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Management of intellectual capital of construction enterprises

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Abstract: An objective criterion for ensuring the economic development of Ukraine is a change in approaches, where the main source of competitive advantages is intellectual capital (IC), which is formed on the basis of its management strategy, innovative ideas, knowledge, creative activity, modern technologies compared to natural, labor or financial resources. In developed economic systems, the share of intellectual capital in the value of companies reaches 80%, which is associated with the implementation of "new" approaches to determining the trajectories of market changes, ensuring competitive advantages and leadership, identifying tools and intangible factors that make it possible to activate the mechanism of innovation development and attraction of investment resources. In the conditions of globalization processes, there is a rethinking of approaches to the formation and implementation of the intellectual capital management strategy of construction enterprises through the use of investment resources, where the main attention is focused on specific innovative projects.

Keywords: capital, enterprise, intelligence, management, income, economy, strategy.

1. Introduction

The concept of determining the intellectual capital of construction enterprises was developed by studying its structure and a set of functional, cost, urban planning, spatial and features that, as a result of constant transformations, form the relevant knowledge, skills, and experience of workers for the creation of an intellectual product, which made it possible to ensure the growth of investment attractiveness, competitiveness and effectiveness of activities based on interaction between customers, investors, contractors, state authorities and construction enterprises.

Systematized theoretical approaches to the structure of intellectual capital, which allow to identify its components, carry out an assessment and develop management measures that affect the effectiveness of the formation and use of intellectual capital of construction enterprises.

The structural components of the intellectual capital of construction enterprises are determined: human capital, intellectual property, organizational, brand capital, market assets, investment-innovative and social capital, stakeholder relations, information support. The proposed structural elements of intellectual capital make it possible to form a quantitative foundation and a methodological basis for evaluating the intellectual capital of construction enterprises.

Grounded theoretical approaches to the formation and use of intellectual capital of construction enterprises: functional, effective, knowledge , structural, factorial, integral, complex, an approach based on the directions of formation and improvement of information and analytical support for the use of intellectual capital in construction enterprises.

2. Object and subject of research

On the basis of the analysis of the main indicators characterizing the state and directions of operation of the construction sector, ambiguous trends were established, associated with a decrease in the effectiveness of activity, a slight increase in non-current and current assets with a reduction in the technical readiness of fixed assets and a significant impact of current liabilities and guarantees compared to own capital Defined in 2016. positive changes in the construction sector are associated with an increase in the production of construction products and works. It has been proven that the consequences of crisis phenomena observed in the socio-economic development of the state have not been overcome in the field of construction production.

Construction, like most other spheres of economic activity, is characterized by unprofitable formation and use of fixed assets and intangible assets (Table 1).

It was determined that during the studied period there is a slowdown in the development of the construction sector in European countries, where the dynamics of the domestic construction sector is in a corresponding trend. Compared to European companies, domestic enterprises are characterized by low volumes of product sales and investment attractiveness.

Table 1. Rate of profitability of fixed assets and intangible assets by types of economic activity as of January 1, 2016, relative to unit (without taking into account the temporarily occupied territory of the Autonomous Republic of Crimea and the city of Sevastopol and part of the area of the anti-terrorist operation) according to the data of the State Statistics Service of Ukraine*

Spheres by types of economic activity	Value indicator profitability basic means and intangibles assets	
	January 1, 2015	January 1, 2016
That's all	*-0.29*	*-0.13*
rural , forest and fishing household	0.25	0.97
industry	-0.20	-0.20
construction	*-0.88*	*-0.76*
wholesale and retail trade ; repair of motor vehicles vehicles and motorcycles	-1.49	-0.86
transport, warehouse household , postal and courier services activity	-0.09	-0.02
temporary placement and organization food	-0.44	-0.45
information and telecommunications	-0.45	-0.09
financial and insurance activity	8.81	-0.03
transactions with real estate by property	-0.57	-0.34
professional , scientific and technical activity	-0.84	-0.41
activity in the field administrative and auxiliary service	-0.06	-0.05
education	0.06	0.06
protection health and provision social help	-0.16	-0.14
art , sports, entertainment and recreation	-0.14	-0.16
granting others species services	-0.01	0.19

*Processed by the author

3. Target of research

The object of research is the intellectual capital management processes of construction enterprises.

The subject of the study is a set of theoretical and methodological provisions and practical recommendations for determining the strategic contours of increasing the efficiency of the formation and use of intellectual capital of construction enterprises.

4. Literature analysis

At the theoretical level, a conceptual apparatus for determining the intellectual capital of construction enterprises and its structural components needs to be developed. Conceptual approaches to the formation and use of intellectual capital are of particular importance, taking into account the peculiarities of the functioning of construction enterprises.

A significant contribution to the development of the theoretical and methodological foundations of the definition of intellectual capital and the formation of its structural components was made by M. Armstrong, O. Vagonova, V. Geets, Yu. Daum, O. Dykan, L. Edvinsson, A. Zharinova, O. Kendyukhov, O. Kirdina, A. Lapin, T. Momot, G. Nazarova, K. Sveiby, H. Stupniker, T. Stewart et al.

Solving fundamental issues regarding the strategy of intellectual capital management of enterprises was dealt with by N. Brenen, E. Brooking, T. Gunter, S. Ilyashenko, K. Mamonov, R. Petty, V. Svichkar, Yu. Yurchenko et al.

5. Research methods

Special methods were used to conduct the research: structural and content analysis - for the formation of a conceptual apparatus for the definition of intellectual capital, its structural elements at construction enterprises; economic and financial analysis - to characterize the state and development trends of construction enterprises, in general, and elements of intellectual capital, in particular; expert analysis - to determine indicators of formation and use of intellectual capital of construction enterprises

6. Research results

have been developed , including the formation of the mission, strategic goals and objectives, information and analytical support, evaluation procedures, directions of strategic management, which take into account the stages of the life cycle of construction projects through the use of diagrams Shuchard , a process model, network graphs and a structural-functional scheme for the implementation of the management strategy, which made it possible to offer methodical recommendations for increasing the efficiency of the formation and use of intellectual capital in construction enterprises;

A methodological approach to the integral assessment of the formation and use of intellectual capital of construction enterprises is proposed based on the definition of an integral indicator and the application of analytical, expert, and hierarchies analysis methods by modeling the indicators of the formation and use of IC, which allows for the formation of information and analytical support for the development of the BP intellectual capital management strategy;

The methodological principles of the process of developing a two-level system of indicators for assessing the formation and use of intellectual capital of construction enterprises have been determined based on the establishment of hierarchical levels and the results of a SWOT analysis, which take into account the structural components of BP IC, which allows determining the current state and dynamics of changes occurring in the field of formation and use intellectual capital;

An approach to assessing the level of competitiveness is proposed, which is based on the method of expert evaluations and modeling of indicators of activity efficiency (I_e), financial condition (I_{fc}), marketing activity efficiency (I_{ae}) and construction product quality (I_{pq}), which made it possible to determine an integral indicator of competitiveness (Table 2) and to characterize the competitive state of construction enterprises in order to establish cause-and-effect relationships between it and

Table 2. The results of the assessment of the results of the integral indicator of the competitiveness of construction enterprises, resp . unit

Indicators	PJSC "Holding Company "Kyivmiskbud"	PJSC "Poltava House-Building Combine"	Zhytlobud-1 Trust PJSC	Galbud PJSC	DPAT "Construction Company " Ukrbud "	PJSC "Kyivske specialized RB Society"	PJSC "Ukrainian special BMP " Ukrspetsbudmontazh "	PJSC " Kryvorizhaglobud "	PrJSC "Lutskyi domobuidevelnyi combine »
And $_e$	0.427	0.18	0.455	0.261	0.139	0.027	0.023	0.203	0.035
And $_{fs}$	0.153	0.102	0.037	0.06	0.21	0.275	0.045	0.149	0.107
And $_m$	0.582	0.48	0.584	0.529	0.463	0.422	0.46	0.363	0.549
And $_I$	0.477	0.417	0.548	0.431	0.439	0.3	0.374	0.406	0.495
K $_{r1}$	0.31	0.29	0.32	0.34	0.33	0,36	0.35	0.38	0.36
K $_{r2}$	0.29	0.28	0.27	0.27	0.32	0,31	0.35	0.32	0.33
K $_{p3}$	0.19	0.19	0.19	0.19	0.178	0,17	0.16	0.17	0.2
K $_4$	0.21	0.23	0.21	0.2	0.182	0,17	0.14	0.13	0.11
And $_k$	**0.387**	**0.268**	**0.382**	**0.292**	**0.276**	**0.215**	**0.15**	**0.239**	**0.212**

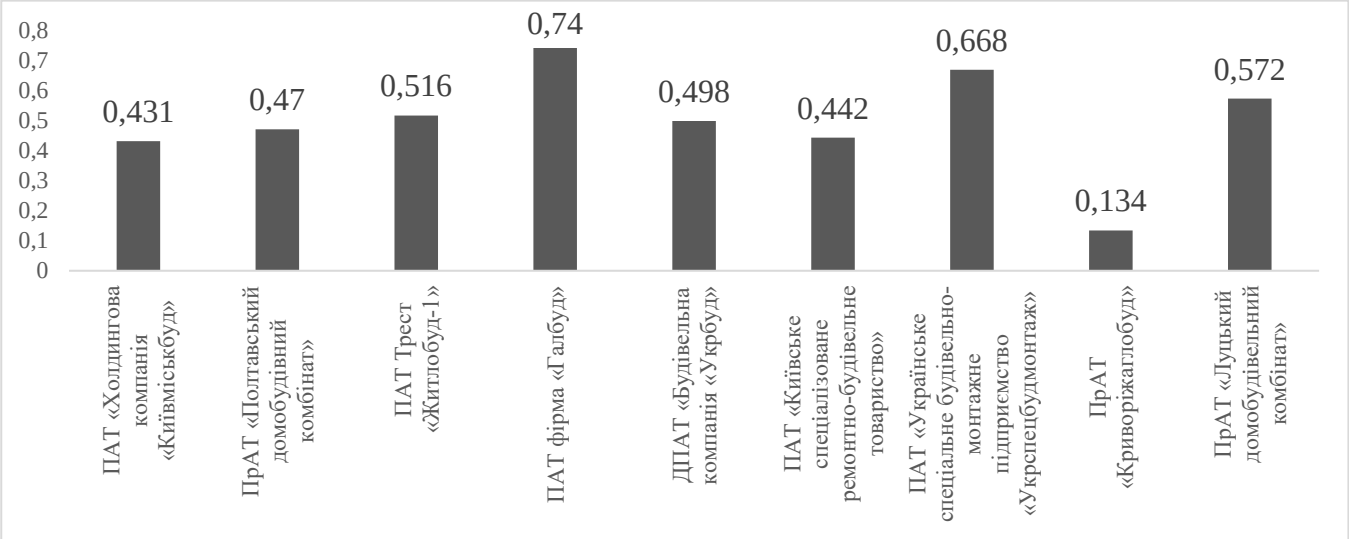
* Developed by the author

areas of formation and use of intellectual capital and making relevant management decisions. On the basis of the developed scale and the application of the presented approach, a low or average level of competitiveness was determined at the investigated construction enterprises.

$$I_к = К_{р1} x I_e + К_{р2} x I_{fc} + К_{р3} x I_м + К_{р4} x I_{ae}, \quad (1)$$

where $К_{р1}$, $К_{р2}$, $К_{р3}$, $К_{р4}$are rank coefficients that characterize the influence of indicators that form an integral indicator of the competitiveness of construction enterprises.

An approach to assessing the level of investment attractiveness has been developed, which is based on determining the influence of indicators that characterize the effectiveness and efficiency of construction enterprises, financial stability, liquidity and property status by applying the results of expert assessments of customers of construction products and investors, which made it possible to form a quantitative basis based on an integral criterion of investment attractiveness for determining directions of formation and use of intellectual capital and making informed management decisions. Taking into account the scale and results of the implementation of the proposed approach, a low, medium and high level of investment attractiveness of construction enterprises was established (Fig. 1).



Picture 1. Results of the assessment of the integral criterion of the investment attractiveness of construction enterprises, resp. unit.

Source: developed by the author

Proposed directions for modeling the influence of the integral indicator of the formation and use of intellectual capital on generalizing criteria

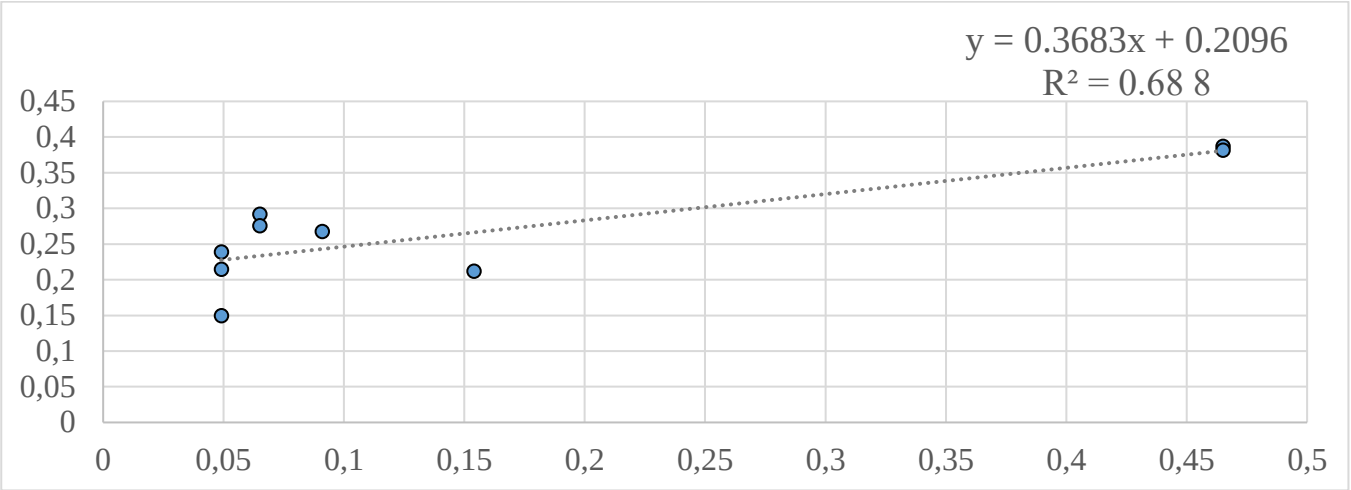
competitiveness and investment attractiveness of construction enterprises,

which include: formation of information and analytical support for modeling; construction of a correlation matrix that determines the relationship between the integral indicator of the formation and use of intellectual capital and generalizing criteria of competitiveness and investment attractiveness of construction enterprises; development of models characterizing cause-and-effect relationships; checking the developed models for adequacy based on the application of relevant criteria; interpretation of established causal relationships between integral indicators.

Developed models characterizing cause-and-effect relationships between the integral indicator of the formation and use of intellectual capital and the generalizing criteria of competitiveness and investment attractiveness of construction enterprises based on the application of the substitution method, the essence of which is the step-by-step inclusion of factors in the model. A linear indirect relationship was established between the integral indicator of the formation and use of intellectual capital and the general criterion of the competitiveness of construction enterprises (Fig. 2).

The model of dependence between the integral indicator of the formation and use of intellectual capital and the general criterion of the investment attractiveness of construction enterprises indicates a low connection between them.

Proposed criteria for assessing the adequacy of models characterizing causal relationships between the integral indicator of the formation and use of intellectual capital and generalizing criteria of competitiveness and investment attractiveness of construction enterprises: coefficients of correlation and determination, Student's, Fisher's, tests for homo or heteroscedasticity , Durbin - Watson , tests for multicollinearity . It has been proven that ensuring the growth of the general indicator of the formation and use of intellectual capital leads to an increase in the level of competitiveness of construction enterprises.



Picture 2. Graph and model of dependence between the integral indicator of the formation and use of intellectual capital and the general criterion of competitiveness of construction enterprises, resp . unit.

Source: developed by the author

The need to implement changes in the field of formation and use of intellectual capital to eliminate disparities regarding the growth of investment attractiveness has been established.

Measures have been developed to increase the general criterion of competitiveness and investment attractiveness of construction enterprises based on the results of modeling the integral indicator of the formation and use of intellectual capital. There is a well-founded need to ensure an increase in the integral indicator of the formation and use of intellectual capital by more than 4% in order to increase the level of competitiveness. It is proposed to change the trajectory of the formation and use of intellectual capital and approaches to its application to ensure the investment attractiveness of construction enterprises.

Methodological aspects of the intellectual capital management strategy of construction enterprises include a set of methods, models, directions of its development and implementation, which summarize the processes of formation and use of IC, the results of its assessment.

A process approach to the development and implementation of the intellectual capital management strategy of construction enterprises is proposed, which is based on a set of interrelated actions, which include the formation of a mission, strategic goals and objectives, information and analytical support, the results of evaluation procedures and the application of Shuchard diagrams , a process model, network schedules and a structural-functional scheme for the implementation of the management strategy, the implementation of which is aimed at creating a structural-logical model and methodical recommendations for increasing the efficiency of the formation and use of intellectual capital.

A structural-functional scheme for the implementation of the intellectual capital management strategy of construction enterprises has been developed, which is determined by a set of interrelated actions, which includes entering the system based on indicators and tools, the corresponding information and analytical support and output in the form of business processes to ensure the implementation of this strategy.

7. Prospects for further research development

The value of the work results for practice is determined by the formation of a toolkit for the development of an intellectual capital management strategy using a system of indicators for its evaluation through the application of a process approach and the results of modeling the investment attractiveness and competitiveness of construction enterprises. This made it possible to increase the efficiency of the formation and use of intellectual capital of construction enterprises.

8. Conclusions

A structural and substantive analysis of theoretical approaches to clarifying the concept of "intellectual capital of construction enterprises" was carried out, which is proposed to be considered through the prism of structural characteristics and functional, cost, urban planning, spatial and features that, as a result of constant transformations, form the relevant knowledge, skills, experience of workers to create intellectual product. The formation and use of intellectual capital of construction enterprises is determined by the directions of its assessment and the set of strategic implementation tools.

The proposed structural components of the intellectual capital of construction enterprises, which are determined by the basic characteristics affecting the formation and use of human capital, intellectual property, organizational, brand capital, market assets, investment-innovative and social capital, stakeholder relations, information support. To implement a methodological approach to the assessment of the formation and use of IC, the methods of assessing the structural components, the level of their interaction, which creates opportunities for making informed management decisions, are defined.

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