

# PROBLEMS OF INTELLECTUAL CAPITAL MANAGEMENT OF ENTERPRISES

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## ABSTRACT

The article highlights the key issues of intellectual capital management of enterprises. The existence of these problems has a systemic nature and their solution goes beyond the micro level of business. Intellectual capital, as an object of management, is not homogeneous. There are many related and adjacent concepts. The improvement of the terminology apparatus is based on the study of the essential characteristics of certain categories and the identification of the links between them. A separate problem is the structuring of intellectual capital. Within the three traditional constituents (human, organizational and consumer capital), the author presents his own specification of elements of intellectual capital. The problem of the economic evaluation of intellectual capital and its elements lies in the subjectivity of existing methods. Comparative analysis of evaluation methods, identifying their advantages and disadvantages for individual cases allows us to find the best way to evaluate. The author proposes solving the problem of methodology of intellectual capital management at the intersection of functional and process approaches to management. The obtained results have a theoretical character and are the basis for development of applied methods of management of intellectual capital of enterprises.

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**Introduction.** *Formulation of the problem.* The notion of intellectual capital was introduced into the scientific circulation about half a century ago. The intellectual capital management concepts developed since then have different interpretations of its structure, goals, measurement tools, methods for improving efficiency, development strategy, and so on. Even the notion of intellectual capital is still debatable, especially in the sense of applying to a specific enterprise. As a management object, intellectual capital is very complex, since it has a heterogeneous structure of elements that differ significantly for enterprises of different types, forms of ownership, stages of development, or even a way of controlling the control subsystem. Therefore, it is expedient to identify and describe those intellectual capital management problems that are inherent in the overwhelming majority of businesses, regardless of their peculiarities at the moment. After that, you will be able to search for related approaches to solving the identified problems and build on them the application tools for improving the mechanism of intellectual capital management of enterprises and its individual components.

*Analysis of recent research and publications.* The theoretical foundations of intellectual capital were laid on the fringes of 1980-1990 by such well-known scholars as A. Brooking, L. Edvinsson, D. H. Luthy, T. A. Stewart, P. H. Sullivan, K. E. Sveiby. In numerous works of their followers are reflected the results of the practical application of individual instruments of measuring intellectual capital and certain aspects of management. The specifics of the management of the intellectual capital of enterprises in post-Soviet countries are thoroughly reflected in the works of A. Bosak, O. Butnik-Siversky, S. Ilyashenko, O. Kendiukhov, L. Lukicheva, I. Moiseenko, A. Chukhno, O. Shkurupiy and others. The aforementioned scholars present different approaches to intellectual capital management, but do not focus on identifying related problems that arise through various instruments of managerial influence on individual objects within specific enterprises.

*Isolation of a previously unsettled part of the general problem.* The identification of common, related and adjacent problems of intellectual capital management in the context of its separate components in the conditions of different enterprises will unify the tools of economic appraisal of intellectual capital and form a universal mechanism for its development. Separate elements of this mechanism should be associated with the identified management problems and be capable of modification.

*The aim of the study.* Identify intellectual capital management problems that are systemic in nature, describe them and outline ways to solve them in the context of the formation of a theoretical concept and applied management tools.

**Research results.** The peak of the concept of intellectual capital management came about at the beginning of the 2000s, when leading multinational companies were looking for ways to increase the market value of their assets. Due to the increase in the aggregate value of intangible assets, their

capitalization and, consequently, the possibility of lending and increased volumes of securities transactions in the open market sharply increased. In the same period, the bubble began to blow up on the real estate market, the prices of Internet companies rose sharply, patents and licenses for high-tech assets were resold at fantastic prices. We saw how it ended in 2008, but can it be considered that the revaluation of intangible assets and speculative transactions with them were the main factor behind the development of the financial crisis? In order to answer this question, it is necessary to separate various intangible assets from each other to study the peculiarities of their commercialization and to determine the distinctiveness of their management in a market economy.

Thus, the first problem of intellectual capital management should be considered heterogeneity of the object of management. In addition, this heterogeneity is dynamic - the structure of the intellectual capital within a large corporation is changing rapidly and often not predictable. What is included in the concept of intellectual capital, what are its essential features, and can we clearly separate the notions of "intellectual capital", "intangible assets", "objects of intellectual property" and "intellectual product"? These seemingly purely theoretical terminological questions actually turn into a problem of accounting for intangible assets, and therefore - in the problem of determining their value, depreciation, taxation of related transactions, the identification of property rights and much more.

How different are the recognized definitions of intellectual capital can be seen from the following statements. Sveiby (1997) almost does not use this concept, but identifies it with intangible assets, which in his understanding mean "individual competence, internal and external structure of the enterprise". Stewart (1997) argues that "intellectual material includes knowledge, experience, information and intellectual property and participates in the creation of values" (p. 12). Edvinsson and Malone (1997) distinguish "the sum of human and structural capital; knowledge that can be converted into property." Brooking (1996) calls intellectual capital "the intangible assets of the enterprise, which are the basis of its existence and competitive advantages." Sullivan (1998) writes that the basis is "knowledge that can be converted into value" (pp. 238-244). Butnik-Siversky (2002) defines intellectual capital as "an intellectual product that is created or acquired, which is valued, objectified, and identified (separated from the enterprise), held by the entity for the purpose of obtaining profit (added value)" (p. 26). Ilyashenko (2008) defines intellectual capital as "intellectual ability of people, in combination with the material and non-material resources created by them that are used in the process of intellectual work" (p. 96). Lukicheva (2006) interprets this term as "a set of intellectual assets and labor resources within a particular science-intensive enterprise" (p. 113). Kendiukhov (2007) argues that intellectual capital can "create a new cost of intellectual resources of the enterprise represented by human and machine intelligence, as well as intellectual products produced independently or from other sources as means of creating a new value." And this list can be continued. Dozens of authors compete in originality, mix different intrinsic signs, replace some concepts with others, etc.

The results of author's own research suggest that the term "intellectual capital" is best defined in terms of a structural and functional approach, as "the result of intellectual work in the form of intellectual resources and intellectual products, the value of which can create an added value through the commercialization of human, consumer and structural assets" (Bosak, Prokopenko, 2016, p. 90). As for the combination of essential features of different terms, it is better to depict them graphically (Fig. 1). As we see the essence of intellectual capital includes three main components - human, structural and consumer capital. However, these components are formed from different combinations of resources, and it is not always possible to separate their intellectual component from financial ones. As for products of intellectual activity, they are the result of the use of intellectual resources and consistently turn into intellectual assets, intellectual property for intellectual capital.

The second problem is determining the structure of intellectual capital. Unambiguous identification of the components of intellectual capital and their elements will formalize the procedures for their economic evaluation and simplify the management process. However, we see different and often contradictory approaches of scientists to the structuring of intellectual capital.

Brooking (1996) considers human, infrastructure and market assets, as well as intellectual property, to be the main elements of the intellectual capital. Edvinsson and Malone (1997) distinguish between human and structural capital. Stewart (1997) believes that there are three components - human, structural and consumer capital. Kendiukhov (2008) allocates as many as five components: personified, infrastructure, techno-technological, brand and client capital. Ilyashenko (2008) introduces the concept of human (personal), organizational (structural) and interface capital. Again, the list can be continued, however, if we discard synonyms and avoid substitution of concepts, then it turns out that the classical scheme of intellectual capital allocation for human, structural and consumer remains the dominant one. True, there is a question of structuring these components into smaller elements. If indivisible elements are identified and links between them are established, then it is likely that we will be able to resolve the issues of the structure of the intellectual capital at the highest level.

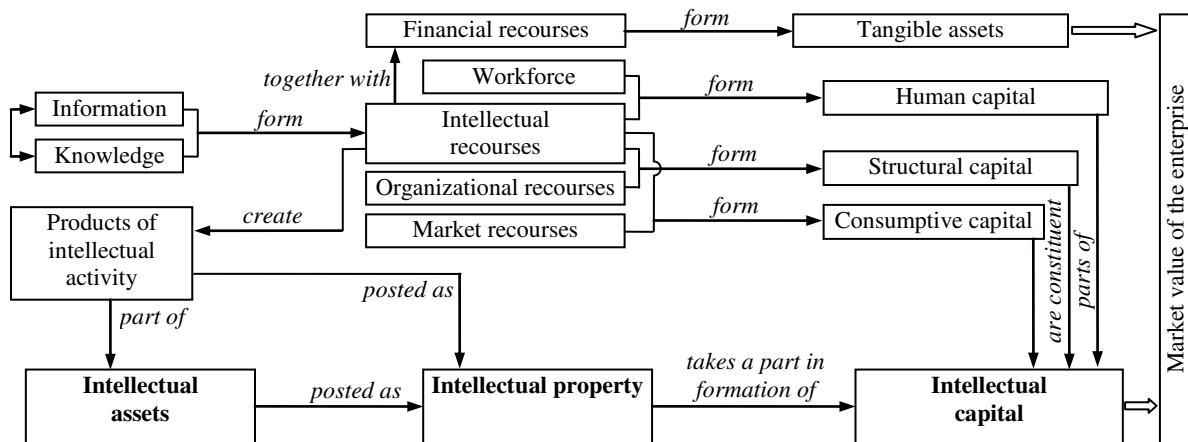


Fig. 1. Value of the concepts formed by the intellectual capital (Bosak, Prokopenko, 2016, p. 87)

The results of the conducted studies indicate that not all elements of the intellectual capital can be separated within a separate component. First of all, we believe that the term "structural capital" should be replaced by "organizational capital". Some actors use both terms in parallel, while others focus on one of them, but modern management realities come from the fact that the term "structural capital" has a narrower meaning. Despite the possible controversial issues, we consider it appropriate to structure the intellectual capital as follows:

1. Human capital:

1.1. Physical and physiological features of the individual (health, physical parameters, endurance, resistance to deterioration of working conditions).

1.2. Psychological features of the individual (character type, psychological parameters, emotional stability, adaptability, conflict level).

1.3. Social features of the individual (motivations, value system, communication abilities, personal and corporate culture, empathy, level of engagement in social interactions).

1.4. General characteristics and competencies of the individual (education, ability to take certain actions, ability to study, general knowledge of fundamental sciences, social sciences and foreign languages)

1.5. Specific professional characteristics and competencies of the individual (confirmed qualification characteristics, professional skills, work efficiency, ability to perform adjacent work, tendency to leadership and innovations).

2. Organizational capital:

2.1. Enterprise management system (management concept, organizational management structure, internal regulations, business processes, staffing, job descriptions, forms of power, management styles, strategic and tactical planning, motivation subsystem, control subsystem, means of regulation).

2.2. Objects of intellectual property (patents, licenses, know-how, trade secrets, commercial rights, industrial designs, trademarks, author's certificates, innovative proposals, utility models)

2.3. Internal infrastructure of the enterprise (information systems, communication systems, databases, knowledge bases, document management systems, information technologies, internal networks, logistics structure, transportation, warehousing)

2.4. Technological and technological subsystems (research and development, laboratory work, innovations, technologies, design work, energy supply, security systems, repairs).

2.5. Internal social relationships (corporate culture, social responsibility, synergy, psychological environment, informal groups).

3. Consumer capital:

3.1. Client capital (customer database, orders portfolio, customer relations, customer structure: systemic, permanent, situational and one-time clients).

3.2. Brand equity (trademarks, brands, advertising and PR, corporate name, corporate design, marketing communications, marketing technologies, market analysis methods, distribution channels, intelligent brand management products).

3.3. External infrastructure (external communications, information support of external contacts, business contacts, suppliers, contractors, trading networks, legal support, banking services, insurance).

3.4. External social relationships (social responsibility, social communication, public reputation, service policy, competition methods, environmental stance, relationships with civic organizations, trade unions and political parties).

Definitive structuring of the elements of intellectual capital is the basis for their further codification and creation of effective tools for their economic evaluation and development.

The spectrum of meters is very wide. Quantitative and qualitative indicators will have to be used. The monetary equivalents of individual elements of intellectual capital, their efficiency and growth potential should be measured. Based on this, it is necessary to formulate a general strategy for the development of the intellectual capital of the enterprise and its individual components.

The third problem of intellectual capital management is the lack of a universal method of economic appraisal. There are a lot of methods for estimating the total value of intellectual capital and the monetary equivalent of its components. However, these methods are subjective. The results obtained often depend on the goals that are set by the corporation's management. If the goal of measuring the overall level of intellectual capital is to increase the market value of a business, then it is likely that the chosen methods will be somewhat engrossed. If the company prepares for a merger, sale or liquidation, the desirable indicators will vary greatly and interested persons will be tempted to choose exactly the methods of evaluation that are better suited to their goals. There are no obvious accounting mistakes, just qualified managers among all methods will choose the ones that are most profitable for them. It is possible to reduce the level of subjectivity of the chosen methods of estimating intellectual capital and its components in two ways: 1) to oblige managers to use only certain methods of estimating intellectual capital in certain identified situations; 2) develop an integral estimation method, which will be based on a combination of different types of techniques, and thus offset the sharp deviations of the results obtained from the normalized values.

What are the methods of estimating intellectual capital in the disposal of modern management? There are numerous typologies of methods for estimating intellectual capital, but the typology which was initiated by Luthy (1998) and developed by Sveiby (1997) is considered to be the classical one. All existing methods are divided into 4 groups:

1. Direct Intelligent Capital Methods (DIC) identify individual elements of an intellectual capital, output their monetary estimates, and then calculate an integral estimation of the intellectual capital of the enterprise by a certain algorithm.

2. Market Capitalization Methods (MCM) are based on the fact that the equity capital of an enterprise and its market capitalization are mainly different. This difference will be the equivalent of the monetary value of the intellectual capital of the enterprise.

3. Return on Assets methods (ROA) offer to calculate the return on total assets, and then compare the obtained indicator with the industry average. The resulting difference is multiplied by the average tangible assets of the enterprise and thus reaches the average amount of income from intangible assets.

4. Scorecard Methods (SC) are based on the approach of creating special indicators that are measured in points for each element of the intellectual capital. The results can be aggregated for groups of elements of intellectual capital, graphically displayed and compared with other enterprises. However, there are no monetary estimates, the integral indicators are conditional.

The described groups of methods have clear advantages and disadvantages, which show the specifics of their application. The methods of ROA and MCM allow to get the cash equivalent of an intellectual capital on an organization-wide scale. This indicator reflects the market value of the company's intangible assets, but says nothing about their structure or development potential. These methods are most often used to assess the stock value of an enterprise when merging and selling companies. The disadvantage of ROA and MCM methods is that they are very sensitive to changes in interest rates and discount rates. For the same reason, they cannot be used for state-owned enterprises, non-profit organizations or separate subdivisions.

DIC and SC methods better reflect the state of development of intellectual capital and they can be used to evaluate individual elements of intellectual capital. Although DIC methods operate with monetary instruments, while SC methods are scores, they give quite realistic estimates. However, these assessments are contextual, they need to be customized for each business separately and they are hard to be interpret by financiers and accountants.

Often, in practice, the cost of intellectual capital is calculated by various methods and then an averaged result is deduced. By another method, algebraic sum of the cost of individual independent elements of the intellectual capital is compared to the difference in book value and stock value of the enterprise. One way or another, this problem cannot be solved completely. There are only partial solutions that cannot fully satisfy all groups of stakeholders at the same time.

The fourth issue, which is particularly acute for large companies, is the choice of the concept of intellectual capital management. Formally there is a methodological conflict between functional and process approaches to management. The functional approach is based on the allocation of specific management functions (based on common functions, namely, planning, organizing, motivating, controlling and regulating). Each of these functions is the basis for the formation of management

methods (administrative, economic, technological, and socio-psychological). In turn, management methods are formalized in the form of managerial decisions. The process approach is based on the business processes of the enterprise. Each business process has inputs (resources), outputs (results), management influences and mechanisms of implementation. For a process approach, the implementation of a specific management function is not important, what matters is discrete result of an individual business process. Historically, there is an opinion that functional approach works better for standardized streamlined production, and process - for diversified and mobile companies. But the essence of intellectual capital combines different types of productions and forms of business organization. Tangible resources move to the background. Business efficiency starts depending more on the ability of management to effectively manage intellectual resources and create such business models that encourage the creation of new knowledge.

Contradictions of functional and process approaches to management were partially eliminated within the framework of the process-structural approach. This approach proposes to combine the elements of management technology into specific structural units and link them together with management functions and key business processes. However, process-structural approach has not become wide-spread due to the lack of algorithmic base and application tools that would prove their effectiveness.

**Conclusions.** Intellectual capital is both a factor of production and commodity. The effectiveness of intellectual capital management is determined by the growth rate of market value of enterprises, but depends on the distribution of traditional resources. Unlike tangible assets that are subject to unambiguous assessment, intangible assets are difficult to assess by monetary indicators. At the same time, the productivity of intangible assets situationally determines the productivity of financial and human resources. Intellectual capital management is a complex process that is accompanied by systemic problems that modern management science cannot unambiguously solve. The first problem is the complexity and heterogeneity of intellectual capital as an object of management. So far, an unambiguous list of essential features of the intellectual capital has not been formed, nor has conclusive understanding of the constraints of related categories been defined. The second problem is the complexity of structuring individual elements of the intellectual capital and their groups. One of the ways of solving this problem is to approve the basic list of elements of the intellectual capital within the individual components at the level of separate industries. The third problem is the lack of a universal method for evaluating the intellectual capital and its components, which would give credible results. Today, the objectivity of most of the known methods of economic evaluation of the intellectual capital is questionable. Finally, the fourth problem is the variability of approaches to intellectual capital management. The conflict between representatives of the functional and process approaches to management does not allow for the existence of a holistic concept of management of the intellectual capital. In the future, for each of these problems, comprehensive research should be carried out in the context of studying individual components of the intellectual capital with anchoring to specific enterprises, industries and sectors of the economy.

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