

BASIS OF INTELLECTUAL CAPITAL MANAGEMENT PROVIDING INNOVATION DEVELOPMENT ¹

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Humanistic and social conditions of modern business



1. INTRODUCTION

Rapid development of the information economy and the rapid globalization is creating more opportunities to enterprises (in particular, to gain access to the latest scientific and technological achievements, to expand the distribution chains and markets for its products and services), allowing to create valuables and to provide competitiveness of either separate firms or economy at a whole. On the other hand, these processes are resulted in increasing the competition. In these conditions the key factors of ensuring the enterprise's competitiveness is becoming intellectual capital and the efficiency of its management. Awareness of this requires an assessment of intellectual capital, the identification of strengths and weaknesses in its structure, identification of ways to implement intellectual potential and, consequently, the formation of an optimal intellectual capital management strategy to provide additional competitive advantages in the market and increase profits. In the reality of global competition intellectual capital gives opportunity to enterprises. The main function of the intellectual capital is to fasten income growth in some degree owing to formation and realization of necessary knowledge system for the company. Knowledge system in its turn provides highly efficient economic activity. Besides, intellectual capital determines quality of its management system. It dictates rate and character of the production technologies renewing, which soon will be competitive advantages.

Transition to new stage of civilization development has facilitated the research of intellectual capital phenomenon. Ukrainian and foreign scientists paid much attention to this

matter. The research of knowledge as the source of development was performed by such foreign scientists as W. Petty, G. Becker, M. Blaug, K. Griffin, E. F. Denison, R. Crawford, F. Machlup, T. Stewart, W. Hudson, T.W. Schultz, A. Smith, D. Ricardo, J. S. Mill, K. H. Marx and others. Famous domestic scholar S.M. Illyashenko analyzed the approaches to determining the structure and methodology for assessing intellectual capital in his paper. K. Wiig investigated integration of intellectual capital and knowledge management.

The intangible asset leader does the following: studies the history of strategy, understands, and can articulate the differences between industrial/manufacturing era strategies and intangible intellectual capital asset strategies; thinks strategically about the central problems of the enterprise; advances and defends strategically sound strategies that use intellectual assets when they offer a superior solution; gets involved in strategic planning and joins the strategic conversations within the company; grows out of functional discipline management into executive leadership¹.

Particularly, Karl Sveiby confirmed that people create profit, that's why investments into personnel are not to be concerned as expenses; workers' competence is resource to create prosperity.

In 1998 Annie Brooking investigated model "The Technology Broker's Audit" to determine value of the intellectual capital in the firm in money terms and presented structure in the following way: market assets, human assets, infrastructure assets, and intellectual property. This model was investigated for managers in order to diagnose and to develop weak places in the intellectual capital. It is based on the method of directing questions in knowledge management, estimation of research and investigations number, brand value existing. The more positive answers are, the more developed intellectual capital is².

¹ Moore L. *Intellectual capital in enterprise success: strategy revisited*. John Wiley & Sons Inc. 2008, p. 16

² Брукинг Э. Интеллектуальный капитал: ключ к успеху в новом тысячелетии, Л.Н. Ковачин (пер. с англ., ред.), Питер 2001.

Formation of the intellectual capital strategy is observed in works of. Bril, K. Viig, K. Chala, A. Vasylyk, who proposed various types of them according to the intellectual capital structure.

As author mentioned in the work³, formation of the intellectual capital management strategy is related to such scientific and practical tasks solving as economy modernization, effective use of the intellectual potential (state, region, enterprise), increase of the competitiveness and enterprises' capitalization. It is especially relevant for Ukrainian enterprises, since some of them do not take into account the factor of intellectual capital impact on the enterprise's work.

2. STRATEGIC MANAGEMENT OF ENTERPRISE'S INTELLECTUAL CAPITAL

2.1 intellectual capital: essence and structure

Based on capital theory paradigm, taking into account historical, system and structural approaches, it has been found to be a set of interrelated non-material resources (knowledge and skills of employees, intellectual property, relations with counteragents, brand, etc.) involved in enterprise's commercial and industrial activity for creating the added value and providing its competitive advantages on the market.

Johann and Goran Russ, worked out the Intellectual Capital Index, have broken down intellectual capital into three groups: human capital, organizational capital and customer capital.

In the different way the structure of intellectual capital was regarded by Skandia, the Swedish insurance company⁴.

The intellectual capital structure is presented on fig. 1 according to Skandia's intellectual capital model. The model, developed by Skandia, shows the relationships between the different areas, which comprise intellectual capital.

³ Бриль І. Стратегія управління інтелектуальним капіталом, Донецьк 2012.

⁴ *Supplement to Skandia's 1995 Annual Report*, Skandia, Stockholm 1996.

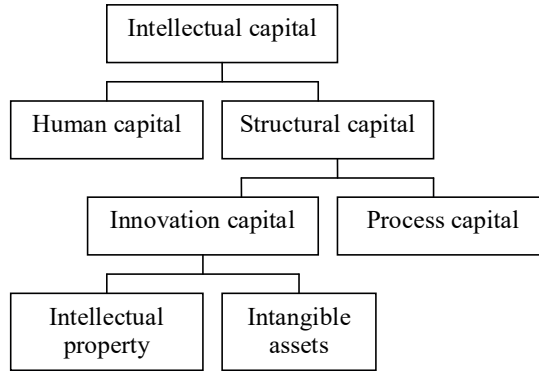


Figure 1. Intellectual capital structure⁵

In Skandia's model intellectual capital consists of several entities facets which may be defined as follows⁶:

Human capital consists of competence and capabilities of the employees. When an enterprise educates its employees, it increases its human capital.

Structural capital consists of the results of intellectual activities in data and knowledge bases, documents, etc. Skandia suggests, "Structural capital is what is left after the employees have gone for the night"⁷

Customer capital consists of the value of the enterprise's relationships with its customers.

Organizational capital consists of embedded knowledge assets in the process and innovation areas.

Process capital consists of the enterprise's value creating processes such as its organizational structure, management practices, systems and procedures, infrastructure computer systems and the like.

⁵ Ibidem

⁶ Wiig K. Integrating Intellectual Capital and Knowledge Management [Online resource] [in:] *Long Range Planning*, 15 February 2016, p. 401. – Access mode: https://www.researchgate.net/publication/222186650_Integrating_intellectual_capital_knowledge_management.

⁷ *Supplement to Skandia's 1995 Annual Report*, Skandia, Stockholm 1996.

Innovation capital consists of both explicit knowledge and hard-to-identify intellectual assets such as a positive culture.

Intellectual property consists of documented and captured knowledge such as innovations, operational practices, patents, technology, educational programs, corporate knowledge bases, and designs and specifications of products and services.

Intangible assets consist of the value of positive culture, community image, etc.

2.2 fundamentals to choose a strategy of enterprise's intellectual capital management

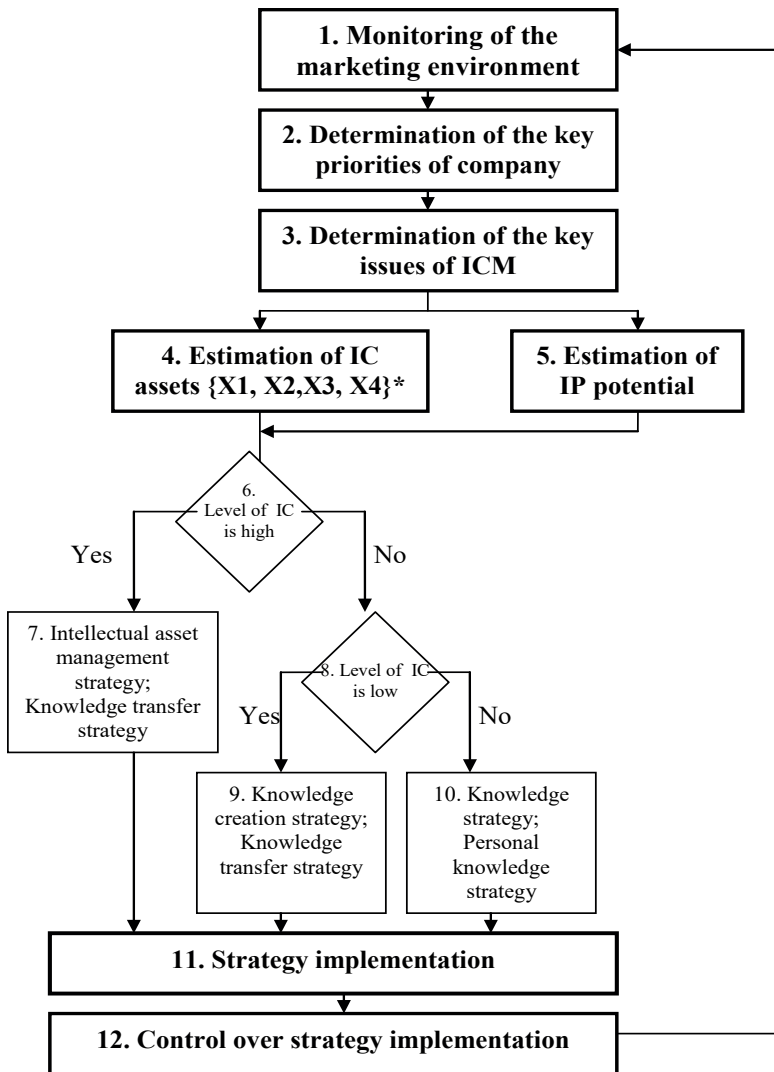
An objective of the intellectual capital strategic management at the enterprise is to find strategies, which provide stable competitive advantages of the enterprise at the market in relation to competitors under the same political, economic, social, legal and other conditions.

In order to provide the best result from investigation and introduction of the intellectual capital management strategy, it is necessary to coordinate it with strategic aims and key aspects of general corporative strategy of the enterprise, with production, marketing, innovative, financial strategies and with strategy of human resources management. It means that while investigating the intellectual capital management strategy it is necessary to focus attention on those spheres, which will assist solving of the enterprise's strategic tasks⁸.

Factors, which influence the selection of intellectual capital management strategy are external (type and state of economy, STP, suppliers, consumers, investors, political, legislative socio-cultural, demographic factors, globalization) and internal (type of the enterprise's activity, personnel, management strategy, organizational structure of the enterprise, level of technical and technological provision, enterprise's image etc).

⁸ Василик А. Формування стратегії управління інтелектуальним капіталом підприємства на основі концепції менеджменту знань [in:] *Соціально-трудові відносини: теорія та практика*, 2011, № 1, p. 120-127.

Generally, the process of intellectual capital management (ICM) strategy selection is represented at fig. 2.



* **X1** – human capital; **X2** – process capital; **X3** – intellectual property; **X4** – intangible assets

Figure 2. The algorithm of selection of intellectual capital management strategy [created by authors]

K. Wiig highlighted five basic knowledge-centered strategies⁹:

1. Knowledge strategy as business strategy emphasizes knowledge creation, capture, organization, renewal, sharing, and use in all plans, operations, and detailed activities to provide the best possible knowledge available at each point of action.

2. Intellectual asset management strategy emphasizes enterprise-level management of specific intellectual assets such as patents, technologies, operational and management practices, customer relations, organizational arrangements, and other structural knowledge assets. Management's task is to renew, organize, evaluate, protect and increase the availability and marketing of these assets.

3. Personal knowledge strategy emphasizes personal responsibility for knowledge-related investments, innovations and competitiveness, renewal, effective use and availability to others of knowledge assets within each employee's area of accountability. The objectives are continually to build knowledge and to apply the most competitive knowledge to the enterprise's work.

4. Knowledge creation strategy emphasizes organizational learning, basic and applied research and development, and motivation of employees to innovate and capture lessons learned to obtain new and better knowledge, which will provide improved competitiveness.

5. Knowledge transfer strategy emphasizes systematic approaches to transfer (i.e. obtain, organize, restructure, warehouse or memorize, repackage for deployment and distribute) knowledge to points of action where it will be used to perform work. This strategy includes knowledge sharing and adopting best practices.

Based on the research and evaluation of personnel, organization, customer and informational capitals as constituents of the intellectual capital, we propose to select strategy of the enterprise's intellectual capital management.

⁹ Wiig K. Integrating Intellectual Capital and Knowledge Management [Online resource] [in:] *Long Range Planning*, 15 February 2016, p. 400. – Access mode: https://www.researchgate.net/publication/222186650_Integrating_intellectual_capital_knowledge_management.

The general algorithm of such selection is demonstrated in the fig. 3.

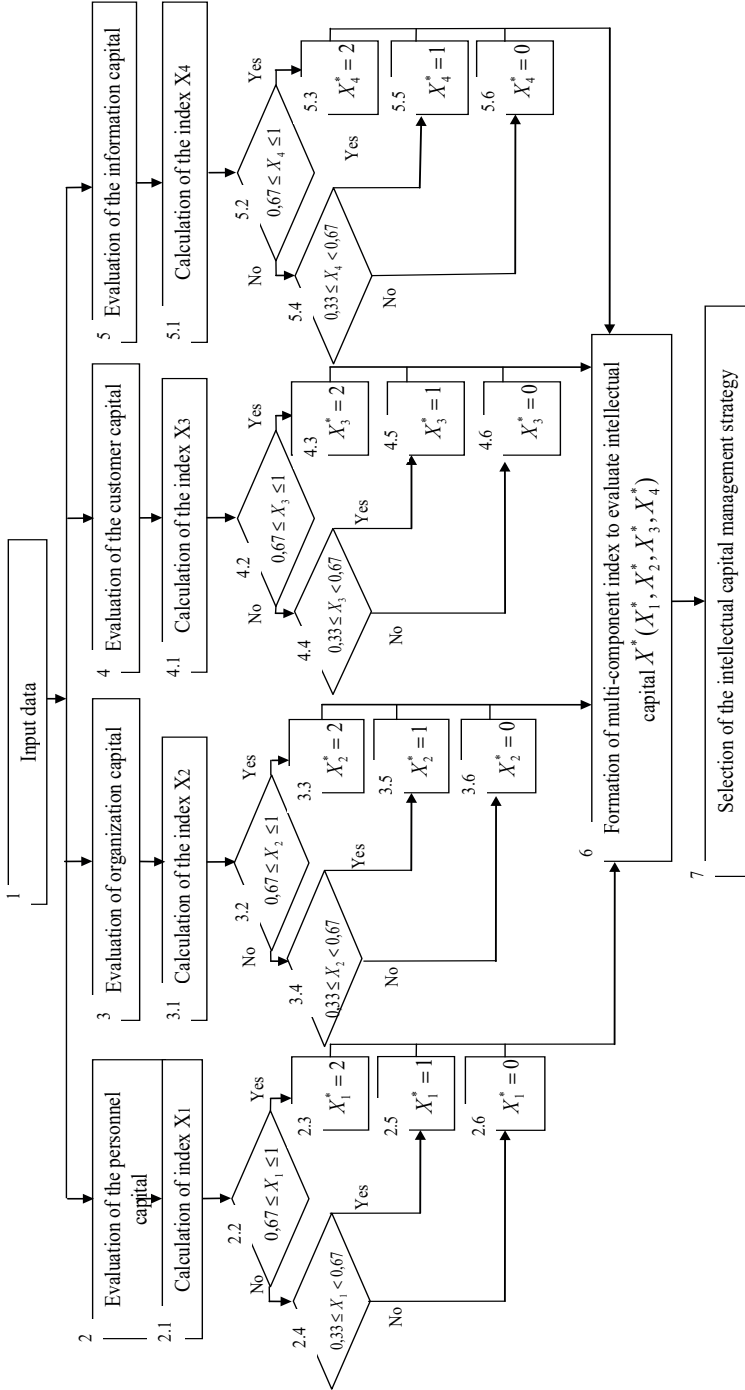


Fig. 3 Block-scheme of algorithm for selection of the intellectual capital management strategy, based on its constituents evaluation [created by authors]

Table 1 demonstrates possible combinations to evaluate the intellectual capital constituents and proper variants of strategies.

Variants of intellectual capital management strategies
[created by authors]

INDEX $X^* (X_1^*, X_2^*, X_3^*, X_4^*)$	TYPES OF INTELLECTUAL CAPITAL MANAGEMENT STRATEGIES
(0;1;1;2), (0;2;1;1), (0;1;2;1), (0;1;1;1), (0;2;2;1), (0;1;2;2), (0;2;2;2), (0;2;1;2), (1;2;2;2)	Strategy to develop personnel capital
(1;0;1;1), (1;0;1;2), (2;0;1;1), (2;0;1;2), (1;0;2;2), (1;0;2;1), (2;0;2;2), (2;0;2;1), (2;1;2;2)	Strategy to develop organization capital
(2;2;1;0), (1;2;2;0), (1;1;2;0), (2;1;1;0), (2;1;2;0), (1;1;1;0), (1;2;1;0), (2;2;2;0), (2;2;2;1)	Strategy to develop information capital
(1;1;0;1), (2;2;0;1), (2;1;0;1), (1;1;0;2), (2;2;0;2), (2;1;0;2), (1;2;0;1), (1;2;0;2), (2;2;1;2)	Strategy to develop customer capital
(0;2;0;2), (0;1;0;1), (0;2;0;1), (0;1;0;2), (1;2;1;2)	Strategy to develop personnel and customer capitals
(0;2;2;0), (0;2;1;0), (0;1;1;0), (0;1;2;0), (1;2;2;1)	Strategy to develop personnel and information capitals
(2;0;0;1), (2;0;0;2), (1;0;0;1), (1;0;0;2), (2;1;1;2)	Strategy to develop organization and customer capitals
(2;2;0;0), (2;1;0;0), (1;2;0;0), (1;1;0;0), (2;2;1;1)	Strategy to develop customer and information capitals
(0;0;1;1), (0;0;1;2), (0;0;2;1), (0;0;2;2), (1;1;2;2)	Strategy to develop personnel and organization capitals
(2;0;1;0), (1;0;1;0), (2;0;2;0), (1;0;2;0), (2;1;2;1)	Strategy to develop organization and information capitals
(0;0;0;1), (0;0;0;2), (1;1;1;2)	Strategy to develop personnel, organization and customer capitals
(0;0;1;0), (0;0;2;0), (1;1;2;1)	Strategy to develop personnel, organization and information capitals
(1;0;0;0), (2;0;0;0), (2;1;1;1)	Strategy to develop organization, customer and information capitals
(0;1;0;0), (0;2;0;0), (1;2;1;1)	Strategy to develop personnel, customer and information capitals
(0;0;0;0)	Strategy to develop all constituents of the intellectual capital
(2;2;2;2), (1;1;1;1)	Strategy of interconnection between all constituents of the intellectual capital

Within the framework of every strategies type, we defined top-priority directions for their realization. One proposes to observe the following types of intellectual capital management strategies: a strategy to develop personnel capital; a strategy to develop organization capital; a strategy to develop information capital; a strategy to develop customer capital; and their combinations: strategy to develop personnel and customer capitals; strategy to develop personnel and information capitals; strategy to develop customer and organization capitals; strategy to develop customer and information capitals; strategy to develop personnel and organization capitals; strategy to develop personnel, organization and customer capitals; strategy to develop personnel, organization and information capitals; strategy to develop organization, customer and information capitals; strategy to develop personnel, customer and information capitals; strategy to develop all constituents of the intellectual capital; interconnections of all constituents of the intellectual capital.

Taking into account the last tendencies in management of *personnel capital* at the enterprise^{10,11,12,13}, the following types pf personnel capital development strategies are defined:

- strategy of personnel development, which provides constant increase of workers' qualification with purpose to master the innovative goods production;
- strategy of personnel retention at the enterprise requires to introduce measures concerning retention of high qualified workers at the enterprise, prevention from head hunting by competitors. It is possible to realize thanks to motivational tools;

¹⁰ David A. Thomas, Ted Childs Jr., Ilene H. Lang and others, *Managing Human Capital: Global Trends and Challenges. Summit Report 2008*, Harvard Business School 2009.

¹¹ *Global Human Capital Trends 2016. The new organization: Different by design*, Deloitte University Press 2016.

¹² Griffin R. *Fundamentals of management*. 7th Edition, New York, Cengage Learning 2011

¹³ Найдюнова М., Громова О., Паламарчук І. Організаційно-економічний механізм формування інтелектуального капіталу високотехнологічного підприємства [in:] Вісник НТУ «ХПІ», 2013, № 53 (1026), p. 76-80.

- strategy of intellectual stimulation is based on the enterprise's personnel motivation to produce science-intensive goods and to provide its development in accordance with market demands;
- strategy of intellectual extension, oriented to involve new high qualified workers to provide effective development of the science-intensive productions. In order to develop *organization capital* one has to use the following types of strategies:
- strategy to form progressive organization structure, oriented for work under market conditions;
- strategy to form innovative corporative culture, which is oriented to activate generation of innovative ideas by personnel in various spheres of enterprise's activity;
- management of brand that is oriented to choose the concept of enterprise's and its production positioning at the market, development of measures to form consumers' loyalty to the brand;
- optimization of the intellectual infrastructure, that provides construction of enterprise's optimal organization structure, which is aimed at rational use of the intellectual resources.
- Within the framework of *information capital* development let us distinguish the following strategies:
- strategy of informational systems and data bases development (collection of customers' data bases, receiving of access to data bases of inventions and innovations, purchasing of new software),
- strategy of intellectual property and intellectual assets management (formation of the enterprise's intellectual resources portfolio, investigation and use of intra-firm structure and intellectual assets classification, development of the strategy, determination of the intellectual assets value, evaluation of business schedules and technologies, investment);
- bench-marketing introduction – constant systematic search and introduction of the best practices into the investigated enterprise's (structural subdivision's) activity;

- strategy of individual knowledge transformation in the staff¹⁴ (conversion of the personnel capital into information capital: provision with knowledge exchange between workers, development of their individual competence and its use to increase the enterprise's competitiveness;
- strategy of technologies transfer¹⁵ (transfer of patents for inventions; patent licensing; trade of inventions; transfer of technological documents; transfer of know-how; transfer of technological schedules, which follow purchase or rent (leasing) of equipment and machines; information exchange of personal contacts on seminars, symposiums, exhibitions etc; engineering; scientific researches and investigations in scientists' and experts' exchange; conduct of collective investigations and studies by different firms; organization of collective production; organization of collective enterprise).

Strategy of customer capital development is cooperation of workers with customers, study of their tastes, likes, study of the customer's behavior; formation of the company brand, the main task of which is to develop consumers' devotion to the brand, attraction of consumers' attention to the constant innovations, which are coordinated with their values; corporative social responsibility; transfer of information from the sphere of cooperation with enterprises' external counteragents to the inner-corporative systems, its retention and use, collection of customers' data bases; consideration of customers' demands and wishes in creation of new goods or in improvement of the existed products and their production technologies.

Strategy of development of all intellectual capital constituents is urgent mainly for new enterprises, which start their activity at the market and do not succeed to form their intellectual capital, and for those, which are at the recession

¹⁴ Kreitel W. A. *Ressource Wissen: Wissensbasiertes Projektmanagement erfolgreich im Unternehmen einführen und nutzen*, Wiesbaden, Gabler 2008.

¹⁵ Перерва П., Коціські Д., Сакай Д., Вереш Шомоші М. Трансфер технологій, Харків, Віровець А.П. Апостроф 2012.

stage and wish to continue activity in their sphere or at other markets, i.e. to diversify production. In order to realize objectives of this strategy, one should select the following directions: intellectual extension and technologies transfer, bench-marketing and strategies of the brand positioning.

Strategy of interconnection between all constituents of the intellectual capital – is an integrated strategy, oriented to develop enterprises through interconnection of personnel, organization, customer and information capitals, which have high rates and bring great profit. Intellectual capital management has to be oriented to support the achieved level, to look for and to master new spheres for enterprise's intellectual potential realization. With this purpose one should focus attention on retention of personnel at the enterprise and on the intellectual infrastructure optimization.

Having realized measures, defined within the chosen strategy, it is necessary to control their efficiency, analyzing indices change, which characterize level and quantities of the intellectual capital at the enterprise. It will enable to respond in time to positive and negative changes (if they appear) and to correct the strategy according to internal and external factors of the marketing environment.

In the context of intellectual capital management, it is important to distinguish strategies by their orientation inside or outside the enterprise, since this distribution is caused by peculiarities of intellectual capital elements, which have mostly non-material benefits. It lets administration to keep and protect existing competitive advantages. Therefore within the mentioned types of the intellectual capital management strategies, different strategies can be oriented to the internal and external environment of the enterprise. Disadvantage of every above mentioned strategy type realization can be great devotion to develop one type of the intellectual capital and to insufficient development of other types, as a result of which synergetic growth of the intellectual capital is not achieved in general. The disadvantage results in nonadditivity (interaction) of intellectual capital

being characterized. It means that in the process of its elements cooperation one can get positive result, which will exceed the efforts. Given this, the main task of management has to be keeping and strengthening of the effective interconnection between different constituents of the intellectual capital, which is demonstrated by two last strategy of the intellectual capital development.

3. CONCLUSIONS

Strategy implementation is phased process. It is necessary to adopt the system used for the intellectual capital management of the organization on this stage. This system defines: what departments will be responsible for what, and what information systems are needed to monitor the implementation of the strategy, what retraining of employees will be required, etc.

And the last one, but not the least, is the control and strategy revision. The main objectives of ICM control as follows: definition of what parameters and how to check; assessment of the state of the controlled object in accordance with accepted standards, regulations or other benchmarks; elucidation of the causes of deviations, if any are be opened as a result of the assessment; implementing adjustments, if it is necessary and possible.

To pursue these strategies, organizations undertake specific programs and activities, provide supporting infrastructure capabilities, and sometimes create incentives to motivate individual employees, teams, and even departments and business units to cooperate with the new objectives. In order to estimate efficiency to use intellectual capital at micro-level, one can use factors of its separate constituents in dynamics or comparing with enterprises-competitors' factors.

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