

Knowledge Management: An Introduction

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ABSTRACT

Knowledge management (KM) deals with a sequence of processes that involve the storage, management, sharing, and the usage of an organization's knowledge and information. This is mainly for the efficient storage of organizational knowledge for maximum utilization. It is a well known fact that knowledge is very crucial for the functioning of an organization as this helps to facilitate decision-making, problem-solving, and innovation. Knowledge management process has evolved with advancements in technology and information storage methods. A successful KM process needs to be tailored towards unique needs, having a good understanding of the organization's structure, anticipating obstacles, and leveraging effective tools. A knowledge management system (KMS) is a software designed to facilitate the creation, organization, sharing, and utilization of knowledge within an organization – for overall organizational efficiency. This paper looks at the benefits, importance, challenges, and the future for KM and KMS.

KEYWORDS: Knowledge management, knowledge management system, personal knowledge management, knowledge engineering, knowledge acquisition, knowledge-based systems

INTRODUCTION

The ability to manage knowledge is now very crucial as we are in a knowledge-based economy. In the 1950s, about half of all workers in industrialized countries were making or helping to make things, but in the 2000s only a small percentage of all workers were dedicated to industrial work. This is due to the fact that as the demand for knowledge work increases, so does the complexity of the management of this knowledge. Furthermore, knowledge is being viewed as a commodity or an intellectual property/asset, but there exist some paradoxical characteristics of knowledge that are radically different from other valuable commodities, such as:

- Using knowledge does not consume it.
- Transferring knowledge does not result in losing it.
- Knowledge is abundant, but the ability to use it is scarce.
- Much of an organization's valuable knowledge walks out the door at the end of the day [2].

However, with the advent of the Internet, we have access to unlimited knowledge, but we need to

determine what is useful and that which is not. A great organization is one that learns, remembers, and acts according to the best available information, knowledge, and processes. The two key factors in competitiveness are the ability to: 1) create and, 2) diffuse knowledge. Therefore, the ownership of knowledge as well as the ability to use the knowledge to create or produce goods or services is what defines a successful organization [2].

HISTORY OF KNOWLEDGE MANAGEMENT

Knowledge management (KM) efforts have a long history, which include on-the-job discussions, formal apprenticeship, discussion forums, corporate libraries, professional training, and mentoring programs [3-5]. The increasing use of the computers in the second half of the 20th century has led to the specific adaptations of technologies such as knowledge bases, expert systems, information repositories, group decision support systems, intranets, and computer-supported cooperative work to further enhance such efforts [3].

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The term “personal knowledge management” was introduced in 1999, which refers to the management of knowledge at the individual level [6]. In the enterprise, the early collections of case studies recognized the importance of knowledge management dimensions of strategy, process and measurement [7, 8]. Some very important lessons learnt include people and the cultural norms that influence their behaviors are the most critical resources for successful knowledge creation, dissemination and application; cognitive, social and organizational learning processes are essential to the success of a knowledge management strategy; and measurement benchmarking and incentives are necessary/essential to accelerate the learning process and to drive cultural change [8].

Furthermore, the history of knowledge management (KM) is brief because it is a relatively new discipline that started in the 1970s due to papers published by management theorists like Peter Drucker and Paul Strassman, based on how information and knowledge could be used as valuable organizational resources, as shown in Figures 1 and 2. Dorothy Leonard-Barton of Harvard Business School also contributed significantly to the development of the theory of KM and the growth of its practice.

Late 1970s was when Everett Rogers at Stanford and Thomas Allen at MIT, pioneered studies on information and technology transfer that led to a better understanding of many facets of organizational knowledge cum the usage of computer technology to store this knowledge, as shown in Figure 3. In 1978, Doug Engelbert introduced knowledge management system (KMS) which was named “Augment,” an early hypertext/groupware application system that interfaced with other applications and systems. Another KMS introduced by Rob Acksyn and Don McCracken, in the 1970s and before the world wide web, was called the Knowledge Management System.

In the 1980s came the increased understanding of how knowledge served as a competitive organizational asset, while many companies have not strategized to incorporate the knowledge concepts and how to effectively manage organizational knowledge. Despite all these, theorists like Peter Drucker, Matsuda and Sveiby have written a lot about the knowledge worker, resulting in the concepts of knowledge acquisition, knowledge engineering, and knowledge-based systems.

It was during the 1990s that KM began to grow to become a major focus in many local and global companies. With the publishing of the book by Nonaka and Hirotaka Takeuchi titled, “The

knowledge creating company: How Japanese Companies Create the Dynamics of Innovation,” then was knowledge management given more attention. By mid-1990s many companies then began to realize a competitive edge as a result of increased company knowledge assets. The end of the 1990s was said to be the phasing out of the total quality management (TQM) and business process re-engineering initiatives and the implementation of knowledge management solutions [9]. According to O’Leary, KM is defined as the “Organizational efforts designed to: (a) capture knowledge; (b) convert personal knowledge to group-available knowledge; (c) connect people to people, people to knowledge, knowledge to people, and knowledge to knowledge; and (d) measure that knowledge to facilitate management of resources and help understand its evolution” [9], as shown in Figure 4.

FORMS OF KNOWLEDGE

The three forms of knowledge are [2]:

1. Explicit knowledge: This is information in tangible form such as books, newspapers or articles.
2. Implicit knowledge: This does not originate in a tangible form, but can be transferred into tangible form, such as the dictation of a speech or an experience.
3. Tacit knowledge: This is information that is difficult to capture in a tangible form such as someone’s perception of an experience or a feeling after a big event.

The field of KM mostly relies on explicit knowledge, also called formal or codified knowledge. Implicit knowledge is the practical application of explicit knowledge – which is the best practices and skills that are transferable from job to job, and the best way to perform a task with results. Implicit knowledge can eventually become explicit or tacit or both.

KM is a continuous cycle of three processes:

1. Knowledge creation and improvement
2. Knowledge distribution and circulation
3. Knowledge addition and application.

The success of any organization depends on how it continually reinvents itself, and while employees should know how to access and share knowledge within the organization. Learning from the past will lend credence to enhance future performance. Some common KMS are:

- Cross-training programs
- Content management systems (CMS)
- Documented management systems
- Chatbox
- Social networking tools

THE IMPORTANCE OF KNOWLEDGE MANAGEMENT

Poor knowledge-sharing practices is said to have cost Fortune 500 companies about \$31.5 billion dollars annually. This is also coupled with a survey published in the book, Critical Knowledge Transfer, it was estimated that losing a key employee can carry with it a knowledge-related cost of up to \$1 million dollars per employee. Furthermore, when employees quit and retire, they take with them decades of company knowledge. Where the organization may even train those that replace them, the departing employees are never able to pass on everything, because much of their knowledge is tacit knowledge. Computer hard drives can fail, and devices can be stolen too. In transferring tacit information, some people are better at it than others. Therefore, knowledge management is important, because of these situations [1, 2], as shown in Figures 5 and 6.

Some of the benefits of knowledge management are that [10]:

- It helps to encourage a culture of collaboration, allowing employees to share expertise and ideas, and work towards common goals.
- Access to organized knowledge and information helps employees work more efficiently, avoiding duplication of effort and making better-informed decisions.
- Employees feel empowered and engaged in their work, and experience a sense of fulfillment leading to employee retention.
- It enables faster problem-solving and the generation of innovative ideas, leading to improved solutions and competitive advantage.
- Having access to accurate and up-to-date knowledge supports informed decision-making at all levels of the organization.
- It promotes a learning culture within the organization, fostering continuous learning and professional development.
- It ensures that valuable information is not lost when employees leave or retire, preserving critical knowledge for future use.
- It effectively streamlines processes, leading to cost savings and reduced errors.

KNOWLEDGE MANAGEMENT GOAL

A major hurdle in the implementation of a knowledge management system is getting employees to embrace it. This is as a result of fear that sharing their knowledge will reduce the value that they provide and put their jobs at risk, and/or that a new system will take up too much of their time. This tantamount to the

fact they are comfortable with the old ways of doing things and do not want to adopt another tool or process into their workflow (i.e. resistance to change). It therefore follows that to attain success, the company must create a company culture that prioritizes knowledge sharing as very crucial. The overall goal of KM should be to drive positive business and employee outcomes [2].

KM TECHNOLOGIES

Knowledge management technology can be categorized into [5]:

1. Collaborative software (Groupware).
2. Workflow systems
3. Content management and document management systems
4. Enterprise portals
5. eLearning
6. planning and scheduling software
7. Telepresence
8. Semantic technology such as ontologies

KNOWLEDGE RETENTION

Knowledge retention, as a part of knowledge management, helps in converting tacit form of knowledge into an explicit form. This is a complex process which aims to reduce the knowledge loss in the organization [11], and the loss of intellectual capital [12]. Knowledge retention strategies are divided into four major categories which are [13]:

- Human resources, processes and practices
- Knowledge transfer practices
- Knowledge recovery practices
- Information technologies used to capture, store and share knowledge.

KNOWLEDGE AUDIT

Knowledge audit is the comprehensive assessment of an organization's knowledge assets, including its explicit and tacit knowledge, intellectual capital, expertise, and skills. This helps to identify the organization's knowledge strengths and gaps, and to develop strategies for leveraging knowledge to improve performance and competitiveness, thereby enhancing organizational effectiveness and efficiency [14].

Knowledge auditing is the examination of what people in an organization know, how well they know, and how they share that knowledge; and when there is no clear structure for sharing information within an organization, people start working in isolation, resulting in "information silos" and work duplication, leading to inefficiency and wasted productivity. The four components of a knowledge audit are as follows [15]:

1. Knowledge needs analysis.
2. Knowledge inventory analysis.

3. Knowledge flow analysis, and
4. Knowledge mapping.

KNOWLEDGE PROTECTION

Knowledge protection is the behaviors and actions taken to protect the knowledge from unwanted opportunistic behavior for example appropriation or imitation of the knowledge [16]. Knowledge protection is used to prevent the knowledge to be unintentionally available or useful for competitors, which could be in the form of a patent, copyright, trademark, lead time or secrecy held by a company or an individual [17].

Knowledge protection methods could be: formal protection, informal protection, and semi-formal protection; and organizations could use a combination of formal and informal knowledge protection methods [18].

The balancing of knowledge protection and knowledge sharing is said to be a critical dilemma faced by organizations today. Knowledge sharing can lead to innovation, collaboration, and competitive advantage, protecting knowledge can prevent it from being misused, misappropriated, or lost. Finding the right balance between knowledge sharing and knowledge protection is a complex issue that requires a nuanced understanding of the trade-offs involved and the context in which knowledge is shared or protected [19, 20]. Information security is essential in helping organizations protect their assets whilst still enabling the benefits of information sharing. Despite implementing effective knowledge management strategies, organizations can protect valuable intellectual property while also encouraging the sharing of relevant knowledge across teams and departments [19].

However, knowledge protection also has its own risks. The four major risks associated with knowledge protection are:

- Overprotection – this occurs when intellectual property rights are too broad or too strict, which prevents others from building upon existing ideas and stifling innovation as noted by Rouyre and Fernandez [21].
- Misappropriation – this refers to the unauthorized use or theft of intellectual property, which according to the World Intellectual Property Organization (WIPO) can result in significant financial losses for individuals and organizations [22], which can occur as a result of leaked confidential information, stolen trade secrets, or patent being infringed upon.
- Infringement claims.

- Inadequate protection.

BARRIERS TO KNOWLEDGE MANAGEMENT

Knowledge management effort can fail due to a number of reasons. It usually starts with a “people problem.” According to the American Productivity & Quality Center (APQC) research, the biggest barriers that hurt KM implementations are awareness, time and culture. This is because people are not aware of the tools and the approaches available to them, nor have (or make) time to participate, or unwritten rules and assumptions that make KM participation difficult or unappealing [23]. Other challenges include unsupportive technology, resistance to change, duplicate or false information, and lack of management contribution

According to a KM research in Indian manufacturing industries, 30 enablers and 25 barriers were identified and ranked on the basis of questionnaire-based survey – this indicated that “team building and knowledge variety”, “employee knowledge”, and “knowledge integration” as the most important enablers and “pressure for conformity”, “issue of common language required to integrate complex knowledge”, and “employee turnover” as most important barriers [24].

CONCLUSION

As crucial and important knowledge protection is to the promotion of innovation, creativity and efficiency to organizations, it also has some risks. Some of the risks are overprotection, misappropriation, infringement claims, and inadequate protection. All necessary steps must be taken to protect intellectual property of individuals and organizations, but should as well consider the potential risks and benefits of such protection.

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Figure 1 Knowledge Management.

Source:https://www.google.com/search?sca_esv=f874f96aa109150a&sxsrf=ADLYWILcJJwg4UvBlpzrlqWJc2h1512MUA:1724934181487&q=images+on+knowledge+management+by+wikipedia&tbm=isch&source=lnms&fbs=AEQNm0Aa4sjWe7Rqy32pFwRj0UkWERaHdBms7t-tHL1116ec0FnDIxrxgGhNFSZEtYqV91QqM6LWlRlFWKmjC_P6yIDKkCHq3GGQ94mnVKDr-jOCiy2E3tlg6qO-sP11UqL1C5r99KqIUftXdoCN1t2Cz778C3wfExfN-rSe2Xnhompvb6-p7NU&sa=X&ved=2ahUKEwig5pfJmJqIAxUeVKQEHTGuHZ8Q0pQJegQIDxAB&biw=1366&bih=580&dpr=1#imgcr=TWIbxe8f2-ZjXM

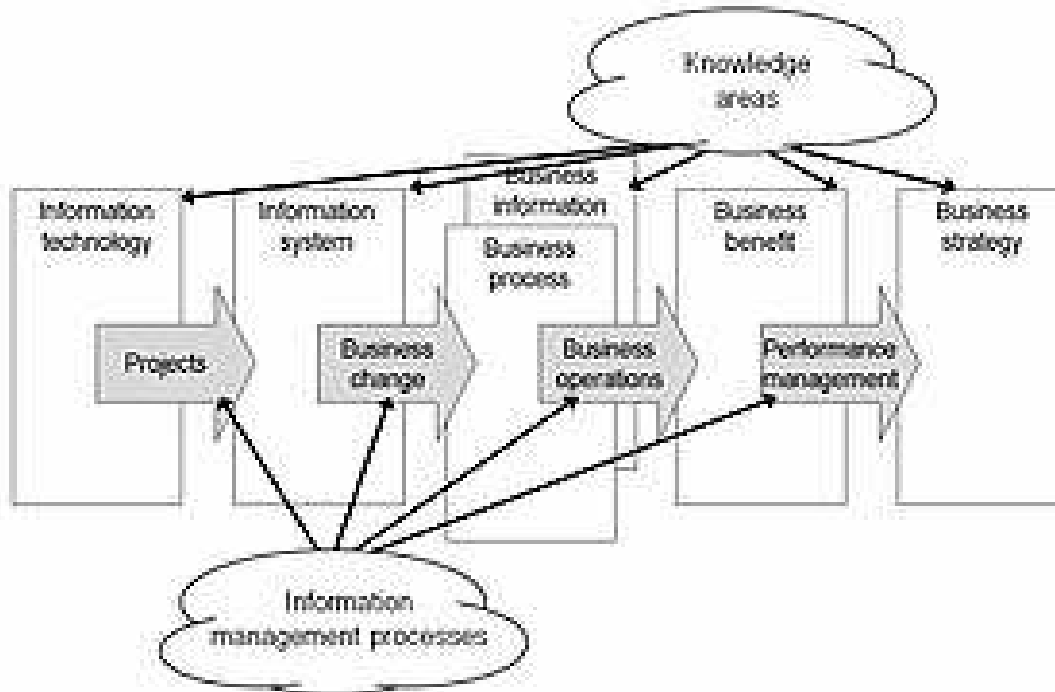


Figure 2 Information management.

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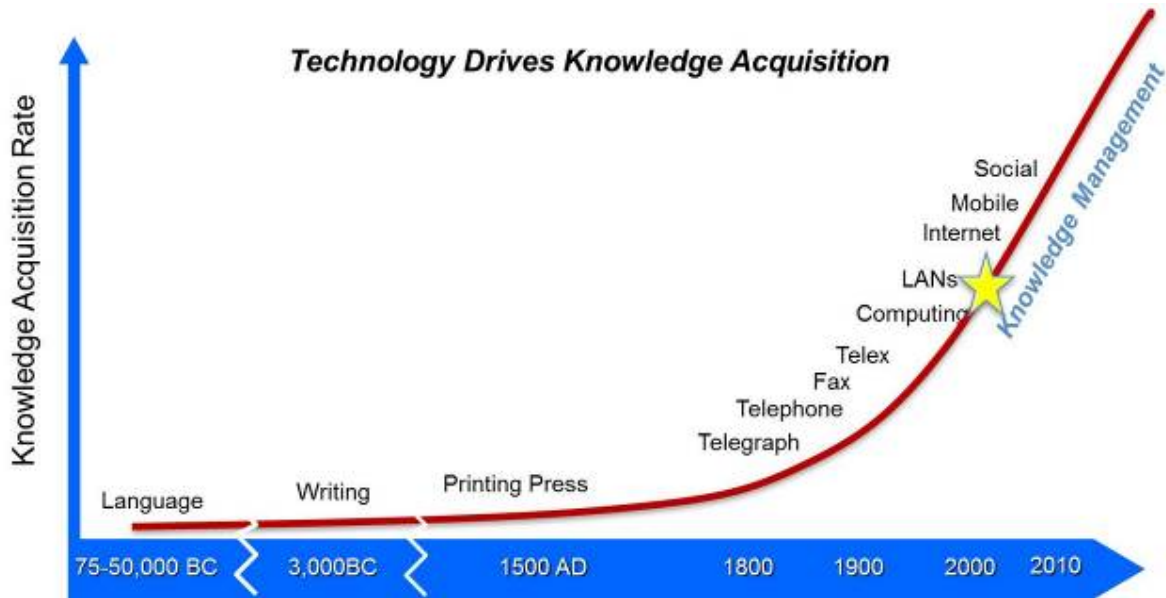


Figure 3. Technology drives knowledge acquisition.

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Figure 4 Organizational learning and KM.

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Figure 5 Enterprise resource planning.

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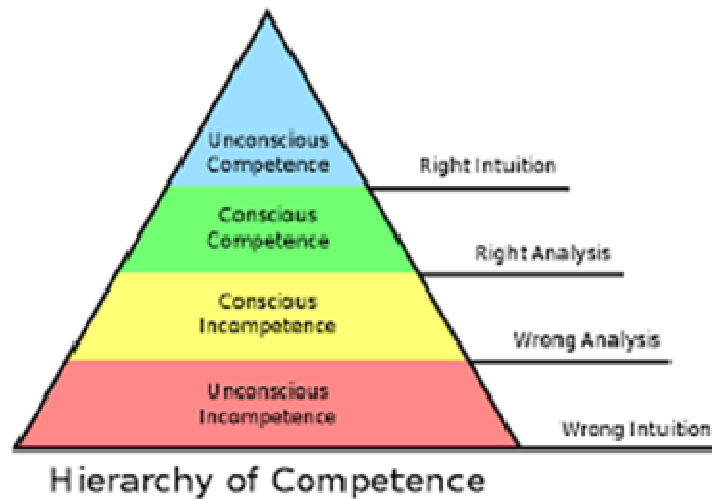


Figure 6 Four stages of competence.

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