EVALUATION OF INTELLECTUAL CAPITAL OF AN ORGANIZATION

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ABSTRACT

The article considers approaches to the definition of«intellectual capital». For measuring and accounting of such capital, an organization is proposed to supplement the existing methods with comparison of estimated objects using cluster analysis. It is shown how the use of this option can improve the integrity and objectivity of the evaluation. An original method for determining the dynamic characteristics of an object is proposed. The article emphasizes economic substance of intellectual capital; features for assessing its value in terms of market capitalization are highlighted.

ENGLISH SUMMARY

Background. *Intellectual capital of an organization in the modern sense means that first of all knowledge is possessed by its people. In this case, knowledge consists of with different skills, experience and organizational structure to ensure their use.*

Many scholars recognize that intellectual capital is the most important factor of production in the modern economy. But the problem of scientific interpretation of its definitions, structure and content still exists. Even after analyzing views of a large number of researchers it is very difficult to give a clear and universal definition of intellectual capital. The essence of the concept changes with development of society and market relations.

Objective. *The objective of the authors is to investigate the definition «intellectual capital», existing methods of its evaluation and to show advantages of cluster analysis method.*

Methods. *The authors use description, comparison and analysis.*

Results.

Intellectual capital includes two basic concepts – «intelligence» and «capital». Intelligence is a qualitative component of any capital good, providing a synergistic effect when creating a new value. And capital contains a functional trait, assuming a certain rate of return on the performed work. Thus, intellectual capital is a system of capitalized intellectual knowledge, the creative use of which provides for the production of new intellectual goods and achievement of an adequate return [1].

V. L. Inozemtsev considers intellectual capital as «collective brain», accumulating scientific and everyday knowledge of workers, intellectual property and experience of organization, using channels of communication and information structure, information networks and image capabilities of the company [2]. B. B. Leontiev defines intellectual capital of the company as value of the aggregate of its available intellectual assets, including intellectual property, congenital and acquired intellectual abilities and skills of the staff, as well as the accumulated knowledge and constructive relationships with other subjects. One of the main functions of intellectual capital, according to the scientist, is « to accelerate significantly the growth of the mass of profit due to formation and implementation of knowledge systems, which an enterprise requires, things and relationships that, in turn, provide it with a highly efficient economic activity» [3].

Problem of identification, measurement and accounting of intellectual capital gains special significance today. In the current economic environment characterized by increased competition, the role of intellectual and information resources increase substantially, and they are determinant in achieving success in the competitive interaction. Accountancy operates the market value of the organization on a par with the balance and market value. It implies the presence in the financial statements of information about intangible assets (goodwill, business strategy, intellectual capital). The process of accounting of intellectual and information resources is rather complicated.

Competitiveness of an organization is largely ensured by intellectual capital, because getting all sorts of technological and organizational advantages over competitors is one of its key functions. It is clear that the relationship with the market value of the organization implies the existence of such categories as price, rent, etc. However, if they do not find a direct reflection in the definitions of intellectual capital, its priority in the competitive struggle still remains, and it is postulated in early works of Steward on this issue [4].

The main purpose of intellectual capital is to significantly accelerate the growth of the mass of profit due to formation and use of systems of knowledge, necessary for an organization. However, its presence and efficiency of use determine the quality of the existing management system.

Particular difficulty in assessing intellectual capital is the fact that its worth and marketability are dynamic categories that do not have universal properties. Therefore, in our opinion, evaluation of intellectual capital should be carried out in the dynamics, as the value of existing capital is determined and increases (or decreases) only in the context of the development strategy of the organization, while with another strategy available intellectual resources may be of little use.

When evaluating the intellectual capital any organization faces many problems. The main ones are:

• limited opportunities of strictly formal and adequate description and measurement of intellectual resources;

• a high degree of uncertainty in the results of scientific research and new developments;

• methodological features of the definition of standards of creative work and their reliability.

These problems hinder the unambiguous interpretation of the evaluation results, which in turn lead to the need for the formation of industry standards.

An actual scientific task implies that mehods of evaluation of intellectual capital should provide for: 1) the adaptive nature of means evaluating the state of an object of research; 2) the real predictive mechanism.

In this case, we use an approach based on the typology of assessments of intellectual capital [5, 6]. At the same time the idea of combining the method of cluster analysis [7] and the methods of evaluation of intellectual capital dominates.

The essence of the cluster analysis is that, having sample data, we carry out its division into groups that contain similar objects. Application of the method allows generating internally homogeneous groups, not based on any prior assumptions, but relying on the analyzed data, characteristics of the objects under study. As a result of partitioning we get a homogeneous set of objects, within which we can distinguish objectively existing regularities. Moreover, cluster analysis makes it possible to overcome one of the present complex issues in the evaluation – the complexity and, as a consequence, an arbitrary valuation of intellectual resources and efforts.

Researchers disagree on the definition of the exact number of methods for assessing intellectual capital. We will follow [5] and divide them into four categories: 1) methods of direct measurement; 2) methods of market capitalization; 3) methods of return on assets; 4) methods of scoring.

Methods of the first group – methods of direct measurement (Direct Intellectual Capital methods – DIC) are based on

identification and evaluation of monetary values of individual assets or components of intellectual capital, and then an integrated assessment is formed. The disadvantage of these methods is a consequence of the so-called emergence of intellectual assets if, relatively speaking, after evaluating two units of some equipment, we have an idea of how they might interact, then the interaction of individual ideas will not sure have a positive cumulative effect.

The use of cluster analysis and the selection of groups of objects with similar characteristics of intellectual capital allows us to overcome this difficulty, as a result, evaluation objects with different structure of assets get in different groups. Within each of the groups we can already carry out comparison and evaluation as they are internally homogeneous.

Methods of market capitalization (Market Capitalization Methods – MCM) rely on calculation of difference between market capitalization of the company and its shareholders equity, and the obtained value is considered as the value of its intellectual capital or intangible assets. This approach is very convenient, but it does not show the individual value of the intellectual resources of the organization, but instead it shows how many potential customers are willing to pay for them. Cluster analysis in this case allows us to select a group of organizations with similar characteristics of market evaluation. Then it is possible to compare the test organization with recognized leaders (or the most stable objects) and rank it within the selected group.

More close to the assessment of intrinsic value of intellectual capital are suitable methods of return on assets (Return on Assets methods – ROA). Ratio of the average income of the organization before taxes for a certain period of its tangible assets is compared to the same period for the industry. The difference between these values gives the excess return on the organization of the industry average. To calculate the average additional income from the use of intellectual capital, the resulting difference is multiplied by the value of tangible assets of the organization. Further, by the direct capitalization or discounting of generated cash flow it is possible to determine the value of all intellectual resources. The advantage of cluster analysis is fairly obvious: a comparison can be carried out not with the average values for the industry, but with the average values for the cluster to which belongs the organization being assessed.

The fourth group includes methods that do not involve the receipt of the results of cost – the so-called methods of scoring (Scorecard Methods – SC). In their application various components of intangible assets or intellectual capital are identified, indicators and indices are calculated in the form of scoring. This procedure is most appropriate for the cluster analysis of the results and the allocation of homogeneous sets, because it implies a set of characteristics and there is an opportunity to share the available sample of a large number of criteria. An additional advantage when using SC methods is the fact that belonging to one of the clusters is an integral feature that allows overcoming the fragmentation of evaluation of intellectual capital.

From the standpoint of the total valuation of intellectual capital the most acceptable methods are MCM and ROA, which in some way complement each other: the methods of MCM show how much a potential buyer is willing to pay, and the methods of ROA concern own cost of intellectual capital. Organizations belonging to the same cluster on the basis of one feature and belonging to different on the basis of other features are of the greatest interest. The essence of the situation is that the market valuation of intellectual capital and its own assessment of its value is not the same for such an organization. This, in turn, can be an indicator of near significant changes in its market condition.

Increasing the use of cluster analysis may relate primarily to dynamic characteristics of intellectual capital evaluation. After construction of clusters for each of them the dynamics of their center in the given coordinates (performance evaluation) is calculated. We can distinguish two types of behavior of organizations in the field of intellectual capital management: the first – following to the center of the cluster, the second – the movement to the edge of the cluster. The second type of behavior means that the organization is leaving previously occupied cluster and tends to have problems with management technology.

Conclusion. *The use of cluster analysis helps to build an internally consistent classification of valued companies, complementing existing methods and enabling to move to quantitative integrated assessment based on the position of the object in the cluster. An additional effect compensates for the complexity of the object and the lack of uniqueness (precision) of the rating scale of intellectual capital. Appearance of dynamic characteristics enhances the completeness and quality of the results, but at the same time the likelihood of problems in the controllability of the system under study.*

Keywords: intellectual capital, intangible assets, knowledge economy, cost estimation, competitiveness of an organization, intellectual resources, cluster analysis method, market capitalization, efficiency.

REFERENCES

1. Salikhov, B. V. Intellectual capital of the organization [*Intellektual'nyj kapital organizacii*]. Moscow, Dashkov and Co. publ., 2008, 156 p.

2. Inozemtsev, V. L. On the theory of post-economic formation of society [*K teorii postjekonomicheskoj obshhestvennoj formacii*]. Moscow, Academia publ., 1995, 340 p.

3. Leontiev, B. B. Price of intelligence. Intellectual capital in the Russian business [*Cena intellekta. Intellektual'nyj kapital v rossijskom biznese*]. Moscow, Aktsioner publ., 2002, 101 p.

4. Stewart, T. A. Intellectual capital: The new wealth of organizations [*Russian title: Bogatstvo ot uma: Per. s angl*]. Minsk, Pardoks publ., 2001, 352 p.

5. Kruchinina, N.A., Tsurikov, S. V. Classification of intellectual capital evaluation methods [*Klassifikacija metodov ocenki intellektual'nogo kapitala*]. http://www.safbd.ru/sites/default/files/2008_1_tsurikov.pdf. Last accessed 1.09.2014.

6. Ienicu N. M. A retrospective of evaluation models on intellectual capital. *Annals of Faculty of Economics,* 2011, Vol. 1, Iss. 2., p. 544–549

7. Barngolts, S. B. Economic analysis of economic activity at the present stage of development [*Ekonomicheskij analiz hozjajstvennoj dejatel'nosti na sovremennom jetape razvitija*]. Moscow, Finansy i statistika publ., 1984, 214 p.

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