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APPROACHES TO THE FORMATION OF A SYSTEM OF EVALUATION INDICATORS FOR ANALYSING THE EFFECTIVENESS OF THE COMMERCIALISATION CHAIN

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Shorter product lifecycles, new product introductions, increased competition, the emergence of new markets and ever-changing consumer needs are forcing companies to bring new products to market. However, not all innovative solutions are commercially successful. At the same time, there are many systems for assessing the effectiveness of the commercialisation chain that would meet the needs of companies in different sectors. The aim of the work is to systematise evaluation indicators and to develop recommendations that can be useful in forming a system of evaluation indicators for analysing the effectiveness of the commercialisation chain. Currently, there are various approaches to the evaluation of innovation commercialisation. Researchers base them on indicators grouped according to specific criteria with certain weights. The company can choose one of these approaches or develop its own. At the same time, they need to consider the following points. When creating a system of evaluation indicators, it is advisable to use as many indicators as are most relevant to the organisation's objectives. When creating this set of indicators, one should consider different aspects (effects) of commercialisation. It is better to focus on objective indicators (indices); however, in their absence and the need to calculate indicators with different units of measurement, there is a need for their normalisation. When determining the weights of groups and individual indicators, in order to achieve greater objectivity, it is possible to use simultaneously the methods of balancing, weighting and general category weighting. After calculating the integral indicator, it is necessary to check its adequacy using various methods and to compare its value in different scenarios. The data approach to the development of the system of evaluation indicators for the analysis of the effectiveness of the commercialisation chain will contribute to the formation of a sufficiently objective evaluation system that takes into account the various impacts of commercialisation (economic, market, social, environmental, and so forth).

Key words: *innovations, innovation commercialisation, evaluation system, indicators, efficiency, competitiveness, marketing.*

JEL Classification: *C52, H21, M31, O31*

Problem statement. The shortening of product life cycles, the regular appearance of new products, increased competition in the sales market and the emergence of new markets with ever-changing consumer needs are forcing companies to innovate and launch new products. The commercialisation of innovations increases the probability of market success and competitiveness. At the same time, only a proportion of projects are commercially successful. Therefore, there is a need to create a system of indicators that would allow to assess the success of future commercialisation of innovations.

Analysis of recent research and publications. Ukrainian and foreign scientists study innovation activity. Many researchers define groups of indicators to assess the commercialisation of innovations [1–8].

The works of Kostsyk R.S. [3] are devoted to the commercialisation of innovative products of machine-building enterprises, Geipele I. et al. [5] – to the development of an engineering and economic system of indicators for the production of the nanotechnology industry. Perminova S.O. [7] examines modern practices of management of processes of bringing innovative development to its commercial use, Kutsik O.I. & Klipkova O.I. [9] – evaluation of commercialisation of intellectual property objects in the system of innovative development of the enterprise.

Loustric I. & Matyas M. [10] created an index to study the success of innovation commercialisation in territorial marketing. Nepelski D. & Van Roy V. [11] proposed indicators and tools for the monitoring and management of innovative activities of complex collaborative research projects, in particular an assessment of the innovation potential (innovation readiness, management of innovative activities, market potential) and an assessment of the innovator (innovator capabilities and environment). At the same time, there is no single system for assessing the commercialisation of the innovation that would be suitable for enterprises of different spheres of activity.

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Khomenko et al [12] systematised the factors influencing the intensification of innovation commercialisation.

Formation of the article's objectives (task statement). The purpose of the publication is to systematise the indicators and develop recommendations that can be used to form a system for assessing the commercialisation of innovations.

Summary of the main research material. There are several approaches to the selection of indicators, which are used to draw a conclusion about the success of an innovation project and the feasibility of its commercialisation.

In general, all the indicators identified by the authors can be classified into one of the following groups: profitability, costs, investments, sales/production volumes, production capacity, market and competition, customers, personnel, legal and security indicators, operational processes, environment and safety, information and communication indicators.

Profitability indicators include the following [1–4; 6–7]:

– Net profit from the sale of innovative products;

– the ratio of the company's profit from the sale of innovative products to the amount of costs associated with the commercialisation of innovative products;

– the ratio of the company's profit from the sale of innovative products to the total costs of developing and commercialising innovative products;

– profitability of innovative activity;

– profitability of implementing innovative products;

– assessment of the license fee.

The market and competition are characterised by the following [1–6; 8]:

– The level of diversification of market segments;

– the share of market coverage of the innovative product in the structure of the sales market that can potentially be covered by the enterprise, and so forth;

– the level of market power (based on Tobin and Lerner coefficients);

– total market size;

– market growth rates;

– increase in market share;

– availability of alternative competitive inventions;

– nature of competition.

Production capabilities reflect [1–4; 8]:

– Territorial limitations of production capacities;

– technical efficiency from the introduction of innovations;

– index of the impact of innovation on labour productivity growth;

– the limit of competitiveness;

– number of innovative products introduced;

– quality of the goods produced;

– quantity of new technologies acquired by the company;

– the number of new technologies (technical achievements) transferred by the enterprise;

– the number of advanced technologies created;

– the number of advanced technologies used.

Costs [1–3; 5–6]:

– The amount of costs associated with the commercialisation of innovative products;

– the ratio of the amount of expenses related to the commercialisation of innovative products to the total expenses of the enterprise;

– the ratio of the amount of expenses for the promotion of innovative products to the profit received from the sale of innovative products;

– the amount of fixed costs associated with the commercialisation of innovative products;

– the amount of variable costs associated with the commercialisation of innovative products;

– specific costs associated with the commercialisation of innovative products;

– cost savings (cost reduction) from the commercialisation of innovative products.

Table 1 – Approaches to the definition of groups of indicators for assessing the commercialisation of innovations

Indicators	Nakonechna & Makhonko, 2016	Chorna & Glukhova, 2012	Kostsyk R.S., 2016	Palmberg, C., 2006	Geipele et al., 2015	Myroschenko et al., 2012	Perminova, 2020	Zozulyov & Skorokhod, 2012
Profitability	+	+	+	+		+	+	
Market and competition	+	+	+	+	+	+		+
Production capabilities	+	+	+	+				+
Costs	+	+	+		+	+		
Investments		+	+		+	+	+	
Volumes of sales/production	+		+		+	+		
Consumers	+		+			+		+
Legal and security indicators		+	+		+			+
Personnel		+	+		+			+
Ecology and safety		+			+			
Operational processes	+					+		

Source: [1–8]

Investments [2–3; 5–7]:

– Index of reduction of the investment payback period;

– reimbursement of expenses (return of assets);

– capital investment in the industry, the number and share of companies in the country specialising in these innovations;

– the amount of investment in research and development of innovation infrastructure;

– the share of borrowed financial resources in the total amount of financial resources aimed at commercialising innovative products;

– the share of attracted financial resources in the total amount of financial resources aimed at commercialising innovative products;

– the share of invested financial resources in the total amount of financial resources aimed at commercialising innovative products;

– turnover of receivables and payables arising from the commercialisation of innovative products.

Sales/production volumes [1–3; 5–6]:

– the volume of innovative product implementation;

– the ratio of costs associated with the commercialisation of innovative products to the total costs of the enterprise;

– quantity of commercialised products that are an innovation for the enterprise/market;

– the share of innovative products in total production;

– the number of innovative products that have a price/consumer/logistical advantage in the market;

– production volumes, structure and dynamics of production, sales of high-tech products.

Consumers [1–3; 6; 8]:

– the number of consumers of innovative products;

– the level of demand for innovative products offered by the company;

– areas of use of innovative products by consumers.

Legal and security indicators [2–3; 5; 8]:

– Quantity of patents;

– effectiveness of cross-border cooperation in research;

– the number of fundamental research projects during the year (number of scientific and technical papers);

– the number and quality of scientific publications by researchers;

– global level of innovation activity, national industry priorities;

– the level of novelty and protection of the invention;

– support in technology implementation;

– level of support available;

– quantity of applications for titles of protection filed;

– the number of security documents received.

Personnel [2–3; 5, 8]:

– Staff turnover;

– the level of staff participation in the development and implementation of innovations;

– headcount of employees engaged in scientific, research, technological development and innovation;

– employment and unemployment rates, as well as their share in the industry;

– the number of specialists trained in vocational education;

– level of public awareness;

– commercial experience of the inventors;

– the reputation of inventors;

– the share of employees engaged in innovative activities in the total number of employees of the enterprise;

– headcount of employees involved in the commercialisation of innovative products;

–the share of employees involved in the commercialisation of innovative products in the total number of employees engaged in the company's innovation activities.

Ecology and safety [2; 5]:

– Reduction of occupational diseases among employees;

– increasing the level of compliance of the construction process with environmental and sanitary standards;

– improvement of employee safety and health.

Operational processes [1; 6]:

– The ratio of the number of completed transactions during commercialisation to the planned number;

– the ratio of the number of deviations from the actual values of the indicators, according to which the commercialisation plan was formed, to the total number of indicators reflected in the commercialisation plan;

– the number of transactions envisaged in the commercialisation plan was adjusted during commercialisation due to changes in the internal and external environment of the company.

Typically, each group has both quantitative and qualitative indicators. Some indicators are measured in monetary and physical units; there are relative indicators. At the same time, each organisation will consider its own set of indicators, optimal in specific conditions.

Therefore, in order to create a commercialisation assessment system, it is necessary to develop an integral indicator that includes a set of subindicators and allows to take into account different aspects of commercialisation outcomes.

At the same time, it is important to bear in mind that there are many different performance indicators and ways of constructing them suggested by experts. There are several approaches one could use to calculate the integral indicator.

1) From the perspective of an organisation, commercialisation of innovations results in economic, scientific, technical and social effects, so the integral index can be calculated as follows [2]:

$$I_{IE}^{ent} = I_{econ}^{ent} x I_{sc-tech}^{ent} x I_{soc}^{ent}, \text{ where } I_{IE}^{ent} \to 1, \quad (1)$$

where I_{IE}^{ent} – efficiency index from the perspective of the enterprise, I_{econ}^{ent} – economic efficiency index, $I_{sc-tech}^{ent}$ – index of scientific and technical efficiency, I_{soc}^{ent} – social efficiency index.

Each of the components also includes several indicators.

Economic efficiency index [2]:

$$I_{econ}^{ent} = I_r x I_{p-l} x q_{Tobin} x L, \text{ where } I_{econ}^{ent} \to 1, \quad (2)$$

Where I_r – index of profitability of innovation activity, I_{p-l} – profitability index of patent and licensing activities, qTobin – modified Tobin's coefficient, L – modified Lerner coefficient.

Index of scientific and technical efficiency [2]:

$$I_{sc-tech}^{ent} = I_{opt} x I_{i.p-l} x I_{prog}, \text{ where } I_{sc-tech}^{ent} \to 1, \quad (3)$$

where I_{opt} – construction process optimisation index, $I_{i.p-l}$ – index of intensity of patenting and licensing activities, I_{prog} – technology progressiveness index.

Social efficiency index [2]:

$$I_{soc}^{ent} = I_{lp} x I_{sat} x I_{ia}, \text{ where } I_{soc}^{ent} > 0, \quad (4)$$

where I_{lp} – labour productivity index, I_{sat} – index of satisfaction with working conditions, I_{ia} – personnel innovation activity index.

For the full set of indicators, the lower limit of the integral indicator of the efficiency of innovative activity from the perspective of the enterprise is 0.01.

All the indices reflect the impact of the commercialisation results of the quality of the organisation's human resources work and therefore cannot reach the maximum marginal value, because at the time of the assessment, significant changes in the human resources work (increase in labour productivity, 100% innovative activity of employees and complete cessation of dismissals) cannot take place. Therefore, any positive change in any direction is an indication of effectiveness. Indicator values greater than zero will be considered acceptable and corresponding to one, i.e., full efficiency.

The integral indicator can also be calculated from the personnel position. At the same time, it is advisable to evaluate according to the criteria of sociality (reduction of working time costs, improvement of personnel qualifications, increase in wages) and environmental efficiency (reduction of occupational diseases, increase in the degree of compliance of the production process with environmental and sanitary standards). In this case, the integral indicator takes the following form [2]:

$$I_{IE}^{pers} = I_{soc}^{pers} x I_{ecol}^{pers}, \text{ where } I_{IE}^{pers} > 0, \quad (5)$$

where I_{IE}^{pers} – efficiency index from the point of view of the staff, I_{soc}^{pers} – social performance index, I_{ecol}^{pers} – environmental performance index.

2) If the results of commercialisation of innovations are considered from the point of view of economic efficiency, realisation of market opportunities of the organisation, acquisition of competitive advantages by the enterprise in the market, completeness and timeliness of the commercialisation plan, the effectiveness of commercialisation of innovative products can be calculated as follows [6]:

$$E^n = \cup_{i=1}^{a} e_{f1-i} \cap \cup_{i=1}^{b} e_{f2-i} \cap \cup_{i=1}^{c} e_{f3-i} \cap \cup_{i=1}^{d} e_{f4-i}, \quad (6)$$

Where n – overall number of indicators that characterise the effectiveness of commercialisation of innovations in terms of all groups; e_{f1} – indicators that characterise the economic efficiency of commercialising innovative products; e_{f2} – indicators that characterise the realisation of the organisation's market opportunities; e_{f3} – indicators that characterise the company's competitive advantage in the market; e_{f4} – indicators that characterise the completeness and timeliness of the commercialisation plan; *a, b, c, d* – the number of indicators in the set e_{f1}, e_{f2}, e_{f3}, e_{f4}, respectively.

Each of the four selected groups of indicators reflects a specific aspect of the effectiveness of commercialisation of an innovative product.

3) The integral commercialisation indicator is calculated on the basis of all commercialisation indicators and their weighting factors in the context of the process performance [9]:

$$I_к = X_1 \cdot K_1 + X_2 \cdot K_2 + X_3 \cdot K_3 + \ldots + X_n \cdot K_n, \quad (7)$$

where $X_1 \ldots X_n$ – summary indicators of the components of the commercialisation process; $K_1 \ldots K_n$ – weighting factors of the relevant components in the overall commercialisation process; n is the number of components of the commercialisation process.

Summarising indicators are determined by taking into account the quantitative parameters of each component and weighting factors.

At the same time, the X_i indicator is calculated as follows [9]:

$$X_i = \frac{\sum_{i-1}^{m} \left(I_{ef} \cdot K_w \right)}{100}, \quad (8)$$

where I_{ef} – commercialisation performance indicators; K_w – weighting coefficients in the total set of coefficients, in %; m – the number of commercialisation efficiency and effectiveness indicators.

4) This approach involves the analysis of various existing indices that quantify different aspects of innovation and market success. It can be used in territorial marketing to evaluate the results of the commercialisation of innovations at the level of the city (region) [10].

The approach takes into account the degree of subjectivity in justifying the effectiveness of the indicator, especially for new policy areas such as sustainable development.

The approach is based on the use of secondary sources. This allows the structure and data points to be updated quickly and thus maximise the potential value of the index for investors and other stakeholders.

For all selected relevant variables, "success" is measured based on the current natural peak of market, economic, legal and organisational variables related to technology diffusion, large-scale adoption, commercialisation, business and consumer demand, and the broader economic environment.

The integrated index measures the diffusion, adoption and commercialisation of innovations, consumer and producer demand, as well as economic viability and stability, creating an analytical framework for a city's "propensity to succeed in the minibus market".

For normalisation, the min-max method was used. It scales the data linearly, assigning 0 to the worst value and 1 to the best, and gives a normalised result as a value from 0 to 1 inclusive.

The normalisation process is based on the following equation [10]:

$$I_c^q = \frac{x_c^q - \min\left(x^2\right)}{\max\left(x^2\right) - \min\left(x^2\right)}, \quad (9)$$

where x_c^q is the initial data for the indicator q of city c, $\min\left(x^2\right)$ and $\max\left(x^2\right)$ are the actual maximum and minimum values, respectively, for the indicator q in city c.

Any indicator q for city c that has a negative value was converted by assigning the value of the worst (best) performer to the best (worst) performer, i.e., using the following rule [10]:

$$\widehat{x_c^q} = \max\left(x^q\right) + \min\left(x^q\right) - x_c^q \qquad (10)$$

This quantitative definition of "success" is a snapshot of each indicator at the moment in time when the index is constructed. Hence, it is recommended that the index be recalculated annually to account for changes.

The researchers use three weighing methods to ensure maximum reliability.

Variables can be considered:

– Independently and equally – the equilibrium method (EW);

– as having a different level of importance for the integral indicator, determined either by experts or the public – weighting method;

– as part of complex categories that group correlated indicators describing similar parameters – the method of weighting general categories.

The equilibrium method assigns a weight of 1 to each variable.

The second weighting method uses a ranking system where the sub-categories are ranked in order of perceived importance, then divided into groups of 4 and each group is given equal weight. The sub-category "most direct impact on the consumer" is given the highest weight (4/5). Each of the following three groups is weighted slightly less than the previous one (from 3/5 to 1/5 according to their order of importance, taking into account the direct impact on the consumer, then on the company and then the indirect impact).

The third weighting method groups "correlated" indicators into main categories; for each general category, the researchers assigned a weight of 1 to be distributed equally among the corresponding subcategories. They present the results in the form of a cartogram, where the axes are indicators and the values on the axis are normalised for the indicator. The values per city are shown in colour.

The result is three maps and three integral indicators (according to weighting methods). The normalised index thus makes it possible to compare a city's propensity to succeed in the market, both over time and over space.

Conclusions. There is currently no single approach to assessing the commercialisation of innovation. All approaches are based on a set of indicators grouped according to specific criteria, taking into account their weighting. There may be an uneven number of individual indicators within a group. At the same time, the set of indicators, the grouping, the calculation of weights and the verification of the appropriateness of the models are different.

The main difficulty is that many indicators reflect specific aspects of an organisation's commercialisation performance. Researchers measure these indicators in different ways (monetary, qualitative, relative, indices, and so forth), and their importance in different organisations will vary. These aspects should be taken into account when developing or choosing a commercialisation assessment system.

The company can choose one of the approaches described above or develop its own, taking into account the limitations of each of them.

Enterprises should identify a list of individual indicators, weighting factors and comparison methods to build their integral indicator.

When developing a commercialisation assessment system, it is advisable to use a large number of indicators that best meet the organisation's objectives (Table 1, as in approaches 1, 3-4).

When compiling this set of indicators, it is advisable to take into account different aspects (effects) of commercialisation (as in approaches 1-2).

Focusing on objective indicators (indices) is preferable, but such information is collected only occasionally. The calculation of indicators with different units of measurement should be normalised (as in approach 4).

The weights of groups and individual indicators can be determined by an expert method. However, it is subjective or balanced weighting and weighting of general categories at the same time to achieve greater objectivity (as in approach 4).

After calculating the integral indicator, it is necessary to check its adequacy using different methods and comparing the values under different scenarios.

An informational approach to the development of a commercialisation assessment system will contribute to the formation of a sufficiently objective assessment system that takes into account the various effects of commercialisation (economic, market, social, environmental, and so on).

REFERENCES:

1. Nakonechna, O. S., Makhonko, O. M. (2016) Pokaznyky komertsializatsii innovatsiinykh proektiv [Indicators of commercialization of innovative projects]. *Eastern Europe: Economics, Business and Management,* 4(04), pp. 189–192.

2. Chorna, M. V., Glukhova, S. V. (2012) *Otsinka efektyvnosti innovatsiinoi diialnosti pidpryiemstv* [Evaluation of the efficiency of innovative activity of enterprises]: monograph. Kharkiv: KhDUHT, 210 p.

3. Kostsyk, R. S. (2016) *Komertsializatsiia innovatsiinoi produktsii mashynobudivnykh pidpryiemstv* [Commercialization of innovative products of machine-building enterprises]: autoref. Dissertation Abstract. Lviv: NU "Lviv Polytechnic", 238 p.

4. Palmberg, C. (2006) The sources and success of innovations – Determinants of commercialisation and break-even times. *Technovation*, 26(11), pp. 1253–1267.

5. Geipele I., Staube T., Ciemleja G., Geipele S., Zeltins N. and Ekmanis J. (2015) The Development and Design of Engineering Economic Indicator System for Nanotechnology Industry Product Manufacturing: a Case Study of Latvia. *Latvian Journal of Physics and Technical Sciences,* 52(5).

6. Myroschenko, N. Yu., Pauk, O. E., Zalutskyi, V. P. (2012) Komertsializatsiia innovatsiinoi produktsii mashynobudivnykh pidpryiemstv [Commercialization of the enterprise's innovative products: evaluation method]. *The Economic Messenger of the NMU*, 3, pp. 80–85.

7. Perminova, S. O. (2020) *Komertsializatsiia innovatsii: Konspekt lektsii* [Commercialization of innovations: Synopsis of lectures]: ed. manual for students specialty 073 "Management", educational and professional program "Management of investments and innovations" / KPI named after Igor Sikorskyi; editor: S. O. Perminova. Kyiv: KPI named after Igor Sikorskyi, 127 p.

8. Zozulyov, O. V., Skorokhod, K. O. (2012) Protsedura otsiniuvannia mozhlyvosti komertsializatsii tekhnolohii (na prykladi tekhnolohii priamoho vidnovlennia zaliza) [The procedure for assessing the possibility of commercialization of the technology (on the example of the technology of direct iron recovery)]. *Economic bulletin of NTUU "KPI": collection of scientific papers*, 9, pp. 193–199.

9. Kutsik, V. I., Klipkova, O. I. (2015) Intehralna otsinka komertsializatsii obiektiv intelektualnoi vlasnosti u systemi innovatsiinoho rozvytku pidpryiemstv [Integral assessment of commercialization of intellectual property objects in the system of innovative development of enterprises]. *Trade, commerce, entrepreneurship*, 8, pp. 34–37.

10. Loustric, I., Matyas, M. (2020) Exploring city propensity for the market success of micro-electric vehicles. *European Transport Research Review,* 12. DOI: https://doi.org/10.1186/s12544-020-00416-8

11.Nepelski, D., Van Roy, V. (2021) Innovation and innovator assessment in R&I ecosystems: the case of the EU Framework Programme. The *Journal of Technology Transfer,* 46, pp. 792–827. DOI: https://doi.org/10.1007/s10961-020-09814-5

12. Khomenko, L. M., Vasilyeva, T. A., Nebaba, N. O., Kutsenko, V. I. Komertsializatsiia novoho produktu na rynku: systema faktoriv vplyvu [Commercialization of a new product on the market: a system of influencing factors]. *Actual problems of economics*, 7, pp. 115–121. DOI: https://doi.org/10.32752/1993-6788-2023-1-265-115-121

ПІДХОДИ ДО ФОРМУВАННЯ СИСТЕМИ ОЦІНОЧНИХ ПОКАЗНИКІВ ДЛЯ АНАЛІЗУ ЕФЕКТИВНОСТІ ЛАНЦЮГА КОМЕРЦІАЛІЗАЦІЇ

Лілія Миколаївна Хоменко[1], Ярослав В'ячеславович Решетняк[2]

Скорочення життєвого циклу товарів, поява нових предметів, посилення конкуренції та виникнення нових ринків, постійні зміни в потребах споживачів змушують підприємства виводити на ринок нові товари. Однак не всі інноваційні рішення закінчується комерційним успіхом. При цьому відсутня єдина система оцінювання комерціалізації інновацій, яка відповідала б потребам підприємств різних сфер діяльності. Метою роботи є систематизація показників та розроблення рекомендацій, що можуть використовуватися при формуванні системи оцінки комерціалізації інновацій. На даний момент існують різні підходи до оцінки комерціалізації інновацій. В їх основі – різні показники, згруповані за певними критеріями з певними вагомостями. Підприємство може обрати один із описаних підходів або розробити власний. При цьому потрібно враховувати наступні моменти. Розробляючи систему оцінювання комерціалізації доцільно використовувати велику кількість показників, які найбільше відповідають задачам організації. Складаючи даний набір показників слід враховувати різні аспекти (ефекти) комерціалізації. Краще орієнтуватися на об'єктивні показники (індекси), однак за їх відсутності та необхідності обчислення показників, які мають різні одиниці вимірювання, потрібно їх нормалізувати. При визначенні вагомостей груп, окремих показників для досягнення більшої об'єктивності, можна скористатися одночасно рівноважним, зважувальним та методом зважування загальних категорій одночасно. Після розрахунку інтегрального показника потрібно перевірити його на адекватність, шляхом розрахунку різними методами та порівняння значення при різних сценаріях. Даних підхід до розроблення системи оцінювання комерціалізації інновацій сприятиме формуванню достатньо об'єктивної системи оцінки, що враховує різні впливи від комерціалізації (економічний, ринковий, соціальний, екологічний тощо).

Ключові слова: *інновація, комерціалізація інновацій, система оцінювання, показники, ефективність, конкурентоспроможність, маркетинг.*

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