & Leidner (1999), Borghini (2005), Darroch (2005), Kruger & Johnson (2010), Storey & Kahn (2010). The organizational culture, like the culture in general, is revealed by the common use knowledge, accepted behaviours and values developed within the organization. It is reported many times that a series of adopted OKMS are based on architectures and methods that enhance the old practices (usually inadequate to current requirements), instead of creating new and beneficial dynamics within the organization. This analysis demonstrates the need for analysing the current features of the organization, in terms of habits and

values, for the purpose of proposing a solution that reflects the changes. One of the most debated issues regarding the knowledge distribution is the fact that organizational environments leans more towards competition than towards cooperation. Consequently, a series of OKMS, involving collaboration in their design and their use, will fail because personal knowledge pieces, required for collaboration, are blocked inadequately and premeditatedly. The fear of making mistakes is another obstacle in the process of knowledge exchange. In general, people feel they can better explain certain things when talking directly to the person who needs that knowledge. People also fear that a static description of their expertise may be poorly made, because knowledge has a dynamic character and are difficult to transfer in many situations. This is a challenge for OKMS developers in their attempt to allow certain knowledge pieces to be correctly contextualised and linked with a range of previous knowledge and experience. The organisations should create environments that stimulate learning and should be tolerant to mistakes. The latter is the true key element that stimulates the creation of new knowledge. There have been highlighted significant examples in this respect. Large companies have managed to achieve important successes only by learning from mistakes. Choi & Lee (2003), Choi, Poon & Davis (2008), Garavelli, Gorgoglione & Scozzi (2004), Hair, Anderson, Tatham & Black (2001). There are also permanent suspicions regarding improper and unethical knowledge use, which is an intellectual property asset. It is a situation characterized by the lack of trust and leading to a behaviour that blocks knowledge transfer and communication. This concern is increasingly better managed and resolved through the development of environments that allow social interaction, based on network-type structures, in the form of practice communities. Lack of time is another serious reason which prevents the acceptance, implementation and operation of OKMS. This leads to inherent reruns and great efforts in terms of accessing and achieving suitable knowledge for situations that are not really new. All these demonstrate that reaching effective solutions basing on KM, in terms of processes and systems, can be achieved step by step, based on real cases, after clearly understanding the current organizational culture and its entire system of values. These are just some of the challenges that KM is facing in its attempt to adopt, as well as it can, certain technological solutions. Clarke & Turner (2004), Lee & Choi (2003), Massey, Montoya-Weiss & O'Driscoll (2002).

1.2 Knowledge mobilization process and its role in the synthesis of OKMSs

Knowledge mobilization is a process whereby personal and professional knowledge in a particular problem area of an organization are capitalized, shared, developed and implemented as an OKMS (www.sacyhn.ca). Such an environment for the knowledge mobilization is built on a network-type structure, and must be able to support distributed knowledge processes. In this way, it allows the network members, on the basis of several projects for planning, development, implementation and refinement of certain initiatives (based on research results and practice) to mobilize and increase their capacity to meet the needs initially settled. There is a series of

conflicts between group knowledge processing and the technologies able to support such processes. These conflicts concentrate on the following remark: the effective knowledge creation and sharing are deeply embedded in interpersonal contexts, strongly dependent on the face-to-face character, while the technologies created to support these distributed processes are often created to support mobile knowledge, but not so compatible with the interpersonal context outlined above. It's exactly the problem of *modelling knowledge distributed processes in order to generate strategic alliances.* This is a topic to be discussed, as an essential problem in developing intelligent OKMS. The feasibility of such systems, based on knowledge mobilization, is real with the emergence and hybridization of some advanced approaches of the management in the private sector, with the technology innovation and the development of processes for communication and creating alliances. Knowledge mobilization should be viewed from the perspective of combining the external knowledge with the internal ones, in order to create new knowledge that users/customers would better agree. It thus highlights the need for innovation based on building relationships or partnerships, a practical reformulation of the collective intelligence. From this perspective, the knowledge mobilization is the solution accepted and developed in this work for creating intelligent organizations, KM-intensive organizations, distributed technologies and human resources' competencies within and outside the organization. Clarke & Turner (2004), Holsapple & Jones (2004), March (1991), McKeen, Zack & Singh (2006).

An example may be the *Supply Chain Management* (SCM) for a more efficient organization management and for synchronizing its abilities with the ones of other organizations, for a virtual integration, which brings great competitive advantages. SCM is a concept that extends the operations perspective from one organization to the entire supply chain. It is an increasingly hot topic and it is approached by many companies. SCM is applied to a number of issues and business practices. In essence, SCM is a set of practices to manage and coordinate the entire supply chain, from the raw materials suppliers to the final consumer. The objective is to develop a synergy along the entire chain, rather than focusing on a specific organization. SCM is an expansion of internal programs like TQM and streamlined production. Often they have brought substantial improvements by removing barriers between departments and by efficiently managing the business processes. Therefore, it is reasonable to consider the improvement potential that allows an overall view and managing the entire supply chain. It is assumed that there are significant synergies to be acquired by managing the complete supply and delivery chain. The objective of the synergy development is achieved by reducing costs and increasing the offered value. The most commonly mentioned benefit of SCM is the reduction of the costs. A typical example is the reduction of the stock. It is less common for companies to increase the value provided through the chain. Some companies are trying new methods of products and services clustering to increase the value for the end customer. Typically, the supply chain can be viewed as an aerodynamic pipeline that processes the raw materials, transform them into finished goods and delivers them to the final consumer. The best practices for SCM can be described as a set of

interrelated processes that function as a whole. This is *virtual integration*, contrasting with the traditional vertical integration. The idea is to get the benefits of the vertical integration and, at the same time, to avoid the related costs, ever larger (for example, additional levels of managers and reporting systems). However, virtual integration raises problems related to economic unit's boundaries, which are not well defined. Given these SCM practices, the units have more reasons to connect their processes in this way. The major driving forces can be classified into three categories, which are the basis for developing the synergy in a supply chain: reduce costs, enhance the value, competition within the network. SCM is a set of practices for the entire chain management, from the raw materials suppliers to the final consumer. The basic constructive elements are the organizations (business units), rather than the companies. Here are some typical characteristics: the reduction and consolidation of suppliers and customers bases, stock coordination and price policies, information transfer, networked computer systems, cooperative problem solving and internal positions at the client's premises to represent the supplier. SCM is not a traditional vertical integration. It is driven by opportunities to reduce costs, increase value and by the competition within the network. When choosing their partners, companies must consider the potential of the economic entities. To integrate marketing, sales and services, CRM requires a strong integration of the business processes involving consumers. These sales departments of the CRM-based processes are unstructured and non-transactional. CRM processes can therefore be regarded as knowledge-oriented processes with the following strongly correlated characteristics: knowledge intensity: CRM-based processes require knowledge of heterogeneous sources, not necessarily computational sources, to meet the process' goals; complexity of the processes: CRM-based processes have particularly a complex structure, or no clear structure. This implies a need for a high degree of knowledge for executing a process. The most important concern is to collect, store and distribute only useful knowledge and not wasting time and effort in collecting and storing useless knowledge. In order to integrate the various CRM-based processes, there are often developed projects. These projects promote the process models that can form the basis for an analysis of knowledge flows in the CRM processes. The origins of CRM can be traced in the Marketing Relationships concepts. Marketing Relationships are an integrated effort to identify, build and maintain a network of consumers, and to continuously strengthen this network, for the mutual benefit of both parties, through interactive, individualized and valuable contacts, added throughout a large period of time. Marketing relationships have largely a strategic nature. Although business processes are important, there is a lack of a holistic vision for business processes connected to Marketing Relationships. On the other hand, Customer Relationship Management was influenced by several information systems concepts, focusing on different areas of applications. In the processes integration flow, these systems continue to merge into CRM integrated systems. Typically, CRM-based business processes require not only transactional data that can be automatically collected and stored in relational databases, but also a significant amount of knowledge. Also, CRM processes are complex and structured only to a certain extent. For this reason,

they can be considered intensive knowledge processes. More than developing an integrated approach to CRM processes, it is, therefore, essential for the system to address the KM flow from and to the consumer, regarding all the communication channels, such as being able to use knowledge about consumers.

1.3 Creating competencies in the context of knowledge mobilization

All knowledge-based organizations have a common goal, namely to increase employees' competency and implicitly their performance. This way, they benefit of personal knowledge and build, step by step, more efficient business processes. To achieve these objectives, organizations follow different strategies that, according to Hansen, Hansen & Haas (2001), can be classified into two categories, oriented towards: 1) knowledge codification, involves developing knowledge repositories that can be reused in the future, e.g. KBSs. Rubin & Wand (2007), Wenger (1998); 2) inter-personal contacts, through the processes of access, communication and sharing of expertise, knowledge, information (also called personalization strategies). At first sight, the difference between these two approaches is important: knowledge codification is characterized by the reuse of old knowledge, while personalization strategies particularly put emphasis on knowledge creation and innovation. Davenport & Völpel (2001), Gloet & Terziovski (2004), Grant (1996), Kebede (2010), March (1991). In our work we are equally interested in both strategies. While the first strategy will be used for the synthesis of subjective knowledge models, re-usable in a certain sense, as currently perceived and used in different logical decision-making processes, the second strategy is particularly important for the development of organizational initiatives to allow the employees, on the one hand, a high degree of autonomy, and secondly an active and constructive participation in generating new knowledge, involved in developing new products, new services bundles or new business processes. Organizations have always been oriented towards accumulating and transferring knowledge in order to create economic value and competitive advantage. In this context, knowledge must be visible and tangible. The ambiguous character, the intangible nature of tacit knowledge, as well as their permanent importance, make the KM research and application more challenging.

There were identified several important trends related to the business environment strongly based on competition. According to some researchers, these trends will lead to dramatic changes in productivity and in structural and functional approaches of the companies or organizations of any kind. The combinations between production cycles reduction, increasing diversity of the products oriented towards services bundles, rapid development and increasing complexity of the technologies with strong orientation towards intelligent technologies, markets globalization, frequent changes in demand, business environment's uncertainty and strong competition are the trends of the economic context. The knowledge within the companies or organizations are stored in the employees' minds, or are implicitly encoded and used in various organizational processes, services or systems. They are

the reunion of the experience, expertise and operational information (in action), at the individual or work group level, used in performing certain tasks. Solving problems within companies is a complex activity, fundamentally based on knowledge. It requires making decisions in a dynamic business environment, using various sources of information. It is widely recognized that organizational knowledge management contributes, as a decisive factor, to the effectiveness of the business processes. We call such an organization the Organization Intensively based on Knowledge (OIK). In the context of an OIK, the tasks that persistently and permanently use knowledge, such as those of abstraction, representation and processing the uncertainty or imprecision, decision making in the absence of information, recognition of certain forms and characteristics of organization's development, etc., involve an effective combination of company's competencies and an aggregation of the responsibilities. The groups within the OIK must effectively manage its skills and create mechanisms to generate innovation and new ideas. For this purpose, it is required the development of practice groups, based on organizational learning (organizational process that can take an individual form, a group form based on communication, and the learning based on the use of information repositories). The purpose of organizational learning is to enhance its knowledge, in order to build an organizational culture and a more coherent understanding of the knowledge assets' value, in direct relation with different business processes. To examine more deeply the relationship between KM and organizational memories, it is required a classification of the knowledge, data and available and useful information, according to the organization's needs.

Increased competitiveness, frequent teamwork in communities of practice, as a result of the great changes in terms of technology, have increased both the importance of human capital within organizations and the knowledge resources sharing, in order to obtain a competitive advantage. The human capital of the employees is one of the most complex resources for the organization's control. This capital has a high financial value and can be accumulated based on certain learning processes, processes that are essential in the organization's struggle for existence. The managers concerned with the strategy and the industrialists identified the organizational learning as a basis for achieving competitive advantage on the local or international markets, since 1990. The competencies are generally perceived as unique resources, based on knowledge, and that lead directly to a competitive advantage. They are created by continuous knowledge refinement, both explicit and tacit knowledge. The term of competence was originally developed by the organizational psychology. From this perspective, knowledge can be interpreted as ingredients (personal confidence and information that enhance an individual's ability to take decisions or to effectively perform an action) or products (the direct results of organization's members actions, usually embedded in private practices or in different outputs of the organization) of the daily activity within the organization. KM is based on various practices and technologies that enable the knowledge exchange so that knowledge can be replicated and expanded for the use in all actions undertaken

within the organization, and Fisher and Ostwald (2001) define it as a cyclic process composed of three fundamental activities: creation, integration and dissemination.

Knowledge Creation – (KC) is the conscious activity of the organization of generating new knowledge. The theory on creating new knowledge is based on the idea that the knowledge resource inherently includes human values and ideals. In this way, the creation process cannot be described as a normative causal model because human ideals and values are subjective and the concept of truth depends on all these. *Knowledge Integration (KI)* refers to all activities based on which an organization identifies, acquires and uses external knowledge. As long as the development of new products or services is a crucial aspect of any company, KI is a complex process which is not very well known both in research and practice. For this purpose, it is necessary to develop systemic models to support the identification, explanation and solving problems specific to KI. *Knowledge Dissemination (KD)* allows the access to some specific knowledge for the employees and the units who need to apply this knowledge. Teams are the cornerstone for the effectiveness of a KM application. Working in a distributed context, based on strong social interactions, has profound significance for KC and KD. New ideas can occur through dialogue and discussions. This dialogue can often involve strong interactions and conflicts, but right these conflicts can motivate the organization members to obtain answers to a series of fundamental questions, using experience in various new ways. Consequently, these interactions often lead to changing personal knowledge into knowledge of the organization. There are a number of authors who emphasized the role of the teams and communities of practice in the knowledge distribution, something which will be subsequently analyzed. Choy, Yew & Lin (2006), Garavelli, Gorgoglione & Scozzi (2004), Grant (1996), Wenger (1998).

At the individual level, knowledge is created on the basis of cognitive learning processes, while at the social systems level (i.e. groups) knowledge is generated based on collaborative interactions. Factors participating in the KC may be internal or external to the organization. KC is the process of transforming raw data into information. During this process, the KC uses various technologies to classify knowledge. Competencies, as an abstraction of a relevant work and constantly adapting to the organization's strategies, are a promising concept for applying the management theory, in the case of human skills and knowledge, in the context of a large number of applications. From the management perspective, the competencies provide a more accurate possibility to approximate human knowledge, than the notion of knowledge according to the classical KM approaches. To be competent is more than to know, as it is closer to the action and its rational results. Hamel and Prahalad define the competency as the basis of what the organization should know for future successes. Hamel & Prahalad (1994). Their model includes skills, knowledge, behaviour, environment and customers. The competency is defined as a function that depends on intelligence, education, experience, ethics and interest. From the perspective of human resource management (HRM), the concept of competency can be practically understood as a minimum capacity that an employee must have to perform different tasks at a certain quality standard. The competencies

consist of four components: knowledge, skills, attitude and capability. When discussing competencies, is imperative to know the competency levels, such as: (1) practical competency (an employee has demonstrated the ability to perform a specific assignment or task), (2) key competency (an employee must demonstrate that he understands what and why he does a certain thing), (3) reflexive competency (the ability of an employee to integrate actions with their understanding - this way, he learns from the actions and adapt them to future action which differ from the previous ones), (4) applied competency (an employee has demonstrated the ability to perform many tasks, which he understood and reflexively applied). In the recent years, many authors have suggested a number of approaches related to competency modelling and management within organizations. These approaches have in common the concentration, throughout the organization, to develop tools that unify the human resources with their tasks.

They define the competencies in certain ways, develop a general framework and establish certain procedures for implementing this approach in the specific context of an organization. Schmidt and Kunzmann (2006) classified competencies into two categories: 1. t*echnical knowledge and job specific skills* (specific knowledge and skills of using the necessary tools to perform a specific job). They are intimately related to the organization's core competencies and capabilities, 2. *performance abilities* (performance skills and competencies) based on communication styles, teamwork styles, leadership ability. These skills reflect the efficiency and effectiveness of technical knowledge application. They are related to the organization's core values and priorities. The competencies refer to a series of individual and organizational characteristics. At the individual level, we find the technical knowledge and individual capabilities that lead to performance. Although the technical skills (knowledge of related disciplines, research knowledge) are obviously very important for the scientific success, the literature on R & D highlights the importance of communication skills and teamwork skills as a source for productivity growth within the organization. The central competencies refer to a set of skills and technologies that enable the organization to provide the customer with a particular advantage and thus be more competitive. The firms must have necessary competencies and specific competencies (differential). The necessary competencies are those which support the value creation, and the specific ones are those that confer the organization or group of organizations a competitive position. These specific competencies define the organization's weapons, and Lindgren, Henfridsson and Schultze consider them to be the basis for the future competition. Lindgren, Henfridsson & Schultze (2004).

2. Knowledge Distribution

The knowledge process underlies the organization process at all social levels, and any organization's interactions with its environment are primarily cognitive interactions, to acquire, process, and use the knowledge. To survive, it is necessary to know. The evolution of an organization throughout its life cycle, as well

as the many micro-decisions and micro-actions that form its daily life, is based on a variety of cognitive acts. *Organizational learning and development* represent pair-dimensions of the reality of an organization. It is important to remember that all the elements of an organization are involved in the knowledge process, regardless of the hierarchical level on which it is located or the specialized function that is executed. It is proved that the network is the most common organization pattern in social systems, including the economic ones. At all organization levels - from the ordinary workers of a clothing mini-manufacture and to the vast regional economies, such as the European one – the elements and processes of the organizational systems are interconnected in a dense network type communicational structure. Networks are non-linear configurations for organizing and their operation is based on various interconnected feedback circuits, negative and positive. Organizational networks are first of all communications networks, and, in this situation, cannot exist without a symbolic language, power relations, technical norm, value constraints, etc. Organizations use communication to maintain themselves. In fact, organizations are made up of a multitude of communications, flowing through self-generating network structures. This means that each communication generates representations, meanings and interpretations that produce other communications, so that the entire network self-generates itself. We showed in chapter II that communication processes are basically reverse connections (feed-backs). Within the organization the multiple communication feed-backs intersect or overlap, creating a symbolic and normative framework consisting of philosophies, beliefs and values- a structured set of shared meanings, continually fed by new communications. This framework helps the organization's members to find their identity, and the organization itself - to realize its own borders. Of course, we mean no legal or economic borders, but the ones that shape the organization's moral-affective space, space composed of the expectations, loyalty, commitment and involvement of the members. Organizational Communication generates ideas, attitudes and contexts of meaning, on the one hand, and rules of behaviour, on the other side.

In organizations, communication not only acquires the knowledge, but also transforms it into behaviours. The organizations that are closer to the characteristics and behaviour of self-generating communication networks are more flexible, more dynamic. Of all the features of these communication networks, three are particularly important: (1) the existence of a strong sense of cohesion and adherence to a set of common values among its members, (2) openness to environment and tolerance for diversity and novelty, (3) increased learning capacity.

To bring the internal structure of the organization closer to the configuration of a self-generating communications network and to connect it to many other similar external networks is the key of competitive survival and adaptation of the organization. The features mentioned above develop when organizations develop like some communities of practice - common contexts of meaning.Vaccaro, Parente & Veloso (2010). A community of practice occurs within an organization if among its members there is a mutual commitment and solidarity based on which is further developed a shared repertoire of tacit rules, behavioural routines and knowledge.

Communities of practice coagulate at the level of informal dynamics of the organization. They have an adaptive and complex nature, impregnating the formal structures. It takes place a formal hierarchical structure dilution by the appearance within it of informal concentrations structured in the network. Learning or the organization's capability to acquire knowledge and to transform it into goal-oriented behaviours depends on how are interacting the formal structures and the informal networks. An effective way to develop the organization learning ability is to encourage and strengthen communities of practice, for only in this way the process of creating and using knowledge has a natural character, and the knowledge dissemination is reflected not only in the operational performance, but also in a strong feeling of personal satisfaction for the organization's members. Knowledge creation and its counterpart - organizational communication - are not possible without spiritual, emotional and moral motivation. The flexibility implies the existence of an active communications network, organized as some multiple reverse connections that are interconnected. Setting up and fostering self-generating communication networks, as a support for learning and knowledge, means not only connecting the organization to its environment but, above all, connecting it, as much as it is possible, with itself. Ultimately, knowledge is created by the individuals who form the organization. The real capital of the organization is not knowledge, but these people. This finding leads to the conclusion that the essence of knowledge management is, in fact, the optimization of the human relations. Powerful and competitive organizations are knowledge-based organizations. The concept of *knowledge-based organization* is the label for four types of organizations: (1) organizations based on the knowledge incorporated in behavioural routines, with the support of advanced technologies and a consistent set of formal rules for their assistance, (2) organizations based on complex professional expertise, (3) organizations based on symbolic analysis, (4) intensive communication organizations, that create knowledge.

The intellectual capital becomes the most important factor of competitiveness for these organizations. Their strength lies in knowledge, and the organizational behaviours of employees have considerable intellectual determinant. The intellectual capital results from the organization's cognitive resources, resources that can be located both at the intellectual and collective level. There are *three categories of cognitive resources* - accumulated (as an intellectual "stock"), the internal organizational processes and the organization's interactions with the environment. *Accumulated cognitive resources*, at the individual level, consist of the members' instrumental skills (scientific or professional languages, computing technology) and the general knowledge. At the collective level these resources comprise the organization's human capital (values, experience, skills) and the knowledge infrastructure (technical know-how, professionalism, entrepreneurial and industrial skills of the organization). *Internal organizational processes*, as cognitive resources, refer to the organization members' personal competencies (self-confidence, creativity, critical spirit, analytical skills, intelligence and psychological capital). At the collective level these resources are reflected in the innovation

potential (concepts, patents), the process capital (organizational culture, internal communication networks, formal management systems, informal structures) and in the institutional capital (corporate governance, public relations, image, reputation, partnership networks). At the individual level, *the interactions* occur actively as cognitive resources, primarily through the formation of some social skills (teamwork, solidarity, expression). At the collective level these cognitive resources take the form of commercial capital (brands, brand capital, marketing skills), of the skills to work in a network, organizational openness towards the exterior etc. One of the core missions of the organizations, in general, and particularly of the knowledge-based organizations lies in capitalizing the intellectual capital, in order to achieve the highest possible efficiency of the activities. The management's obligation is to ensure the cognitive resources development and to manage the knowledge creation and distribution within the organization. The intense-cognitive organization is the organization where intellectual capital becomes much more important than physical and financial capital.

In this context, it is necessary to highlight the elements that guide the organizations' reform towards the requirements of an efficient accumulation and exploit of intellectual capital: understanding that, by its very nature, the intellectual capital is symbolic, interpretive, accumulated and manifested primarily through individual behaviours of the organization's members. Hence this capital can be formed only under the conditions of flexible interpersonal relationships within the organization, which stimulates communication and knowledge sharing. This relational framework makes imperative the redefining of the power configurations within the organization. Intellectual capital determines the focus shifting from the organizational power based on status to the knowledge-based power. This power is negotiated depending on the type of knowledge needed by the organization, its importance for competitiveness, knowledge's capacity to become an "intangible good" of the organization and on the practical ways of capitalizing knowledge; understanding that, in the intense-cognitive organizations, the power is democratic, being widely spread among members of the organization, because, whatever its content is, tacit knowledge can be only partially converted into formalized, explicit knowledge; awareness of the risk of proliferating the organizational conflicts due to the subjectivity and relativity of the knowledge symbolic interpretations made by different members or groups of interests within an organization.

The accumulation of intellectual capital is fundamentally a learning process, referring actually to the formation of collective experience and knowledge based on organizational strategies and structures that stimulate the transformation of experience into behavioural references. Organizational learning takes place within specific relational and power networks, able to provide the reflexive feedbacks that ease the system's self-awareness - "learning to learn". Communicational openness is therefore a prerequisite for an effective organizational learning.

Learning is the indispensable premise of the organizational change. Explicitly, learning is even the organizational change process by transforming the personal and other organizations' experiences into rules, procedures and decision-

making and action strategies. Although carried out by the members of the organization, the organizational learning is not limited to the amount of individual accumulations, involving the restructure of the behaviour, decision-making models, relational structures and collective action strategies, restructuring operated on the basis of what has been learned and, a very important thing, the systematic use of what the organization's members learned from the everyday work practices, through communication mechanisms that encourage learning and the practical application of the learned elements. Undoubtedly, the individual and collective learning processes are very closely related as they are often difficult to separate. According to Kolb (1996), individual learning is highly experimental, being essentially a process of selection, accumulation and consolidation of certain experiences. Thus, the individual first observes and analyzes the organizational reality, then uses the results of these reflections for synthesizing abstract concepts and generalizations. In the next phase, the new concepts are tested in various practical situations, in order for those concepts that have proven their validity to start generating concrete experiences. Similarly, collective learning is a process of generating information by using the internal and external environment of the organization. This new information, derived from multiple internal and external sources, is permanently correlated and combined. The information is produced internally through the experiments, analysis of successes and errors and the use of data from the autocorrelation. New information is collectively integrated and interpreted in the organizational context. We can observe in the collective learning the manifestation of a *cyclic behaviour*: integration - interpretation - action - generation. Each phase of this cycle is characterized by a certain style of individual learning, having strengths and weaknesses. For example, the integration requires a reflexive style, which means that it succeeds only if the members are good listeners, tolerant, careful, with a balanced judgement and within the organization there are a variety of points of view. The weakness of this style refers mainly to the low personalization and to the distance. The interpretation is based on a theoretical style, which involves combining the observation with theory, rationalization and the logical analysis of information. The shortcomings of this style may be the extreme perfectionism, too much detaching, ignoring the intuitions. Action needs, however, a pragmatic style, which means that the members must behave as experimenters and innovators, to take the risks and be oriented towards action. The shortcomings of this style can result from neglect of the theory and dialogue. Finally, the generation takes place, in an optimal manner, based on the activist style, which calls for sociability, openness, communication skills, persuasion ability, accepting the competition. The weaknesses of this style can be getting stuck on details or speeches degenerating to populism. The organizational learning cycles are not linear processes: today we integrate new information and experiences and tomorrow we interpret them etc. The learning organization can be compared to a swarm or a forum: every day more individual and collective learning processes overlap, intertwine, converge, break, intensify, split etc. Organizational learning is like a continuous fuss. Every day, every moment, the learning organization needs all those styles and all their associated competencies to carry out the phases of as many

learning cycles as it can. But very few people have multilateral capacities, able to show off a variety of skills needed for learning. This vast and complex organizational learning dynamic, apparently chaotic and without a purpose, arises from a combination of various communication processes within the organization and between the organization and its environment.

Conclusions

There is no absolute ideal organization, only for a specific culture, a specific environment and specific context. Therefore, an organizational structure will always be relative and context dependent. During the last decades, there was a transfer from data-based information systems to KBSs. Competitive differentiation in the industries and business is no-longer about automating transactions and record keeping, it is about activating and supporting knowledgeable interactions with customers and suppliers, as well as across functions within the enterprise.

There are mixed representations of knowledge, symbolic and connectionist representations, each of them with its advantages and disadvantages. Different modes of knowledge representation are a fundamental element of any KBS. The multidisciplinary of Artificial Intelligence is found in the origins of these knowledge representation methods. Some reasoning mechanisms admit only one knowledge representation method (e.g. logical reasoning). Others, on the contrary, are compatible with various types of representations. There is not an ideal representation. Choosing a method depends on the knowledge nature, the level of control to be exerted on reasoning and the type of the problem to be solved, as example diagnosis or planning.

While knowledge are created by people, organizations must motivate and support these creative processes, developing internal environments, specific to the organization, to support continuous innovation. In other words, organizations are required to mobilize the tacit knowledge created and accumulated at the individual level, to aggregate them in the form of knowledge goods available for the collective. When they exert this role, organizations must ensure five conditions for the spiral process of knowledge creation to be continuous, namely: (1) *intention* - is defined as an organization's aspiration to the own goals, and it is the base within the spiral. To create knowledge, an organization must support its employees by formulating this intention and proposing it to the employees. This is achieved by defining a mission or creating a strategy that can motivate employees to engage in knowledge conversion activities. (2) *autonomy* - everyone in the organization should be allowed to act according to their own motivation to access a range of new opportunities, to create and distribute knowledge. (3) *creative fluctuation and chaos* - fluctuation refers to the organization's ability to perceive and process differentially, in an adaptive way, a series of signals from the environment in order to increase their skills, knowledge and systems. The chaos is generated naturally from the outside, when the organization must cope with different real crisis, such as a decline in performance due to market changes or to a significant increase of the competitors'

performance. But chaos can also be generated from the inside, subjectively by some leaders, by proposing unclear targets, imprecise, even inaccurate. (4) *redundancy* - refers to the overlapping of some information on different business processes, management responsibilities or throughout the organization. The distribution of such redundant information supports the tacit knowledge distribution process, whereas at the individual level can be obtained interpretations of certain trends, in relation to the interest of other organization's members. Redundancy is an organization's internal control over the direction towards which it moves. Basically it can be implemented by joint participation of several departments at the same task (is a fuzzy way to work together) or through a strategic personnel rotation. (5) *variety* - the organization's internal diversity must reflect, in an own form, the environment's complexity, in order to meet challenges from the environment. To achieve this condition, any member of the organization should have quick access to a range of needed information, going through, as much as possible, a small number of stages.

To develop knowledge in the form of competitive advantage, a company must have a clear understanding of the internal knowledge, the forms and the nature of the processes involving knowledge. Knowledge within the organization can be individual or collective, tacit or explicit, heuristic, procedural, declarative, technical, in the mental models forms. A key factor in creating any kind of knowledge listed above is the technology. The use of technology solutions for certain items, belonging to the knowledge creation, is not a recent phenomenon. The different knowledge conversion sub-processes, all equally important, require common technological support. The implementation of such solutions would be useful for: (1) socialisation-e-meetings, chats or synchronous collaboration, groupware that allows knowledge transformation, (2) externalisation (which involves creating mental models)-dialogue, collaborative systems and conference technologies, (3) internalisation-audio presentations, views, (4) combination- classification, searching within documents, data mining, knowledge maps, ontologies. Technical advances in the processing and storage capacity of computers, together with the linkage of these computers into networks of distributed nodes, have greatly increased the capability of organizations to deliver goods and services. With these increased capabilities have come heightened expectations for quality, accuracy, responsiveness, and capacity. Particular topics of interest on KMSs include, but are not limited to: Organizational Knowledge Management approaches, Information management challenges, Service Oriented Architecture (SOA), software environments, Semantic web services environments, Information modeling and the representation of semantics, Intelligent software tools and services, Information management systems in practice.

The management must ensure the organization's internal and external integration (connection task), and organize the acquired information to produce knowledge and afterwards the desired behavioural routines (alignment task). Knowledge is the result of the connections and interpretations. In this situation, organizational knowledge can be imagined as a collection of representations, analogies and meanings that are the basis of most organizational behaviours. In

organizations, the communication and knowledge are inextricably welded: the first one creates the second, which further enriches the first. We communicate in order to know, and the knowledge is necessary to achieve our objectives. Once obtained, the knowledge assists the contacts' flow and multiplication, thus stimulating communication. Knowledge may indeed become a source of immense power, but only if it is associated with strong communications networks, to build intelligent organizations. An intelligent organization is characterized by: (1) as few as possible hierarchical levels. (2) organized as a network, matrix, constellation. (3) relations based on horizontal or bottom-up cooperation. Top-down cooperation refers more to hierarchy than to cooperation itself. A distributed organization juxtaposes a central body that maintains order and overall coherence of autonomous entities directly interconnected through horizontal information and collaboration open systems. This system highly exceeds a matrix organization, where horizontality is primarily organizational, not informational. Autonomous entities can fall within a hierarchical structure (company → directions → services → departments, etc.). What is important is that they cooperate and communicate with each other directly, without having to go through a central control body. Moreover, cooperation/communication is not only between the leaders of subordinate entities, but also between entities, regardless of which these are. Any member of an entity can interact with any member of any other entity without formerly obtaining the approval of his boss (regardless of his position in the entity's hierarchy). A distributed organization closely resembles with the organizational structure of the Internet, where the servers (which can be related to entities) are directly interconnected, without going through a central server. The evolution towards distributed organizations seems to be inevitable once everyone has access to collaboration systems that allow horizontal, crisscross interactions. Organizations that remain too hierarchical may soon crumble under the pressure created by these systems. This trend started with phone, fax, and the Internet which has exploded. Central coordinating items appear and disappear when making successive adjustments in response to environmental change. Companies wishing to increase their collective intelligence, must therefore make a priority from implementing collaborative intranets. We do not refer here to an intranet for information or communication, but one that provides real cooperation. A collaborative intranet allows information to flow through individual horizontal interaction, rather than a top-down central coordinated communications company. Information finds its way to right individuals, on appropriate levels. They do not need the same information level at the same time to produce collective intelligence. What matters is that information must be distributed. This information may reach to someone in the organization who really needs it, without requesting it.

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