

Knowledge Management: A Tool for Implementing the Digital Economy

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Abstract—The issues of application of knowledge-management technologies in modern economic conditions are stated. The aspects of digitalization of the economy, including those at the corporate level, are considered. The concept of “knowledge management” is analyzed from the point of view of foreign researchers; it is noted that knowledge has become an important intangible asset and a factor of competitiveness. The main results of knowledge customization (knowledge maps, knowledge packages, resource catalogs, forums and chats, practice communities, storytelling, corporate blogs, and a bank of ideas) are distinguished. Application of ontological models and gamification in order to involve staff in the dissemination and exchange of knowledge is shown. The roles of human and information technologies in knowledge management are compared.

Keywords: digital economy, digital transformation, knowledge management, intangible assets, knowledge customization, knowledge discovery, ontological modeling, information technologies

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INTRODUCTION

At the St. Petersburg International Economic Forum in June 2017, the President of the Russian Federation V.V. Putin proposed to launch a large-scale system program for the development of the economy of a new technological generation, the digital economy [1]. Presidential Decree No. 203 On the Strategy for the Development of the Information Society in the Russian Federation for 2017–2030 contains an official definition of this phenomenon: “the digital economy is an economic activity in which the key production factor is data in digital form, processing of large volumes and the use of analysis results that, in comparison with traditional forms of management, make it possible to significantly improve the efficiency of various types of production, technology, equipment, storage, sale, and delivery of commodities and services” [2].

Thus, the digital economy has become the main trend in the development of the modern information society, including e-government, industrialization 4.0, advanced financial technologies, and knowledge management.

In the digital economy, quick access to information and knowledge can be seen as the main asset of an organization. Knowledge is the key asset of any organization, but Russian organizations are still at an early

stage of understanding the importance of managing this valuable asset.

Knowledge management is critical for the success of an organization in both the real and digital environments. Economic innovations are often a direct result of knowledge management and their exchange. Information technologies provide new opportunities for effective work and an even more effective exchange of knowledge.

The purpose of this paper is to investigate the role of knowledge management in the processes of digital transformation.

TRANSFORMATION OF ENTERPRISES IN THE DIGITAL ECONOMY

The industrial economy is characterized by dividing the process of creating goods into separate production functions [3], which were processing the resources provided by nature using machinery and equipment [4], replacing manual labor with mechanized and automated labor. Mechanical engineering acted as an intermediary between the subject of labor and the objective process of creating material goods and its priority was manifested in the fact that workers adjusted themselves for the machine, maintaining and servicing its work. The main form of organization of economic activities under such conditions was large

industrial complexes in the manufacturing and processing industries. In the economy of a new type, further universalization of not only basic but also auxiliary, servicing functions and processes is observed.

Development of the basic components of the new economy through its digitalization includes infrastructure, electronic business operations, and e-commerce. This process becomes a significant factor in technological evolution, allowing producers to overcome territorial constraints, reduce the transaction costs of decision making and merchandise, develop new business models based on network effects, and involve the consumer in the creation of goods.

The digital economy generates external and internal effects associated with the transformation of economic relationships that are informational in nature. The number of behavior models based on data that often do not meet the qualitative requirements of completeness, reliability, and relevance is increasing. Economic opportunism involves abuse in the use of data on competitors, markets, and technologies. The number of economic crimes in cyberspace is increasing, which causes firms to suffer losses that were previously unknown to the traditional economy. The factor of production is the speed of obtaining and processing certain and significant data; the element of unfair competition is planned disinformation. Old economic categories, terminology, and interpretation of certain concepts are subject to change [5].

The share of the digital economy in world GDP is now 5.5%. As of 2015, programs in the field of digital economy and Internet economy development have been approved in many countries of the world, including Brazil, the UK, Germany, the Netherlands, Ireland, China, Malaysia, Singapore, the United States, Philippines, Sweden, Estonia, and Japan. The largest industrial companies of the world implement development strategies within the “Industry 4.0” and “Internet+” concepts (for example, Siemens, General Electric, SAP, and Intel) [6].

According to the research of the company Boston Consulting Group (BCG), in 2016 the indicators of the development of the digital economy in Russia demonstrate a restrained dynamics. The share of the digital economy in GDP in 2016 returned to growth after a decline in 2015 and today is 2%. The contribution of the digital economy to GDP grew from 1.5 trillion rubles in 2015 to 1.7 trillion rubles in 2016. The average annual dollar growth in 2010–2016 amounted to 4.8%, which is still below the average annual growth rates of the digital economy in the leading countries (6–7% in Scandinavia and 8–9% in the United States and the United Kingdom) and much lower than in the catching-up countries (over 20% in China) [7].

The BCG study notes that, in general, the digital intensity of the world economy is constantly growing. However, the level of digitalization among countries varies considerably. According to the level of digitali-

zation and GDP per capita, the following groups of countries are distinguished:

Leaders are countries that use the most advanced digital technologies: the United Kingdom, Denmark, the Netherlands, Norway, Sweden, and South Korea.

Players are the countries with the most developed economies: Germany, the United States, Japan, and the EU as a whole.

Laggards are countries with a high level of GDP per capita and lower rates of digitization than in countries with similar economic development: the UAE and Saudi Arabia. In recent years, these countries have reduced the digital divide that separates them from the leaders and have paid much attention to the development of public electronic services.

Nascent natives are a group of countries where the level of digitalization is higher than the relative level of economic development, for example, China.

Compared to other countries, there was no breakthrough success in the development of the Russian digital economy (as, for example, in China), but there was no loss in relative position either, 39th among 85. Over the past 5 years, Russia has moved from the edge of the third group (Laggards) to the edge of the second group (Players), where there are countries with developed economies.

When comparing the current level of digitalization of the Russian economy with the dynamics of the leaders of the rating, it can be concluded that at present Russia lags behind them by 5–8 years.

There is a correlation with the data of the Information and Communication Technologies Development Index [8] (Russia is 45th in the rating) and with the data of the Digital Evolution Index [9] (Russia is the 39th in the rating), while only the Digital Globalization rating [10] puts Russia at the 14th place, in the group of leading countries. This can be explained by different methods of calculating these indices.

It should be noted that Russian specialists have extensive knowledge in applied sciences, which are particularly in demand in the digital age: software development, cybersecurity, and using artificial intelligence [11]. Active development of the infrastructure of information and telecommunication technologies on a national scale is occurring and the volume of the domestic market is expanding. As a country with a rich intellectual and scientific base, Russia can enter the group of countries leading the digital economic market in the future.

Thus, technologies blur the usual boundaries between markets and define new business models. The world is entering the era of digital business, which is characterized by an unprecedented level of convergence of technologies, business processes, communications, artificial intelligence, and “smart” objects. Transition to the digital form of business generates a wave of breakthrough innovations in many industries.

According to Yale University Professor Richard Forster, only 25% of the companies with the highest capitalization from the Standard & Poor's list will be able to maintain their leadership positions in the next 5 years. This means that in the short term 25% of their competitors will work in a new way: more efficiently, faster, and more focused on the consumer. The availability of IT contributes to the emergence of completely new players in the market that are more flexible and technological that use completely different models of business management and, accordingly, are more competitive [12].

Digital transformation means the company's readiness to follow modern trends, that is, maximally involve the most recent IT models and solutions [13].

According to another definition, "digital transformation is the process of transition of an organization to new ways of thinking and working based on the use of social, mobile and other digital technologies. This transformation includes changes in thinking, leadership style, the innovation promotion system, and adoption of new business models to improve the work of an organization's employees, its customers, suppliers, and partners" [14].

Digital transformation not only optimizes the company's work but also significantly increases its chances of winning in competition: in the new digital economy, an organization is able to effectively resist rivals and receives a significant long-term advantage [15].

In the conditions of digitalization, the transformation directions of companies can be [16, 17]:

- transition from a narrow functional specialization to integration through diversification;
- reducing the number of hierarchical levels and refraining from isolating functional and staff links;
- decentralization of a number of management functions through the creation of semi-autonomous or autonomous business units that are fully responsible for profits and losses;
- increasing the role of innovation and creating innovative firms within large companies, which are focused on the production and self-promotion of new products and technologies;
- upgrading the status of information, financial, and staff integration tools of the company;
- creation of autonomous groups (teams) focused on project technologies.

Companies have implemented digital transformation design ecosystems that include a variety of participants: customers, suppliers, partners, and researchers. They also actively use social networks and communities for various purposes, for example, to get feedback from customers about a new product or service [18]. In addition, these companies are becoming not just multinational but global. Digital technologies in combination with integrated information allow

them to obtain a global synergetic effect while retaining the ability to quickly respond to local changes.

Thus, increasing the competitiveness of business is the ultimate goal of the digital transformation of an enterprise, and effective knowledge management is the way to achieve this ultimate goal. Organized knowledge management can greatly accelerate the processes of digital transformation of enterprises.

THE "KNOWLEDGE-MANAGEMENT" SUBJECT AREA

In a complex business environment, competitive advantages of organizations are completely dependent on how well they can manage corporate assets. These assets can be divided into tangible and intangible assets. Traditionally, the main corporate material assets are machines, equipment, commodity stocks, and financial capital. Intangible assets play a small and vague role, irrespective of the industry, and as a rule, many organizations still underestimate their importance. To succeed and overcome competition in modern market conditions, organizations require a much wider range of resources.

Any organization that wishes to succeed in the digital economy must have an intellectual, comprehensive and easy-to-use system for managing knowledge reserves, as well as a system of access to knowledge and a system for acquiring new knowledge.

For successful competition in their own market, organizations must learn how to manage their intangible assets, that is, knowledge. Knowledge management is a concept whereby an enterprise consciously and comprehensively collects, organizes, distributes, and analyzes its own knowledge regarding resources, documents, and human skills. The long-term prosperity and survival of an organization to a large extent depends on its ability to use the hidden value of intangible assets [19–21].

Knowledge is the most important element of the management system in any sector of the economy. The digital economy forces to allocate them as a factor of development and the main competitive advantage.

Considering the concept of "knowledge management," the term "knowledge" should be clarified.

In computer science, knowledge is a kind of information that reflects the experience of a specialist (expert) in a particular subject area, their understanding of a set of current situations, and ways of transition from one description of an object to another.

According to D.A. Pospelov [22], knowledge is characterized by internal interpretability, structuredness, connectedness, and mutual activity.

D. Bell [23] defined knowledge as a set of organizational statements about facts or ideas that represent a reasonable judgment or experimental result that are transmitted to others through communication in some systematized form.

Table 1. Comparison of explicit and implicit types of knowledge according to different authors

Author(s)	Explicit knowledge	Implicit knowledge
I. Nonaka et al. [22]	<ul style="list-style-type: none"> —Can be formulated in natural language and presented in the form of data, scientific formulas, specifications, etc. —Relatively easy to process, transmit and store. 	<ul style="list-style-type: none"> —Deeply personal and difficult to formalize. —Based on action, procedures, order, purposefulness, ideas, and emotions.
F.A.J. Van den Bosch and R. Van Wijk [20]	<ul style="list-style-type: none"> —Formulated, systematized, trained, and easy to transfer inside. —The mass of explicit knowledge is built on the foundation of implicit shared knowledge. 	<ul style="list-style-type: none"> —Difficult to formulate, systematize and study, because this knowledge proceeds from specific context of personal experience and training in the process of work. —Often in the form of rules and procedures.
K.L. Lyons [13]	<ul style="list-style-type: none"> —Knowledge is somehow documented or codified. —Easily classified, categorized, combined and distributed. —Usually stored in the knowledge base or in the document management system. 	<ul style="list-style-type: none"> —Knowledge has a human essence. It is based on personal experience accumulated over a long time. —Influence of intangible (non-material) factors. —Takes the form of rules of thumb, intuition, advice, techniques, learned skills, best practices, animal instincts, and even knowledge of who was in contact with the information not based on their own experience.
J. Vorbek et al. [23]	<ul style="list-style-type: none"> —Documented and ideally structured knowledge, easily understood and available in various environments. 	<ul style="list-style-type: none"> —Exists in the heads of professionals of companies. —Includes experience, ideas, rules of thumb, and tricks and subtleties, which have not received generally recognized attention from previous management models.

Knowledge is also commonly referred to as information stored in a computer and formalized in accordance with certain structural rules that the computer can autonomously use when solving problems based on logical inference.

Knowledge is also information that is organized and analyzed in order to make it understandable and applicable to solving a problem or making decisions [24].

V. Allee [25] detailed the archetype (prototype) of knowledge, which contains data, information, knowledge, opinions, philosophy, and wisdom. Essentially, the archetype defines data as a set of white flags in a vast sea of information. It is particularly important that information becomes knowledge when it is analyzed, linked to other information, and compared to what is already known.

Some researchers define knowledge in the context of *know-what*, *know-how*, *know-where*, and *know-when* in the order pertaining to the concept of managerial knowledge. As an example, F.A.J. Van den Bosch and R. Van Wijk [26] presented the conceptual basis for the integration of managerial knowledge. The *know-what* concept can be defined as something that people carry in their head and pass on to each other, but the *know-how* concept makes it possible to use *know-what*

in practice [27]. On the other hand, Japanese researchers I. Nonaka, R. Toyomo, and N. Konno [28] defined “knowledge” largely via related, dynamic, and humanistic aspects, in contrast to traditional Western epistemology that focuses on the absolute, static, and non-human view of knowledge. These researchers agree that knowledge is created in a spiral between two opposite concepts, such as order and chaos, little and much, part and whole, soul and body, implicit and explicit, self and others, deduction and induction, or creativity and control [29].

In general, knowledge can be divided into two types: explicit and implicit. A comparison of these types of knowledge is given in Table 1.

Knowledge management can be viewed from various perspectives [30]. Here, we give the main approaches to the definition and interpretation of the concept of “knowledge management.” One way or another, all the definitions are related to the application of knowledge management in the corporate business environment.

J. Harrington and F. Voehl [31, p. 41] define knowledge management as a strategy for transforming a company’s intellectual assets, including recorded information (explicit knowledge) and the abilities of its employees (implicit knowledge), into new values

and into increasing its productivity and competitiveness.

P. Quintas [32] discussed three different approaches that give companies different answers to their knowledge-management initiatives. In the first case, it is priority gathering of knowledge of employees, use of available resources or knowledge assets, and improved access to corporate experience. In the second case, it is a focus mainly on capturing and reusing past experience, training, building and extraction of stored knowledge [25]. In the third case, it is a focus on the basic initiatives of knowledge management, strengthening of ties, training, and knowledge sharing. In addition, organizations recognize the importance of creating knowledge and strive to build a culture that supports it. P. Quintas cites the definition of “knowledge management” given by Xerox: knowledge management is a discipline that creates an environment for more effective work and learning and encourages the continuous creation, aggregation, use, and reuse of personal knowledge to achieve a new business value.

The next definition, given by Y. Carlisle [20], is related to the work of knowledge experts and the importance of knowledge sharing between employees: knowledge management is more than just managing software and hardware and solving user-friendliness issues. It is much more related to the use of creativity and people’s experience and to the effective management of dynamic social processes that create and use a wide range of different types of knowledge.

The Gartner Group gives the following definition: knowledge management is a discipline that provides an integrated approach to the creation, collection, organization, and use of enterprise information resources and access to them. These resources include structured databases, textual information, such as documents describing rules and procedures, and, most importantly, implicit knowledge and expertise in the minds of employees [33].

Having analyzed various definitions of the concept “knowledge management,” we can propose the following definition: knowledge management is a system of knowledge, skills, and abilities that provides for critical problems of the enterprise’s activity and implements a synergetic combination of data and information processing methods with application of information technologies and creative innovative abilities of people.

TOOLS AND TECHNOLOGIES FOR KNOWLEDGE MANAGEMENT

The effectiveness of knowledge management is manifested at two levels: individual and organizational. At the individual level, knowledge management provides employees with the opportunity to acquire new skills and experience through joint work, sharing knowledge with colleagues, and mutual learning, as

well as increasing personal effectiveness, which leads to better career growth.

At the organizational level, knowledge management provides two main advantages: the ability to

- improve an organization’s performance by increasing its efficiency, productivity, quality, and innovation (organizations that practice knowledge management tend to have a high level of productivity; with increased access of employees to knowledge, organizations can more effectively make decisions, optimize processes, reduce repetition of work, increase innovation and data integrity, and expand cooperation);

- increase the financial value of an organization through the acquisition of employee knowledge as an asset similar to traditional assets, such as goods or real estate [34, 35].

To solve organizational problems of knowledge management, it is necessary to combine human and information technologies, that is, people and information, in order to preserve the acquired corporate experience and knowledge for their re-application, and also to provide employees with access to necessary information.

As a rule, the main results of the customization of knowledge are “knowledge maps,” “knowledge packs,” resource catalogs, forums and chats, practice communities, storytelling (the story of how something happened), corporate blogs, and a bank of ideas.

The catalog of knowledge resources and information makes it possible to see what formalized experience already exists in a company.

Knowledge packs are a collection of thematic links to internal and external resources that are necessary to solve certain tasks, for example, to work on current projects or search for new employees.

Knowledge maps are a visualized set of interconnections of information units and objects of knowledge, as well as their carriers, that are represented graphically. Such maps contain references to necessary knowledge and indicate the path of access to it (contact numbers, addresses, and resources) [36].

Forums and chats are means of informal or relatively formalized communication. Participants in the discussions should have clearly defined professional interests, for example, training, obtaining new knowledge, and experience in problem solving from more proficient colleagues.

Practice communities are a group of people united by professional interests who share knowledge on a certain topic, solve problems together and find new approaches to solving business problems. Most often, with the existing communication needs among professionals, the leading role belongs to the company and directly depends on information and communication technologies [37].

Storytelling and corporate blogs are a way of sharing “implicit” knowledge and forming a corporate culture. As shown above, knowledge is present in organizations in explicit and implicit forms and the concepts of storytelling and corporate blogs help in the identification of knowledge. Employees describe their impressions and opinions (that is, implicit knowledge) in the form of long interviews dealing, for example, with negotiating, correcting errors in software, or reporting on a business trip. The results are recorded in the knowledge base.

A bank of ideas is a specialized tool for collecting ideas and best practices from company employees. The bank makes it possible to save all of the received ideas, review and leave comments by colleagues and experts, give estimates on certain criteria, and track the stages of implementation of ideas.

It should be noted that the main obstacle to the dissemination of knowledge within an organization is the inability of people to share their ideas about basic concepts (that underlie certain phenomena or events) with each other. In some cases, this problem can be solved using ontological models of knowledge management. The ontology here means explicit, that is, obvious specification of conceptualization, where the description of a set of objects and connections between them is used as conceptualization [38]. The knowledge infrastructure on which the corresponding ontological model relies includes different types of interrelated ontologies, thus representing experimental knowledge in the form of a semantic network to which known search programs or machines can be applied. Elements of the knowledge system are usually created or modified by collective efforts and any knowledge created as a result of collective creativity is subject to collection as part of a historical ontology. This aspect is critically important when accumulating hidden knowledge. The main issue in knowledge management is the extraction of lessons from past experience, which directly follows from the ontology of the components of managed knowledge [39].

One of the tools for involving employees in the processes of dissemination and exchange of knowledge within an organization is gamification, that is, the technology that involves the use of gaming approaches for non-gaming processes. The gamified process contains one or more of the following components [40]:

- remuneration for certain actions (scores or points);
- awards or prizes that can be obtained for major achievements or exchanged for points;
- visualization of goals (what is needed to obtain another reward, points, etc.);
- visualization of achievements.

As a rule, gamification systems are built into the knowledge portal as a system of involvement in the learning process and knowledge sharing. As an example, in 2016, the key “Knowledge Portal” tool was implemented in PAO Gazprom Neft as part of the knowledge-management system [41]. An important feature of the portal is a gamification system built in such a way that first it motivates employees to fill out their profile (tell the company about themselves and their experience); it then stimulates learning an e-course, after which involvement in the processes of interaction and knowledge sharing begins (the system encourages employees to subscribe for a professional forum, evaluate a publication or a course, write a comment to a document, etc.). The system employs activity levels (rules for each are written), the virtual currency is “barrels” (these are earned for each new level and can be used in a virtual store), and many activity ratings (of employees, communities, units, documents, and courses) occur.

Thus, information technologies support the rules that accompany the knowledge-management process and help to remove emerging barriers in solving the tasks of forming a unified working environment and the mechanism for the location, accumulation, use, and modification of knowledge, supporting innovations, and communicating information to all interested employees.

Global sources of knowledge acquisition (Internet, commercial databases)		Humanitarian technologies of knowledge management (corporate universities, continuous training in real time)	
Distribution of knowledge in the company (electronic document management systems, data collection systems)		Allocation of the value of individual knowledge	
Integrated communication networks	Multi-functional working groups (practice communities)	Distribution of knowledge between the company’s divisions (internal Intranet networks)	

The process of knowledge management in the company (see the scheme above) is realized to a

greater extent on the basis of the tools of information technology and management knowledge.

However, information technologies do not play a dominant role in knowledge management: if the company does not carry out activities to create a culture of joint work and common data access, IT solutions will not yield tangible results. As well as the use of only humanitarian technologies without the involvement of information technologies will not lead to effective knowledge management.

The effectiveness of the search for the necessary information and the possibility of its subsequent repeated use depend on the choice of the knowledge-representation method. This means that knowledge formalized in an explicit form can become part of corporate intelligence after special processing (structuring) [42].

Let us determine the following functional capabilities of information systems without which it is practically impossible to fully solve the tasks of knowledge management:

- preservation of knowledge in the context of solving problems, implementing projects, and relationships between people. This reflects the business process that leads to a desired result, reveals background information, the alternatives that have been tried, and the reasons that they did not yield the desired results. Knowledge that can be used to improve the business process is transferred to new products and services;

- directing user actions to place information about certain rules, which make it possible to successfully find and use it in the future;

- use of “people/content” links stored in the information system;

- reducing the dependence of knowledge on the people who own them. Losses associated with the departure of employees to other companies are minimized (losses of knowledge important for doing business and losses of connections with key customers/suppliers);

- correspondence communications reduce the need to spend time on personal meetings. Knowledge gained through personal correspondence consultation is stored in the system along with the context and can then be used by the entire community or group;

- access to the information system at any time in any place does not create restrictions on the duration of correspondence communications and guarantees receiving the accumulated knowledge at the right time and not only at the time of personal communication or events that provide group communications.

The main information technologies that support knowledge management are [43]:

- Data Mining: pattern recognition, distinguishing significant patterns from data in storage or input/output flows. These methods are based on statistical modeling, neural networks, genetic algorithms, etc.;

- document-management systems: storage, archiving, indexing, marking, and publication of documents;

- content-management systems;

- corporate search engines;

- means for organizing joint work: intranet networks for knowledge management, group work technologies, and virtual conferences;

- eLearning systems;

- corporate portals and knowledge portals;

- decision-support systems: expert systems, systems supporting discussion groups, etc.;

- gamification systems for engaging in learning and knowledge sharing processes;

- corporate social networks;

- social networks (Facebook, VK, Instagram, LinkedIn, Twitter, etc.), which allow interested individuals to learn about the knowledge, experience, and interests of clients/potential customers of the company and the company to present itself and its products/services to the widest audience. As an example, the number of registered Facebook users has already exceeded the population of China; its monthly audience is 1.968 billion people. Social networks use a tool for creating communities. Upon entering the community, users are actually in constant communication. The company also obtains the opportunity to talk about new products, promotions, and sales hits, which can increase the efficiency of doing business. Thus, social networks, where relationships between people are represented by nodes and lines with certain directions, can be used to study affiliations, social roles, habitual joint actions, manifestations of certain feelings, material relationships, similarity in behavior or taste, etc. Here, we can talk about two-way relationships: the company receives valuable knowledge about its customers/potential customers and their knowledge (customer knowledge management), and customers receive valuable knowledge about the company [44].

CONCLUSIONS

The new economy that is developing through digitalization, allows enterprises to overcome territorial constraints, reduce transaction costs of decision making and merchandise, and develop new business models based on network effects. Increasing business competitiveness is the ultimate goal of the digital transformation of an enterprise and effective knowledge management is the way to achieve this ultimate goal. Organized knowledge management can greatly accelerate the processes of digital transformation of enterprises [45].

Thus, without proper management of information systems, plans, procedures, and tools, information becomes a serious and annoying problem for many companies and in most cases is considered informa-

tion noise. However, being conscious of its important economic role, companies attempt to prioritize the collection and management of their own data, turning it into organizational knowledge or corporate intelligence.

Having analyzed the concepts of “knowledge” and “knowledge management,” one can conclude that knowledge management is not just a technology. Technology is the basis for the development of knowledge management, while the knowledge-management system is the basis for optimizing the existing business processes of an organization and their further modernization. Knowledge management leads to the creation of new knowledge, which contributes to the formation of information capital and innovation, which is the most important factor in the sustainable development of any company.

Modern enterprises operate in the face of growing competition, which is chaotic, complex, and global in conditions of limited resources. Knowledge of employees and companies becomes a valuable resource, which begins to be taken into account on par with other material resources.

Integration of information and humanitarian technologies will make it possible to save the obtained corporate experience and knowledge for their multiple effective use and at the same time provide users with access to the necessary information.

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