

THE ROLE OF INFORMATION TECHNOLOGY IN KNOWLEDGE MANAGEMENT

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Abstract

Knowledge is a vital resource for corporate competitiveness and there are number of information technology solutions that provide support to knowledge management. One of the relevant issue to be discussed is- Role of IT in success or failure for implementation of KM. The purpose of this study is to explore the role of technology in facilitating knowledge management. Moreover study also provides an insight about the tools and techniques used for implementation of KM and IT's role for enabling KM.

Keywords: Knowledge, knowledge management, IT.

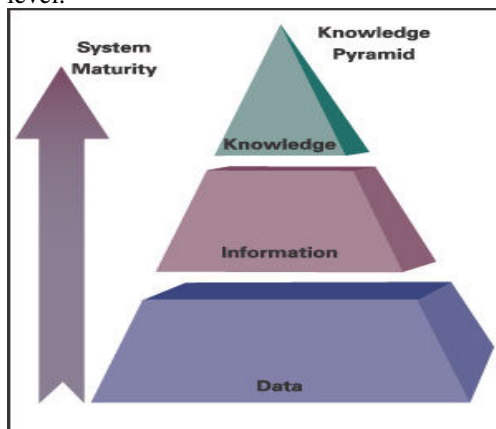
Introduction

Survival and success of any organization depends on organization's adaptability to the changing business environment. The competitive environment is no longer predictable and it is changing rapidly in terms of complexity and uncertainty. In consequence knowledge Management (KM) has been recognized as a source for enhancing organization's capabilities resulting in success of the organization. For understanding knowledge Management it is important to distinguish knowledge from information. Thus we can say:

1) Information consists of facts and data describing a problem and knowledge covers truths and beliefs, concepts and Know-how.

2) Information relates to description or definition while knowledge comprises of strategy, practice, method or approach.

We cannot consider data and information as knowledge until we grill the facts and values from it. In the hierarchy knowledge is at the highest level, information at the middle level and data at the lowest level.



We initially started with data processing in 1960s moved on to information age in 1980s and finally reached knowledge age in 1990s where knowledge Knowledge management is difficult concept to define and it is a multifaceted concept for different circumstances and for different people.

The American Productivity and Quality Center defines knowledge management as "the strategies and processes of identifying, capturing and leveraging knowledge"(Atefeh et al 1999, p. 172).

Management is an emerging framework of four process sets involved in knowledge creation, knowledge collection, knowledge organization, Knowledge refinement and knowledge dissemination (Alavi and Leider 2001).

Another way to perceive Knowledge management is as management of organizational memory, assisted by an organizational memory information system (OMIS) that supports the fundamental activities leading to organizational effectiveness (Stein and Zwass 1995).

In KM focus is on "Doing the right thing" rather than "doing things right" so that core competencies do not become core rigidities in future (Malhotra 2000).

IBM and Lotus defined knowledge management when entering into the knowledge management arena: "a discipline that systematically leverages content and expertise to provide innovation, responsiveness, competency, and efficiency" (Pohs, 2001). While Microsoft states that "Knowledge management is nothing more than managing information flow; getting the right information to the people who need it so they can act on it quickly" (Gates, 1999).

Here we see number of ways to perceive KM emphasizing on its different aspects but it is also evident that researchers and practitioners do not agree on any single definition that can be taken as the standard definition of KM.

However each definition agrees on certain viewpoints as:

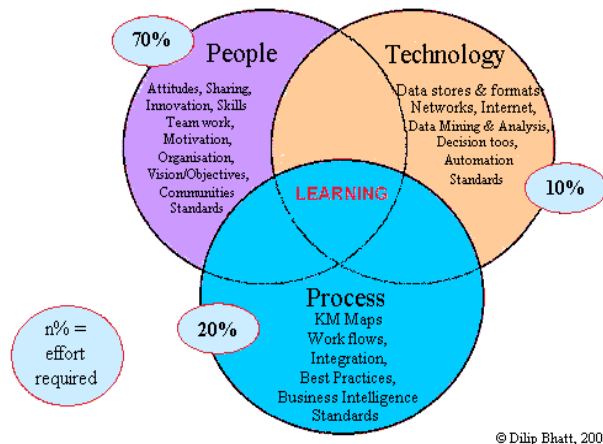
- Knowledge is embedded in processes, products and services.
- Knowledge is represented in database and documents.
- Knowledge is transferred and shared in the organization.
- Knowledge can be accessed by outsourcing.

Successful KM gives access to better information needed to do a job, although it does not provide answer to the problem it facilitates the learning of the answer. (Dean Call, 2005)

The Knowledge organization – components and conceptual structure

KM involves people, process and technology as overlapping components. Any of the three KM components is not focused alone, all are considered in tandem for decision making process. KM yields maximum benefits only when all the implications of decision making process are addressed.

Knowledge Components



Source: <http://www.eknowledgecenter.com/articles/1010/1010.htm>

Moreover, KM components can be correlated with effort required as shown in fig-2. People/cultural issues are 70% of the effort required, process is 20% and technology is 10%. But this does not imply that technology is least important however it is easiest and quickest to implement.

Now, if we consider the conceptual structure of knowledge organization, it consists of three layers. The middle layer addresses KM life cycle- Knowledge collection, Knowledge organization, Knowledge refinement and knowledge dissemination. The outer layer is the organizational environment consisting of technology, culture, supplier and customer intelligence and competition and leadership. The inner most layer is knowledge organization which drives knowledge from several resources.

Any business expertise that is in form of documents or databases (explicit knowledge) or residing in people's head (tacit knowledge) can be captured by

KM process. 95% of information is stored as tacit knowledge which helps business in winning unpredictable and competitive situations.

In an ideal knowledge organization, people exchange knowledge across functional areas of business by using technology and established process.

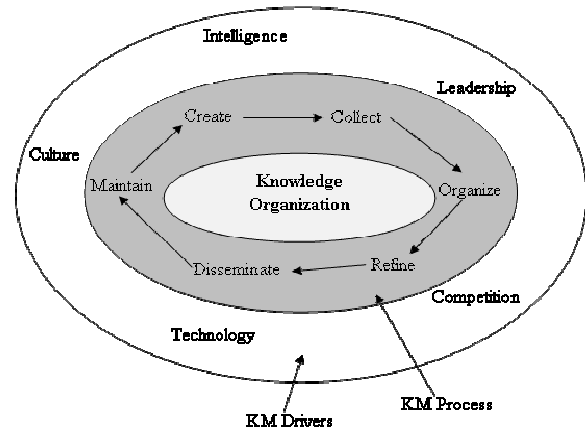


Fig-2
Background

In this section we will discuss about the evolution of discipline of KM. Our main focus here is to study the correlation between increased development in technology and social mechanisms that supports the activities of knowledge organizations.

a) Integration of technology and KM

Technology has provided a major stimulus to KM by implementation of KMS. IT that provides support to KM include databases decision support systems, enterprise resource planning systems, expert systems, management information systems, lesson learned systems and many others. Moreover social mechanisms also support KM. Examples of such KM mechanisms are On-Job training, learning by observation, face to face meetings, mentoring for knowledge sharing and employee rotation among departments.

b) A transition from organizational learning to KM

Organizational learning(OL) takes place either by learning of its members or incorporating new members who already possess knowledge that organization was not having earlier.

Learning is an organizational-level process and organizations learn from the results that are obtained from the behavior of members. The convergence of OL and KM started in 1996 and it was introduced in same paper by (Ponzi, 2002) for distinguishing the two concepts. OL and KM are the processes that facilitate knowledge change.

OL researchers see KM as a part of OL (Gibbs and Keysl 1998; Ponzi 2002) on the other hand KM researchers consider KM beyond OL (DiBella and Gloud 1995; Ponzi 2002).

The shift from OL to KM involves three milestones. First OL focuses on knowledge creation and its transfer while KM literature focuses on capturing knowledge and its application. Second, OL emphasize on maximization of individual potential by the self development process. On the other hand KM focuses on individuals and their networks for the gains of the organization. Finally, OL focused on social and structural aspects and KM identifies the importance of technology in creation sharing and application of knowledge. (Sabherwal and Sabherwal, 2006).

c) Increased implementation of KM across Organizational process

KM is important for creation of organizational structure, various organizational tasks and processes that potentially lead to the new knowledge discovery. Willet, 2000 states that the increased embedding of KM in all walks of organizational life may also be seen in the emergence of knowledge repository as a new driver of behavioral norms in organizations.

In addition, today’s model Knowledge-intensive organization is expected to have highly sophisticated communication and computing devices that facilitates multimedia integration for capture, process, display and storage of information.

In contrast to hierarchical organizations the knowledge communities in the knowledge intensive organizations are interconnected via groupwares. They also use advanced groupware facilities for conducting meetings, creating multi-author documents and for accessing data and knowledge from knowledge repositories.

Role of IT

One of the fundamental questions in KM is about the role of IT in KM organizations. It is a debatable topic and involves issue, whether IT is evitable (McDermott and O’Dell, 2001; Hibbard and Carillo, 1998) or inevitable component (Duffy, 2000; Lang, 2001) of KM? Does technology forms a part, only a part of KM? Is IT a key component of KM and is it as important as people and process components?

There are a number of perspectives that answer the above stated questions. We now discuss different views about the role of IT in KM in literature.

A considerable portion of KM projects fail in spite 94 percent of companies considered KM to be strategically important for their business (Kleindl 2003). Some others report the failure rate is as high as 70% (Rossett, 2002). The obvious question to be answered is how can so many companies fail at something that is so important to them?

After all KM is simply about good sense and managerial basics. For KM projects to be successful

an appropriate balance of technology, process, people and content is needed and should be supported by proper strategy and change program. Companies must have a clear understanding of what KM entails or how to manage knowledge.

There are many views that researchers and practitioners have given about the role of technology in KM.

According to Davenport and Prusak (1998) technology is least important when compared to organizational and human issues.

“Usually people begin a KM project by focusing on the technology needs, whether they want a database or a portal. But the key is people and process” (Kaplan, 2002).

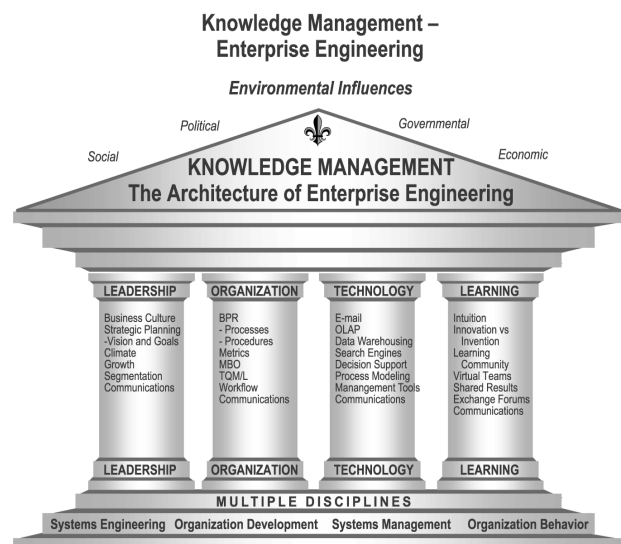
Knowledge cannot, by definition, be converted into an object and “given” from one person to another . . Information technology, while critical for enabling the spread of information, cannot capture and store knowledge. Only people can do that (Senge et al., 1999).

Reneker and Buntzen (2000) discuss that KM visualizes people as primary knowledge managers rather than conceptualizing KM as set of practices to enhance utilization of knowledge.

While some others argue:

Duffy (2000) consider IT as playing its role in managing, storing and accessing documents and databases, but for any KM project to be successful IT professionals should be well aware about the various knowledge management processes. IT when integrated with KM processes becomes a major player in companies for KM processes.

Stankosky and Baldanza (2000) in their conceptual framework have clearly stated that technology is one of the pillars of KM along with other pillars of organization, leadership and learning.



Source: © Stankosky et al. (1999)

IT related issues have also been described in Nonaka and Takeuchi model and Perez-Bustamante (1999) has defined technology as applied knowledge for catering the market needs.

On keeping in view the basic idea discussed by Renker and Buntzen (2000) (discussed earlier)

practitioners should analyze and select KM tools very carefully to anticipate their benefits in implementation of KM projects and IT has to be a balanced and integrated part of KM projects for complete success.

There is never ending debate about the role that information technology play for knowledge management. On one hand IT is used as a medium for flow of knowledge that supports communication, collaboration knowledge seeking enabling collaborative learning (Ngok, 2005). On the other hand KM academicians warn management people about the huge investment in IT at the expense of human capital (Sveiby, 1997). This may lead IT driven KM strategies converting knowledge into static and inert information disregarding the role of tacit knowledge and this inturn can bring back the earlier organizational motto "More IT, less people".

More precisely speaking incorporating IT to scale up KM projects seems unavoidable (Lee and Choi, 2003). The best solution about applying IT to KM is to have the awareness about the limits of IT that can give most optimum results for KM. Another fact worth mentioning here is that any IT deployment will not be completely successful until accompanied by cultural change towards knowledge values.

Therefore, technology support is necessary for KM in an organization. Knowledge projects are likely to succeed when a sophisticated technology infrastructure is adopted. IT infrastructure includes E-mail, document management, data warehousing, workflow software, decision support system etc.

KM is useless for competitive purposes until communication and application system supports the various business operations. Moreover, knowledge creation, seeking and dissemination are improved by IT and IT is also an important facilitator for storing and sharing organizational knowledge.

So, we can conclude from the above discussion that IT is an indispensable enabler of KM.

KM Enablers

Knowledge management system is an integration of information technologies for capturing, organizing, transferring and distributing knowledge. Implementation of enterprise wide Knowledge management system is not a simple task but a well designed KMS has benefits like accessibility, availability, timeliness. A knowledge management system must be open, distributed, customizable and secure to effectively meet the needs of the organization.

New knowledge management products are introduced in the market and the existing products are being modified so that they can be reintroduced as knowledge management products. Computer applications has addressed various aspects of knowledge management for years but there is no single technology that fills the criteria for KMS, because KM is not solely about technology it also

includes aspects of organizational learning, information science, training, change management, business process analysis, motivation and interpersonal communication. The following technologies contribute in organization's knowledge management environment:

- a) **Intranets-** Intranets have wide spread across organizations for sharing dynamic information. Intranet can be divided into two components namely the technology infrastructure and web server. Technology infrastructure includes universal web server, thin client, HTML format, IP networks and web server is the repository for content. The web server and web browser have enabled greater access to information for groups of knowledge workers and application developers.
- b) **Document management systems-** Document management system are repositories for organization's document or explicit knowledge in an organization. These systems are mainly used for creating, processing and reviewing documents. Some of the organizations are approaching organization wide KM based on document management. Document management systems are vital knowledge repositories that must be integrated into knowledge infrastructure of an organization. However they are not used as the complete basis for the knowledge management system as knowledge workers resist to use highly structured document management process for creating and processing complex documents.
- c) **Information retrieval engines-** Information retrieval from corporate text repositories or searching through intranet exist in many organizations as a knowledge silo. Vendors are continuously adding new features as relevancy ranking, natural language querying, summarization, preferential searching and others for satisfying the needs of information seekers and precision of finding the information.
- d) **Groupware and Workflow systems-** Groupwares are used in the organization for communicating and collaborating among workgroups and departments in formal or adhoc conversations when users cannot communicate in real time. So it can be rightly said that groupwares are important technology for exchanging and enhancing tacit knowledge. On the other hand the workflow systems are used for codification of knowledge transfer processes. As an example proposal generation system can be considered where workflow system facilitates preparation of structured and ordered information and its review.

- e) **Brain storming applications-** are used to convert tacit knowledge to explicit knowledge. These applications are useful knowledge creation tools that help in categorizing, organizing and identifying knowledge resources.
- f) **Data warehousing and mining tools-** Organizations create data warehouse and provide the managers with data mining tools to take decisions based on increasingly complex set of data. KMS provide access to data ware houses by open database connectivity and structured query language. Data mining tools also provide access to reports to the users based on subject area which they are investigating.

Conclusion

The study in this paper mainly concentrates on the technological aspects of Knowledge management and we can conclude from the above discussion that Organizations have recognized the value of utilization of knowledge that resides and being created within the organization long back. They have been practicing Knowledge management by the use of IT. Organizations have used a wide variety of methods for the knowledgemanagement, as there are no standard methods for its implementation. The best way to achieve Knowledge goals is to start with the existing structures and methods and then apply them effectively to achieve theknowledge goals.

IT supports the categorization and collaboration of explicit forms of knowledge at low cost(Pinho, Rego, (2012)). Moreover, information technology is “an important enabler for KM initiatives in organizations with the usual caveat that the KM problem has other significantsocial and cultural dimensions” (Davenport and Prusak, 1998).

We can also conclude that IT is an important facilitator for improving the dynamic capabilities of an organization.

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