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## FORECASTING INNOVATION ACTIVITY OF ENTERPRISES IN EXTREME CONDITIONS: APPLIED ASPECT

## ПРОГНОЗУВАННЯ ІННОВАЦІЙНОЇ ДІЯЛЬНОСТІ ПІДПРИЄМСТВ В ЕКСТРЕМАЛЬНИХ УМОВАХ: ПРИКЛАДНИЙ АСПЕКТ

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The article develops a strategy of innovation activity of an industrial enterprise on the basis of its innovation profile. For this purpose, the production and economic activity of PE "GALAVTOPROMMAST" was researched and analyzed, its innovation activity was analyzed, the trends in the development of production and economic activity of this enterprise over the past 3-5 years and trends in the development of innovation activity were studied, the results of the study of trends in the problem and a measure to improve the strategy of innovation activity of PE "GALAVTOPROMMAST" has been developed. The success of the innovation strategy of an industrial enterprise depends on the ability of this enterprise to successfully carry out various areas of innovation activity, rationally combining them with each other. If there is no good compatibility between the individual areas of innovation activity, then the enterprise has neither a clear innovation strategy nor a sustainable advantage. Management in this case is reduced only to exercising control over independent functions, and operational efficiency determines the relative performance of the enterprise. The article develops a model for forecasting strategies of innovation activity of PE «GALAVTOPROMMAST» on the basis of the innovation profile of enterprise.

**Keywords:** prediction, development, strategy, enterprise, industry, innovation, activity.

Враховуючи екстремальні умови сьогодення, ефективне впровадження інновацій є серед вирішальних факторів соціально-економічного розвитку, яке і спрямоване на розв'язання соціальних, економічних, екологічних та інших проблем. Послідовна та поетапна активізація інноваційної діяльності підприємства за всіма напрямками його функціонування дозволяє одержувати нову продукцію, нові техніко-технологічні процеси, нові форми організації та управління виробництвом. Це все відповідно забезпечує зміцнення конкурентних позицій на ринку, особливо в умовах економічної кризи, в умовах війни чи післявоєнної відбудови. Завдяки прогнозуванню та реалізації інновацій відбувається вплив на ринкову ситуацію. При цьому функціонування підприємств у довгостроковій перспективі пов'язано з формуванням стратегії розвитку, яка тримає орієнтир

на посилення інноваційної активності. Формування такої стратегії представляє процес прийняття управлінського рішення щодо змісту функціональних стратегій такого роду та пріоритетності їх фінансування з метою забезпечення конкуренції на ринку. В статті розвинуто прогнозування, а саме стратегію інноваційної діяльності підприємства на базі його інноваційного профілю. Відповідно цьому було досліджено та проаналізовано виробничо-господарську діяльність ПП "ГАЛАВТОПРОММАСТ" в умовах сьогодення, в умовах війни та економічної кризи. Проаналізовано його інноваційну діяльність, досліджено тенденції розвитку виробничо-господарської діяльності даного підприємства за період 3-5 років та тенденції розвитку інноваційної діяльності, узагальнено результати дослідження тенденцій за проблемою та розроблено захід для удосконалення стратегії інноваційної діяльності ПП "ГАЛАВТОПРОММАСТ". Успіх інноваційної стратегії підприємства залежить від здатності цього підприємства успішно здійснювати різні напрямки інноваційної діяльності, раціонально поєднуючи їх один з одним. Якщо між окремими напрямками інноваційної діяльності немає хорошої сумісності, то підприємство не має ні виразної інноваційної стратегії, ні сталої переваги. Управління в цьому випадку зводиться лише до здійснення контролю над незалежними функціями, а операційна ефективність визначає тільки відносні показники діяльності підприємства. Розроблено модель для прогнозування інноваційної діяльності ПП "ГАЛАВТОПРОММАСТ" на основі його інноваційного профілю.

**Ключові слова:** прогнозування, розвиток, стратегія, підприємство, промисловість, інновація, діяльність.

**Staging problems.** The aim of this article is to study the development of strategies for innovation activity of industrial enterprises, to allocate the innovation profile of PE «GALAVTOPROMMAST» and to develop a model for forecasting strategies of innovation activity of this enterprise on the basis of its profile.

**Analysis of the latest research and publications.** The issues of planning innovation activity, its strategic planning have been repeatedly voiced at international scientific and practical conferences and studied by both domestic and foreign scientists. In particular, Grechanyk O. E., Khlebnikova T. M., Temchenko O. V. [1], Efremova, A. S., Krylov D. V. [2], Kurbatska L. M. [3] and others paid attention to the innovative development of enterprises in terms of their activation and the development of an appropriate strategy. Zianko V. V., Epifanova I. Yu., Nikolaychuk O. B. [4] are different definitions of the concept of "innovation strategy". За твердженнями According to N. V. Roten [5], the systematization of various approaches to the definition of this category allows to consider the strategy of innovation activity as a set of actions for the transition of the enterprise to a new state according to new characteristics through the introduction of innovations of various directions (technological, product, managerial, organizational, etc.), which becomes the basis for the formation of their competitive advantages and positioning in competitive commodity markets. However, it should be noted that the issue of developing a strategy for innovation activity of an industrial enterprise on the basis of its innovation profile, in particular an industrial enterprise, is not fully studied, therefore it requires further research.

**Highlighting previously unresolved parts of the general problem.** Innovative develop-

ment is an integral and active part of all spheres of life of society and, in particular, of an industrial enterprise as its primary link. It is difficult to overestimate the importance of innovative development for enterprises: only through innovation it is possible to ensure the competitiveness of products both in the domestic and world markets. In the practical activities of industrial enterprises, one can observe trends towards a planned or spontaneous strategy. The provisions of each individual innovation strategy are determined by the following factors: the degree of clarity of the management's intentions, the degree of readiness of the organization's employees to act in accordance with these intentions, the degree of management's control over the organization's activities and the degree of predictability of the external environment. This determines the need for forecasting strategies of innovation activity of industrial enterprises.

**Formulation of the goals of the article (statement of the task).** The purpose of the study is to highlight the essence of innovation activity of industrial enterprises, namely the development of strategies for their innovation activity, determining the possibilities of conducting innovation activities by industrial enterprises in market conditions.

**Presentation of the main material of the research.** In today's conditions, the innovation strategy PE "GALAVTOPROMMAST" associated with long-term planning of innovation activities carried out by the top management of the enterprise, therefore, the formation of an innovation strategy is not only an analytical process of determining long-term goals and creating mechanisms for achieving them, providing for the implementation of the strategy. Innovation strategy is part of an economic

strategy PE "GALAVTOPROMMAST", which is designed to ensure the achievement and implementation of the goals of innovative development on the basis of effective distribution and transformation of resources between areas of innovation activity.

The development of an innovation strategy necessitates strategic decision-making and, accordingly, the implementation of strategic management. The need for strategic management arises when the activity of an economic entity is influenced by environmental factors with an increased level of uncertainty. The essence of strategic management is to help the enterprise find, develop and have the appropriate ability to use resources in the most efficient way to achieve its goals. Figure 1. We will present the process of developing an innovative strategy for PE "GALAVTOPROMMAST", which includes several stages.

The innovation strategy of the enterprise is developed on the basis of the strategic goals of creation and operation of the enterprise. To do this, it is necessary to clearly formulate a common goal and ways to achieve it, strictly limit private goals in time and determine the timing of their achievement, assess the reality and consistency of goals to each other.

Developing its own innovation strategy, PE "GALAVTOPROMMAST" clearly defines: directions of innovation activity; the scale of innovation activity; the ratio of own and borrowed financial resources, as well as the levels of autonomy in production and organizational activities; distribution of profits for reinvestment in production and other purposes;

areas of investment; sources of innovation (own developments or attracted from outside); rational proportions between innovative projects; the pace of development, the timing of changes in products and the technology of their production.

Enterprises in relation to innovation activity, in today's conditions, use four main strategies: offensive, defensive, integration, residual.

The choice of one or another innovation strategy depends on the purpose of development of the enterprise and the state of indicators of innovative potential. Hence follows the most important methodological provision, according to which the choice of innovation strategy by an enterprise is made on the basis of an assessment of the direction and magnitude of innovation potential.

The purpose of the strategy of PE "GALAVTOPROMMAST" is not to lag behind others in the field of technical and technological development, to maintain the position of the manufacturer following the leader, to protect itself from the risk inherent in leading enterprises. Therefore, this enterprise applies an integration strategy – a strategy of innovative changes to reduce the costs of this enterprise associated with the implementation of production and economic activities, taking into account innovative changes: the introduction of resource- and energy-saving technologies, reduction of unproductive costs, effective organization of labor, etc.

In order for the strategy of PE "GALAVTOPROMMAST" to coincide exactly with the conceived, it is necessary that the management of the enterprise has clear

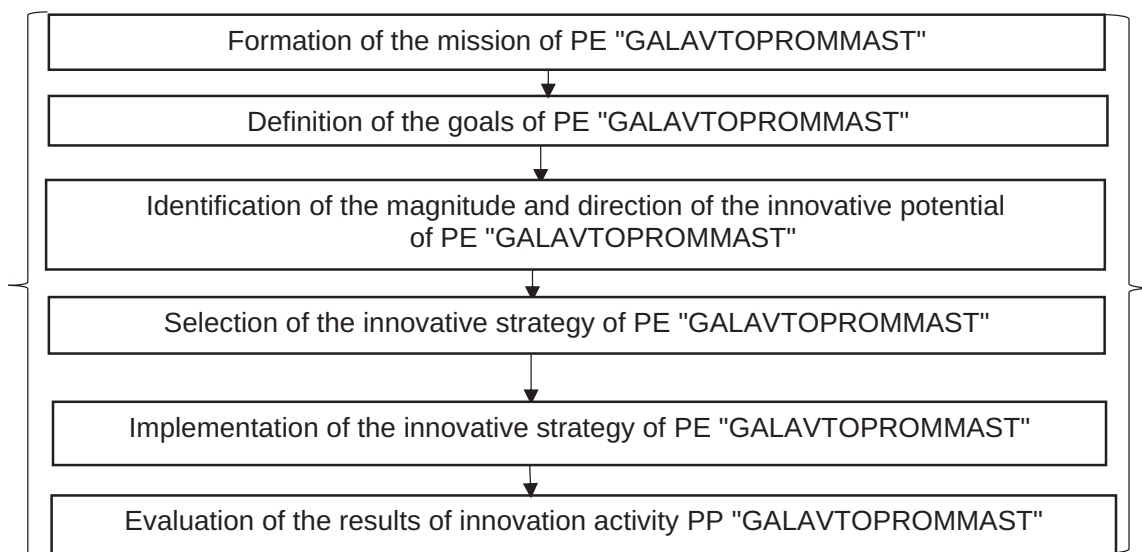


Figure 1. The process of developing an innovative strategy of PE "GALAVTOPROMMAST"

Notes: built by the authors on enterprise data

intentions, formulated in sufficient detail, so that before the start of actions, the employees of the organization have no doubts about the goals set and methods of achieving them, as well as that all its employees act in accordance with these intentions voluntarily, under the controlling influence of management. Fig. 2. we will demonstrate a list of innovation strategies of PE "GALAVTOPROMMAST", which will allow us to determine in the future the need to predict the strategies of innovation activity of this enterprise against the background of its innovation profile.

It is also necessary to pay attention to the problems of implementation of the strategy of innovation activity of PE "GALAVTOPROMMAST" and ways to solve them. (Table 1).

Under the innovation profile of PE "GALAVTOPROMMAST" we understand the specific features of the enterprise based on the priority elements in the structure of intellectual

capital. The intellectual profile of the enterprise will be understood as a priority direction of development from the point of view of the structure of intellectual capital, based on the identified patterns of influence of elements of intellectual capital on the formation of market value. The intelligent profile of the enterprise reflects the ability to effectively influence the factors of the market environment, due to the peculiarities and specifics of the internal environment. The intellectual profile of PE "GALAVTOPROMMAST" reflects its specifics in the field of innovative growth and development, the ability to effectively influence the factors of the market environment. Forecasting of the strategy of innovation activity is proposed to be determined on the basis of the type of intellectual profile.

Based on the identification of priorities of the intellectual profile, the type of enterprise and the possibilities of intellectual growth and

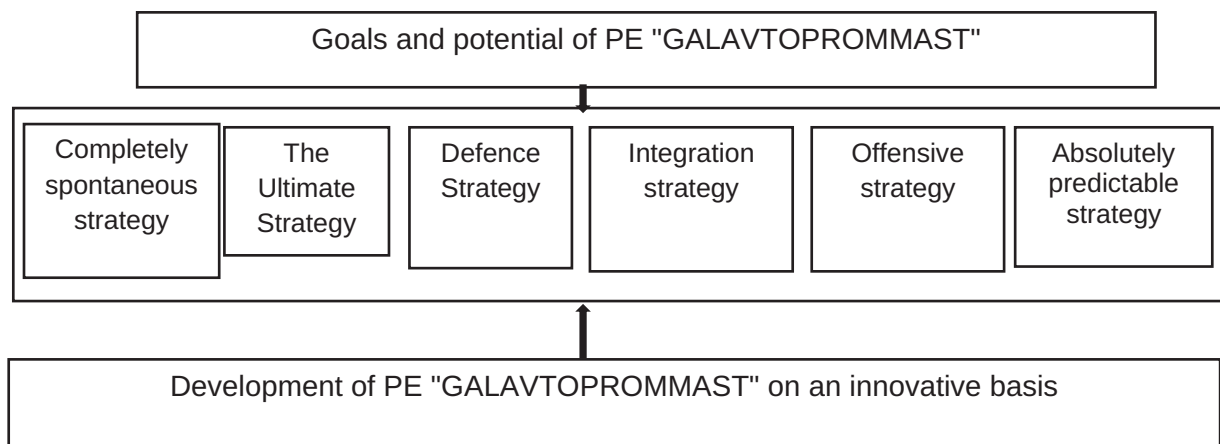


Figure 2. List of innovative strategies of PE "GALAVTOPROMMAST"

Notes: grouped by [2–4; 6] and enterprise data

ПІДПРИЄМНИЦТВО, ТОРГІВЛЯ ТА БІРЖОВА ДІЯЛЬНІСТЬ

Table 1

**Problems of Implementation of the Strategy of Innovation Activity PE "GALAVTOPROMMAST" and ways to solve them**

Problems of Implementation of the Strategy of Innovation Activity	Solutions
Low level of structuring and algorithmization of the process of choosing a strategy and its revision in the context of innovation activity	Forecasting strategies of innovation activity on the basis of the innovation profile of enterprise
Insufficient level of consideration of elements of the innovation profile in the strategic management of innovation activity of enterprise	
Lack of experience in assessing the innovative potential of enterprise as a component of its management in order to increase the effectiveness of the innovation strategy	Introduction of a methodology for assessing the innovative potential of an enterprise, which influences the choice of its strategy

Notes: generated by the authors

efficiency in the choice of investment vector are determined. To solve this problem, a matrix is proposed (Fig. 3). An enterprise that develops innovations has the resources to review human and organizational capital. The deterministic approach is included in the orientation towards the formation of systems for the creation and use of innovations.

Innovative development of any enterprise in the long term entails the need to follow certain principles and rules, which are individual for each particular enterprise. It is obvious that any enterprise that has embarked on the path of development, sets the goal of innovative transformation, needs constant support at a high level of innovative abilities of the entire economic system, in search of new innovative opportunities, investors, development of programs for innovative development of PE "GALAVTOPROMMAST". Therefore, the development of an algorithm for forecasting the strategy of innovation activity of PE "GALAVTOPROMMAST" on the basis of the innovation profile necessitated the solution of the following tasks: analysis of the interpretation of the term innovation potential,

existing approaches to the management of innovation potential, formation of an algorithm for forecasting the strategy of innovation activity of this enterprise (Table 2).

Using the given recommendations for forecasting the strategies of innovation activity of this industrial enterprise on the basis of the innovation profile of the enterprise, it is determined that the enterprise belongs to such a type as the enterprise - developer of innovations, and it is necessary for it to use resources to review the human and organizational capital. Such an enterprise should focus in its activities on the formation of systems for the creation and use of innovations.

**Conclusions.** The development of an algorithm for forecasting the strategy of innovation activity of PE "GALAVTOPROMMAST" on the basis of the innovation profile necessitated the solution of the following tasks: analysis of the interpretation of the term innovation potential, existing approaches to the management of innovation potential, formation of an algorithm for forecasting the strategy of innovation activity of this industrial enterprise.

Bidominant	$D_{CHK,OK}$	$D_{OK,BA}$	Bidominant
High Innovation Orientation Sector	Innovation Developer Enterprise (Strategy for Translating Informal Assets into Formalized Ones. Strategy for the introduction of intellectual property objects into the internal intellectual capital of the enterprise. Strategy for the formation of intellectual capital to increase the competitive position in the market)	Enterprise-commercializer of innovations (Strategy for using the capital of internal communications of the organization as a source of additional profit from the sale and use of its own developments))	Medium Innovation-Oriented Sector
Medium Innovation-Oriented Sector	Follower enterprise (Strategy of formation of intellectual property objects in the long term within the enterprise by transforming market capital into internal capital)	Enterprise-translator (Strategy of using human capital to form a high external position, image, brand of the enterprise in the industry market)	Low Innovation Orientation Sector
Bidominant	$D_{CHK,PK}$	$D_{PK,BA}$	Bidominant

Figure 3. Matrix of forecasting the innovation strategy of PE "GALAVTOPROMMAST"

Notes:

1.  $D_{CHK,OK}$  – bidominant with a predominance of human and organizational capital; bidominant with a predominance of organizational capital and balance sheet assets; bidominant with a predominance of market capital and balance sheet assets; bidominant with a predominance of human and market capital.

$D_{OK,BA} D_{PK,BA} D_{CHK,PK}$

2. Developed by the authors according to the company's data



Table 2

**Recommended stages of forecasting strategies of innovation activity  
of PE «GALAVTOPROMMAS» on the basis of the innovation profile of the enterprise**

Stages	Content
Stage I. Diagnostics of intellectual capital PP "GALAVTOPROMMAST"	Diagnostics of the existing quantitative and qualitative volumes of intellectual capital at the enterprise. The methodological basis of the stage can be econometric methods and methods of factor analysis
Stage II. Forecasting Innovation Strategy PP "GALAVTOPROMMAST"	After the evaluation and analysis of the results in the first block, the stage of forecasting and selection of the most significant elements of intellectual capital, which are able to provide the largest increase in the market indicators of the enterprise, begins.
Stage III. Development and implementation of the strategy for increasing intellectual capital as the basis for innovative development of PE "GALAVTOPROMMAST"	Development of a strategy for strengthening the most significant elements of intellectual capital and strengthening weak ones within the framework of a comprehensive program for the development of intellectual capital as the basis for innovative development of enterprise
Stage IV. Evaluation of results for PP "GALAVTOPROMMAST"	Assessment of economic efficiency from management, which consists in calculating the ratio of the level of investments made in intellectual capital to the increase (decrease) of market capitalization

Notes: formed by the authors

REFERENCES:

1. Grechanyk O. Ye., Khlebnikova T. M., Temchenko O. V. (2022) Suchasni problemy upravlinya inovacijno-aktivnymy pidprijemstvamy: dosvid Ukrainy ta ES [Modern problems of management of innovative and active enterprises: the experience of Ukraine and the EU]. *Investyciji: praktyka ta dosvid*, vol. 2, pp. 74–80. (in Ukrainian)
2. Krylov D. V. (2022) Analiz rejtyngovogo ocynuvanya rozvytku inovacijnoji dijalnosti v Ukraini [Analysis of the rating assessment of the development of innovative activity in Ukraine]. *Efektivna ekonomika*, vol. 5. Available at: [http://www.economy.nayka.com.ua/pdf/5\\_2022/10.pdf](http://www.economy.nayka.com.ua/pdf/5_2022/10.pdf) (in Ukrainian)
3. Kurbatska L. M. (2021) Suchasni formy orhanizatsii biznes-protsesiv: analityka ta otsinka efektyvnosti [Modern forms of organization of business processes: analytics and efficiency assessment]. *Economy and the state [Ekonomika ta derzhava]*. No. 7. P. 57–61. (in Ukrainian)
4. Nikolaichuk O. A. (2012) Rozvytok teoretychnykh pidkhodiv do sutnosti ta klasyfikatsii investytsii v intelektualnyi kapital pidprijemstva [Development of theoretical approaches to the essence and classification of investments in the intellectual capital of an enterprise]. *Visnyk Zaporizkoho natsionalnoho universytetu – Bulletin of Zaporizhzhya National University*. No. 4(16). P.53–61.
5. Rotan N. V. (2013) Intelektualnyi kapital yak zasib formuvannia konkurentnykh perevah pidprijemstva [Intellectual capital as a means of forming competitive advantages of the enterprise]. *Informatsiini tekhnologii v osviti, nauksi ta vyrobnyctvi – Information technologies in education, science and production*. No. 3(4). P. 302–307.
6. Pro «Stan innovatsiy v Ukraini pid chas viyny». [About “The state of innovation in Ukraine during the war”]. URL: [https://www.slideshare.net/APPAU\\_Ukraine](https://www.slideshare.net/APPAU_Ukraine) (accessed 22.02.2024)

СПИСОК ВИКОРИСТАНИХ ДЖЕРЕЛ:

1. Гречаник О. Є., Хлебнікова Т. М., Темченко О. В. Сучасні проблеми управління інноваційно-активними підприємствами: досвід України та ЄС. *Інвестиції: практика та досвід*. 2022. № 2. С. 74–80.
2. Крилов Д. В. Аналіз рейтингового оцінювання розвитку інноваційної діяльності в Україні. *Ефективна економіка*. 2022. № 5. URL: [http://www.economy.nayka.com.ua/pdf/5\\_2022/10.pdf](http://www.economy.nayka.com.ua/pdf/5_2022/10.pdf) (дата звернення: 04.03.2024).
3. Курбацька Л. М. Сучасні форми організації бізнес-процесів: аналітика та оцінка ефективності / Л. М. Курбацька, Т. М. Самілик, Т. І. Шутько. *Економіка та держава*. 2021. № 7. С. 57–61.
4. Ніколайчук О. А. Розвиток теоретичних підходів до сутності та класифікації інвестицій в інтелектуальний капітал підприємства. *Вісник Запорізького національного університету*. 2012. № 4(16). С. 53–61.
5. Ротань Н. В. Інтелектуальний капітал як засіб формування конкурентних переваг підприємства. *Інформаційні технології в освіті, науці та виробництві*. 2013. № 3(4). С. 302–307.
6. Про «Стан інновацій в Україні під час війни» URL: [https://www.slideshare.net/APPAU\\_Ukraine](https://www.slideshare.net/APPAU_Ukraine) (дата звернення: 22.02.2024).