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# Knowledge management in corporations – synergy between people and technology. Barriers and benefits of implementation

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**Abstract.**<sup>1</sup> Knowledge management is a strategic process in organizations and companies, which is increasingly recognized by both managers and employees. Modern companies try to maximize their gains in different ways. The increasing competition and more advanced management methods in companies are the reason for exploring new possibilities by managers. This article aims to describe implementation process of knowledge management in business and organizations by using modern technologies and verify barriers, which can stop these processes. The author, on basis of researches, verifies opportunities of optimization factors affecting knowledge management, in order to obtain the highest performance and effectiveness of employees.

The article is divided into four parties: the first part defines process of knowledge management and also knowledge, its types and directions for use. The second section presents barriers in organizations, describes why the knowledge is not use enough and not arrive to circulation of information in companies. The next chapter presents technologies of knowledge management, especially CMS that are not still discovered, but can be the great supports for processes in organizations. In the last part, the author suggests solutions, which can reduce barrier and problems of knowledge management in companies using suitable technologies.

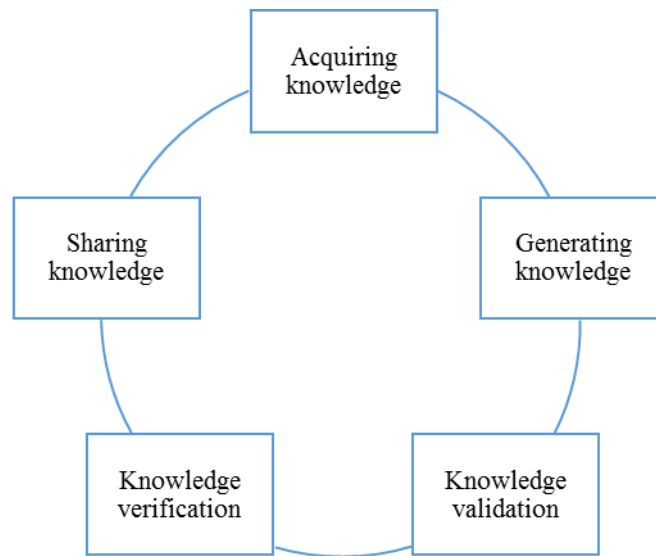
**Keywords:**<sup>2</sup> Knowledge Management, company, barriers, benefits, Content Management Systems, CMS

## 1 Introduction

In recent years, many organizations have recognized that the assets are not only important in organization's life. People, human capital, influences decisively on effectiveness and performance of company and decide about final gains. The knowledge management [1] is a compilation containing methods of gathering, managing, capturing and using knowledge, both explicit and tacit [2, 3]. Explicit knowledge [4] is

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knowledge that can be readily articulated, codified, accessed and verbalized [5]. It is easy to transfer this kind of knowledge to others. Most forms of explicit knowledge can be stored in certain media [6]. There is many examples of explicit knowledge like the data contained in books and encyclopedias. Tacit knowledge is the kind of knowledge that is difficult to transfer to another person by means of writing it down or verbalizing it [7,8]. For example, that Paris is in the France is a part of explicit knowledge that can be written down, transmitted, and understood by a recipient. However, the ability to speak English, walk on the street or play a piano use complex equipment requires all sorts of knowledge that is not always known explicitly, even by expert practitioners, and which is difficult or impossible to explicitly transfer to other people. Knowledge management is, in part, an attempt of the best possible use of knowledge, which is available in organization, creation of a new knowledge and growth of knowledge understands [9,10]. There are many types of knowledge management. The author suggests the easiest distribution of the activities, which are necessary in the human resources management [11,12,13].



**Fig. 1.** Scheme of knowledge management cycle processes

The first phase focuses on acquiring knowledge from the environment. At this stage, the information come from outside of the organization. The employees, who have knowledge of specific subjects, verify which areas will be used in the further process. It is also important to show a role of metadata, which determinate methods of acquiring knowledge and present the best practice. This phase defines the goals and

steps for managing the special areas and attributes and recipient are allocated. The next phase is generating knowledge. The tools, which support knowledge management and learning, are useful here. The author believes that content management system, which is described later in the next chapter, by standardizing and creating parts in common with KM can be massive support for knowledge management processes in company. Nowadays, the knowledge is aggregated in systems and there is no place for rating, only collecting and fixing. It should be remembered about secure access to confidential information. Gaining knowledge from the organization can support market competition and even eliminate our company.

The next step is valuing knowledge, sorting it, prioritizing and eliminating unnecessary content. Dedicated staff rates aggregation of content by degree of importance and next the knowledge is disseminated. The knowledge gained from employees and external processes, segregated and valued according to previously determined criteria is available for organizational units in accordance with thematic scope and demand for it. The intellectual capital is growing, the employees are learning, exchanging the information and using procedures, which improve these processes. The last stage is about exploiting knowledge, what means that employees use the new knowledge in practice. Thanks of their new skills and experience they can work more effective and create the new areas in the company, which contributes to maximizing the organization's gains. Whole five-processes cycle creates comprehensive tool for the knowledge management in organization.

The knowledge management brings many benefits for the companies. The strategy of implementation the knowledge management programme that is optimized properly can increase the efficiency of employees in the organization. The main advantages of implementation the knowledge management procedures are:

*A. Improve customer service by reduce the response time.*

Thanks to the fact that the knowledge is located in the single place and facilitation of searching the information, it is possible to reduce customer-waiting time for the answers and orders. The company contains the full information to focus on specific topic and the answers are confirmed by the data of the knowledge management process.

*B. Optimization of employee's rotation in the company.*

The process of the knowledge management can be linked with staff hiring and whole Human Resources department. The analysis of aggregation knowledge process can brings managers date about level of knowledge of their employees or even about their investment for company development. Thanks to this fact the managers can identify the most talented and resourceful employees.

*C. More innovation in teams.*

The aggregation and the information management which are received by employees, may be affected more creativity and creates new ideas for organization's development. Different views for many topics and interdisciplinary of many aspects in single place can support innovation and brings the company the new elements of strategy.

*D. Reduction of cost of running business.*

In case of specific knowledge about the markets and the company, attention should be paid to potential action that may reduce costs of system functioning and remove unnecessary processes. The time needed to useless operations may be redirect to other important processes and actions

*E. A coherent strategy.*

Thanks to the fact that the knowledge is well organized, it is more uncomplicated to create the organization's strategy. The competition analysis and the estimation of other company's actions is easier than ever.

The knowledge management process is beneficial for the company. These, described above, advantages may increase the gains of the organization by providing competitive advantage, optimizing processes in the company and select the appropriate staff in terms of merit, value as well as quantity. It is very hard to look for faults in this process. The only downside may be the accumulation of all knowledge in one place. In case of interception of this data by the competition, the company may go bankrupt. This strategic place can be considered as a core of business. Some data may be useless using third parties because they are not information but only data [3]. Particular attention should be paid to the security of systems that will hold file collections, and to plan the permissions and topology of attributes assigned to individual employees. It is important that the data access hierarchy is maintained. There may be multiple approaches to sharing data, for example, some companies will decide to publicize the full range of knowledge for all employees, regardless of the degree in the company hierarchy. Others, however, can share employees with those who are outsourced, internal to the company, and those still in the ordinary, managers and management. Each of them will have a different scope of information disseminated. Breakdown can also be based on the content of the departments concerned, but this will reduce the interdisciplinary and creativity of the public.

## 2 Barriers in organizations

There are many barriers in the literature that exist in the area of knowledge management. Any signal that prevents the transfer of knowledge should be passed to the environment. Often, employees avoid feedback on problems and barriers that block the whole organizational unit / company process. The author tried to find the most common barriers of sharing knowledge in the organization. According to the study, the problems were divided into 3 groups.

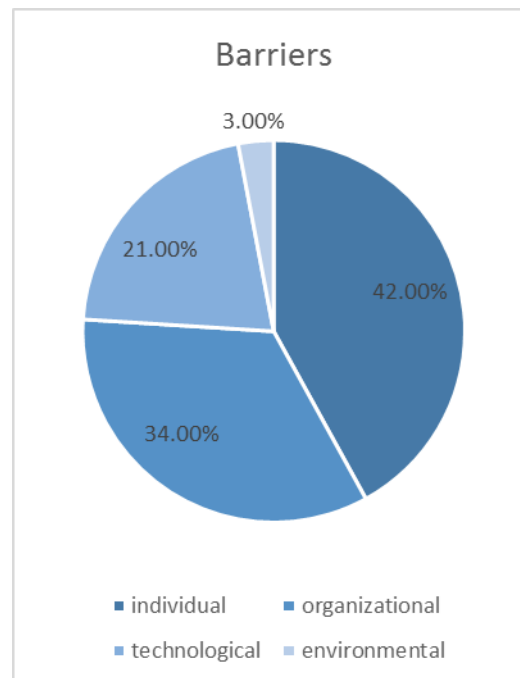


Fig. 2. Barriers related to the exchange of knowledge in an enterprise

The research indicated that the two most numerous groups of problems are individual and organizational. Below are potential individual barriers to sharing knowledge in organizations:

*A. No time to share knowledge.*

Due to the distribution of work in organizational units, it is not possible to talk with other employees and exchange experiences and perceptions of the problems.

*B. Varied level of knowledge and experience.*

Due to the different levels of proficiency in the company, employees have barriers in conversation such as junior-senior.

*C. Low awareness of the owned knowledge and benefits flowing from it.*

Employees are often unaware of the fact that they are rich in knowledge and can expand it by exchanging with others.

*D. Other differences such as age difference or sex.*

Employees avoid direct contact with others due to differences in age, sex, job seniority, the scope of activities performed on a daily basis.

The second area is organizational barriers. These include:

*A. Wrong company management.*

Lack of supervision, weak leadership, managers unaware of the benefits of exchanging knowledge. Company strategy does not capture knowledge management. The goals in the company are unclear and unspecified.

*B. There is no company resources to share.*

It is important that the conditions in the company guarantee the exchange of knowledge. This is not only about hardware and the latest technologies, but also about real places such as shared social rooms.

*C. Varied level of knowledge and experience.*

At this point, there is no hierarchical structure but the wrong selection of organizational units. Often they are too small and focused on narrow processes so employees cannot analyze other topics. Such schemes can be found in specialist companies such as advanced technology where every department is strictly responsible for a narrow range of work.

Apart from individual and organizational barriers, the third group is technological.

*A. No social network in the company.*

Many companies are focused on providing employees with good contact with colleagues. Organizations that do not attach much importance to their peer relationships and willingness to share knowledge are much smaller. Great support is social networks running in a single company in the cloud or on local servers. Tools include instant messaging, chats, knowledge sharing portals.

An important element in the company can be content management systems, which will serve as a backbone for the text file layers stored. The systems will be discussed later in this chapter.

*B. No training in the use of communication through technology.*

Companies that do not invest in training to support remote communications through tele-informatics devices may lack the concept of implementation of knowledge management processes.

These barriers can vary to some extent in reducing the success of implementing a knowledge management process in a company. Establishing a unified, standardized knowledge management system can certainly optimize these processes, encourage employees to engage, and manage data realistically in all organizational units. The author believes that Electronic Content Management Systems, especially those based on GNU GPL such as WordPress, Drupal, Joomla, can largely meet the needs of a content management and knowledge company and their legal personality and license to use free and develop projects lead to competitiveness with paid counterparts dedicated to the target entities.

### **3 Technologies supporting Knowledge Management - CMS**

One of the most important elements for implementing knowledge management in a company is technology that allows free exchange of information. Many companies focus on advanced systems that will support processes. The author suggests the development and opening of content management systems available under the GNU GPL, which are based on open source. Many platforms like WordPress, Joomla and Drupal are currently only used to publish raw data on the Internet. Some of them have functionality enhanced with community and multimedia features. In this chapter, they will be characterized and described with reference to Knowledge Management implementation.

Content management is the sum of processes [14] and technologies that help manage process, collect and publish information in a variety of forms.

There are several types of content in CMS. The best known is the content displayed on the browser screen. It is primarily text, graphics, graphs, videos, animations, and the interface of the system. In addition, on the server side there are counterparts to the



displayed content, their components, generators and content contained in the database. The administrator operates on processes, programs, and algorithms. It also includes metadata such as formats, schemes, objects for content authors, creation dates, expiration, etc.

The entire content management process has many meanings in different perspectives [15]:

- A. From the point of view of business objectives, CM distributes business value.*
- B. From an analytical perspective, it balances organizational forces.*
- C. From a professional point of content management combines the individual in the organization.*
- D. From the perspective of the process, CM collects, manages and publishes information.*
- E. From a technical perspective, content management is a technical infrastructure.*

All systems, regardless of their mode of operation and location of use, have one main objective - the optimal and efficient management of data and information. Each of them has a basic set of features that is also repeated in other software.

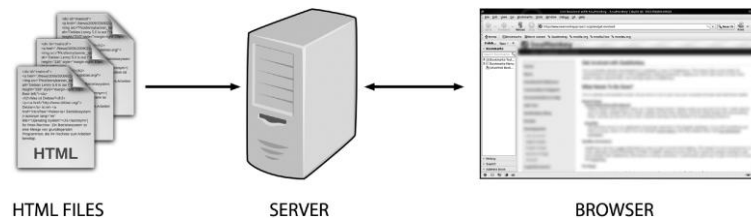
- A. Monitoring and control of content - division of roles and the creation of hierarchies with rights for individual users, content security.*
- B. Verification of content in the system and data coming from the outside.*
- C. Managing the entire document cycle - from creation, modification and use, to disposal.*
- D. Search keyword optimization.*
- E. Ability to create reports.*
- F. In some cases the publication of the content.*

Content management systems are dynamic pages. At the outset, it is useful to define the concept of static and dynamic pages, and to define the differences between them.

Classic, static pages flourished in the 90s of the last century. Currently static standardization has been abandoned and moved to dynamic sites.

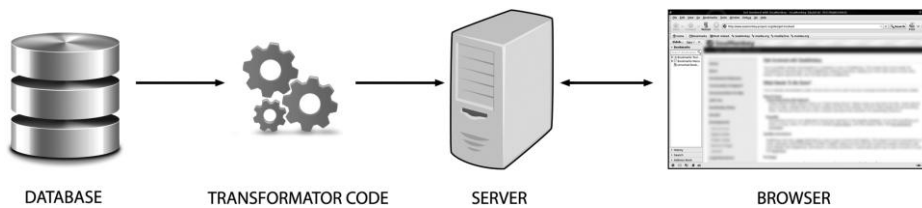
Static pages are portals [16] that do not change their content when called in a user's browser. In order to make any changes to the page, the administrator is forced to overwrite the files manually. Simple pages, based on HTML, have both advantages and disadvantages. They are quite easy to prepare and the whole process of creating a website is fast. There are freeware wizards on the market that allow you to modify portals without the knowledge of the language. Preparing a static website does not

require a lot of effort, so it is cheap. The greatest use of such sites is for simple www business cards. They do not require a server with PHP support and MySQL databases. Hosting can also be free. Unfortunately, when user send a page to the server and make modifications to it, basic knowledge of creating websites is essential. The biggest drawback is the lack of interaction with users. These pages only serve to convey unilateral information without any action on the user-administrator line. They are usually less interesting than dynamic and users spend less time on them.



**Fig. 3.** Scheme of static websites [17]

Dynamic pages are generated in real-time in front of the HTML server based on data provided by the program to browse the Internet. These sites are dependent on the actions that the user is currently reviewing. For example, when you add a comment on the page, a new entry, date added and author appears. Sometimes additional user identifiers such as IP, the browser from which the page is displayed, and the version of the system are also provided. There are two ways to change content: First, the client-side uses scripting languages such as JavaScript and ActionScript that make direct changes to the Document Object Model (DOM) elements. The main advantages of this method are the shorter response times, the much less server load and the better interactive effect of the application. There is no need to contact the database, which is a big help in changing the code. The second method is the so-called. Server-side, using programming languages such as PHP, ASP and Perl. This processing is useful for database contact and persistent memory. An example of this activity is user validation or data exchange.



**Fig. 4.** Scheme of dynamic websites [17]

A content management system is a software that allows user to create, manage, and publish content. The early use of CMSs was mainly about managing documents and files, usually internally, and now it is managing the content on the public network. The purpose of such systems is to provide an intuitive interface for viewing user content as well as an interface for the site administrator, usually from the admin panel. CMSs are a great way to work with your system [18]:

- A. *Dynamic content.*
- B. *Easy to make changes.*
- C. *Content Management Tab.*
- D. *Add interactive content.*
- E. *Integration with the media.*
- F. *Full control over the entire site.*
- G. *Allow many people to manage the site.*

Content Management Systems can fully support the knowledge management area in organizations. Currently, most of the free platforms are geared towards publishing content on the Internet. In the case of system installation on the local server, it is possible to support processes taking place on the premises of the organization. The system can be considered as the core of an organization that will aggregate all data and support internal communication. The next chapter is an analysis of the implementation of content management systems and its impact on the potential elimination of barriers in the knowledge management process between employees and organizational units.

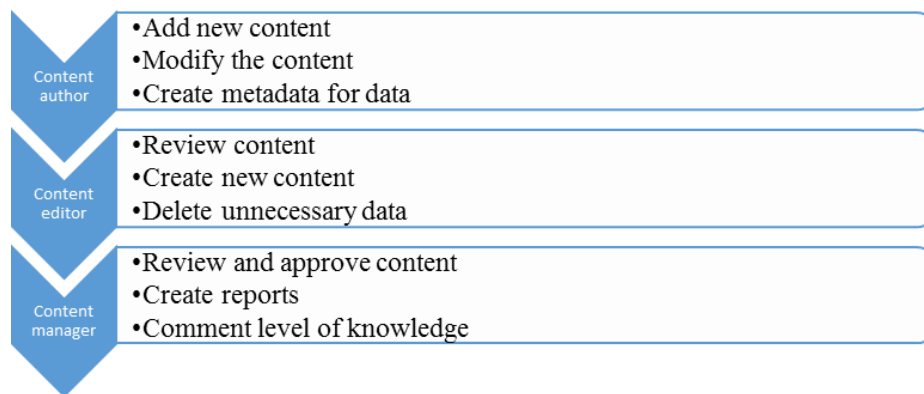
#### **4 Methods for barrier limitations in the Knowledge Management process using CMS**

Enterprise content management processes have a direct impact on knowledge management. They support processes from the technological point of view. The author noted that implementing a CMS in an enterprise might translate into a partial elimination of communication and technological barriers to knowledge management in an organization.

In the case of individual barriers, a varied level of experience and knowledge can be standardized in the system. Aggregation of information and data at the server level will allow access to all employees regardless of their experience and seniority. By empowering and attributing individual employees, the system can motivate to upload knowledge as one of the tasks of the daily schedule

This can make employees aware of their level of knowledge. Age and gender differences and other externalities are automatically abolished. Managers can support the CMS to improve the overall management process as well. Systems can publish content for teams and supervise work performed by individual organizational units within a company. Through the systems can therefore be strengthened supervision of employees. Extensions that coordinate the task time can have the functionality of sending divert alerts. Discussing this topic should mention the possibility of using the core of system and thousands of plugins included in the system. The GNU GPL-based system allows modifications to the code made by thousands of developers around the world. User can also create his own extensions depending on how he use them. For example, for advanced medical companies, it is possible to create a register of medicines and patients, as well as conducting Business Intelligence analyzes, and for law firms, a directory of lawyers and online clients. Systems, whatever the industry, can support knowledge management in a given thematic area.

In a single process in the enterprise can be engaged a multitude of employees. The process can take place on the basis of equality or hierarchization. Below is an example process of system hierarchy [19,20].



**Fig. 5.** Roles in hierarchical CMS distribution.

## 5 Conclusion

Implementation of Content Management Systems in the organization can improve the flow of information within the company, remove barriers to the exchange of knowledge between employees and increase efficiency and productivity of organizational units. The author noted the lack of literature indicating the possibility of using such systems in companies. By verifying the market, most organizations use paid platforms that are not standardized and do not have a common system. This article identifies specific systems that, thanks to the open source GNU GPL license, can be supported by thousands of free worldwide programs. Using an enterprise knowledge management system will increase company profits, employee productivity and creativity, and improve co-workers' relationships, and can also have an impact on improving managerial-level management accuracy as well as individual, organizational and technological barriers in many cases will be reduced.

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