

## KNOWLEDGE MANAGEMENT SYSTEM IN THE ENTERPRISE AND CUSTOMER KNOWLEDGE MANAGEMENT<sup>1</sup>

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**Abstract:** *Modern enterprises need to constantly develop their competences to meet market requirements. The development of these competences through the application of knowledge management (KM) and research and development works is insufficient. That is why companies are looking for new competences in their environment, among their suppliers, competitors, research institutions or universities. A still underestimated source of knowledge is the client. While the institutional client can often provide the company with access to important and valuable knowledge resources, the individual customer knowledge is often ignored in assessing the requirements for products or services. Classic Knowledge Management (KM) and Customer Relationship Management (CRM) systems collect information about the client and probably elementary knowledge from the client, but usually do not directly involve the client's potential in the creation of new knowledge. A Customer Knowledge Management (CKM) system adequately fills this gap. The aim of the CKM is to optimize the exchange of knowledge between the company and its institutional and individual clients, and to use their creative potential. In this study, the CKM is defined as the activity consisting in planning, organizing and controlling projects in relation to the knowledge and innovative potential of the client. It is aimed at acquiring and developing customer knowledge by combining it with the knowledge of the company, and also creating new knowledge together with the client for the improvement of the company's activity and creation of innovative solutions, products and services. The implementation of a CKM in an enterprise requires a specialized adaptation of the knowledge management system (KMS). Here, the KMS is defined as a set of principles, methods, means, knowledge (including information), people and their interrelationship networks, which allows to adopt and implement knowledge management strategies, functions and tasks in order to achieve the organization's goals. Based on this definition, the KMS components were characterized, i.e.: people, a network of relationships, knowledge resources, instruments and methods as well as knowledge management principles. Next, the principles of choosing the CKM implementation style were discussed depending on the adopted strategy of personalization or codification. It has been established that prosumerism and/or communities of creation should be used in a KMS based on the codification strategy. In a KMS based on personalization strategy - team-based co-learning, mutual innovation and/or joint intellectual property. The CKM focuses on the processes of: 1) acquiring knowledge about the client, 2) acquiring knowledge from the client, 3) transferring knowledge to the client (sharing knowledge, disseminating knowledge and/or sharing knowledge with the client), 4) co-creating knowledge with the client. In relation to these processes, some useful ways of their implementation have been discussed, including the level of suitability of the CRM system.*

**Keywords:** *knowledge management, knowledge management system, customer knowledge management, customer relationship management.*

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<sup>1</sup> The paper was financed with subsidies granted to the Faculty of Management of the Cracow University of Economics for maintaining the research capacity.

**JEL Classification: D83, L14, M19, M21, M31, O31**

## **1. INTRODUCTION**

In today's business, success is based on the ability to adapt the activity to the conditions and requirements of a knowledge-based economy. It is therefore necessary to recognize knowledge as a key resource of a company, which determines how to acquire and use the remaining necessary resources. This translates, among other things, into the creation and use of advanced technologies, including information and communication technologies. But that's not all. It is necessary to introduce knowledge management, aimed at implementing the organizational process of creating knowledge, efficiently and effectively. For this purpose, a knowledge management system needs to be implemented, and knowledge employees should be acquired and involved in the work. To properly direct the process of organizational knowledge creation, a company must acquire the skill to sense what the society thinks, feels and wants. This may be the basis for success in creating new products and successfully introducing them to the market. Attempts to rely research and development processes on ideas coming only from within the company, and imposing certain solutions on customers usually fail. In the 20<sup>th</sup> century, this strategy was unsuccessfully tested, among others, by American companies. Therefore, recognizing the client's needs seems a key issue. For this purpose, enterprises invest in customer relationship management systems, and in their development. However, it turns out that nowadays these actions may be insufficient in the pursuit of competitors. Of course, one should still listen to customers, because they are increasingly intelligent and smart. However, a single smart and dissatisfied customer can prevent tens or hundreds of customers from purchasing a given product at the local level, and potentially thousands of customers globally. The reasons may of course vary, nevertheless, due to the increase in the wisdom of clients and their increasingly frequent specialist knowledge, conscious entrepreneurs and managers have focused on the use of client knowledge and their potential to create new knowledge.

This study presents a complex problem related to defining the Knowledge Management System, and a proprietary approach to it, presented both in a narrow and broad aspect. Next, the essence of Customer Knowledge Management and the basic styles of its implementation are described. The most important part of the study is the presentation of requirements for the Knowledge Management System of an enterprise in which the Customer Knowledge Management System is to be used. First of all, reference was made to the principles of knowledge management, company knowledge resources, knowledge management tools and knowledge management methods. Also, several practical applications have been derived with respect to the operation of the Knowledge Management System and Customer Knowledge Management.

## **2. LITERATURE REVIEW**

### **2.1. Knowledge Management System**

The theory of knowledge management (KM) does not provide uniform definitions of many basic terms (Tabaszewska, 2011). This is also the case with definitions of the Knowledge Management System (KMS).

Probably the most common approach method to the KMS in the subject literature is to define it as an information management system, or the organization's computer information and communication system. For example, M. Alavi and D.E. Leidner (1999) refer the name KMS to a class of information systems. In this approach, the objective of the KMS is to support construction, sharing and application of knowledge in organizations. L. Damodaran and W. Olphert (2000) define KMS's as "information systems which are perceived as facilitating organizational learning by capturing important (content and process) knowledge and making it available to employees". According to F. McKenna (2008), the KMS is "an information management system with all the tools required to help an organization turn information into knowledge". He defines the KMS as one that: 1) provides the user with the explicit information required, in exactly the form required, at precisely the time the user needs it, 2) connects to all sources of knowledge, 3) converts data into information and then facilitates the conversion of information to knowledge. U.S. Aktharsha and H. Anis (2011) refer the KMS to a comprehensive information and communication technology platform used for KM in the organization, supporting the creation, interception, storage and dissemination of information. However, according to R. Maier (2002, p. 76) a KMS is "an Information and Communication Technologies (ICT) system in the sense of an application system or an ICT platform that combines and integrates functions for the contextualized handling of both, explicit and tacit knowledge, throughout the organization or that part of the organization that is targeted by a KM initiative".

The presented approaches aim to identify a KMS with an ICT-based information management system. This is probably a legacy of the growth in knowledge based systems in the eighties and early nineties, and has led to much of the early work on KM focusing on the delivery of technological solutions. While it is now recognized that good KM does not result from the implementation of information systems alone, the role of ICT as a key enabler remains undiminished (Carrillo, Anumba & Kamara, 2000).

L. Damodaran and W. Olphert (2000) noticed the need to define the KMS more broadly, as more than an ICT-based system and pointed that the KMS must be a sociotechnical system which has as its objective the management and sharing of knowledge to support achievement of organizational goals. These authors note that by this socio-technical definition the KMS comprises the knowledge itself, sometimes referred to as the intellectual capital of the organization, as well as organizational attributes (including intangibles such as culture), policies and procedures, and some form of an electronic storage and retrieval system. Z. Chen and X. Xu (2010) define the KMS as a system based on information technology that includes intangible elements, such as organizational culture, apart from the tangible elements of the organization, such as IT hardware. In addition to organizational culture, the researchers attribute particular importance to interpersonal relations and methods of knowledge transfer in

the KMS. In contrast, C. Soo, T. Devinney, D. Midgley, A. Deering (2002) consider the basic and particularly important components of the system to be: a database subsystem (allowing to quickly get the right information), an organizational language subsystem (allowing to understand the meaning of things), and a networking subsystem (allowing to acquire information and knowledge from internal and external sources), a transfer subsystem (allowing knowledge to be transferred between people or, as a result of a rare combination of information, new knowledge to be created from an individual resource of experience). Among the universal KMS elements J. Beliczyński, Cz. Mesjasz and A. Stabryła (2009, p. 198) listed: knowledge sets (databases and data/knowledge banks), networks of relations, knowledge transfer methods, IT systems, such as MRP/ERP, IT networks (Internet, extranet, intranet), semantic systems (the organization's jargon and the KMS language), and the organization's culture.

In summary, KMS will be understood narrowly and broadly. In a narrow sense, it is a system platform created by information and communication technologies. It supports the implementation of all operational tasks of KM, i.e. processes involving knowledge, in particular transfer, collection, identification and selection, recording and storage of knowledge (Mikuła, 2012, pp. 15-16), but also planning, organizing and controlling these processes. In a broad sense, it is a system of resources and factors that allows adopting and implementing strategies, functions and tasks of KM to achieve the organization's goals.

## **2.2. Customer Knowledge Management**

Unfortunately, until recently marketing and Customer Relationship Management (CRM) practices have not been able to capture knowledge from clients that comes from social interaction with the company's employees (García-Murillo & Annabi, 2002). The modern client, on the other hand, is an intelligent person (regardless of whether they are individuals, or represent an institution). They can generate knowledge about the products and services used. At the same time, they often have an extensive creative potential. So why not reach for these resources? This idea is used by Customer Knowledge Management (CKM).

The CKM is commonly defined as a combination of KM and CRM (Belkahla & Triki, 2011). It is even indicated that the aim of the CKM is to integrate KM and CRM (Bueren et al. 2004). The CKM changes the classic role of a client into a subjectified knowledge partner. It involves gaining, sharing and expanding the client's knowledge for the benefit of him and the company (Gibbert, Leibold & Probst, 2002b). In other words, it is a process of generating, disseminating and using customer knowledge, which takes place in the organization and between the organization and the client (Rollins & Halinen, 2005). The CKM is then based on planning, organizing and controlling projects in relation to the knowledge and innovative potential of the client. It is aimed at acquiring and developing customer knowledge by combining it with the knowledge of the company, and also creating new knowledge together with the client for the improvement of the company's activity and creation of innovative solutions, products and services.

M. Gibbert, M Leibold, G Probst (2002a) defined five styles of realizing a CKM. These are:  
- prosumerism – in which the client acts as a producer and consumer,

- team-based co-learning – which is building corporate social capital by involving clients in the process of mutual learning, and the aim of which is to reconfigure entire organizations and value systems,
- mutual innovation – which is involving the product's end users in innovative processes,
- communities of creation – which is creating groups of clients with expert knowledge that interact not only with the company, but also with each other,
- joint intellectual property – which enables the company to achieve significant successes for a long time through the education of clients and common ownership as well as continuous development of knowledge. Clients and the company create a future business together, analyzing the scope of joint ventures, co-creating new strategic initiatives and jointly developing knowledge. In fact, the client's success becomes a corporate success and vice versa.

### **3. METHODOLOGY**

The methodological foundation for this study is the method of analysis and critical evaluation of the subject literature in the field of KM and CKM. The focus was on the contradictions and dependencies that occur between various approaches to the KMS. Next, the focus was on the essence and methods of implementing CKM. Using the comparative method, it was accepted as the procedure task to correct existing views and to find an approach to the KMS that would be adequate to the objectives of CKM and would take into account the idea of its implementation. Using the synthesis method, conclusions regarding the construction of the KMS using CKM were derived.

### **4. RESULTS AND DISCUSSION**

#### **4.1. Theoretical approach to an enterprise knowledge management system**

Considering the previously described definitions of the KMS, this system will be ultimately understood in a broad sense as a set of principles, methods, means, knowledge (including information), people and their interrelationship networks, which allows to adopt and implement knowledge management strategies, functions and tasks in order to achieve the organization's goals. Such a definition of the KMS meets the recommendations of P. Meso, R. Smith (2000). Their research indicates that for a company to be able to derive long-term strategic benefits from a KMS, it should apply a wider socio-technical point of view when developing, implementing and managing a KMS. They suggest that enterprises must take into account not only technology, but also organizational infrastructure, organizational culture and people who create a KMS, and the knowledge to be processed by this system, as presented in Figure 1.

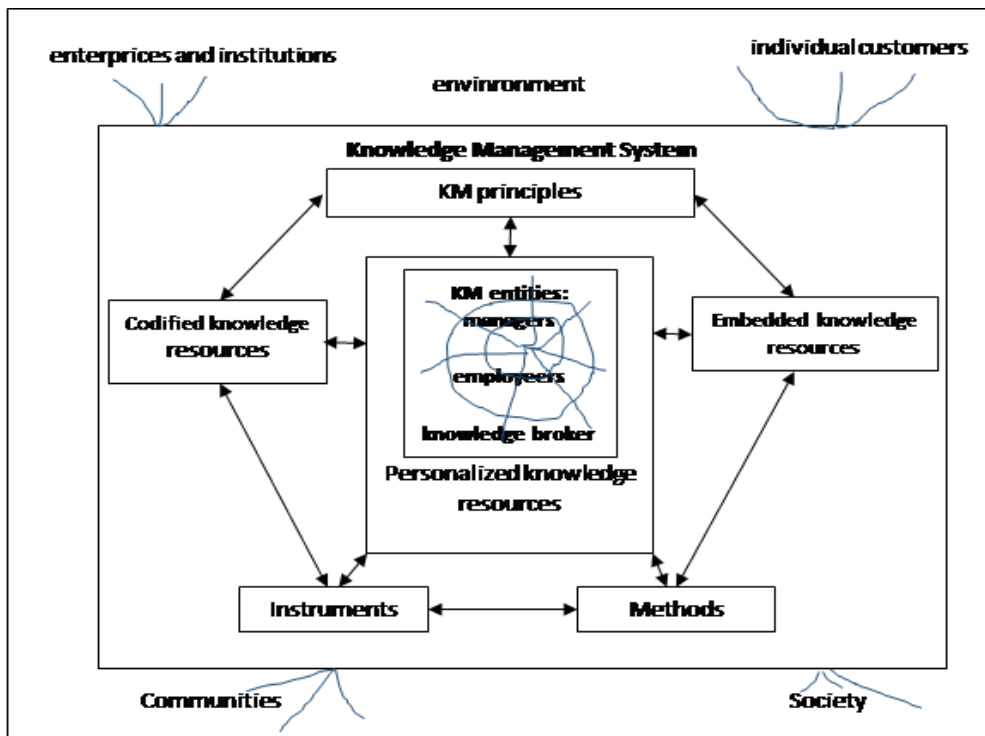


Figure 1: *The model of an organization's Knowledge Management System*  
 Source: Own study

The heart of the KMS is people: managers, knowledge workers and staff. Their intellectual resources make up the human capital of the organization. It is especially important because they are the carrier of key knowledge used by the company in the personalized form, both explicit and tacit. An important part is played by the knowledge broker, whose task is to make key decisions regarding the KMS and supervise its operation. It may be a one-person position, but a team of specialists in the field of KM and ICT may also act as a knowledge broker. Formal organizational relationships and informal interpersonal relationships create a network of intra-organizational relationships, which is the basis of knowledge transfer processes between people. This network is being extended by the enterprise towards external institutions and enterprises (including institutional clients), and the society, including different types of its communities, as well as individual clients. Next, the KMS is comprised of the codified knowledge resources (created as a result of the codification of personalized knowledge and its supplementation with codified knowledge derived from the environment) and established knowledge resources (created as a result of knowledge depositing in the products of human activity, i.e. in the structural capital, products and services).

Instruments are an important group of the KMS components; nowadays, ICT is widely used for the purposes of implementing processes using knowledge and KM. There are four main types of information systems can be distinguished in enterprises: operational-level systems, knowledge-level systems, management-level systems, and strategic-level systems. The internet, which connects hundreds of thousands of different public and commercial networks from over 200 countries around the world, should also be included. Over 500 million people working in science, education, administration and business use the internet to exchange

information or making business transactions with other organizations around the world (Laudon & Laudon, 2018). All these technologies perfectly support KM in organizations.

Methods are systematic ways of proceeding, and in the last century, hundreds of them have been developed to solve various problems, as part of the science of management. It turns out that some of them can be used in KM. The choice of methods depends on the objectives, KM strategies used and the processes implemented with the participation of knowledge (transfer, creation, etc.).

An important element of the KMS is KM principles resulting from the character of the adopted knowledge strategy, applied KM strategies and implemented operational tasks (processes involving knowledge). These are in addition to principles that help create appropriate conditions within the organization for the purposes of KM. An entire range of them is presented in the literature addressing the issues of the learning organization, intelligent organization, knowledge-based organizations, virtual organizations and organizational behaviors. Examples of these principles are: a) knowledge as a dominant resource, b) continuous learning at an individual level, a team, organization and inter-organizational network, c) forming full trust, d) creating a knowledge-oriented organizational culture, e) excess (redundancy in the field of non-material resources), f) an unambiguous vision of knowledge strategy, g) system thinking, h) knowledge sharing (more in: Krakowiak-Bal et al. 2017b, pp. 197-199).

The broad view of the KMS allows considering it as an original system for the entire enterprise. A KMS is born when the company is founded, and its origins are visible in the design phase of the business model, even if it is a sole proprietorship. In such a case, the KMS is created by the person running the business and include their resources of personalized knowledge, codified knowledge stored in computer memory and documents, the founder's relations with other people, external sources of information and knowledge (available e.g. via the internet), methods and means of implementing processes using knowledge, as well as the principles that govern its operation. As concluded by E. Tabaszewska (2011, p. 116), the development of the KMS is initiated in line with the development of an organization itself, while the act of system implementation is understood as the planned project of implementation of a KM concept and, what follows, the application of KMS instruments, including its organizational specification. Therefore, even if any organization experiences KMS development, not each and every one reaches the stage of implementing the project of formal changes within the framework of KM.

#### **4.2. Customer knowledge management as an enterprise knowledge management subsystem**

While discussing the use of CKM in the framework of KMS, the first important issue to be considered is the choice of the dominant strategy for the construction of KMS (codification or personalization). This problem was solved by M.T. Hansen, N. Nohria & T. Tierney (1999), who pointed out that if a company produces standard products or uses a business strategy based on mature products, or its employees use mainly explicit knowledge during the implementation of tasks, then a codification strategy should be applied. However, if the

products are tailored to the individual needs of the customer, or the company uses a strategy based on product innovations, or its people use mainly tacit knowledge to solve problems, then it is best to apply a personalization strategy. The use of a specific strategy determines the level and the possibility of knowledge codification, the degree of use of ICT tools, the applied KM principles, and the methods used.

As for the basic CKM styles, ICT provides great opportunities for support in the practical use of prosumerism, i.e. it is possible to effectively use the codification strategy. In this case, personalization can be very time-consuming for the customer and the company's representatives. Considering the constant lack of time among high-class specialists, the effective use of communities of creation will certainly require the introduction of a certain degree of codification, especially when these specialists live across long distances and in different time zones. As for other CKM styles, such as team-based co-learning, mutual innovation and joint intellectual property, the best results should be achieved with personalization. The optimal methods of sharing knowledge and creating new one will certainly be those based on face-to-face meetings. Reversely, in a KMS based on the codification strategy, prosumerism and/or communities of creation should be used, and in a KMS based on personalization strategy – team-based co-learning, mutual innovation and/or joint intellectual property.

CKM focuses on four main groups of processes: 1) acquiring knowledge about the client, 2) acquiring knowledge from the client, 3) transferring knowledge to the client (facilitating, disseminating and/or sharing knowledge with the client), 4) co-creating knowledge with the client (Mikula 2016). These processes can be implemented in very different ways depending on the needs and capabilities of the company. The first three types of processes can be carried out using a CRM system. It can support CKM in such activities as: 1) creating customer profiles containing their contact details, which have been collected from previous transactions and which can be used in the future for any query; 2) helping in shaping the customer's model providing additional information on consumer behavior, such as when, where and what color of the product they buy; 3) developing various marketing activities, such as promotional campaigns or incentive programs aimed at a group of clients or an individual customer, or a mass marketing project aimed at the entire market (Shannak et al. 2012).

Effective acquisition of knowledge from the client often requires direct contact with them. It is easier to do so in a situation of cooperation with an institutional client. If it is necessary to acquire knowledge from individual clients, one can use simple methods, such as website content analysis. For example, blogs written by home bread-baking enthusiasts contain many comments on both the recipes and ingredients, as well as the devices used. They can be an important source of knowledge for manufacturers of breadmaking machines (because specific devices are often commented in detail on these websites), but also for manufacturers of ready-made blends of baking ingredients, and even producers of frozen bread. Some companies independently create discussion websites and encourage users of a product group to share knowledge with them. They also try to create communities of specialists from different companies, but this is an extremely difficult task. Another very simple method of acquiring knowledge from a customer is to call him after the service has been delivered with a request to answer the questions and comments about its course. For many years, this method of acquiring



knowledge from its customers in Poland has been used, for example, by Toyota (but the system doesn't work well and requires improvement).

As part of KM, it is important, among other things, to properly plan, organize and control the course of core processes involving knowledge within the organizational system and between the system and its environs (Krakowiak-Bal et al. 2017a, p. 336). CKM can't be implemented as a "massive attack" of a number of company services in various matters; this can only discourage the client from cooperating. All projects must be integrated in detail during the planning and organization phase. A good solution is continuous cooperation of one of company representatives with the client. Good interpersonal relations and mutual trust can be built thanks to the continuity of cooperation. One can't disregard the right choice of person for the position of a representative working within the CKM. In addition to the appropriate level of knowledge, they should also have psychological characteristics necessary to act in the area of interpersonal relations, well-developed communication skills and courteousness. Effective ways to motivate company representatives and clients must be developed. On the other hand, control should include identification and examination of factors determining knowledge sharing and joint creation of knowledge, along with barriers in this area, as well as pointing to improvement activities. The control should be largely decentralized to the level of the company's representatives, but should also be performed by the CKM manager and the KMS broker.

## **5. CONCLUSIONS AND RECOMMENDATIONS**

In general, KM is based on acquiring appropriate resources, developing and controlling the use of conditions, strategies, methods and techniques that enable knowledge-related processes, including the optimal use of knowledge resources and their development by incorporating the knowledge resources from the environment into the knowledge conversion.

KMS is a combination of human capital and structural capital components of an organization, so it is a component of organizational capital. KMS is created by processes, relationship networks (formal and informal) within and outside the enterprise environment, as well as methods, technologies and software used, but also databases and documents, knowledge contained in products and services which, together with people and their knowledge, allow implement such important tasks of KM as identifying, transferring, collecting, selecting, creating, combining, saving, storing, assessing and applying knowledge. Expanding the network of relationships with the environment within the KMS, including clients, provides the opportunity to "draw" knowledge from the environment and use the creative potential of the clients. For this purpose, it is worth to use CKM in a thoughtful and appropriately planned way.

Together with CKM, the KMS is worth implementing and developing, because if it works effectively and brings tangible benefits, it also increases the value of the company. Nowadays, lots of experience in applying the CKM idea is generated by the companies in the Knowledge Intensive Business Services sector, and its future result remains most interesting.

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B. Mikula, *Knowledge Management System in the Enterprise and Customer Knowledge Management*, [w:] *Contemporary Issues in Economics, Business and Management*, edited by V. Babić, Faculty of Economics, University of Kragujevac, Kragujevac, 2018, s. 19-27 ([working paper](#))

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