

Management Science in Knowledge Management

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Technological developments, globalization, and numerous information types have caused significant changes in every part of people's life. In this era, along with the occurrence of information society, organizations have also initiated this changing process. Nowadays, increasing competition in economy makes information the most valuable part of production. Management administration, which is of high importance for the firms and which provides advantage in sustainable competition, has become one of the most popular topics. From now on, information is an economical tool for organizations. The people, who have information, are evaluated as powerful. Moreover, if the organizations produce new information from available information, they move ahead of their opponents. Information is in the centre of financial and social change. Meanwhile, information has a key role in both societies' and foundations' superiority struggle over another. Knowledge management is a compile of strategies and processes for creating, finding, and exploiting information. Reaching, gathering, sharing, utilizing, evaluating, and storing information are some of the processes of knowledge management. One of the most important parts of obtaining advantage in competition firms is to evaluate information effectively. In this paper, information management, its importance, its conceptual development, its aim, its underlying perspective, and its processes are highlighted. In the results of the study, two questions have been studied: What can be done in addition to current situation of information management and what are the points need to be careful about. The main focus in this article is on the knowledge management and its importance in the management science.

Keywords: knowledge management, technological change, management information systems, information

Introduction

This article discusses the management of information and knowledge pioneer of global competition. Information has existed since the cradle of humankind, and it has constantly developed in every part of people's life so far. Information has become like a pile. From the past to the present, many people have defined information and uttered unforgettable words about it. Famous Sokrates said "There is only one good, knowledge, and one evil, ignorance". According to Farabi, the biggest virtue is science and wisdom. Knowledge is like an endless sea. True knowledge is the basic for living as a human (Kocadaş, 2002). As for philosopher Bacon, knowledge is the power.

In the past, economic activities were composed of agriculture, industry, and services; yet today this situation has changed and organizations have faced with information economy. In this kind of structure, knowledge is basically shaped with competition and professional lives are changing. This economy serves as an

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innovation and creation dominant structure, in which being fast is important in global senses (Öğüt, 2001).

Technological developments, with the numerous information and globalization, have led to important changes in every part of life. Particularly, with the unbelievable extension of computer technologies, accessing and sharing have been affected in information systems. Due to having easier connections among each other, this situation has made the easily combination of these systems necessary.

In the era, with the existence of information society, organizations have also been included in this changing process. Nowadays, the most valuable production factor is information. Knowledge management, which is of high importance for the firms and which provides advantage in sustainable competition, has become one of the most popular topics.

Via globalization, there are no longer national or international boundaries and there is more competition among firms. As a result of this competition, digital firms have occurred, which direct important relationships among its customers, suppliers, and employees. Digital firms have obviously more advantages than other firms in that they provide low cost with rapid access opportunities. Nowadays, all firms progress in order to be digital firms.

In the course of the changing process of management, four important changes in the world have affected. The first change is about actively involvement of global economy, the second change is about the transition from industrial economy and society to information society, and the third change is about the organization structure and administration, and the last change is about the occurrence of digital firms (K. C. Laudon & J. P. Laudon, 2002).

In order to raise competition force and develop its performance, as well as preparing them for the future, studies about directing information in a systematic way have increased. Recently, knowledge management has become one of the most popular topics (Wiig, 1999). The organization ability of firms depends on their abilities about collecting, processing, and combining information (Kim, 1998). Lastly, internet, intranet, and extranet, and the rapid growth of connected global webs except them, have led to fundamental changes in the ability of information management at the beginning of 21st century. Internet firms as well as global electronic and trade systems led to important changes in today's firms (K. C. Laudon & J. P. Laudon, 1999).

Knowledge Management

When the studies about knowledge management are taken into consideration, it can be seen that they are generally about three topics. These topics are the quality of the information, elements that make up the infrastructure of knowledge management, and knowledge management processes.

Knowledge management has been defined by different experts in different sources similarly. In these definitions, knowledge management has been written as knowledge management, producing, obtaining, sharing, using, and administering information. Knowledge management is the whole of activities which are used to make information use effective and administer information in order to create value and provide competition advantage (Zaim, 2005).

Parallel with the relatively increase among production factors, information is in the centre of global financial changing process (N. Kakabadse, A. Kakabadse, & Kouzmin, 2003) and it is evaluated as the most superior tool of the economies comparatively (Beijerse, 1999).

According to Manasco (1996), knowledge management is the compile of strategies and processes about creating, finding, obtaining, and exploiting information in order to increase competition.

Some experts have defined knowledge management as the direction of intellectual assets in an organization. As for this approach, knowledge management is every kind of activity about strategy and politics which are used to administer human assets (McAdam & Reid, 2001). In another definition, it is the administration of intellectual capital (Lee & Yang, 2000). Sveiby and Simons (2002) expressed it as the art of value creation from intangible parts of the organization.

As for Odabaş (2005), knowledge management is the process of a firm, in which the aim is to increase value, compensate for the deficient parts, or adapt to competition. For this aim, all external and internal resources are gathered, arranged, and shared among colleagues who contribute to personal and institutional productivity.

According to Carla, Jackson, and Grayson (1998), knowledge management is a conscious strategy which helps to transmit information to the right people at the right time and which can increase organizational performance by exploiting information and sharing.

From the management science perspective, knowledge management is a process which changes management understanding radically. During the process of decision, knowledge is of high importance and it makes the decision making process faster and easier.

Importance of Knowledge Management

In terms of organizations, the ambiguity and rapid changes have made the information the most important tool (Koçel, 1998). The most valuable production factor in knowledge economy is information (Drucker, 1994; Wu, 2008). Knowledge is in the centre of industrial and social change and it has a key role in the competition among societies.

In terms of organizations, the effective administration of information is evaluated as one of the ways that leads to a long term advantage in competition (Beijerse, 1999; Hicks, Dattero, & Galup, 2007; Tiago, Couto, Tiago, & Viera, 2007).

As for Özdemirci (2001), institutional management administration, which can be provided via the institution's use of information technologies, makes information accessible and applicable.

Knowledge management is an administrative and strategic tool in firms. Thanks to this tool, right decision making, guessing about future, having inter-institutional or intra-institutional relations, having standards in products and services, solving present problems, and finding solutions for the future problems can be done.

The findings of Göker (2001) clearly illustrate the importance of information in economical development and new economy. On one hand, industry welcomes radical changes in line with technological advances. However, in an economy, which is directed by information, knowledge is of high importance not only for industries with high technology but also for industries with lower technology. On the other hand, the thing which determines innovation is technologic innovation. Technology is an information category. The information source of the technology of this era is scientific information. Therefore, today's production economies are characterized as information based or information directed. In an information based economy, the crucial point is accessing information and producing new information as a result of that accessed information.

There have been many studies about the advantages of knowledge management. Gallivan, Eynon, and Rai (2003) emphasized that knowledge management has a strategic importance in order to stand in global

competition environment. Furthermore, Goll, Johnson, and Rasheed (2007) and Park and Kim (2006) have conducted field studies that point out the relationship between knowledge management and firm performance.

As for firms of today, the vital points are the length and permanency of competition period, economical survival, and having strategic advantage against their competitors. To access this information, knowledge management should be attached importance. While firms are accessing to information, they have to obtain the information from their close and general surroundings in a systematic way, and they need to process this information in a reliable way in the due time. In that case, it can be said that there is an effective knowledge management that can make the goals reachable.

A successful knowledge management provides big opportunities and advantages in terms of firms. The shortening of product development time and presenting the new product in a rapid way, the enlargement of market, the increase in product variety, the decrease in cost, the quick adaptation to different economical conditions, the right and on time providing of the needs and requirements of the customer can be outlined as examples (Schulteis & Sumner, 1998, p. 62). In that sense, functions of information systems can be provided through implementing such functions.

The tendency to think strategically helps to answer the following questions in a firm (Thompson, 2001):

- What will be the progress of competition in the future?
- What are the needs of the customers?
- What kind of behaviours do the competitors have?
- How can the competition advantage be obtained and sustained?

In today's firms, knowledge management has become as important as accounting, finance, marketing, or human resources. Information systems are important parts in production of services and products which present strategic advantage for the firm in global market.

Sharing and communicating information are important things in knowledge management. Sharing and communicating information among individuals and groups leads to the occurrence of new ideas, and it is of crucial importance on this issue. Thus, the firm makes itself more advantageous with the new ideas and applications in economies.

In the era, the individuals, who access to and use information and who think critically and creatively will contribute to the development rather than the individuals who memorize. Tonta (2001) stated that in the future "ignorant people" will not be those who are "illiterate", but "they will be those who do not know how to access to information".

The increasing number of virtual organizations is only one example of digitalization which converts a virtual thing into reality. In this era, the increasingly growing role of virtual money, processes, communities, paths, and even sex makes the boundaries between the reality and dreamy world, in which people can implement what they dream (Wacker, Taylor, & Means, 2000).

Knowledge management is the most important strategic part for the sustainability and competition of firms in economy. Knowledge management is used among many fields like administration, management application, management philosophy, technologies, strategies, and human behaviour.

Due to the increasing importance of information in business world, knowledge management function in organizations includes the processes and techniques, which can create add value from information at a maximum level (Göker, 2001).

Development of the Knowledge Management Concept

Changing process of organizations in information society has firstly started with the efforts to increase quality and productivity. In 1950s, knowledge was a bureaucratic obligation for organizations. After 1980s, it became customer focused and its aim turned out to provide more value for customers. In this process, information has a strategic role for organizations. In the course of changing, they need to redefine information and they have determined its meaning in line with the requirements. In 1990s, information has become a strategic source to provide competition advantage.

The first publications, conferences, and counselling activities about information society appeared in 1990s. Thus, organizations have started to understand the importance of knowledge management. In 1997, more than 30 conferences were held in Europe and USA, a lot of books were published and 1.5 million dollars counselling income was obtained (Little, Quintas, & Ray, 2002).

Aims of Information Management Systems

The most basic aim of knowledge management is reaching goals for the firms. Another aim is to implement the information by the right person at the right time (Nemati & Barko, 2003). The basic aims of knowledge management can be outlined as follows (Özgener, 2002; Plunkett, 2001):

- accelerating curve of learning;
- providing faster enhancement;
- producing new information in organization;
- enabling the opportunity to transmit the right information to the right people at the right time;
- providing chance for accelerated transformation;
- making the organization obtain the valuable information from outer sources;
- easing the development of information via public culture and its incentives;
- presenting the information through documents, data bases, and software (via present organizational information sources);
- providing opportunity of available information for organizational decisions;
- making the information in organization transfer or the same parts in another organization transfer;
- converting organizational knowledge into intellectual capital and provide its measurement through knowledge management.

To Odabaş (2005), the most important aim of knowledge management is to reveal the recorded or potential information sources and include them into processes of organizations. Another aim of knowledge management is to provide the production of new information by making employees access to information from information sources.

The importance of knowledge management composed with these aims is stated by Nonaka (1998). The only reliable source of constant competition superiority is information in an economy in which the only true thing is ambiguity. As the markets changed, the technologies became widespread and the new products became old products in just one night, successful firms have become the firms, which have produced information steadily, spread the information widely, and used the new technologies in products rapidly.

Background of Knowledge Management

In order to have an effective application of knowledge management, a strong background is the primary

requirement (Tiwana, 2000). There are five basic points which compose the background. These points are technology, leadership, intellectual capital, organizational culture, and organizational structure.

Technology

Knowledge management is beyond technology, but certainly technological background is the indispensable part of it (Thierauf, 1999; Davenport & Prusak, 1998). In that sense, technological changes, namely the catalyzors of knowledge management (Binney, 2001), make the most exciting point of this issue in the points which they make the application of knowledge management (Gottschalk & Khandelwal, 2003; Reyes & Raisinghani, 2002). Moreover, in knowledge management applications, information technologies are used in different and multi-directional ways (Lindvall, Rus, & Sinha, 2003).

Leadership

Leadership and upper administration support have a crucial role as regards the success of knowledge management (Goll et al., 2007). The will and attitudes of employees to produce and share information need to be reinforced, and the motivation of the administration needs to be enhanced (Cruz, Perez, & Cantero, 2009).

Organizational Culture

It is the compile of shared beliefs, norms, traditions, and value judgements among the employees in an organization. Organizational culture is of high importance in terms of successful implementation of knowledge management (Lopez, Peon, & Ordas, 2004). On this issue, an information friendly organizational culture, willing participation of participants, needs to be composed in order to exploit information at a maximum level (Koulopoulos & Frappalo, 1999).

Intellectual (Human) Capital

In today's economy, global competition has accelerated. Situation of markets has become ambiguous, products and services have become similar. In this economy, what makes a firm different and what makes them obtain competition advantage are the most important parts in intellectual capital. The quality of intellectual capital and how this kind of capital is of significant importance are the success of knowledge management applications (Marr, 2004). Intellectual capital is classified in three groups as human capital, structural capital, and relational capital (Bozbura, 2004).

Organizational Structure

In the success of knowledge management, the structural background plays a key role. The formation of an organization in line with the knowledge management bares great importance (Beijerse, 2000; Narasimha, 2000).

Process of Knowledge Management

Knowledge management has the process of disclosing, collecting, arranging, and evaluating the knowledge. It has also the processes of sharing with the employees, being made fruitful, being collected in the data pool, and it has many processes like these.

The stages of the mentioned process are outlined as follows (Beijerse, 2000):

- identification of required information;
- identification of accessible information;
- identification of information deficiencies;

- developing information;
- acquiring information;
- building an information channel;
- providing information share;
- utilizing information;
- evaluating utilized information.

Perhaps, the most important processes are the producing of knowledge and developing knowledge.

Today, due to the increasing pressure in global competition, if an organization wants to obtain sustainable competition advantage, it has to develop new information (Beveren, 2002; Roth, 2003; Bergman, Jantunen, & Saksa, 2004).

Producing knowledge is the term used for an organization that has the new and useful ideas as well as the ability for finding solutions. Organizations produce information by restructuring their previous or present knowledge as a consequence of various interactions (Bhatt, 2001). On the other hand, developing knowledge is expressed as the further improvement of the knowledge, related to the available services and products by working on them or the new ideas' and inventions' being transferred from thought to action (Shani, Sena, & Olin, 2003).

For the information to express value only through its being used in line with its purpose of use and classification of the information in line with its type, target of use and through its preservation in the way, it can be offered to the access of the workers today and in the future (Offsey, 1997).

The classification and the preservation of knowledge are necessary both for the use of knowledge and its re-evaluation in the future. In this way, knowledge becomes part of the organization getting out of the possession of the individuals to a great extent (Nemati & Barko, 2002).

Another knowledge management process is the share and transfer of knowledge. The process of sharing the knowledge is the exchange of the knowledge between the person who offers the knowledge and the one who demands it (van den Hooff & de Ridder, 2004). In this process, information increases as it is shared, becomes valuable as it is transferred, and thus new types of information are produced. Even, in most cases, the transfer process mentioned creates a reaction and this is called the multiplication effect of the knowledge (Sveiby & Simons, 2002). In this respect, one of the basic aims of knowledge management is to make use of the available knowledge potential at the maximum level through the sharing of the knowledge effectively among the individuals, themes, and departments (Robertson, 2002; Wong & Aspinwall, 2004).

During knowledge management, use of information and implementing it, information affects organization in the long term effectively; it contributes to organization; and the knowledge management reaches its goal (Ordaz & Allez, 2004). According to Wilhelmij and Schmidt (2000), the success of knowledge management largely depends on how effective knowledge is used, and to what extent this knowledge is put into practice in terms of products, processes, behaviours, and policies etc..

Conclusions

Together with technology and globalization, there have been major changes in the role, definition, and use of knowledge from the past to the present time. With this change, the purposes, targets, needs of the firm, and the strategies of the firm as a whole have also undergone changes. With the transition from the industrial societies to information society, information has a key role in the success of the companies.

The studies about knowledge management are also important for the modern management strategies. For Snyman and Kruger (2004), for the firms that try to withstand the changing market conditions today, the increasing global competition and fascinating technological developments, the most valuable possession is valuable. For this reason, firms need to make maximum use of knowledge from the sources in an effective way.

The people who manage knowledge and the departments which plan the knowledge, should work on the knowledge system that the company needs what they think the firm should have in time. At the stage of knowledge management and use, words of knowledge, data and information, and their connotations should be distinguished. Decision making, planning, comparing, analysis, evaluation, guessing, determination, work applications, and procedures etc. should be made regarding the meanings of these expressions. At first, knowledge is personal. In order to make it usable by the society, it should be coded, clarified, conveyed, managed, and put into the use of groups.

With the concepts of the renewed economy and economy knowledge, new work models, professional areas, and job definitions have started to be used. In today's firms, management knowledge systems and decision support systems have started to be used. The inputs provided from these systems have started to take part in basic production factors. Thus, the composition and processing of knowledge management systems require information technologies as an indispensable thing.

A successful knowledge management occurs only if there is an organizational culture which supports continuous learning, attendance, sharing ideas, increasing knowledge, the strong attendance of information management, and the effective use of intellectual capital. Moreover, the organizations' mission, target, strategy, and politics also shape the right information politics as well as the right strategy. Under these circumstances, technology can be utilized in an intelligent way (Sütcü, 2014).

For the knowledge management to be applied successfully, the infra structure of knowledge management should be given importance. The knowledge management which includes leadership, technology, institutional culture, human capital, and organization should be used with the elements of infra structure. Without the elements of infra structure, knowledge management cannot achieve success.

As a result, recently, knowledge and data have made an increase, and it keeps increasing as a snowball everyday. For the firms to compete with their rivals, they need to re-evaluate the available knowledge in the work procedures. Today, in order to be successful as a firm, they need to use more competitive and authentic knowledge compared to their rivals and adapt to available knowledge and technology infra structure to be able to keep pace with the changes in knowledge and technology.

It is not enough to disclose the institutional knowledge accumulation, it is also necessary to distribute knowledge among the employees. In the knowledge management, the basic elements of the firms should be in balance and coordination with each other such as employees, individuals who are given service, budget, technical infra structure, legal arrangements. Owing to the structure and purpose of knowledge management, good quality knowledge should be provided, used, and conveyed to the related departments in the firm, feedback should be taken, and new knowledge already produced should be accumulated in the information pool of the firm, and should be made ready to be used again for the productivity of the firm. It should be kept in mind that the knowledge cannot be reached and cannot be counted as firm information and capital.

In the company knowledge cycle, the knowledge should be evaluated as for its quality and accumulated in a pool having been purified from the unnecessary knowledge. The knowledge accumulated, arranged, shared, and taken to the knowledge pool should be classified according to their qualities and should undergo the

processes such as data mining. The data obtained particularly through the internet form knowledge density and the knowledge obtained becomes the accumulation of knowledge which cannot be classified. In this respect, to be picky and to stand away from the knowledge without a source and the necessary knowledge should be exploited.

A successful knowledge management depends on to use of technology more than leadership, to invest on technology and to follow the improvements in technology, and apply these in the right time. Meanwhile, the investment should be made to those not only who use the technology, but also to those who have the technological information.

Nowadays, firms have their biggest investments on information technologies. Firms should purchase not only the best and the most recent technological system but also should adapt to that system quickly. For this reason, if it is required, there should be fundamental changes in organizational structures. Furthermore, new firm models need to be developed and previous organizational structures should be abandoned.

Nowadays, particularly via internet, there is not a problem about the deficiency of the knowledge; rather there is too much information pollution. Many firms form databases for knowledge management. In these databases, there is too much unnecessary information. The thing needed to be done in knowledge management by the firms is to use, interpret, make sense of, and administer the required information.

Knowledge management is not only a technical but also a social process. It integrates with organizational learning in social process. This provides individual benefits such as learning from colleagues, intrinsic motivation, firm culture, institutional soul, and advancement.

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