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THEORETICAL ASPECTS OF IMPLEMENTATION OF THE INNOVATION COMPONENT EVALUATING MODEL FOR SMALL BUSINESS ENTERPRISES

The article describes the main components of the definition of the innovative potential of small enterprises and identifies the characteristic features of small innovative enterprises (SIE). The mechanism of innovation potential identification of SIE was developed, where the main activity risks, advantages and disadvantages were underlined. The present state of business in Ukraine, the share of innovative enterprises in business, types of innovation and the level of innovative activity of small enterprises were considered. The author developed the new model for identification and analysis of the effectiveness of innovative components aimed at improving the level of investment attractiveness of the enterprise. The mentioned model is taken into account the positive sides of existing assessment models of innovation and consists of 2 stages (point evaluating and analyses of six coefficient groups) and as a result the integrated indicator is calculated for evaluating the level of innovative effectiveness.

Keywords: innovation component, innovative activity, innovations, small innovative enterprise, innovative potential.

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Statement of the problem. The world experience proves that the driving force in implementation of innovative solutions is generated by small enterprises, and the development of cooperation processes and the growth of small enterprises share in total production volume of large enterprises increase their competitiveness.

Nowadays it is a recognized fact that companies achieve competitive advantage developing and implementing innovations. The necessity of transition of Ukrainian economy into investment and innovation model is caused by the trend of development of new technologies. One of the essential reasons for efficient entrepreneurs is the introduction of achievements of scientific and technological progress and innovation. It is also important for economy to encourage the development of functioning of the new form of business exemplified as small innovative enterprises (SIE).

Analysis of recent researches and publications. Innovative activity of enterprises is in the center of attention of such scientists as A.I. Yakovlev [1], Nechyvilova N.I. and Shapovalova T.Yu. [2], Lukashina N.V. [3], Wasilchak S.V. [4], Dubov V.V. [4] Andrianov L.M. [5]. But, such issues as the analysis of the main trends of small enterprises innovative development and methods of innovation evaluating and the level of innovation implementation efficiency with the aim of increasing the investment attractiveness to ensure the adequate level of funding from investors, though, under studied. These specified issues are the focus of the given research.

The purpose of this article is to analyse the development of innovation activity among Ukrainian enterprises, to create the mechanism of innovative potential identification of small enterprises and development of innovation component evaluating model of small enterprises.

The main material of the study. Innovation activity is the activity aimed at finding and implementing

innovations in order to expand the range of products and improve their quality, technology and organization of production [1, p. 116].

Small innovative enterprises (SIE) are the structural part of the small business sector with its inherent features and functions that allows considering this form of management, as an independent economic phenomenon [2, p. 117].

SIE is the main source of innovation, new solutions generator, which creates opportunities for innovative development of the economy at all. The multidimensional role of SIE should be underlined: whilst, they providing innovative processes in the economy, they are sumultaneously involved in the production of highly technological products (services) [3, p. 86].

The problems of the innovation process in small enterprises are mainly linked to risk financing and innovation implementation. Profitable innovation is always accompanied by high risks and large investments. The growth of high risk levels of innovative projects is connected with high uncertainty level, i.e. a lack of information at all stages of creating and implementing innovations, its ambiguity and inaccuracy [4, p. 183].

Therefore, it is reasonable to create the mechanism of innovation potential identification of small enterprises taking into account the characteristic features, advantages and disadvantages of implementation of innovation activity for small businesses, risks and external influence factors (Fig. 1).

Due to the proposed mechanism the main factors determining the innovative capacity of the SIE (see Fig. 1) it is possible to identify the main constraints and risks and to justify the ways of overcoming possible negative consequences.

So, the main characteristics of the SIE can be considered as:

- 1. The development of the SIE depends on the level of education and knowledge of able-bodied population, training of scientific personnel, ability to suggest and implement innovative ideas.
- 2. From an economic point of view, the SIE is an effective tool for the continual element updates of the production processes, providing high competitiveness of its products and services.
- 3. Information sources for SIE can be formed by specific knowledge about the market and its needs; the emergence of new technologies, materials, production methods; existing structural or geographical gaps in the availability of any particular product.
- 4. Consumers, scientists, competitors, sales agents, dealers and employees can be considered as creative sources of innovative ideas for the SIE.
- 5. The market position of SIE, scientific-technical policy and the life-cycle stage of SIE's products or services should be taken into account for selecting innovation strategies.
- 6. The activity of SIE is closer connected with the risk because the full guarantee of the successful result of innovative activities can not be determined beforehand [6, p. 353].

In addition to theoretical aspects of the development and implementation of innovative components in the activities of small enterprises, the analysis of the development of Ukrainian entrepreneurship bears the great importance. According to the acting law of Ukraine "About development and state support of small and medium entrepreneurship in Ukraine" [7] the number of employees and gross income from any activities must be taken as the criteria for the division of enterprises by size in Ukraine.

So, Fig. 2 shows indicators of the business, in particular the structure of number of enterprises in Ukraine in relation to the size, employment and added value of these enterprises in 2014.

From the analysis of Fig. 2 we can say that the most numerous group among Ukrainian enterprises are micro enterprises (96,26 %) and small enterprises (2,85 %). The experience of developed countries shows that this trend is positive when the share of small business is over 60 %, but the analysis of the following criteria, in particular the added value, revealed that value added equals 10.91 % and 11.09 % for micro and small enterprises in Ukraine accordingly, which indicates a significant level of underdevelopment of small business. A similar trend is observed regarding the criterion of employment level, given that employment is 33,84 % and 12,94 % at micro and small enterprises respectively.

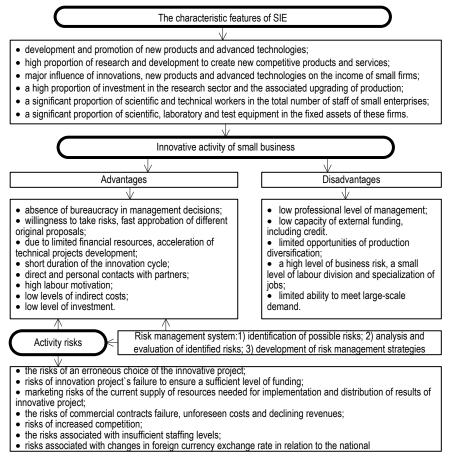


Figure 1 – The factors of the mechanism of innovation potential identification of SIE (created by the author based on [3-6])

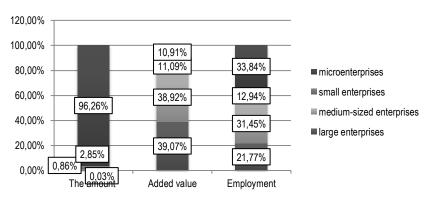


Figure 2 – Indicators of development of business in Ukraine in 2014 (formed by authors based on [8, p. 38-47])

Therefore, it can be argued that the sector of medium and large businesses, ranking as 0.89 % in the aggregate, provide 77.99 % of value added and 53.22 % of employment, which confirms the fact that the overwhelming number of small businesses characterized by the lack of its development.

Further, it is expedient to consider the state of innovation activity in Ukraine in general, namely by type of innovative activity (Fig. 3) and innovative activity of enterprises depending on their size (Fig. 4).

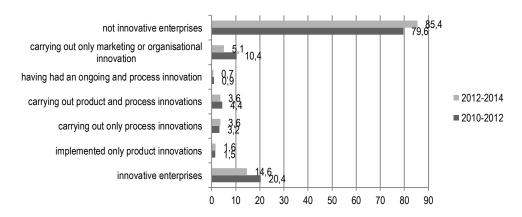


Figure 3 – Ukrainian enterprises by types of innovation activities, % [9, c. 186]

From Fig. 3 it can be concluded that the main part of Ukrainian enterprises are not innovative (about 80 %) during the analyzed period 2010 – 2014. In addition, there is a negative tendency of reduction of enterprises amount across all types of innovation activities in 2014 compared to 2010. The analyzed data testify insufficient level of innovativeness of Ukrainian enterprises. The next reasonable step is consideration of the enterprises innovative activity depending on their size, with the aim of determining the degree of innovativeness of small businesses (Fig. 4).

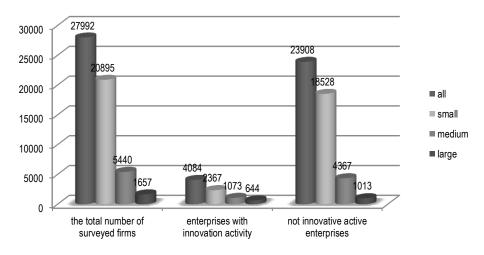


Figure 4 – Innovation activity of Ukrainian enterprises for 2012-2014 (formed by the author based on [9, p. 185])

From Fig. 4 it can be considered that the bulk of small businesses are innovation-active (88,7 %), which indicates insufficient level of innovation activity of small businesses. In general it can be observed that only 11,3 %; 19, 7% and 38,8 % are innovation active companies among small, medium and large business in Ukraine.

In addition to the level of innovation, the main types of small business innovative activities should be determined to analyze the innovativeness of small businesses (Fig. 5).

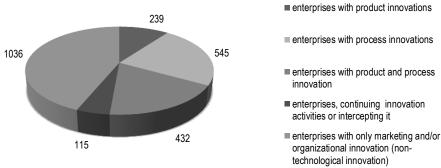


Figure 5 – Innovative activity of small enterprises for 2012-2014 (formed by the author based on [9, p. 185])

So, from Fig. 5 it can be observed that innovation-active enterprises of small business are represented by enterprises with technological innovation (56,2%) and non-technological innovation, that include marketing and/or organizational innovation (43,8%) within the analyzed period. Among the technological innovations the most numerous groups are enterprises with process innovation (40,9%) enterprises with product and process innovation (32,5%), that proves the fact that basic implemented innovations are connected with changes in production methods, the creation and marketing of goods or services and to a small degree of change in existing or production of new goods or services.

Another important criterion in the analysis of innovative activity of small business is the level of novelty of the sold products (goods, services) of enterprises with technological innovations, which are discussed in the table. 1.

According to table 1 it can be identified that the main share of sales among small enterprises with technological innovations is realized by the products that were unchanged or only superficially modified (over 63 %) in all categories, proved that the level of novelty of innovation is very low. But table. 1 shows a positive trend of increasing level of innovativeness of small business in 2014 considering the increasing level of sales that were new to market and new to company (by 5,1% and 1,5%, respectively).

Table 1 –Innovative products (goods, services) realized by small enterprises with technological innovations, the level of novelty [9, p. 195]

	The share of sales that were new to the market		The share of sales that were new for the enterprise		The share of sales that were not changed or only superficially modified	
	2012	2014	2012	2014	2012	2014
All small enterprises	6,4	11,5	21,4	22,9	72,2	65,6
Industry	5	5,3	23	31,4	72	63,3
Services	3,9	17,1	20,5	15,3	75,6	67,6

So, the main reasons for the low innovation activity of small enterprises in Ukraine is the imperfection of legislative and normative-legal support, in particular the lack of complex methods of innovative component evaluating of enterprises to determine the level and effectiveness of innovation activity with the purpose of attracting financial resources from domestic and foreign investors, states, credit and other financial institutions.

Some models of evaluation of innovative components exist in modern terms, among which it is advisable to allocate: 1) the diamond model; 2) model of the innovation funnel; 3) the model of value chain innovation; 4) OSLO (tab. 2).

Table 2 – Modern models of assessment of innovations (compiled on basis of [10-11])

Model	The essence of the model	The main components
The diamond model	The model is based on quality indicators, suggesting a set of questions that relate to the company's strategy, characteristics of the innovation processes in the company, the characteristics of internal environment to identify the motivation for the creation of innovation linkages with other firms and on in-company training	the company's strategy; characteristics of the innovation process in the company; characteristics of internal environment to identify the motivation for the creation of innovation; communication with other companies; training in the company
The model of the innovation funnel	The model assumes that innovation goes from end to end. So,that the beginning of a new innovation is the end of the previous one. This process is repeated spirally	the input (strategic considerations, portfolio management and evaluation); the process (research, ideas, perception of ideas, the target audience of consumers, market entry); source data (sales)
The value chain of innovation	The model requires the creation of economic and mathematical model that allows to determine the key performance indicators (KPI) for each phase of the project	idea; convertation; diffusion
Model OSLO	The model suggests a systematic approach, based on the collection and analysis of data about innovation	innovation at the firm level; links with other firms and public research organizations; study of demand for innovative products

From the analysis of table 2 it can be concluded that the existing models do not take into account the indicators of company activity assessment and the effectiveness of innovation except for the definition of innovative components for the development of enterprises.

So, nowadays there is no comprehensive assessment for the identification and analysis of innovative components of enterprise development, which would consider elements of the assessment of the financial condition, investment attractiveness and indicators to measure effectiveness of innovation.

Researcher developed the model to identify and assess the effectiveness of innovative components of the investment project. This model was designed for the analysis of the qualitative composition of the enterprise for various groups and criteria (taking into account the efficiency of the overall activity, the level of solvency and liquidity, financial and business activity, level of application of innovations and analysis of adequate financial status, quality staffing and innovative activity, profitability of innovation activity and others), which consists of 2 stages.

The first step means express evaluation based on indicators of innovative component identification inside the enterprise at point scale, which is determined by the total score of the enterprise (tab. 3). Enterprise gives "Yes-No"-answers to the questions listed in the table 3. Legal entity can receive "1" point for every "Yes"-answer and "0" points for every "No"-answer. Finally, the total score defines the level of

innovativeness of the enterprise according to the express evaluation. This score should be more than 4 to continue with further estimations (move to the second stage of assessment mentioned in fig. 6-7).

Table 3 – Express evaluation of innovative component identification (questionnaire) (compiled on the basis of [12])

Nº	Question				
1	Is annual revenue growth more than 10%?				
2	The increase in the number of employees (full-time) over the last year is more than 5%				
3	The ratio of the cost of innovative development to total expenditure is more than 5%				
4	The funds allocated by international financial organizations (EBRD, EIB, EIF and others) are planned over the next				
	three years for research and development in the amount of not less than 80%				
5	Has in the last 3 years organisation received grant financing and guarantees, loans from the European funds aimed at				
	the development of research and development?				
6	Was there at least 1 patent in the recent 24 months?				
7	Has the company received funds for research and development corporations, business angels, that is a member of				
	the business angel network				
8	The company is registered in science, technology or innovation park or technology cluster or technology incubator				
9	The company received the tax credit or tax incentives associated with taxation of income from research activities				
	during the past 24 months				
10	The annual growth of cost of employees knowledge improvement is more than 10%				

In the case of matching the calculated score for the scale criteria, namely the value that is greater than or equal to 4 points, it is conducted the second stage of assessment.

The second stage is carried out to evaluate the effectiveness of existing innovative components, that consists of enterprise analysis according to different groups, each of which contains certain coefficients (relative parameters) (fig. 6-7).

To define the innovative components of the enterprise it is essential to converge certain indicators of enterprises to one.

Integral indicator is calculated as a result of analysis of coefficients of proposed groups, which is compared with the average value that is within 50 %. According to the developed scale for the assessment of innovative components of the enterprise it is possible to assess the level of innovativeness of the enterprise.

The company is considered innovative if it received 4 or more points at the 1st stage and 50 or more percent at the second stage.

Table 3 provides criteria for implementation of the first stage of innovative component identification with the purpose of the express evaluation.

Scale for identification of innovative components of the enterprise:

- 0 3 an enterprise is not innovative;
- 4 6 the company is engaged in innovative activities;
- 7 -10 the enterprise with high level of innovation activity.

In the case of enterprise's achieving level of 4 points or higher for the investor it is appropriate to make an integrated estimation of efficiency of the innovative components of the enterprise, which processes the complex indicators of company activity for calculation economic efficiency of investments for innovative activities implementation.

To obtain the input information the data from enterprises financial statements (form № 1 "Balance sheet" and form № 2 "Income financial statement") are used. All groups of indicators are assigned, depending on their weight and the corresponding numeric values (fig. 6 -7).

The transition from different lines and units of measurement to the matched is performed using the index variation fluctuations $\Delta i=P_imax-P_imin$.

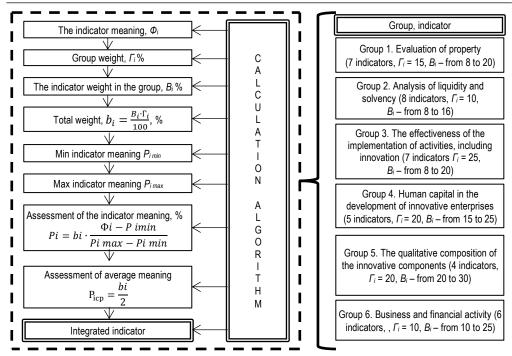


Figure 6 - Calculation of an integrated indicator model for evaluating the effectiveness of innovative enterprise components

In fig. 6 the algorithm of calculation of an integral indicator of innovative components of the investment project (enterprise) is considered (compiled by the author on the basis of [13-14]). The limits of oscillation are determined with an empirical approach using experimental data and expert estimates. The average level is determined by the following formula (1):

$$P_{icp} = b_i \frac{\Phi_{icp} - P_{imin}}{P_{imax} - P_{imin}} = \frac{b_i}{2},\tag{1}$$

where P_{icp} – average assessment meaning of indicator; P_{imin} , P_{imax} – minimum and maximum meaning of indicator; Φ_{icp} – average meaning of indicator (can be calculated by formula 2); b_i – total weight (calculated by multiplication of group weight and indicator weight in the group).

$$\Phi_{icp} = \frac{P_{imax} + P_{imin}}{2},\tag{2}$$

Assessment of the value of the indicator is determined by the next formula (3):

$$P_i = b_i \frac{\Phi_i - P_{imin}}{P_{imax} - P_{imin}},\tag{3}$$

where Φ_i – indicator meaning; P_i – assessment of indicator meaning.

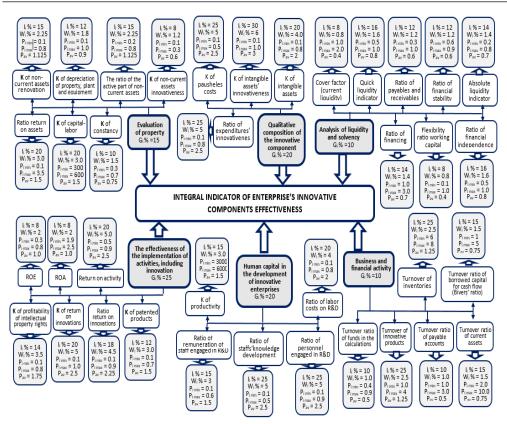


Figure 7 – The set of criteria for calculation of an integrated indicator model for evaluating the effectiveness of innovative enterprise components

In the case that $\Phi_i > P_{imin}$, it applies the inverse of the evaluation formula (3) to formula (4):

$$P_i = b_i \frac{P_{imax} - \Phi_i}{P_{imax} - P_{imin}} \tag{4}$$

The presence of average meaning gives the opportunity to evaluate the deviation of the obtained integral indicator from the optimal value, which is calculated according to the formula (5):

$$BB = \left(\frac{\sum P_i}{\sum P_{icp}} - 1\right) \cdot 100 \%, \tag{5}$$

where BB - the deviation of integral indicator.

All groups and indicators mentioned in fig. 6 are shown in fig. 7.

Description of every criterion from fig. 6 consists of such abridgements as:

K – coefficient;

 $P_{i min}$ - Min indicator meaning;

Pimax - Max indicator meaning;

- Ii % The indicator weight in the group
- G_i%- Group weight;
- W_i % Total weight (G_i %* I_i %/100%);
- P_{av} average meaning (W_i%/2).

The rating scale of an integrated indicator model for the evaluation of enterprise innovative components efficiency (according to fig.6):

- 0 49% the company has a low level of efficiency of innovative activity;
- 50 74% the company has a sufficient level of efficiency of innovative activity;
- 75% and above the company has a high level of efficiency of innovative activity.

Therefore the proposed model of identification and assessment of the innovation component effectiveness (table 3, fig. 6-7) evaluates the effectiveness of activities, including innovation in the following areas:

- 1) express assessment at the point scale by the developed system of criteria;
- 2) assessment of property condition;
- 3) assessment of liquidity and solvency;
- 4) evaluation of the effectiveness of implementation activities, including innovative;
- 5) evaluation of the role of human capital in the development of innovative enterprises;
- 6) assessment of the qualitative composition of the innovative components;
- 7) assessment of the level of business and financial activity.

Consequently, the use of this model will help the investors to determine the level of enterprise innovative component efficiency based on integrated indicator perceiving the target to choose high quality investment project while making their managerial decisions.

Conclusions. Despite the low level of innovation activity of small enterprises of Ukraine, primarily due to inadequate funding, the assessment of efficiency of activity of enterprises, including innovation, is one of the most important components in decision-making by investors, financial institutions or government agencies regarding funding into the investment projects with the existing innovative component. Application of the proposed model of identification and evaluation of innovative component efficiency will allow the company to determine the level of innovativeness of the enterprise and efficiency of its innovative activity both for the enterprise and for external users. The calculation of the mentioned indicators will determine the performance of activities, including innovation and to reveal the extent and quality goals using scorecards. Compliance indicators developed evaluation criteria, in particular 4 or more points on the first stage and 50 or more percent for the second stage will improve the level of investment attractiveness of the enterprise and become an indicator for different types of investors to allocate funds.

That's why in **the further research** there will be a special focus on finding the ways for implementation of the developed model and its specification according to different industries for providing high level of calculations' accuracy.

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Теоретичні аспекти впровадження моделі оцінки інноваційної компоненти підприємств малого бізнесу

У статті розглянуто основні складові визначення інноваційного потенціалу малого підприємства та виявлено характерні риси малого інноваційного підприємства. Проаналізовано сучасний стан розвитку бізнесу в Україні, питому вагу інноваційних підприємств у бізнесі, типи інноваційної діяльності та рівень інноваційної активності малих підприємств. Проведено аналіз існуючих моделей оцінки інновації, на основі якого розроблено методику ідентифікації та аналізу ефективності інноваційної компоненти з метою забезпечення підвищення рівня інвестиційної привабливості підприємства.

Ключові слова: інноваційна компонента, інноваційна активність, інновації, мале інноваційне підприємство, інноваційна діяльність

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Теретические аспекты внедрения моделы оценки инновационной компоненты предприятий малого бизнеса

В статье рассмотрены основные составляющие определения инновационного потенциала малого предприятия и выявлены характерные черты малого инновационного предприятия. Проанализировано современное состояние развития бизнеса в Украине, удельный вес инновационных предприятий в бизнесе, типы инновационной деятельности и уровень инновационной активности малых предприятий. Проведен анализ существующих моделей оценки инновации, на основе которого разработана методика идентификации и анализа эффективности инновационной компоненты с целью обеспечения повышения уровня инвестиционной привлекательности предприятия.

Ключевые слова: инновационная компонента, инновационная активность, инновации, малое инновационное предприятие инновационная деятельность.

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