A NEW LIFE CYCLE MODEL FOR PROCESSING OF KNOWLEDGE MANAGEMENT*

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ABSTRACT

This research focuses on the processing of knowledge management. The definition of knowledge management emphasizes the processes of knowledge in organizations, such as storing, collecting, structuring, sharing, controlling, creating, disseminating, codifying, using and exploiting. These processes do not have a hierarchical order in the literature of knowledge management. Therefore, the process of knowledge becomes incomprehensible in organizations. In this paper, the process of knowledge in organizations will be evaluated within a new model that is called “knowledge management life cycle”.

This model consists of five sequential steps, as knowledge creating, sharing, structuring, using and auditing. In the first step, tacit and explicit forms of knowledge are unfolded. In the second step, knowledge is shared in organization through social and technical communication infrastructures. In the third step, knowledge is (re)structured by mapping, storing, and retrieving. In the fourth step, knowledge is used in product, service, and work processes. Finally, in the fifth step, knowledge is audited in order to determine the flow of knowledge throughout the organization and measure the intellectual capital. In sum, a new perspective will be formed to redefine the conceptualization of knowledge management through developing “knowledge management life cycle” model.

Key words: Knowledge management life cycle, Knowledge management processing, Knowledge management-applications and discipline

1. INTRODUCTION

1.1. Literature Review on Knowledge Management Process

While describing knowledge management concept, it should be considered the process of knowledge in organizations such as storing, collecting, structuring, sharing, controlling, creating, disseminating, codifying, using and exploiting. These processes which are based on managing knowledge have been evaluated non-hierarchical order in the knowledge management literature and describe part of the knowledge management definition. Therefore, this study is aimed to deconstruct of knowledge management definition in organization and investigate how organization can apply knowledge management by taking in to consideration all details of knowledge processes in hierarchical order and how does this model can be maintained. For effective management of knowledge in organizations; the Chief Knowledge Officers should focus on the KM Life Cycle Model by considering knowledge processes.

According to Awad and Ghaziri (2004:24), there are four processes of knowledge management which are consist of capturing, organizing, refining and transferring. The capturing phase deals with knowledge capture and includes e-

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mail, audio files, digital files and the like. After the capturing phase, captured data or information should be organized in a way that can be retrieved and used to generate useful knowledge. One can use indexing, clustering, cataloguing, filtering, codifying and other methods can be used. The third process of knowledge management is refining. Data mining can be applied in this phase. Data mining takes explicit knowledge found in databases and transforms it into tacit knowledge. The last phase of knowledge management process is transfer. Knowledge should be disseminated or transferred by making knowledge available to employees via tutorials or guidelines for effective use.

Another knowledge management process in the literature is come from Becerra-Fernandez, Gonzalez and Sabherwal (2004:32-36). These authors define knowledge management process in 4 steps. These four KM processes are supported by a set of seven KM subprocesses.

The first step is ‘knowledge discovery’ which may be defined as the development of new tacit or explicit knowledge from data and information or from the synthesis of prior knowledge. The knowledge discovery step has two subprocesses as combination and socialization. The discovery of new explicit knowledge relies most directly on combination, whereas the discovery of new tacit knowledge relies most directly on socialization.

The second step of knowledge management process is ‘knowledge capture’ which may be defined as the process of retrieving either explicit or tacit knowledge that resides within people (individuals or groups), artifacts (practices, technologies or repositories) or organizational entities (organizational units, organizations, interorganizational networks). This step’s subprocesses are externalization that involves converting tacit knowledge into explicit forms such as words, concepts, visuals, or figurative language and internalization that transforms of explicit knowledge into tacit knowledge. 1

‘Knowledge sharing’ is the third step of Becerra-Fernandez, Gonzalez and Sabherwal’s knowledge management processes. Tacit or explicit knowledge is communicated to other organizational participants in this step and three important clarifications are in order. First, knowledge sharing means effective transfer, so that the recipient can understand it well enough to act on it (Jensen and Meckling, 1996). Second, what is shared is knowledge instead of recommendations based on the knowledge. Third, knowledge sharing may take place across individuals as well as across groups, departments, or organizations. As a result knowledge sharing step has got two subprocesses in the names of socialization and exchange. Socialization was explained in the Awad and Ghaziri’s study and exchange focuses on the sharing of explicit knowledge. It is used to communicate or transfer explicit knowledge between individuals, groups and organizations.

The last step of managing knowledge management process is ‘knowledge application’. This means making decisions and performing task perfectly in organizations. It requires knowledge utilizations benefits from two processes that do not involve the actual transfer or exchange of knowledge between the concerned individuals-routines and directions that are consist of subprocesses in this step. Directions refer to the process through which individuals possessing the knowledge direct the action of another individual without transferring to that person the knowledge underlying the direction. Routines involve the utilization of knowledge embedded in procedures, rules and norms that guide future behaviour.

O’dell, Grayson and Essaides (2003:25) emphasize the stages of knowledge transfer which is similar to knowledge management process. There are seven components in this model: organizing, sharing, adapting, using, creating, defining, and collecting. The study argues that if company would like to determine what they know, it firstly must espouse this model in turn. For instance, without collecting knowledge, creating stage is not possible to survive in

1 As it is remembered, the Socialization, Externalization, Combination and Internalization processes are called as SECI Model which is the part of knowledge creation theory model that belongs to Nonaka. For more information See Nonaka, I.ve Takeuchi, H. (1995). The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation, New York: Oxford University Press.
organization. Each of the stages depends on the other and not only exhibit in hierarchical order but also interact between each other.

Alavi and Leidner (2001), summarize the process of knowledge management in the context of information technologies such as knowledge creation, storage/retrieval, transfer and application. But this information technology perspective is not only limited to our understanding about managing knowledge but also misunderstand the concept of knowledge management application in organizations.

2. A NEW LIFE CYCLE MODEL FOR KNOWLEDGE MANAGEMENT

In accordance with knowledge management literature, five basic processes can be considered by managing knowledge. These can be defined as creating, sharing, structuring, using, and auditing in turn that is called “knowledge management life cycle” model. This model makes us to understand knowledge management processes in hierarchical order. Each model is explained in the following paragraphs.

Figure-1. Knowledge Management Life Cycle Model
2.1. Knowledge Creating

The first stage of managing organizational knowledge requires entering the ‘knowledge kitchen’. In other words, exploring knowledge creating stage where can be processed in organization leads us to focus which individual, group, and department on. Because if knowledge can not be created in organization; neither sharing nor auditing knowledge can be carried out.

There are too many knowledge creators in knowledge kitchen due to the fact that organization can not create collective knowledge by itself. Thus, organizational participants create knowledge through their intuition, ability, skills, behaviors, and work experiments. ‘Key players, departments and their interactivity can play a critical role in creating knowledge in organization’ (Nonaka, 1996:14).

Two forms of knowledge can appear while creating knowledge. These are tacit and explicit knowledge which are embedding in organization’s products, services and work processes after creating. “The explicit knowledge can be defined as words, diagrams, or photographs that can not convey information that can be understood by direct pointing, or demonstrating, or feeling” (Collins, 2001:71). Explicit knowledge is technical or academic data or information that is described in formal language, like manuals, mathematical expressions, copyright and patents. It is gained through formal education or structured study and codifies, stores, hierarchy of databases and accesses with high quality, reliable, fast information retrieval systems (Smith, 2001:315). Therefore, explicit knowledge is easy to structure and retrieval.

Another form of knowledge is tacitness which completely individual and collective (Polanyi, 1967). Tacit knowledge is a personal form of a knowledge, which individuals can only obtain from direct experience in a given domain. It is held in a non-verbal form, and therefore the holder can not provide a useful verbal explanation to other individual. Individuals and firms might choose to keep their knowledge tacit in order to prevent its transfer and diffusion and thereby, maintain a competitive advantage (Augier, Shariq, ve Vendelö, 2001:128).

Tacit knowledge includes relationship, norms, values, and standard operating procedures. Because tacit knowledge is much harder to detail, copy, and distribute, it can be sustainable sources of competitive advantage. What increasingly differentiates success and failure is how well you locate, leverage, and blend available explicit knowledge with internally generated tacit knowledge (Meyer, 1997). Nonaka emphasizes two dimensions of tacit knowledge. These are technical and cognitive. Technical dimensions covers the kind of informal personal skills of crafts often referred to as ‘know-how’. ‘Knowing-how’ is characteristic of the expert, who acts, makes judgments, and so forth without explicitly relecting on the principles or rules involved (Dictionary of Philosophy of Mind, 2003). Cognitive dimension consists of beliefs, ideals, values, schemata, and mental models.

In the knowledge kitchen, tacit knowledge is transferred by using for organization’s products/services and work processes and this conversion gives rise to competitive advantage between participants in business units. So the tacit dimension of knowledge frequently is purposely hidden by them. Hereby, the basic goal of knowledge management is to convert from tacit to explicit form of knowledge in organization through following participant’s human and social information processing (Sağsan, 2003).

There are some barriers that take place in knowledge creating stage (Krogh, Ichijo ve Nonaka, 2000:18-25). First is individual and the second is organizational level. The first barrier contains beliefs that people can not easily adapt to organization enough and the second is the need for a legitimate language, organizational stories, procedures and company’s paradigm (Berger ve Luckmann, 1967).

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2 'Knowledge kitchen’s is a metaphor which developed by me. It means ‘a place that all forms of knowledge can be processed’ and was used in the place of ‘knowledge creating process’ here.
2.2. Knowledge Sharing

The second important stage of knowledge management life cycle is knowledge sharing. Çapar (2005), emphasizes the ways and tools for effective knowledge sharing as follows:

- formal social communication network,
- informal social communication network,
- teamwork,
- communities of practices,
- organizational learning,
- rumors and,
- formal structured technological communication networks (e-mail, mobile communications, teleconferences, videoconferences, etc.).

Knowledge sharing involves creating knowledge by individuals and groups with their interactivity and connectivity in organizations. Knowledge sharing is carried out by social and technical communication channels. As Çapar argues that, in order to construct these channels effectively, it depends on the stability and durability of organizational infrastructure. If organizational infrastructure is suitable for aligning the knowledge management system infrastructure, the successful knowledge sharing can be carried out.

2.2.1. Constructing Social Communication Infrastructure

This infrastructure requires an effective interactivity between workers in informal ways. The main purpose of this infrastructure is not only converting tacit knowledge into explicit forms in the individual level, but also transmitting message from bottom to up and up to bottom in appropriate positions in the organizational level (Miller, 1999:13).

Three types of network should be constructed while designing social communication channel: oral communication, written communication, and nonverbal communication. The chief means of conveying messages is oral communication. Speeches, formal one-on-one and group discussions, and the informal rumor mill or grapevine are popular forms of oral communication. Written communication includes memos, letters, electronic mail, fax transmissions, organizational periodicals, notices placed on bulletin boards, or any other device that is transmitted via written words or symbols. Nonverbal communication entails body movements, the intonations or emphasis we give the words, facial expressions, and the physical distance between the sender and receiver (Robbins, 2003: 286-88). Knowledge management prefers all three forms of organizational communication because the effective knowledge management system requires all forms of knowledge such as written/verbal, explicit/tacit, audio/visual in organization.

Successful knowledge management strategies entail particularly grapevine communication networks on the grounds that these channels are more persuasive and reliable rather than formal communication channel because of supporting managers. This reliability brings about converting tacit knowledge into explicit forms easily and it is based on interactivity and connectivity between individuals in organizations.

2.2.2. Constructing Technical Communication Infrastructure

Technical communication infrastructure refers to information and communication technology. Information networks, technical communities of practice, internet, web-based networks, intranets, and extranets should be considered in this context. Participants can share their expertise knowledge through e-mail, in-group computerized communication networks, databases, telephone conversations (Davenport and Prusak, 2001:102). Technical communication infrastructure which is known as formal communication networks provide in sharing, structuring, classifying and organizing explicit/tacit knowledge in the environment. The best technological infrastructure for the best knowledge management application allows knowledge flow continuously, mapping information correctly, distributes data sources equally, exchanges information timely and contains intelligence agents and network mining
Nevertheless designing effective infrastructure in technological perspective permits to construct a good communities of practice that is “a group of practitioners who share a common interest in a specific area of competence and are willing to work together” (Rumizen, 2002: 88).

In summary, knowledge can be shared both social and technical communication infrastructure effectively. But it is considered that knowledge sharing is based on voluntarily and reciprocity. For this reason, before constructing these two channels for knowledge sharing, participants can be encouraged by reward systems through verbal communication style. For instance the workers who share their tacit and explicit knowledge can be evaluated a good performance in an organization.

Consequently matching voluntarily, reward system and performance appraisal are necessary for successful knowledge sharing which is also required by trust system because “participant feel they are being treated fairly for the intelligence, creativity, innovation, experience and passion they bring to their work. A fair exchange for knowledge may look somewhat different from culture to culture. Just as communities negotiate their roles and purpose, companies need to negotiate exchanges of knowledge that take place with everyone, both within the company and with the extended enterprise” (Allee, 2000: 14).

2.3. Knowledge Structuring

After constructing a perfect infrastructure system for knowledge sharing; data, information and knowledge should be structured in order to store in organization’s database for the future needs. Structuring knowledge is based on sorting, organizing, codifying, analyzing, and reporting information that provides information retrieval what organization needs in the future. Knowledge structuring is frequently processed by technical communication infrastructure which “includes structuring databases, organizing data for analyzing, taxonomy of data, clustering/managing databases” (Awad and Ghaziri: 2004: 334-38).

Knowledge structuring categorizes data and information through certain types of classification tools and enables for retrieving this information timely. This means that mapping, storing and retrieving information are three important components of knowledge structuring. First is mapping information that refers to determine organizational information sources and what participant knows. In other words mapping knowledge puts forward determining textual/graphical, audio/visual, tacit/explicit forms of knowledge and finding suitable information sources in organizations. A good knowledge mapping benefits from second hand information to the first hand and making knowledge inventory available to overall organization. Second is information storing that contains knowledge repositories such as databases, data warehouses, and information centers and indicates electronic environment of organizational memory. Third is the most critical factor in structuring knowledge that is called information retrieval. In this stage, knowledge is stored and retrieved via information retrieval systems such as surrogates, user interface, Boolean logic, Fuzzy logic, Vector query, and Extended Boolean logic. The aim of information retrieval is to access retrospective information of organization and to share for all users who need information.

2.4. Knowledge Using

Organizations use knowledge for three reasons: 1) Knowledge can be used for determining organization’s work processes and making strategies for sustainable competitive advantage. 2) Knowledge can be used for designing and marketing product. 3) Knowledge plays a critical role of organization’s services quality (Nonaka, 1995).

Also, Alavi emphasized that knowledge can be used through three basic mechanisms: Directives that refers to specific set of rules, standards, procedures, and instructions developed through the conversions of the specialist’s tacit knowledge to explicit and integrated knowledge for efficient communication to non-specialist. Organizational routines refer to the development of task performance and coordination patterns, interaction protocols and process specifications that allow individuals to apply and integrate their specialized knowledge without the need to articulate and communicate what they know to others. Self-contained task teams refer to task uncertainty and complexity prevent the specification of directives and organizational routines, teams of individuals with
prerequisite knowledge and specialty are formed for problem solving (Alavi, 2001:122). Like knowledge structuring, knowledge using is also based on information technology. For this reason, if individuals would like to use information effectively, they firstly should be information literacy.

2.5. Knowledge Auditing

Knowledge auditing means what amount of knowledge can be used in organization’s products, services and processes. This knowledge management life cycle stage refers to the capacity of information processing in organizations. In other words, what amount of information and knowledge are created, shared, stored, and used in organization in a certain time helps us to determine information capacity in organizations.

The knowledge audit provides value when company is doing one or more of the following:

- devising a knowledge-based strategy,
- architecting a knowledge management blueprint or roadmap,
- planning a build a knowledge management system,
- planning research and development,
- seeking to leverage its ‘people assets’
- facing competition from knowledge intensive competitors that are far ahead on the learning curve,
- striving to strengthen its own competitive weakness
- looking for direction for planning a market entry or exist strategy (Tiwana, 2000:242-43).

Another critical factor for auditing knowledge in organization is measuring intellectual capital, intangibles such as information, knowledge and skills that can be leveraged by an organization to produce an asset of equal or greater importance than land, labor and capital.

When we look at the perspectives of knowledge management application in organization, this life cycle model is to encourage Chief Knowledge Officer how knowledge management should be succeeded. The Model brings us to reinvestigate what new management style gains competitive advantage and survive organizational capability in uncertainty environment. Obviously, the answer is knowledge management. Because it is not only a new style of management, but also it is a new business model that focuses on knowledge-intensive works in organizations. Furthermore, most of the important large-scale companies are aware of the importance of knowledge management and they systematically adopt this new business model such as Andersen Consulting, Boeing, British Petroleum, Buckman Laboratories, Chaparral Steel, Chase Manhattan Bank, Chrysler, Coca-Cola, CSIRO, Dai-Ichi Pharmaceuticals, Dow Chemical, Ernst & Young, Ford, GM, HP, Hoechst-Celanese, Hoffmann-LaRoche, Hughes Space and Communications, IBM, IDEO, McDonnell Douglas, McKinsey & Company, Microsoft, Mobil Oil, Monsanto, National Semiconductor, Nynex, Owens-Corning, Sandia National Laboratories, Sematech, Senco Products, Sequent Computer, Skandia, Teltech, Texas Instruments, 3M, Time Life, USA Army, Young & Rubicam.

3. CONCLUSION: BEYOND THE APPLICATION OF MANAGING KNOWLEDGE

Knowledge management application begins with creating knowledge in two forms, tacit and explicit; and goes on knowledge sharing through social and technical communication infrastructure. After sharing, it is needed to structure knowledge at three stages for the retrospective usage: 1-information mapping, 2-information storing and 3-information retrieval. Structured knowledge is ready for using the organization’s products, services and work processes that gains competitive advantage, increases innovative capacity and R&D in organizations. Knowledge auditing is the last stage of knowledge management life cycle in organization as an application. Through this stage, organization can realize the amount of data, information and knowledge by measuring intellectual capital.

As we understand the model of knowledge management life cycle, this new business model or management style consists of comprehensive processes. Therefore, in order to manage these processes, it is needed a new position in
organizations that is called “Chief Knowledge Officers”. The position, briefly leads for managing all forms of knowledge in organization. Hence, knowledge management goes beyond application in the literature so it can be defined as a new discipline: The conceptualization of knowledge management both as application and discipline should include the following expressions:

- Knowledge management includes five basic steps in hierarchical order: creating, sharing, structuring, using and auditing.
- Each of these steps has subprocesses as we see in Figure-1.
- Knowledge management contributes to organizational intellectual capital and innovation capacity.
- Chief Knowledge Officer leads the application of knowledge management with knowledge management team that consists of specialists, chief information officers, communication specialist, consultants, web designer. In order to lead knowledge management, Chief Knowledge Officer needs a comprehensive undergraduate education within the frame of the discipline.
- Knowledge management is interdisciplinary science that requires at least three basic areas’ of information: business management, communication and technology. Business management information is necessary for knowledge management because it applies all forms of organization and entails to know organizational strategies, procedures, policies and etc. Knowledge sharing requires all types of communication between individuals, groups and departments. And finally technology is necessary for applying knowledge management system architecture that composes seven layers: web client, access and authentication, collaborative filtering and intelligence, application, transport, middleware and legacy integration, repositories.

BIBLIOGRAPHY


