DESIGN METHODOLOGY MANAGEMENT SYSTEMS KNOWLEDGE OF BUSINESS PROCESSES IN MANUFACTURING

Методология проектирования системы менеджмента знаний бизнес-процессов на производстве

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Abstract: It is proved that in the knowledge economy, such assets of the company, like knowledge, are of particular value. New knowledge can increase the individual income of the owners as they apply in business processes and production activities. Defined knowledge management as the process of formation of the intellectual assets of the enterprise. Selected technological, motivational and organizational components of the system of knowledge management. The system methodology of knowledge management are methods to transform individual pieces of information in knowledge relating to a particular sphere of activity. System design of knowledge management of the enterprise is divided into a number of stages, which are discussed in the article. The analysis of world experience of the practical implementation of knowledge management has shown that organizations and businesses take this purpose a variety of techniques and methods. Found out that currently there are three schools of knowledge management. The methodology for the integration of knowledge in the enterprise, which is presented in the form of a diagram. The knowledge creation enterprise is carried out ways: through self-education personnel; by performing duties; tools of knowledge management. Proposed projects for the knowledge management implement in stages and characteristics of each stage. It is proved that the culture of designing the system of knowledge management should include management strategies, planning and provide for close cooperation and distribution of powers. It is concluded that knowledge management helps businesses become more competitive, reduce costs, increase the speed of making management decisions and efficiently identify the needs of consumers. The main purpose of the system of knowledge management of the enterprise is knowledge management an integral part of the work of all employees.

KEYWORDS: KNOWLEDGE MANAGEMENT, INTELLECTUAL ASSETS, MANAGEMENT STRATEGIES, METHODOLOGY FOR THE INTEGRATION OF KNOWLEDGE

1. Introduction

The formation of the knowledge economy means a change in the institutional framework of the functioning of an economic system, since a change in the rules and norms of economic behavior of people, their priorities and values. Activities related to the production and preservation of knowledge, separated from material production, remains subordinate. Institute for conservation of knowledge is important in ensuring the sustainability of society. Knowledge becomes a factor of production through its embodiment in the means of production appear specialized institutions aimed at the reproduction and transfer of new knowledge.

Sustainable competitive advantages of the company are possible as a result of the interaction of a complex resource structure, in which they are acquired, developed and used. The complex structure arises as a result of the interaction of network resources. The first one of the main types of resources of enterprises in the modern economy have identified organizational knowledge Polanyi M. [1], which now referred to the strategic assets of the enterprise, which implies that in order to remain competitive should develop mechanisms to acquire necessary knowledge and its dissemination in a timely manner and in the required format.

However in the knowledge economy may increase individual incomes and promote sustainable development of the country, as new knowledge applied to business processes and production activities, allow [2]:

- increase individual productivity of human labor, which makes it capable of performing the work that has greater social value and thus higher rewards;

- to develop in a person business skills and entrepreneurship, which in turn gives him the ability to make informed decisions;

- to have sensitivity to the perception of new scientific developments, reducing the term of their implementation into production and to stimulate the development of new ideas;

- to develop intelligence and individual talents to generate new technological ideas and rational organization of production in relation to specific conditions.

2. The concept of knowledge management

Swiss scientists T. Krog and M. Kene in his concept of knowledge management, special attention was paid to its important part of knowledge transfer [3], which showed the dependence of profitability from the quality of the process of generating new knowledge and the implementation of its intra-company transfer. This dependence brought the concept of "knowledge capital" P. Strassman [4], who linked the increase in profits generated knowledge capital, and proved that awareness raising and training of employees helps to increase the stock of knowledge, which, in turn, form the net value added.

Focusing on these important components of knowledge management as the process of formation of the intellectual assets of the company, we distinguish technological, motivational and organizational components of this system:

1. The technological subsystem includes the totality of management decisions for the identification, storage, transmission, structuring, processing, transforming and disseminating knowledge.

2. The motivational subsystem includes fostering the accumulation and exchange of knowledge, communities, organizations, contractors, external environment.

3. Organizational subsystem includes a set of methods, activities to promote transformation of individual knowledge in the corporate and the creation of intellectual assets of the organization.

The system methodology of knowledge management are methods to transform individual pieces of information as an organized set of data into knowledge as a set of fixed in the minds and thinking of the facts of reality relevant to a particular area of activity. Therefore, the system design of knowledge management of the enterprise involves a series of steps:

- define the goals and objectives of knowledge management;

- audit and assessment of existing intellectual assets and knowledge of the organization, determining their compliance with the order;

- development of the knowledge management strategy;
- creating changes in organizational culture, organizational structure;
- completion of formation and implementation of the system, the evaluation of its effectiveness.

New knowledge is acquired in the learning process as individuals and units, and training of the whole enterprise. Here, the basic process is the process of turning individual knowledge into organizational knowledge [5]. It is the process of creating organizational knowledge is considered the basis of knowledge management. The most well known model that reflects the processes of creating knowledge is the SECL model, developed by I. Nonaka and H. Takeuchi [6], according to which occurs the transformation of explicit and implicit knowledge:

- socialization – the transition of implicit knowledge to formal (improvement of existing skills);
- externalization – the transfer of informal knowledge in formal (description of skills that are used, clarify the regularities of the practical activities);
- combination – transfer of formalized knowledge formalized (in General terms – the creation of one theory to another);
- internalization – transfer knowledge in formal and informal (receive certain skills).

Strategic institutional aspect of knowledge management involves the creation of such institutions:

- organizational culture that promotes and encourages the development of knowledge, gives knowledge of high value, stimulating exchange of knowledge, provides training to staff and managers on knowledge management;
- infrastructure to support knowledge management processes.

There are two types of learning in organizations: an adaptive and paraguachi. Adaptive learning focuses on changes in response to the development of environment, it is necessary for the survival of the enterprise, and Paraguacu training associated with the development in the organization of the characteristic features or the creation of new opportunities to enhance existing competencies in new competitive areas.

The analysis of world experience of the practical implementation of knowledge management shows that organizations and businesses take this purpose a variety of methods and ways: from the explanation of benefits you receive as a result of the effective use of knowledge to develop knowledge management strategies. Gradually changes occur in the organizational structures for the implementation of knowledge management by creating groups, departments or introduction of the posts of managers in knowledge management. According to the author [7], the most suitable for the implementation of effective knowledge management are network organizational structures that are flat, have a low functional barriers and contribute to the blurring of the boundaries of the enterprise.

Thus, the basis of market valuation of business entities are not material factors, and the ability to use internal resources, capacity for innovation and active work in order to consolidate their competitive positions. The introduction of knowledge management entities is part of their investment and strategic policy and provides for the development and implementation of effective innovative projects.

Knowledge of the enterprise is replenished and updated as a result of training, research, hiring of highly qualified professionals use their years of errors and validation of the activities of various working methods. The collective knowledge of the company, as a rule, are reproduced in documents describing the business processes. However, if the knowledge is not documented, and information about its source and location in the enterprise there, then use a full of these important resources is very difficult, if not impossible.

In a particular application of knowledge management as a function and view management activities include:

- the ability to add value to information by the identification, selection, analysis, synthesis, generalization, storage and dissemination of knowledge;

- creating an interactive community in which employees continuously share what they know and use all the conditions for the assimilation of new knowledge;
- providing knowledge of the kind of practical relevant information that can be used in specific situations.

The need to reduce the deficit of knowledge, which is reflected in the competitiveness and services, and firms as a whole, implies the following tasks:

1. The acquisition of knowledge (fit and use for their needs or those of other knowledge that is already in the world; the development and accumulation of knowledge based on NDDKR and industrial experience of staff).

2. Learning (continuous education and training of employees).

3. The transfer of knowledge (the use of new information technologies, providing access to information resources).

Currently, there are three schools of knowledge management.

The first school believes that knowledge management is primarily a problem of information technology. You need to create a computer network and use the software for work groups (Group Ware). The introduction of computer networks adds communication media, for cooperation in groups, people will be more willing to share information and knowledge [8].

The second school suggests that knowledge management is a problem of organizational culture and teamwork. Strong, positive organizational culture focused on the promotion of training, development, distribution of skills, resources and knowledge [9].

The third school tends to need to develop processes of organizational know-how, which have no need of using information technology [10]. The definition of knowledge management is as follows: "the Identification and use of formal and informal knowledge within processes, people, products, and services" [11].

3. Design methodology of the system of knowledge management in the enterprise

Knowledge management can improve the quality of managerial decision-making, providing managers with the information, reduce costs of operations, increase employee initiative. However, the effectiveness of knowledge management depends on the degree of use of information technologies, since knowledge is considered to be a form of public and individual memory, which is the result of structuring and comprehension of the object in the process of cognition and is stored in computer memory. The methodology of integration of knowledge could be schematically represented as follows (Fig. 1).
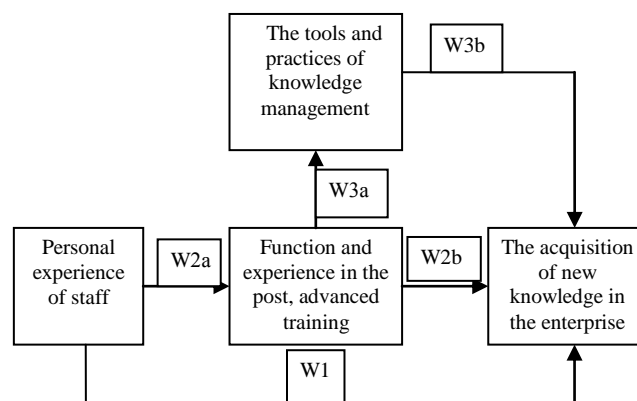
Fig. 1. *Ways of formation of enterprise knowledge*
W1 – due to the self-education of personnel;
W2 – by performing duties;
W3 – by means of knowledge management

Successful introduction of knowledge management depends on many factors. Therefore, implementing the project management in the enterprise, consider the following:

1. Culture and work environment. A formal knowledge management process easier to implement in companies where there is free exchange of information and knowledge among all employees. However, many companies will have to begin this work in other conditions.

Company in which employees, teams and departments compete with each other and conceal knowledge and information, believing that "information is power" will have to do some preliminary work before you can go directly to the implementation of knowledge management. The emergence in the company atmosphere of mistrust promoted by some business processes, but the need for change regarding culture, and it must be given serious consideration.

2. System performance management and compensation. Depending on the adopted in the company's performance evaluation and compensation or staff members openly share their knowledge with others, or hide them, for fear of low evaluations of their work. If there's indeed a team spirit, recognition and praise can be as effective for a reward.

3. The current practice of management. Knowledge management cannot be regarded as an isolated process or program; it affects the implementation of most management strategies is an integral part of the infrastructure of the company. So if your company applies, for example, a program of total quality management (i.e. responsible for quality each employee), there is a necessity to all employees who participate in the implementation of the project at any stage of this work will be required to adhere to the principles of already existing programs.

4. The position of top managers. Top-managers of their behavior should show that they consider knowledge a valuable asset of the company and share inherent in this project ideas as well as share ideas with other active programs. They will have to devote to this project some money, if you intend to use special technology and the introduction of special posts.

5. The planning of the event. Development of plan of all works on project management knowledge and economic justification.

6. The calculation of the cost of knowledge. During the development study of the project on management of knowledge also need to determine the financial value of enterprise knowledge. Calculating the original amount, can be determined and their future value. Since conventional methods of calculating the value of intellectual resources of the enterprise does not exist, the traditional accounting of our businesses into account such intangible assets is not yet engaged.

Many years of experience in this area has shown that project management knowledge (table. 1) fail, mainly because too much attention to technology and lack of metering at different stages of the project the human factor. Meanwhile, the key to managing knowledge is not a computer network, and people.

Table 1

Stages of system design of knowledge management

Stage	Characteristics of the stage
Planning	Development of plan of all works on project management knowledge and its economic justification
Holding audit knowledge	Determination of the location of knowledge exactly who owns them and who needs them in your organization
Mapping knowledge	The results of the audit are knowledge maps, which give an idea about the structure and location of knowledge in the company
Classification knowledge	The division of all knowledge into categories to further help you find, codification of
Getting knowledge	Finding knowledge, retrieve it (from a document or from another source), receipt (from the person) or create a new one, in case of his absence
The organization storage knowledge	The choice of software solutions for managing data storage systems. Create a database and placed in it the newly acquired knowledge with regard to their classification
Control knowledge	Constant analysis of needs knowledge as well as control over the use and relevance of knowledge

4. The introduction of a system of knowledge management

The first step to implementing the project on management of knowledge is the knowledge audit. It will allow you to get a General idea about the existing knowledge in order to then move on to creating a more accurate "maps of knowledge". In some cases it is advisable to conduct an audit of the total volume of information and knowledge, which is used in the company, or which are needed. The knowledge audit will determine:
- needs in knowledge and what knowledge is missing;
- how knowledge is created, acquired and used;
- how organized the exchange and transfer of knowledge;
- what are intellectual assets.

With this information, you can identify the next step in the process of knowledge management. It can also be used for:
- developing the strategy knowledge management (information);
- making decisions about the content of the Internet;
- verification of the costs of obtaining knowledge (information) from the outside;
- determining the need for specialist management knowledge.

Knowledge is useful only if they are relevant, current and from reliable sources. Technologies such as Push, Intelligent Agents and collective filtering, allows you to select knowledge and to sort them according to established criteria. Intelligent Agents are background programs that operate for the people, initiating any process or starts a specified application. After receiving instructions, the agent operates autonomously as long as did not follow the instructions and will not tell its owner the result, while it scans the websites and the database, guided the collection of information specified in the instructions criteria.

Culture system design of knowledge management should include management strategies, planning and provide for close cooperation and distribution of powers of those who implement research and design. He should consider personnel management in conditions of extreme psychological and cognitive loads [12]. In addition, you need to enter a few special posts for experts in knowledge management who will carry out special duties. It should be remembered that the main goal is to make knowledge management an integral part of all employees of the enterprise (tab. 2).

Table 2

Expertise in knowledge management in the organization

Job title	The purpose and objectives of	Responsibilities
Manager knowledge management	• to identify the knowledge assets and needs in knowledge; • to manage the flow and use of knowledge	• to create a team with representatives from all the divisions of the Department; • to identify individual needs in knowledge and prioritize them; • to ensure that all employees effectively use the knowledge sharing tools; • to prevent a decrease in the efficiency of company databases and to increase; • to organize and conduct seminars; • compliance assistance the Department agreed principles of knowledge management
Coordinator knowledge	• to manage the flow and use of internal knowledge in the corporate knowledge base; • participate in conducting industry research	• to conduct certain internal investigations; • to promote existing in the company information database; • train end users to use different sources of information; • to deal with the paperwork that relates to knowledge management, including the conduct of internal distribution lists and manage your library of "hard copies"
Analyst, an expert on knowledge management	• to provide the teams knowledge management help in the management of information; • conduct analytical research to aid other departments of the company	• to perform the role of a consultant to groups knowledge management; • to develop the architecture, processes and infrastructure to databases and Intranet; • edit content of the home pages of libraries; • analyze and report on the results of research on knowledge management
Administrator knowledge	• manage the acquisition and provision of business information; • find and save links to corporate sources of business information; • to meet the needs of the company in knowledge (information)	• to manage external resources; • distribute logs and reports; • keep a record of; • to organize the storage of documents, books and files; • issue invoices and perform other General office duties; • to liaise with departments.

Manager, knowledge management must have the organization skills and experience in companies or in the financial sector. It is also desirable that it have:

- broad knowledge in the field of information technology including knowledge of: databases, the Internet and software for General use;

- deep understanding of the principles of knowledge management;

- experience of creating teams, lead teams and motivate their members;

- communication skills, interpersonal skills.

5. Conclusion

Knowledge management has a strategic focus, since its development and implementation determine the future of the enterprise, due to the formation of his new organization and information culture, the use of more effective business models, and overall changes to the market conduct of the competition.

In the future competitiveness of corporations will increasingly provide the ability to identify, accumulate, and develop knowledge, to obtain new key competences and using these key success factors in the market, create innovation, and then to turn them into long-term competitive advantage. Thus, the management of knowledge helps businesses to become more competitive, reduce costs, increase the speed of making management decisions and efficiently identify the needs of consumers.

In addition, if the company is suitable for implementation of the project on knowledge management as a way to become a team of people working together to continuously learn something new and improve, it will be much easier to implement this project and the positive effect of the implementation will be much larger.

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