Journal of Management & Technology
e-ISSN: 2177-6652

IMPACT OF ATTRACTING INTELLECTUAL CAPITAL ON THE INNOVATIVE DEVELOPMENT OF CONSTRUCTION ENGINEERING ENTERPRISES

IMPACTO DA ATRAÇÃO DE CAPITAL INTELECTUAL NO DESENVOLVIMENTO INOVADOR DE EMPRESAS DE ENGENHARIA DE CONSTRUÇÃO

IMPACTO DE LA ATRACCIÓN DE CAPITAL INTELECTUAL EN EL DESARROLLO INNOVADOR DE LAS EMPRESAS DE INGENIERÍA DE LA CONSTRUCCIÓN

Youren Liu
Lomonosov Moscow State University, Moscow, Russia
https://orcid.org/0000-0001-5633-8332

Anatoly Zub
Lomonosov Moscow State University, Moscow, Russia
https://orcid.org/0000-0001-8794-2399

Shenyu Zha
Lomonosov Moscow State University, Moscow, Russia
https://orcid.org/0000-0002-4095-7662

Scientific Editor: José Edson Lara
Organization Scientific Committee
Double Blind Review by SEER/OJS
Received on 22/02/2022
Approved on 15/11/2022

This work is licensed under a Creative Commons Attribution – Non-Commercial 3.0 Brazil

Abstract
The purpose of the study is to highlight the role of intellectual capital and the directions of its use as a tool for the innovative development of a construction engineering enterprise. The article shows the specifics of engineering activities in the construction sector, systematizes the definition of the "intellectual capital" category. The functions of intellectual capital and their impact on the innovative development of construction engineering enterprises have been determined based on the expert survey; the use of intellectual capital and its components for the innovative development of a construction engineering enterprise has been considered. The article concludes that the integrated application of intellectual capital components can help traditional construction enterprises adapt to the transformation of the digital economy era, provide conditions for the innovative development of engineering and construction enterprises, activate innovations, and then increase the productivity and competitiveness of enterprises.

Keywords: intellectual capital, innovative development, engineering, construction.

Resumo
O objetivo do estudo é destacar o papel do capital intelectual e os rumos de sua utilização como ferramenta para o desenvolvimento inovador de um empreendimento de engenharia de construção. O artigo mostra as especificidades das atividades de engenharia no setor da construção, sistematiza a definição da categoria “capital intelectual”. As funções do capital intelectual e seu impacto no desenvolvimento inovador das empresas de engenharia de construção foram determinadas com base na pesquisa de especialistas; foi considerado o uso de capital intelectual e seus componentes para o desenvolvimento inovador de um empreendimento de engenharia de construção. O artigo conclui que a aplicação integrada de componentes de capital intelectual pode ajudar as empresas tradicionais de construção a se adaptarem à transformação da era da economia digital, fornecer condições para o desenvolvimento inovador de empresas de engenharia e construção, ativar inovações e, assim, aumentar a produtividade e competitividade das empresas .

Palavras-chave: capital intelectual, desenvolvimento inovador, engenharia, construção.

Resumen
El propósito del estudio es resaltar el papel del capital intelectual y las direcciones de su uso como herramienta para el desarrollo innovador de una empresa de ingeniería de la construcción. El artículo muestra las especificidades de las actividades de ingeniería en el sector de la construcción, sistematiza la definición de la categoría "capital intelectual". Las funciones del capital intelectual y su impacto en el desarrollo innovador de las empresas de ingeniería de la construcción se han determinado con base en la encuesta de expertos; se ha considerado el uso del capital intelectual y sus componentes para el desarrollo innovador de una empresa de ingeniería de la construcción. El artículo concluye que la aplicación integrada de los componentes del capital intelectual puede ayudar a las empresas de construcción tradicionales a adaptarse a la transformación de la era de la economía digital, brindar condiciones para el desarrollo innovador de las empresas de ingeniería y construcción, activar las innovaciones y luego aumentar la productividad y competitividad de las empresas. .

Palabras clave: capital intelectual, desarrollo innovador, ingeniería, construcción.

1. INTRODUCTION

Intellectual capital (IC) in the modern conditions of the activity of engineering companies (Mukharramova, 2016) is recognized by researchers as a leading economic resource that has very specific properties: the possibility of repeated use and application simultaneously by an unlimited number of people (Kuznetsov, 2020), accumulation in the form of knowledge and skills (Galbraith, 2008).

Despite the presence of a fairly large number of studies (Stewart, 2007) on the problem of "intellectual capital", it is necessary to intensify research to identify areas, ways of using IC as a tool for innovative development of enterprises, including construction engineering.

In this regard, it is important to determine the functions of IC and their impact on the innovative development of construction engineering enterprises; the use of IC of construction engineering enterprises and its components for the innovative development of these enterprises.

Literature review

Currently, the most widely used definition of IC is those intangible assets of a company that, without being reflected in its financial statements, can be codified, evaluated, and used by the company (Petty, Guthrie, 2000).

The analysis of the evolution of approaches (Brooking, 2001) to the definition of the essence of IC allowed identifying following approaches to its study:

- structural – the study of IC through the disclosure of its structure (Brooking, 1999; Abhayawansa, Guthrie, 2016);

- functional and structural – the study of IC through the analysis of its purpose and the study of the specific role that it plays in the process of social reproduction (Brennan, Connell, 2000; Leontev, 2002; Housel, Nelson, 2015; Hudson, 2013; Lim, Dallimore, 2014);

- terminological – the study of IC through the generally accepted understanding of the essence of the "capital" category as a certain investment (value, resource), the consequence of which is the receipt of income (Asiaei, Jusoh, 2017; Lukicheva, 2008; Nielsen, Roslender, Schaper, 2016).

The study of the essence of the "intellectual capital" concept allowed the authors to systematize approaches to the definition of this category by group characteristics that reflect the specification of the needs of the analysis (Table 1).

Table 1
Systematization of the definition of the "intellectual capital" category

The IC essence	Source	IC definition
As a unity of human and structural capital	A. Brooking (1999), T.A. Stewart (2007)	A special combination of human capital (real and potential intellectual abilities, as well as the corresponding practical skills of the company's employees) and structural capital (its components determine such specific factors as consumer relations, business processes, databases, brands, and IT systems)
	K. Asiaei, R. Jusoh (2017)	The totality of the legal rights of the subject to the results of his/her creative activity, his/her natural and acquired intellectual abilities, skills, accumulated knowledge bases, and useful relationships with other subjects
As intangible assets	L.I. Lukicheva (2008)	IC covers all intangible and non-physical assets and resources of an organization that usually do not have an assessment in its balance sheet (except for intellectual property objects), that is, processes, innovative abilities, implicit knowledge of its members, as well as networks of contacts
	S. Madhavaram, S.D. Hunt (2017)	It is part of intangible assets and is associated with intangible assets concerning objects of intellectual property rights
	S. Abhayawansa, J. Guthrie (2016)	The composition of intangible assets, which corresponds to the expanded structure of the IC, includes three components: individual competence, the internal and external structure of the company
As knowledge	C. Nielsen, R. Roslender, S. Schaper (2016)	A kind of "collective brain" that accumulates scientific and ordinary knowledge of employees, acquired experience, intellectual property, organizational structure, image
	M. Delgado-Verde, G. MartÃn- de Castro, J. Amores-Salvadó (2016)	The total knowledge that the organization has in the person of its employees, as well as in the form of methodologies, patents, architecture, and relationships

	J. Chen, Z. Zhu, H.Y. Xie (2014)	The knowledge that is available in the organization and can be used to obtain various advantages over competitors
	G. Roos, J. Roos (2012)	The knowledge that can be converted into profit
	E. Laver-Cortés et al. (2016)	Accumulated in the process of intellectual activity is a set of knowledge, experience, skills, abilities, relationships that have economic value and are used in the process of production and exchange to generate income
As an intellectual material	G.R. Feiwel (2007)	Formalized and fixed intellectual material used for the production of more valuable property

Source: research data, 2022

According to the researchers (Brennan, Connell, 2000; Leontev, 2002; Housel, Nelson, 2015; Hudson, 2013; Lim, Dallimore, 2014), from the point of view of the functional and structural approach, IC is divided into human capital, relationship capital, or client capital, structural (organizational) capital.

In this study, we will approach the problem of determining the impact of IC on the innovative development of engineering companies from the standpoint of a structural and functional approach, since we consider it necessary to study the purpose of IC at construction engineering enterprises by determining its functions and the role of IC components in the innovative development of these enterprises.

The hypothesis of the study: the complex application of the components of IC will provide conditions for innovative development, activate innovation, will contribute to improving the productivity and competitiveness of construction engineering enterprises.

Research objectives:

1. to determine the functions of IC and their impact on the innovative development of construction engineering enterprises;

2. to consider the use of intellectual capital and its components for the innovative development of a construction engineering enterprise.

The article consists of an introduction, a literature review, methods, results, discussion, and conclusion.

2. METHODS

Research design

We defined an approximate set of quantitative and qualitative research methods to achieve the goal set in the study:

- theoretical methods (analysis, synthesis, comparison, generalization) – for the study of scientific literature on the state of the research problem;
- empirical methods (expert survey method) – to determine the functions of the IC of a construction engineering enterprise and their impact on the innovative development of the enterprise, as well as to determine the components of the IC of a construction engineering enterprise and their use for the innovative development of the enterprise;
- ranking method – to determine the rank of the IC functions that influence the innovative development of construction engineering enterprises.

We used a case study to supplement the results obtained using the above methods, and to better interpret them. When using the case study, we proceeded from certain principles set out (Yin, 2009).

Procedure and research tools

At the first stage of the research, the sources of information necessary for the implementation of the research goal were selected: articles published in journals indexed by Scopus and Web of Science, speeches at scientific conferences, collective monographs containing information about the "intellectual capital" category and its components.

At the second stage of the study, based on an expert survey in the audio/video communication mode (ZOOM), the functions of IC and their impact on the innovative development of construction engineering enterprises were determined; the use of intellectual capital and its components for the innovative development of a construction engineering enterprise (Website of the "construction" research center, n.d.; website of the "petergorproekt" engineering company, n.d.; Website of the "k" engineering company, n.d.). The criteria for selecting experts (21 people) were the presence of articles on this topic published in journals included in the Scopus or Web of Science citation databases in the amount of at least 3 or teaching experience in higher educational institutions or work experience in a construction company for at least 10 years.

The analysis of the collected information was carried out at the third stage of the study, with the interpretation of the results obtained. In particular, after conducting an expert survey, we were able to analyze 20 Chinese companies over the past two years and select, in our opinion, two construction engineering companies that effectively use IC for the innovative development of enterprises. Due to resource capabilities, we were limited in the ability to collect information on each company, so we were forced to limit ourselves to analyzing the activities of companies over the past 3 years.

Statistical analysis

The study used numerical calculation methods using the Microsoft Excel software product, which was used to calculate the percentage of expert mentions of IC functions that affect the innovative development of construction engineering enterprises, as well as components of the IC of a construction engineering enterprise.

3. RESULTS

According to experts, the IC performs several functions that have a direct impact on the innovative development of construction engineering enterprises (Table 2).

Table 2

IC functions and their impact on the innovative development of construction engineering enterprises

Function name	Function feature	The impact of the implementation of IC functions on the innovative development of the enterprise	%*	rank
Information system	Accumulation, systematization, and transfer of knowledge, skills, information	Providing the necessary level of knowledge and sufficient information allows the company to respond faster and more flexibly to changes in the innovation sphere, to monitor scientific and technological progress	86%	1
Cognitive-epistemological	Acquisition of knowledge about processes and phenomena	The generation of knowledge and its adaptation to the needs of the enterprise expand the possibility of its innovative development	82%	2

Educational	Transformation of knowledge into new results of intellectual activity (information, services)	Advanced training of employees in innovation activities contributes to their orientation and the creative process of developing ideas for innovative development	77%	3
Scientific and research	Organization and conduct of scientific research	The implementation of research works on the creation of innovations directly at the enterprise will contribute to taking a leading position in the market and ensure the growth of its innovative level	73%	4
Axiological	Assisting in realizing the importance of certain services, participating in the formation of a more personal attitude to them	Increasing the role and importance of innovations in the minds of customers and partners of the enterprise will contribute to the formation of prerequisites for innovative development	68%	5
Integration	Focus on research in all areas of knowledge to create new services	The creation of innovations, the application of existing innovations in other sectors of economic activity will expand the enterprise's opportunities for innovative development	64%	6
Educational	Formation of self-consciousness of individuals	Formation of motivations and interest of employees in the innovative development of the enterprise	59%	7

Note: compiled based on the expert survey; * – % of expert mentions
Source: research data, 2022

Intellectual capital affects the innovative development of an enterprise through the functioning of its components, which both individually and in a complex play a significant role.

Therefore, it is advisable to consider the components of the IC of a construction engineering enterprise (Table 3).

Table 3
Components of the IC of an engineering and construction enterprise

IC components	Elements of the IC components	%*
human capital	Education, knowledge, skills, and experience	86%
	Competence and professionalism	82%
	Creative abilities	77%
	Health	73%
	Work culture, moral values	59%
client capital	Customer relations	82%
	Information about customers	77%
	The level of performance of contractual obligations	68%
structural (organizational) capital	Technical, software, and information support	86%
	Intellectual property objects of the organization	86%
	Organizational structure and business management system	82%
	Databases	77%
	Communication systems	77%
	Business ethics and organizational culture	64%

Note: compiled based on the expert survey; * – percentage of expert mentions
Source: research data, 2022

According to experts, IC becomes an instrument of innovative development precisely through the influence of its components (Figure 1).

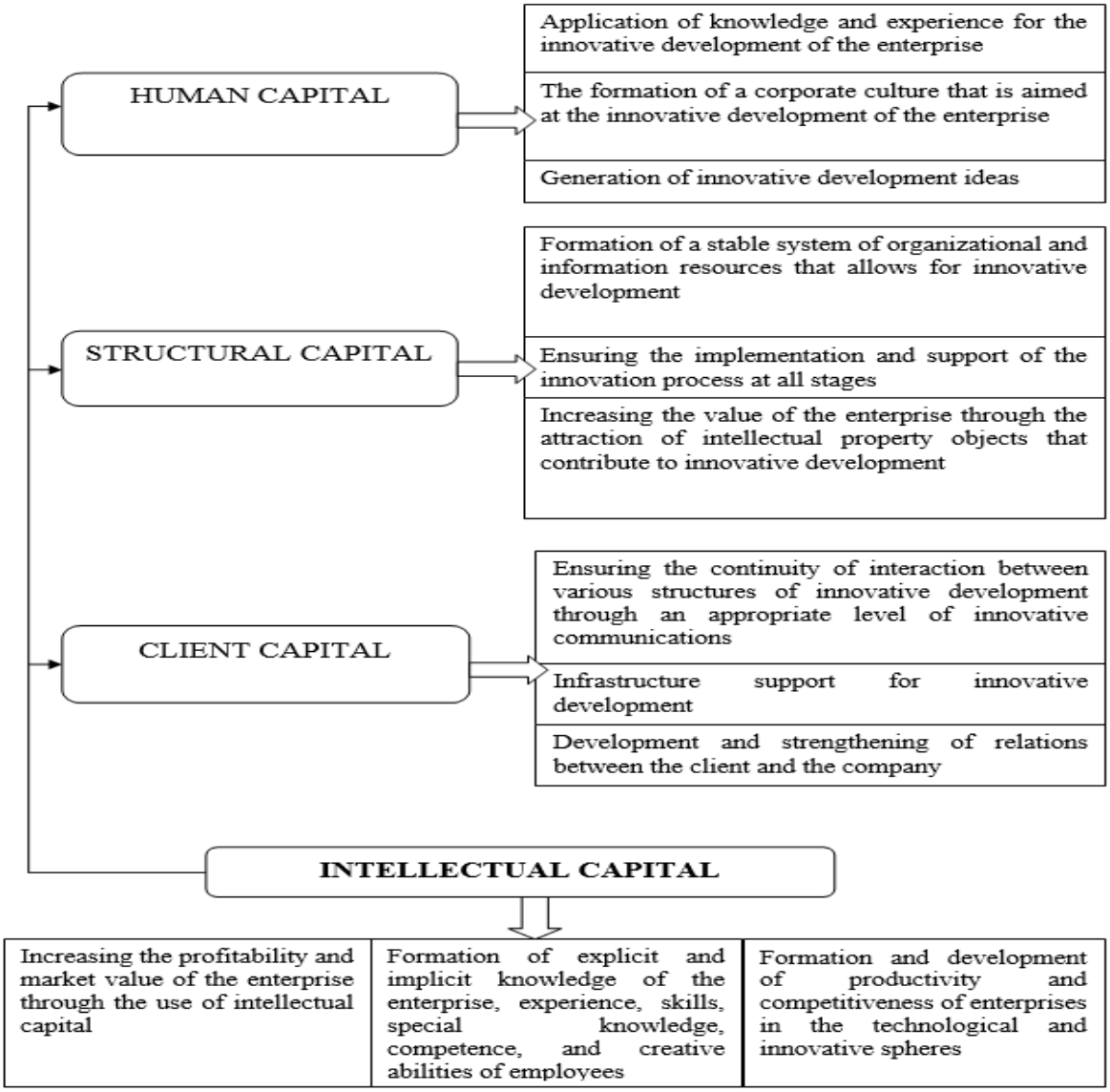

Figure 1. The use of intellectual capital and its components for the innovative development of the enterprise (author's development)

Source**:** research data, 2022

4. DISCUSSION

Let us consider in more detail the integrated use of IC components as tools for the innovative development of construction engineering enterprises from the point of view of the functional and structural approach (Table 3).

Human capital, as one of the components of IC, is one of the main resources of any enterprise. It is its composition (Table 3) from the point of view of qualification, creative thinking, opportunities for generating, accumulating knowledge, producing innovations, allows the enterprise to implement the

directions and realize the tasks of innovative development (Chen, Zhu, Xie, 2014). As Tomas Davenport (2009) notes, the company's value is closely related to the HC and determines it as its key factor. The HC as an intangible asset can create surplus value and added product with the help of skills, knowledge, abilities that a person possesses.

Thus, "Power Construction Corporation of China", is one of the "big six" construction companies in China, has 9 national research schools, 11 academic workstations, 9 postdoctoral research workstations.

The possibility of using the elements of the HC (Table 3) as a tool for the innovative development of a construction engineering enterprise, according to the interviewed experts, depends on many factors, including training of innovation personnel; the availability of highly professional personnel in the labor market that can be attracted to intellectual activity; the composition of personnel at construction engineering enterprises who are knowledgeable with the involvement and implementation of the latest innovative development methods.

The next component of the IC is the structural (organizational) capital (SC). According to the researchers (Madhavaram, Hunt, 2017), this is a part of the IC that concerns the organization as a whole and determines its material, intellectual and innovative means that the employees of the enterprise use in their activities.

T.A. Stewart (2007) suggests that SC is understood as the ability of an enterprise to use competence capital in organizational systems, which transforms information to increase profitability, and notes that SC provides an environment that encourages the creation and then capitalization of information and knowledge. There is a kind of conversion of competence capital into a structural one, the flow of knowledge and information directed from individual competence to the internal structure of the enterprise, then it is fixed in information systems, intellectual property (Roos, Roos, 2012).

Structural capital as an instrument of innovative development provides formalization and documentation of knowledge and experience (Nielsen, Roslender, Schaper, 2016), which can be used for the innovative development of a construction engineering enterprise.

The main components of the IC of a construction engineering enterprise are both computer and software (86% of mentions), as well as the creation and use of intellectual property objects (86% of mentions) and intangible business processes, including a business management system (82% of mentions), existing databases (77% of mentions) and communication systems (77% of mentions) built based on computer systems; therewith, according to researchers (Housel, Nelson, 2015), the main direction of the IC development is the elaboration and continuous development of an information model of enterprise knowledge

management as a model of the organization's cognitive processes, mediated by business processes (work operations) and documents.

The corresponding culture of the organization (64% of mentions), which forms a favorable environment for initiative and creative activity, stimulates employees, increases their interest, opens up opportunities for innovative development of the construction engineering enterprise. The use of IC ensures the transformation of the results of creative work into material products, and then their commercialization. Informatization accelerates the processes of economic activity of the enterprise, including innovation activities.

Thus, modern design technologies such as BIM (Building Information Modeling) are widely used in the companies "Power Construction Corporation of China" and "China Communications Construction". The use of BIM technology can effectively increase the efficiency and accuracy of management work and contribute to the development of construction information. The BIM technology information platform can build a simple model. We can quickly generate and extract relevant information that allows calculating and comparing various schemes by entering the relevant data and parameters of the construction project.

Intellectual property objects (Table 3) as a separate component of the organizational capital of a construction engineering enterprise, according to experts, include:

- objects of copyright (computer programs, databases);
- objects of scientific and technical information (scientific and technical documentation, scientific discoveries, innovation proposals);
- objects of industrial property (inventions; utility models; industrial designs);
- know-how (trade secrets; technical documentation; creative developments; systems for organizing production, marketing, quality management of services, personnel, finance, investment policy; production and commercial experience).

Thus, Power Construction Corporation of China has 18,393 patents on its account, the company's innovative developments are aimed at ensuring safety and reliability in the construction of buildings, structures, and other objects.

According to experts, the use of intellectual property objects by a construction engineering enterprise is one of the main tools of innovative development.

Another component of the general concept of IC is the client capital (CC) (Table 3). Scholars (Madhavaram, Hunt, 2017; Poddubnaya et al., 2020; Dudin et al., 2019; Nikulina, Tarasova, 2021) define it as a stable positive attitude of customers to a construction engineering company and (or) its services, which is a means of creating additional income, provides additional advantages in the market.

Any organization is not able to develop, much less innovatively, without a favorable external environment and stable relations with partners. Therefore, for the innovative development of a construction

engineering enterprise, it is necessary to ensure an appropriate level of communication, the interaction of various innovative structures and infrastructure entities, connections, and stable relations with consumers and customers (Leontev, 2002; Vinichenko, Melnichuk, Karácsony, 2020; Vinichenko et al., 2021).

Thus, the high-speed railway is a new type of passenger railway system based on modern integrated science and technology. Construction companies work closely with research institutions, as well as with equipment manufacturers, which bring together the best representatives of the engineering and financial community of China and have representative offices throughout China. This allows the company to attract both financial and technical specialists to its projects, from which the most effective team is formed to solve all kinds of issues that arise during the implementation of projects. The construction of high-speed railway projects has contributed to the rapid development of related industries, such as mechanical engineering, metallurgy, construction, composite materials, and information technology. Let us take a high-speed railway as an example. The number of parts and components has reached more than 100 thousand and the number of independent subsystems has exceeded 260, involving more than 100 manufacturers of main components and more than 500 related manufacturers covering more than 20 provinces, which leads to the formation of a huge production chain of technical development and manufacture of equipment. In addition, it also serves such industries as tourism, culture, and real estate.

Generalization and accumulation of the results of the analysis of scientific literature and expert survey make it possible to note that IC affects the economic results of a construction engineering enterprise, among which it is worth highlighting:

- increasing the competitiveness of the enterprise (continuous improvement of the quality of engineering services, updating of technological processes, and innovation management help enterprises to be competitive in the market);
- increase in the market value of the enterprise (due to the increase in the liquidity of tangible and intangible assets of the IC);
- reduction of transaction costs (with the help of the development of IC, new approaches are being sought to reduce the costs of customer service, information search, and processing, negotiating, concluding contracts);
- increasing the productivity of the enterprise (the formation and effective management of IC contributes to the continuous improvement of the innovative activity of the enterprise, the development of new technologies, which in turn increases the productivity of the enterprise);
- increasing the innovation potential (it occurs through the use of knowledge, experience, skills, material, financial, information resources to create a positive image of the enterprise in the external environment and provide favorable conditions for activating innovations within the enterprise).

5. CONCLUSION

The article reveals the problem of determining the influence of IC on the innovative development of engineering companies from the position of the structural-functional approach; the problem of using the IC of construction engineering enterprises and its components for the innovative development of these enterprises. The issues of determining the functions of IC and their impact on the innovative development of construction engineering enterprises have been resolved.

The results of the study confirmed the hypothesis that the integrated application of IC components can help traditional construction enterprises adapt to the transformation of the digital economy era, provide conditions for innovative development of engineering and construction enterprises, activate innovations, and then increase productivity and competitiveness of enterprises.

However, the study has some limitations regarding the sample size of experts, therefore, the results of the study cannot be fully generalized. Also, we considered the problem only from the standpoint of a structural and functional approach in this study, therefore, future studies are proposed using other approaches to the "intellectual capital" category.

The prospect of further research may be an analysis of the impact of the intellectual capital of construction engineering enterprises on their financial condition, an increase in the income of construction engineering enterprises.

REFERENCES

Abhayawansa, S., Guthrie, J. (2016). Does intellectual capital disclosure in analysts' reports vary by firm characteristics? *Advances in Accounting*, 35, 26-38.

Asiaei, K., Jusoh, R. (2017). Using a robust performance measurement system to illuminate intellectual capital. *International Journal of Accounting Information Systems*, 26, 1-19.

Brennan, N., Connell, B. (2000). Intellectual capital: current issues and policy implications. *Journal of Intellectual Capital*, 1(3), 206–240.

Brooking, A. (1999). *Corporate memory: strategies for knowledge management*. London; New-York: International Thomson Business Press.

Brooking, E. (2001). *Intellektualnyi kapital: klyuch k uspekhu v novom tysyacheletii* [Intellectual capital: the key to success in the new millennium]. St. Petersburg: Piter.

Chen, J., Zhu, Z., Xie, H.Y. (2014). Measuring intellectual capital a new model and empirical study. *Journal of Intellectual Capital*, 5(1), 195–212.

Claver-Cortés, E., Lópes-Gamero, M.D., Molina-Azorín, J.F., Zaragoza-Sáez, P.D. (2015). Intellectual and environmental capital. *Journal of Intellectual Capital*, 8, 171–182.

Davenport, T. (2009). *Human capital: what it is and why people invest it*. San Francisco: Jossey-Bass Publishers.

Delgado-Verde, M., Martãn- De Castro, G., Amores-Salvadó, J. (2016). Intellectual capital, and radical innovation: exploring the quadratic effects in technology-based manufacturing firms. *Technovation*, 54, 35-47.

Dudin, M.N., Frolova, E.E., Protopopova, O.V., Mamedov, A.A., Odintsov, S.V. (2019). Study of innovative technologies in the energy industry: nontraditional and renewable energy sources. *Entrepreneurship and Sustainability Issues*, 6(4), 1704-1713.

Feiwel, G.R. (2007). *Intellectual capital of Michael Kalecki: a study in economic theory and policy*. Knoxville: The University of Tennessee Press.

Galbraith, J.K. (2008). *Novoe industrialnoe obshchestvo. Izbrannoe* [New industrial society. Favorites]. Moscow: Eksmo.

Housel, T.J., Nelson, S.K. (2015). Knowledge valuation analysis. Applications for organizational intellectual capital. *Journal of Intellectual Capital*, 6(4), 544–557.

Hudson, W.J. (2013). *Intellectual capital: how to build it, enhance it, use it*. Toronto: John Wiley&Sons Ins.

Kuznetsov, B.O. (2020). Kompleksnyi inzhiniring v stroitelstve Rossii kak obekt normativnogo regulirovaniya [Complex engineering in the construction of Russia as an object of regulatory regulation]. *Vestnik NITs korporativnogo prava, upravleniya i venchurnogo investirovaniya Syktyvkarskogo gosudarstvennogo universiteta*, 1, 53–61.

Leontev, B.B. (2002). *Tsena intellekta: intellektualnyi kapital v rossiiskom biznese: otsenka, orientiry, modelirovanie, zashchita prav* [The price of intelligence: intellectual capital in Russian business: assessment, orientation, modeling, protection of rights]. Moscow: Izdatelskii tsentr "Aktsioner".

Lim, L.L.K., Dallimore, P. (2014). Intellectual capital: management attitudes in service industries. *Journal of Intellectual Capital*, 5(1), 187–190.

Lukicheva, L.I. (2008). *Upravlenie intellektualnym kapitalom* [Intellectual capital management]. Moscow: Omega-L.

Madhavaram, S., Hunt, S.D. Customizing business-to-business (B2B) professional services: The role of intellectual capital and internal social capital. *Journal of Business Research*, 74, 38-46, 2017.

Mukharramova, E.R. (2016). Inzhiniring v stroitelstve [Engineering in construction]. *Rossiiskoe predprinimatelstvo*, 17(16), 1959–1974.

Nielsen, C., Roslender, R., Schaper, S. (2016). Continuities in the use of the intellectual capital statement approach: elements of an institutional theory analysis. *Accounting Forum*, 40(1), 16-28.

Nikulina, E.N., Tarasova, E.V. (2021). Application of option models in evaluation of innovative projects of the aviation industry. *Revista Geintec-Gestao Inovacao E Tecnologias*, 11(2), 1860-1867.

Petty, R., Guthrie, J. (2000). Intellectual capital literature review. Measurement, reporting, and management. *Journal of Intellectual Capital*, 1(2), 155–176.

Poddubnaya, T.N., Zadneprovskaya, E.L., Voevodina, S.S., Ilyinova, N.A., Khatit, F.R., Panina E.A. (2021). Distance learning experience in the context of globalization of education]. *Propositos y Representaciones*, 9(1). https://doi.org/10.20511/pyr2021.v9nSPE2.985

Roos, G., Roos, J. (2012). Measuring your company's intellectual performance. *Long Range Planning*, 30(3), 413–426.

Stewart, T.A. (2007). *Intellektualnyi kapital. Novyi istochnik bogatstva organizatsii* [Intellectual capital. New source of richness of organizations]. Moscow: Pokolenie.

Vinichenko, M.V., Klementyev, D.S., Rybakova, M.V., Malyshev, M.A., Malysheva, N.S. (2021). Satisfaction with the quality of life in employees of Russian enterprises in the social partnership system. *Quality Access to Success*, 22(180), 103-108.

Vinichenko, M.V., Melnichuk, A.V., Karácsony, P. (2020). Technologies of improving the university efficiency by using artificial intelligence: motivational aspect. *Entrepreneurship and sustainability issues*, 7(4), 2696-2714. http://doi.org/10.9770/jesi.2020.7.4(9)

Website of the "construction" research center. n.d. Available at: http://www.cstroy.ru/scientific_technical/innovations/

Website of the "k" engineering company. n.d. Available at: http://ik2k.ru/proekty-i-zakazchiki/

Website of The "Petergorproekt" Engineering Company. n.d. Available at: http://www.pitergor.ru/services/

Yin, R. (2009). *Case study research: design and methods*. London; Thousand Oaks.