

Intellectual capital accounting as a component of economic systems development

Semenova Svitlana

*Candidate of Economic Sciences,
Associate Professor of the Department of
Accounting and Taxation
State University of Infrastructure and Technology*



Abstract. Intellectual capital has a significant impact on enterprise value and is one of the most important criteria for assessing the effectiveness of a business entity. Intellectual capital is not a financial or tangible asset; its mostly non-material nature, a variety of its manifestations, features and properties make it difficult to choose the method of valuation and representation in accounting, financial and management reporting. However, its importance in ensuring the sustainable development of economic systems, as well as the formation of the value of companies require adequate accounting information about intellectual capital availability, use and capacity building.

Key words: *intellectual capital, accounting, recognition, evaluation.*

Problem statement

In light of today's global informatization of society and the formation of a knowledge-based economy, an idea is an impetus for the development of economic systems. Therefore, the ability to generate and implement ideas, which are a vital component of intellectual capital, is of special interest to scientists and practitioners. In order to make effective decisions in intellectual capital management, reliable and complete data is required, an important source of which is accounting. However, further research is needed, given the controversy and the lack of a common methodology for recognizing, evaluating and representing intellectual capital in accounting and reporting.

The intelligence is defined as a set of mental abilities or information potential of knowledge of a particular person, obtained as a result of the functioning of consciousness, thinking and reason of man. That said, the assertion that intellectual capital is associated exclusively with an individual is rather limited, since with new developments in the field of artificial intelligence this concept can become more general. However, everybody agrees that artificial intelligence is devoid of creativity, emotionally, motivation, imagination, in contrast to human intelligence, which is capable of solving non-standard tasks and offering unexpected solutions and ideas.

Information has no value per se; it obtains its exclusive value and utility from an individual, who makes decisions on its basis. Formation of accounting information about the intellectual capital of an enterprise is based on the task, collectively, that is, collectively evaluate what has different individual weight and value. In this regard, the identification and estimation of intellectual capital value are the key to strategic and current management decisions, as well as for representing the intellectual capital in the accounting and reporting.

Analysis of research and publications. Intellectual capital acts as a special category of economic analysis and management and is a specific object of accounting. This category is controversial and debatable, but at the same time extremely relevant in modern conditions, as evidenced by many publications. The issues of accounting for intellectual capital in an enterprise are covered in the works of L.V. Bilozor (2017, pp. 101-105). I.A. Deroun offers ways to improve the representation of intellectual capital components in accounting (2013, pp. 28-34). In his monograph on intellectual capital, M.V. Koryagin (2012, p. 389) describes ways of its accounting and gives an overview of its valuation methods. Approaches to the classification of intellectual capital as an object of managerial accounting are covered by I. B. Sadovska (2012, pp. 205-211); other aspects concerning accounting, definition and classification of intellectual capital are reflected in the writings of the following scholars: L. Niemczyk (2015, p. 356), Khavandkar Jalil (2013) and Khavandkar Ehsan (2016, pp. 213-231), N. Maluga and S. Legenchuk (2005, pp. 485-491), Stahle P., Stahle S. and Lin C. (2015, pp. 20-57), S. Petkov (2005, pp. 59-63) etc. Along with this, practical aspects of the division of intellectual capital into components specifically for accounting purposes have remained under-researched. The same refers to the selection of accounting objects for valuation and representation in financial and management reporting in accordance with international accounting and reporting standards and the current needs for managing the economic system's development.

The purpose of the paper is to determine the essence, characteristics and constituent elements of intellectual capital as an object of accounting, financial and managerial reporting, choice of valuation and cost measurement methods used for making effective decisions and ensuring sustainable economic growth.

Presenting main material. Intellectual capital is the intangible value of a business that covers its people (human capital), the value inherent in its relations (relational capital, or consumer capital), and all that remains when employees go home

(structural capital), including intellectual property (IP) as one of its components.

There are different approaches to defining intellectual capital, such as the ability of people to increase the enterprise value and to produce results of intellectual work with the help of material and non-material means. Besides, intellectual capital is regarded as a set of information and knowledge comprising scientific and everyday skills of employees, intellectual property and experience, the culture of communication and organizational structure, information networks and the image of the enterprise. Intellectual capital is also understood as the value of existing intellectual assets, including intellectual property, available and acquired intellectual abilities and skills, as well as the accumulated knowledge base and useful relations with other economic actors.

Intellectual capital can be considered at the micro level as a potential, knowledge and the ability of an individual. At the level of economic system or enterprise, intellectual capital is generally understood as the sum of knowledge of all the company's employees, which is associated with additional competitive advantages; it is also perceived as a set of intellectual resources and their implementation capabilities which determine the company's ability to develop on the basis of information and knowledge. This term is used in educational institutions to account for the value of intangible assets that are not directly shown on the company's balance sheet. Also, intellectual capital of higher educational establishments and scientific institutions is distinguished as a combination of intellectual resources and the ability to implement them, which conditions a long-term development based on the generation, accumulation and use of information and knowledge (facts and rules). At the national level, intellectual capital is called National Intangible Capital (Stahle P., Stahle S. and Lin C. 2015, pp. 20-57).

Let us consider in detail intellectual capital components of the economic system:

1. Human capital is the value that business workers provide through the application of abilities, know-how and experience. Human capital is evaluated through the sum of knowledge, skills, competencies, ideas, energy and motivation;

this is a joint ability of the economic system to solve business problems and use its intellectual property. Human capital resides in people and cannot belong to an organization. Therefore, human capital can easily be lost when employees leave a company for various reasons (if, for instance, top management has failed to ensure proper working conditions). Due to this variability, an enterprise can lose human capital or build it up attracting the most skilled and talented workforce. Human capital also indicates how efficiently an organization uses its intellectual resources measured by creativity and innovation. Human capital leads to the creation and modernization of new products and services that attract customers, increase revenues and stimulate long-term company's economic growth.

2. Structural capital is a part of intellectual capital owned by a company, as secured by documents, systems, processes, databases, publications, reference books and organizational structure, which is a supportive infrastructure and ensures the functioning of human capital. Structural capital includes processes, patents and trademarks, as well as company image, organizational structure, information system, firmware and databases. Due to its various components, structural capital can be further classified into the capital of organization, process and innovation. Organizational capital comprises the value of an effective organizational structure that enables company staff to fulfill its potential and use all its abilities. The capital of processes is defined as methods, procedures and programs that implement and improve the logistics of information, goods and services within the economic system. Innovative capital includes intellectual property: patents, trademarks and copyrights, i.e. intangible assets owned by the enterprise. The distinction between structural and human capital lies in the ability of the former to be identified and separated. Structural capital as an object of intellectual property may be legally protected by patents, commercial secrets, copyright laws and trademarks.

3. Relational capital is a value consisting of the following elements: customer relationships, supplier relationships, trademarks and trade names, which preserve their value only with regard to customers,

licenses and franchises. This is the most valuable form of intellectual capital, as customers pay bills that directly contribute to the increased incomes. However, the relational capital is very intangible in its nature, so companies invest heavily in marketing to shape this form of intellectual capital into a "brand". The notion that customer capital is different from human and structural capital highlights its primary importance to a company's worth. The value of the relationships that a business maintains with its customers and suppliers is also called goodwill, which is valued according to specific accounting rules.

The intangible nature of the intellectual capital components, coupled with the growing importance of their worth's valuation and representation in the company's accounting and reporting, leads to the growing interest in intellectual capital management. In order to create, form and renovate intellectual capital, one requires strategic vision that combines all three aspects of intellectual capital (human, structural and relational) in the organizational context by identifying and exploiting, measuring and disclosing (Khavandkar Ehsan 2016, pp. 213-231).

In the classical economic sense, capital is money that generates money. From the accounting perspective, the definition of intellectual capital as a capital (that is, a liability, either one's own or borrowed source of asset funding) is controversial. The components of intellectual capital belong to the enterprise assets; therefore, it would be better to speak about intellectual assets or intangible resources, with their ability to bring future economic benefits.

Depending on whether all the asset recognition criteria are met, intellectual assets can be on balance, that is, disclosed in the financial statements, or off balance, that is, reflected only in the internal management reporting of the company.

The International Accounting Standards Committee has developed the International Accounting Standard 38 to determine the methodology for accounting intangible assets. IAS 38 defines an intangible asset as a non-monetary asset that has no physical substance and can be identified. In this case, the asset is a resource: (a) controlled by the entity as a result of past events; and (b) the

use of which is expected to bring future economic benefits to the entity.

In order to reflect the object (components) of the intellectual capital as an intangible asset in accounting and reporting, the following recognition criteria must be adhered to at the same time:

(a) future economic benefits associated with the asset are likely to flow to the business entity; and

(b) the cost of the asset can be measured reliably.

The norms of IAS 38 also apply to measures aimed at increasing intellectual capital, advertising, training, commissioning, development and research expenses. Research and development activities are aimed at building knowledge. Hence, although such activity may result in an asset with a physical substance (for example, a prototype), the physical element of the asset is secondary to its intangible component, i.e. the knowledge embodied in it.

Business entities often recognize the cost of resources or liabilities arising from acquisition, development, maintenance or increasing usefulness of intangible resources such as technical or scientific knowledge, development and introduction of new technologies and systems, licenses, intellectual property, market research and trademarks (including brand names and publication titles). Accounting includes such objects as computer software, patents, copyrights, films, customer lists, mortgage rights, fishing licenses, import quotas, franchises, customer relationships or supplier relationships, customer loyalty, market share and marketing rights.

Not all intellectual property objects meet the definition of intangible assets because of the inability to identify or control the resource and the difficulty in proving the existence of future economic benefits. If a component of the equity capital does not meet the criteria of an intangible asset, the cost of its acquisition or internal generation is recognized as an expense when it is incurred. However, if the item is acquired in a business combination, it becomes part of the goodwill recognized at the acquisition date.

By definition, an intangible asset must be identified so as to be distinguished from

goodwill. Goodwill recognized in a business combination is an asset that reflects future economic benefits arising from other assets acquired in a business combination if they cannot be individually identified or recognized separately. Examples of goodwill are: synergistic effects following a business combination, expansion into other markets and organizational capital. However, such an approach to the definition and valuation is not fully justified, since, in accordance with IAS 31 Interests in Joint Ventures, goodwill from the accounting perspective can only arise during acquisition. Furthermore, it is an estimated value that shows the difference between the market and book value of the enterprise at the time of acquisition. In this approach, goodwill calculation is based on the value of material non-current assets, which is illogical during the intellectual capital valuation. Goodwill is predominantly a generalized characteristic that does not show the value of each structural element of the intellectual capital that constitutes it.

Internally generated goodwill should not be recognized as an asset. If an entity makes expenditures to generate future economic benefits, but as a result does not create an intangible asset that meets the IAS 38 recognition criteria, such expenditures are described as contributions to the internally generated goodwill. Internally generated goodwill is not considered an asset, because it is not an identifiable resource (i.e. it is not separable and does not originate from contractual or other legal rights), which is controlled by a business entity and can be measured reliably at cost.

The difference between the market value of a business entity and the carrying amount of its identifiable net assets at any time may include a number of factors that affect the cost of the entity. However, these differences do not reflect the cost of an intangible asset controlled by the entity.

For accounting reasons, a concept of internally generated intangible assets is distinguished; their recognition and value formation depend on the stage of research or development. Therefore, to assess whether the internally generated intangible asset meets the recognition criteria, the business entity classifies the generation of the asset into (a) a research stage; and (b) a

development stage. If it is impossible to separate the research stage from the development stage of the internal project to create an intangible asset, such expenditures refer to the research stage.

It can be difficult to assess the generation of internal goodwill according to the recognition criteria while identifying an asset that will bring future economic benefits and the time moment for which it exists.

Another difficulty lies in reliable cost estimate for such an asset in accounting. Sometimes the cost of internal generation of an intangible asset cannot be separated from the cost of maintenance or increase in usefulness of the entity's internally generated goodwill or from current transactions. Therefore, entities establish additional recognition criteria for internally generated intangible assets as part of intellectual capital, as detailed in Figure 1.

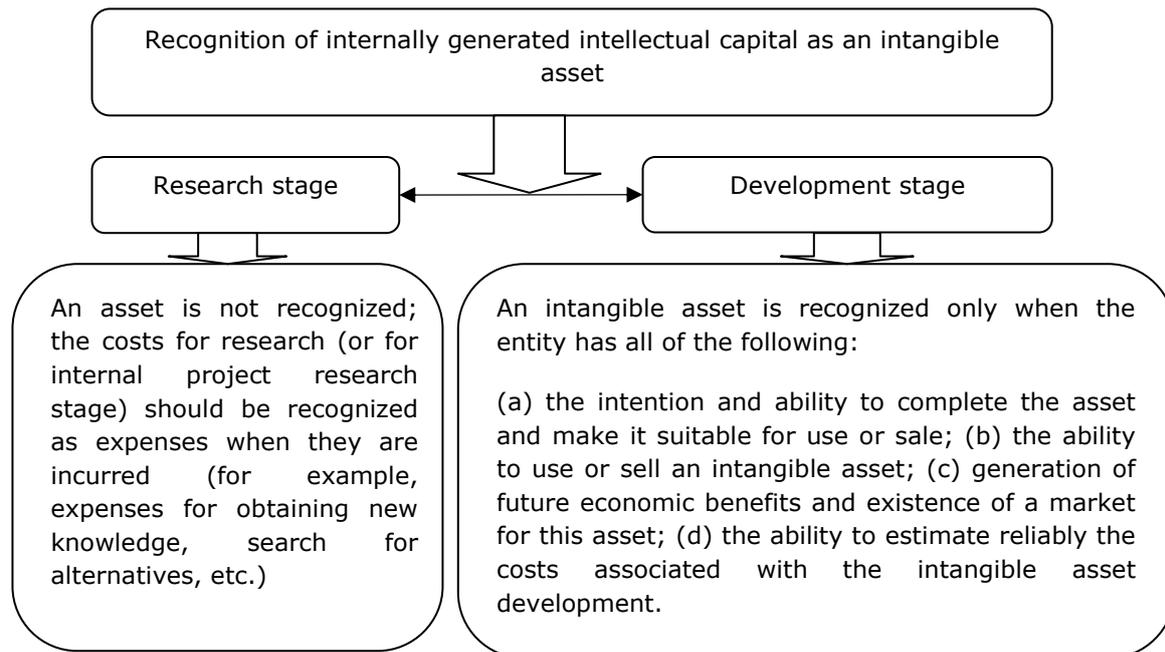


Fig. 1. Criteria for the recognition of internally generated intellectual capital as an intangible asset
Source: compiled on the basis of elaboration [4]

The future economic benefits generated by an intangible asset may include income from the sale of products or services, reduced expenditures or other benefits arising from the use of the asset. For instance, the use of intellectual property in a production process may reduce future production expenses instead of increasing future revenues, which is also considered an economic benefit.

The future economic benefits may arise from synergy of the acquired identifiable assets, or from the assets that individually do not meet the recognition criteria in the financial statements. The identification criterion means that an asset is considered identified in the following cases: (a) it is separable, i.e. can be separated from the entity and sold, transferred, licensed, leased

or exchanged either individually or with the related contract, identified asset or liability, regardless of whether the entity intends to do so, or (b) is the result of contractual or other legal rights, regardless of whether they can be transferred or separated from the entity or other rights and liabilities.

A business entity controls an asset if it has the authority to receive future economic benefits from the main resource and restrict the access of others to the benefits, in particular according to legal rights. Future economic benefits may be derived from market and technical knowledge. A company controls the benefits if, for instance, the knowledge is protected by legal rights such as copyrights, trademark restrictions or by a

legal obligation of employees to keep confidential.

With regard to human capital accounting, a business entity may have a team of skilled employees and determine their qualification growth that will bring future economic benefits from training. At the same time, it is possible that the staff will continue to make use of their qualification. However, a business entity usually lacks sufficient control over the expected future economic benefits flowing from skilled workforce and from training, in order to treat these objects as intangible assets. For the same reason, it is unlikely that a certain management style or technical talent may meet the definition of an intangible asset, unless their use and receipt of expected future economic benefits are protected by legal rights, provided they meet other definition criteria.

A business entity can have a customer portfolio or a market share and expect that the customers will continue to interact with the entity thanks to its efforts in improving customer relationships and loyalty. However, in the absence of legal protection rights or other means of controlling customer relationships and loyalty, the entity usually lacks sufficient control over the economic benefits stemming from customer relationships or their loyalty in order to treat these items (i.e. customer portfolio, market share, customer relationship and loyalty) as intangible assets. In the absence of legal protection rights for customer relationships,

exchange transactions with the same or similar customer relationships (other than part of the business combination) provide evidence that the entity is still able to control the expected future benefits from customer relationships. Since these exchanges also provide evidence that customer relationships can be separated, such customer relationships are consistent with the definition of an intangible asset. An entity's cost accounting system can often provide the reliable estimation of the cost for the intangible asset internal generation, such as salary or other expenses incurred in securing copyrights or licensing, or in developing computer software.

The methodology for intellectual capital accounting varies per each item, depending on whether intangible assets are recognized or not.

If an intellectual capital item is recognized as an intangible asset, it is initially valued at cost. In this case, the cost is the amount of cash or cash equivalents paid, or the fair value of other form of compensation granted to obtain an asset at the time of its acquisition or creation or, if appropriate, the amount attributable to that asset when initially recognized in compliance with the specific IFRS requirements. The offered method of intellectual capital valuation depending on its components and recognition is presented in the table 1:

Table 1
Methodology for valuating a company's intellectual capital as an object of financial and managerial accounting

Intellectual capital item	Cost estimating method	Representation in accounting and reporting
Acquired or created intangible assets (patents, licenses, permits, privileges) – innovative capital as part of structure capital	An initial cost estimate including direct expenses for the item acquisition and preparation for use. After initial recognition, an intangible asset is measured at cost with the deduction of any accumulated depreciation and impairment losses	Representation of intellectual capital through the recognition of intangible assets, their accounting and generalization in the company's financial statements
Internally generated intellectual capital as an intangible asset at the development stage	Systems for calculating labor costs, materials and services used or consumed when generating an intangible asset; fees for registration of legal rights; depreciation of patents and licenses used to	Recognition of capital investments at the development stage and of intangible assets at the stage of implementation in the relevant chart of accounts,

	generate an intangible asset	representation of information in the company's financial statements
Internally generated intellectual capital as an intangible asset at the research stage	At the research stage, an entity cannot prove the existence of an intangible asset that will generate probable future economic benefits; therefore, costs are recognized as expenses when they are incurred	Represented in the accounting and financial statements of the period expenses, on off-balance sheet accounts and in management reporting of internally generated goodwill
Internally generated or purchased brands, trademarks, headlines, publication titles, customer lists etc.	Not recognized as intangible assets; are shown as expenses, as such expenditures cannot be separated from costs for general business development	Represented in financial accounting and cost accounting reporting, on off-balance sheet accounts and in management reporting of intellectual capital's relational components
Expenses for employee training and other components of human capital (employees' motivation, ability and creativity)	Rating scoring system, Scandanavia Navigator indicators, balanced scorecard, motivation matrix	Represented in the accounting and financial statements of cost recognition, on off-balance sheet accounts and in management reporting of human capital representation and characteristics
Other components of structural capital (organizational structure, commercial secrets)	Direct measurement methods (via KPMG technology) based on the value of intangible assets used, as well as assessment of knowledge, skills, values, technologies and processes. Comparative and multiplicative methods, ranking, discounting of future cash flows	In financial accounting and reporting of recognition of expenses for business development, on off-balance sheet accounts and in the management reporting of the of intellectual capital components, organizational capital in particular
Relational capital (relations with partners and customers)	Methods of determining the profitability, weighted average cost of capital, estimated value of off-balance sheet components of intellectual capital	Represented on off-balance sheet accounts and in management reporting of relational capital status and dynamics
Goodwill	Methods based on the market capitalization of an enterprise, Tobin's Q ratio, the price-to-book value ratio of an enterprise	In accounting for the application of the acquisition method under IFRS 3; that is, the buyer recognizes goodwill at the acquisition date in excess of the compensation over the company's identified value in balance sheet

Source: compiled by the author on the basis of elaboration [1-14]

Therefore, when selecting a method of representing the intellectual capital in accounting, it is important to divide its constituent elements further into: (1)

intangible assets; (2) expenses for business development, which are reflected in the accounting and financial reporting system; or (3) the elements that are shown only in

company's internal reporting and valued to meet the information needs of the management decision-making process. In terms of accounting, if a business entity makes expenditures to generate future economic benefits, but as a result does not create an intangible asset, such expenditures are described as contributions to the internally generated goodwill. In accordance with IAS 38, internally generated goodwill is not recognized as an asset in accounting, because it is not an identifiable resource that is

controlled by the entity and can be measured reliably at cost.

The importance and role of intellectual capital in the company's economic growth require the consideration of all its elements in balance sheet and off-balance sheet accounts, in the form of financial, as well as internal management reporting, to determine its state and dynamics, factors of influence, interaction, the possibility of synergy effects and emergence.

Conclusion

It has been found that according to the accounting methods, intellectual capital should be defined as a set of intellectual resources in the form of knowledge, skills, abilities, potential for innovation, unique characteristics, commercial secrets, brand, intangible assets that contribute to the increased value of the enterprise, enhancing its competitive advantages, and are the basis for the economic system development. In accounting, intellectual property is recognized as an asset and reflected in the relevant accounting and financial statements when it meets the criteria for obtaining economic benefits, valuation, identification, controllability, that is, is owned by the enterprise. Not all the components of the intellectual capital can meet such criteria, in which case the assessment is carried out according to economical methods. Some difficulties may be caused by the application of methods for intellectual capital valuation based on market capitalization due to the complexity of determining indicators based on market value, and their dynamism. In addition, such approaches can only be applied to joint stock companies. Scoring methods are very subjective, since they are based on the expert opinion. The use of direct valuation methods is limited, because it is not always possible to determine the value of most intellectual capital elements in monetary form, and methods of determining profitability are too vulnerable to interest rate changes.

It is inappropriate to narrow the definition of intellectual capital to an intangible asset or merely to goodwill, which is quite common in scientific literature. Intellectual capital is the source of intangible assets, but the result of innovations may also have a material nature (for example, an innovative product); in addition, it contains many components that are not recognized as intangible assets. Intellectual capital of the company is expressed through the competence of employees who do not belong to it, whereas the results of their work often do. Intellectual capital generates internal goodwill, but is not limited to its indicator, since the results of intellectual work can go beyond its scope and form both intangible and tangible assets.

Despite its level of development, the accounting system is not yet ready for objective valuation of all components of intellectual capital with features that are too subjective: in particular, knowledge, abilities, potential, risks, factors, expectations, systemic interaction and synergy. However, the existence of intellectual capital is indisputable, and being a component of the modern economic system, it should be represented in accounting and reporting.

Today there is no unified approach to the assessment of intellectual capital both in financial and management accounting, something which requires further research and determines its perspective direction.

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