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**QUALIFICATION PAPER**  
**to obtain an educational degree BACHELOR**

in the specialty 073 Management  
educational-professional program Management  
on the topic:

**Management of the innovation potential of an industrial enterprise**  
**(case study of the LLC “TEKHNOKHIM”)**

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The qualifying paper contains the results of own research. The use of ideas, results and texts of other authors are linked to the appropriate source.

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ASSIGNMENT FOR QUALIFICATION PAPER  
**to obtain an educational degree BACHELOR**

in the specialty 073 Management,

educational-professional program Management

on the topic: Management of the innovation potential of an industrial enterprise (case study of the LLC “TEKHNOKHIM”)

Student. M-01an/2y Sofia Kashpur  
(group) (First and last name)

1. The topic of the paper " Management of the innovation potential of an industrial enterprise (case study of the LLC “TEKHNOKHIM”) " approved by order 0544-VI dated 16.05.2024.
2. The deadline for submission of the completed paper by the student 02.06.2024.
3. The purpose of the qualification paper: to develop methodological approaches and practical recommendations for evaluating and managing the innovation potential of an industrial enterprise using the example of LLC “TEKHNOKHIM.”
4. Object of study is the innovation potential of an industrial enterprise
5. Subject of study: methods and tools for assessment and management of the innovation potential of an industrial enterprise.
6. Qualification paper is performed on the basis of LLC “TEKHNOKHIM”
7. Approximate plan of qualification paper, deadlines for submission of sections to the manager and content of tasks to fulfill the set goal.

№	Title of the section	Submission deadline
I	The essence of the concept and management of the innovation potential of an industrial enterprise	14.05.2024
II	Scientific and methodological approaches to the assessment of the innovation potential of an industrial enterprise	21.05.2024
III	Analysis and evaluation of the innovation potential of LLC “TEKHOKHIM”	04.06.2024

The content of the tasks for fulfilling the set goal of the Bachelor’s qualification paper:

In section 1, the student must reveal the essence of the concept and management of the innovation potential of an industrial enterprise.

In section 2, the student must develop scientific and methodical approaches to the evaluation of the innovation potential of an industrial enterprise.

In section 3, the student must analyze the current state of innovation potential of LLC TEKHOKHIM and develop strategic recommendations for its improvement.

Consultations on work performance:

Section	Surname, initials and position of the supervisor/consultant	Signature, date	
		Issued the task	I accepted the task
1	Smolennikov D., Ph.D Associate Professor	07.05.2024	
2	Smolennikov D., Ph.D Associate Professor	14.05.2024	
3	Smolennikov D., Ph.D Associate Professor	21.05.2024	

9. Issue date of the assignment 07.05.2024

Supervisor of

qualification paper Ass. Prof., Ph.D., Ass. Prof. Denys Smolennikov

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Tasks to be completed received

Sofiia Kashpur

(Name and SURNAME of the student)

(Signature)

## ANNOTATION

The thesis is devoted to the study of the essence of the concept of the innovation potential of an industrial enterprise and the development of methods and practical recommendations for its effective management. The paper examines various theoretical approaches to the definition of innovation potential, analyzes its components, and summarizes scientific interpretations of this concept.

The relevance of the study lies in the need to understand the essence and effective management of the innovation potential of industrial enterprises in the conditions of constant changes in the global economy and rapid development of technologies. Of particular relevance is the fact that innovation is becoming a key factor in the competitiveness of enterprises, and effective management of innovation potential can significantly increase their financial stability and market position.

The aim of the thesis is to develop methodological approaches and practical recommendations for evaluating and managing the innovation potential of an industrial enterprise using the example of LLC “TEKHOKHIM”.

The main attention is paid to the analysis of modern methodological approaches to the management and assessment of the innovation potential of an industrial enterprise. The developed recommendations are based on practical experience and modern trends in the development of innovation processes.

The object of the study is the innovative potential of an industrial enterprise, and the subject is the methods and tools of its assessment and management, as well as the analysis of their impact on the competitiveness and financial resilience of the enterprise.

The practical significance of the work lies in the applicability of the suggested systems, methods and recommendations to enhance the efficiency of management of innovation potential of industrial enterprises, which will contribute to improving their competitiveness and financial sustainability.

The following research methods were used in writing the paper: analysis of literary sources, comparative analysis and empirical methods. These approaches allowed us to conduct a comprehensive analysis and develop practical

recommendations to improve the efficiency of management of innovation potential of industrial enterprises.

The following recommendations were made for LLC “TEKHNOKHIM”: to attract investments and optimize costs by actively seeking investment opportunities to finance innovation projects, developing attractive business plans for potential investors, and participating in international exhibitions and forums. Diversify sources of funding by attracting investments through partnerships with other companies, government grants, venture capital funds, and bank loans on favorable terms. Another important recommendation is to improve working capital management to ensure sufficient liquidity. It is recommended to introduce green technologies in production to optimize costs, achieve sustainable development goals, and increase competitiveness in domestic and international markets. An important aspect is also the development of marketing strategies to expand sales markets, the introduction of modern information technologies to automate business processes and improve management efficiency, which is recommended to increase productivity and reduce operating costs.

The structure and volume of the bachelor's thesis. The thesis consists of an introduction, three chapters, a conclusion, a list of references, which consists of 36 items, and one appendix on 12 pages. The volume of the bachelor's thesis is 75 pages including 6 tables and 1 figure.

When writing the paper, the following tasks were performed:

1. The theoretical basis for determining the essence of the concept of innovation potential of the enterprise is considered.
2. The components of innovation potential were analyzed and scientific approaches to its interpretation were summarized.
3. Methodological approaches to the management of the innovation potential of an industrial enterprise were studied.
4. A comparative analysis of various approaches to the management of innovation potential was carried out with the determination of the most optimal of them.
5. A system of indicators for evaluating the innovation potential of an industrial enterprise has been developed.

6. An algorithm for evaluating the innovation potential for this system of indicators is proposed.

5. Strategic recommendations have been developed to increase the efficiency of management of the innovation potential of the LLC «TEKHNOKHIM» enterprise

The results of the research were tested at the 3rd International Scientific and Practical Conference "Trends and Prospects of Management Development in Global Challenges", Kherson, Kropyvnytskyi, Ukraine.

Key words: INNOVATION POTENTIAL, INNOVATION MANAGEMENT, INDUSTRIAL ENTERPRISE, STRATEGIC MANAGEMENT

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## INTRODUCTION

In the face of rapid technological development and growing competition in global markets, innovation is becoming a key factor in the success of industrial enterprises. The capability to effectively introduce new technologies, products and processes is becoming critical not only for increasing competitiveness, but also for ensuring sustainable development and adapting the enterprise to dynamic market conditions. Innovation is the main driver of change that enables enterprises to respond to external challenges, implement progressive solutions and improve their production processes. Therefore, the issues of managing innovation potential are of particular relevance in the current economic environment.

The innovation potential of an enterprise covers a wide range of components, including available resources, the ability to generate new ideas, the introduction of technological innovations and the effective management of these processes. That is why the study of theoretical aspects of innovation potential and the development of practical recommendations for its management and evaluation is an important area of modern economic science.

In the conditions of a full-scale war, internal instability, economic recession in our country and global changes in approaches to production and the general trend towards the implementation of sustainable development goals in the world, it is especially important to develop effective methods of managing innovation potential, which will allow domestic industrial enterprises to adapt to changing environmental conditions, increase their sustainability and competitiveness, including in international markets.

Hence, the research in this area has not only scientific, but also significant practical significance, since the results of the work allow us to improve the management of innovation processes at enterprises of various industries, directly assess their current innovation potential and the possibility of its forecasting, which, in turn, will contribute to their development and success in the long term.

## CHAPTER 1 THE ESSENCE OF THE CONCEPT AND MANAGEMENT OF THE INNOVATION POTENTIAL OF AN INDUSTRIAL ENTERPRISE

### 1.1 Theoretical principles of determining the essence of the concept of innovation potential of the enterprise

Each enterprise, which operates in conditions of constant change, must develop its own action strategies, considering the specifics of its operation and location. Thanks to this, the enterprise must constantly expand its capabilities for effective solutions to production and economic tasks, as well as improve its competitive position on the market. Understanding the internal and external factors that affect its activities, the enterprise must adapt its strategies to changes in the environment. This process of adjusting one's own economic potential reflects the constant interest of society, including scientists and practitioners, in studying the economic potential of the enterprise in the conditions of change.

In the studies of many domestic and foreign researchers, the economic potential of an enterprise is defined by its real ability to carry out production and economic activities that correspond to the development strategy of the enterprise. Therefore, economic potential can be considered as the ability and capacity of the enterprise to develop in compliance with its goals, to build up competitive advantages at a certain point in time and in a certain direction (Vaskiwska et al., 2020).

Such structural components of the economic potential of the enterprise as production capabilities, strategic planning, investment potential, information resources, innovation capabilities and personnel potential are distinguished (Vaskiwska et al., 2020).

The importance of innovation development for the modern economy of Ukraine cannot be overestimated. After all, thanks to innovations, economic growth can be achieved already soon. The perception of innovation development as a fundamental factor of economic growth was reflected in the fundamental research of many foreign scientists.

In our opinion, the focus should be given to the analysis of the innovation potential of the enterprise. This is determined by the importance of innovation for the stability and competitiveness of the enterprise in the conditions of constant changes in the market and technology. The term “innovation potential” reflects the essence of innovation activity at the conceptual level. The development of innovation activity at the enterprise is feasible only if there is a sufficient level of innovation potential. The decision on the strategy of innovative development of the enterprise is determined by the level of its innovative potential. If the enterprise has sufficient resources, it can choose a leadership strategy and implement diverse innovations. In the case of limited innovation capacity, it is necessary to increase its potential and choose the follow-up strategy, focused on the introduction of improvements in technology.

A comprehensive review of modern scientific methodologies for understanding the concept of "innovation potential" does not provide a clear interpretation. Disagreements regarding the interpretation of this term in innovation theory are caused by different views on clarifying its essence. Hence, there is a need to consolidate the definition of "innovation potential" and specify its constituent elements to effectively address this ongoing debate.

The problems of various aspects of the innovation activity of enterprises and regions, in particular the definition of the concept of "innovation potential", are devoted to the researches of foreign and domestic scientists: B. V. Burkynskyi, L. I. Fedulova, A. L. Masalova, O. V. Nosova, and others. But now, there is a lack of unity in the views of modern authors regarding the interpretation of the concept (Karintseva & Matveiev, 2015) (Table 1.1).

Table 1.1 – Scientific interpretation of the term "innovation potential" in economics.

Author	Definition
1	2
Fedulova L.I	The innovation potential of the organization is a measure of its readiness to perform tasks that ensure the achievement of the set innovation goal, that is, a measure of readiness to implement a project or program of innovation strategic changes (Fedulova, 2004)

Continuation of Table 1.1

1	2
B. Burkyn-Ski	Innovation potential is a set of personnel, research, material, market, intellectual, informational, financial resources (potentials) that are necessary for innovation activity, i.e. directly participate in the innovation process, the purpose of which is to meet the needs of the economy and society in new or improved types of products or services and increasing the competitiveness of the region and the country as a whole (Burkynskyi, 2007)
O. Nosova	Innovation potential is a set of intellectual, technological, scientific and production resources available in the country with appropriate infrastructural support, capable of producing new knowledge, and an effective mechanism of commercialization of the latter (Nosova, 2013)
I. Radzivilo	A complex dynamic system with simultaneous consideration and combination of environmental factors and factors, internal and external opportunities and capabilities, efficiency of their use, principles of timeliness and strategic orientation of the enterprise (Radzivilo, 2012)
O. Karintseva, P. Matveiev	Innovation potential is a complex characteristic of the economic system's capacity for innovation activity and development, using for this purpose all the necessary resources that are available (Karintseva & Matveiev, 2015)
M. Haffer	Innovation potential is a special combination of tangible and intangible resources that are required for the development and effective implementation of innovations on the market (Haffer, 2004)
L. Białoń	Innovation potential is a set of interconnected resource elements that, with the help of specific actions and forces, are transformed into new states, embodying scientific, technological and economic potential (Bialon, 2010)
M. Zastempowski	The innovation potential of the enterprise is a complex of tangible and intangible resources distributed among ten main areas: production, personnel, logistics, research and development, organization and administration, quality management, marketing, invisible resources, finance, information and communication. (Zastempowski, 2013)
Ch. Freeman	Innovation potential is ensuring the growth of the system due to innovations, which are a system of measures for the development, development, exploitation and exhaustion of the production, economic and social-organizational potential, which is the basis of innovations (Freeman, 1982)

Source: summarized by the author based on the analysis of the thematic literature.

Significantly, domestic scientists pay considerable attention to the approaches to the definition of the term “innovation potential”, developing various methodologies and improving the already existing theoretical framework. The rationale behind this is the need to accurately analyze and develop innovation activity in the domestic economic context. In contrast, representatives of foreign economic schools consider the concept of innovation potential in a limited way, modern definitions of this term are not sufficiently presented. In recent studies, innovation potential is often mistakenly identified with the concept of “innovation” or “innovativeness”.

In the case of domestic scientists, a comprehensive approach to determining the theoretical basis of the studied concept allows taking into account various factors affecting the innovation capacity of enterprises, including scientific and technical, economic, organizational and social aspects. This provides a more detailed and accurate understanding of the company's capabilities and limitations in the implementation of innovations, which is critically important for strategic planning and development.

From the given analysis of the thematic literature, we can see that while some researchers focus on the resources that business entities have at their disposal for management, others emphasize the ways of using these resources. One of the most successful is the resource-based perspective, which views innovation potential as a complex set of diverse resources. This covers human talent, scientific ability, information and communication technology, technological progress, market reach, environmental sustainability, and financial and economic assets.

Many scientists, when analyzing the essence and features of an enterprise's innovation potential, separately highlight the financial and economic dimension, which includes financial resources specifically intended for innovation activity, and provides a quantitative assessment of these assets. It is imperative that all components interact seamlessly and perform their intended functions within their operating mechanisms. Indeed, the financial and economic component is extremely important, as it provides the necessary financing of innovation processes, stimulates the creation of a conducive environment for the elaboration and implementation of new ideas, directs innovation

projects in the direction of the needs of the industry, promotes effective planning and distribution of costs associated with innovation.

In addition, this component plays a crucial role in attracting investments, managing financial risks, and ensuring the sustainability of innovation initiatives. By fostering cross-sector collaboration, fostering a culture of continuous improvement, and aligning innovation strategies with broader economic goals, the financial and economic component helps create a robust ecosystem that can foster long-term growth and competitiveness. Thanks to these mechanisms, the innovation potential of business entities can be fully realized, opening the way to significant shifts and breakthroughs in various fields.

Thus, this work considers that innovation potential means the internal ability of the innovation ecosystem of the enterprise to participate in purposeful activities that attract the main production resources and transform them into innovation products, and also take into account external economic factors that affect innovation potential, including state innovation politics, credit policy and competitive strategies of consumers. The innovation potential of the enterprise covers all its available and hidden resources and opportunities for the development and implementation of various innovations, which are formed and stimulated by the cyclical development of the macro-environment.

As a result, we note that the innovation potential is determined by several key characteristics: it is formed by the actual (both realized and unrealized) capabilities of the enterprise in the field of innovation. The availability of resources is a guarantor of the success and growth of the enterprise, this is achieved by identifying and developing its innovation potential. Thus, we see that the innovation potential of the enterprise depends not only on the availability of resources, but also on the ability of managers to use them effectively in real business scenarios.

## 1.2 Analysis of approaches to the management of the innovation potential of the enterprise

To achieve the system of enterprise goals, particularly the goals of management of innovation potential, it is necessary to clearly define the concept of management of the innovation potential of the enterprise.

The management of the innovation potential of the enterprise is understood as the process of purposeful influence (planning, organization, coordination, control) on the objects of management (the enterprise, divisions, bureaus, laboratories, individual employees) in order to analyze the existing potential and assess the degree of its use; in order to balance the available innovation resources, the possibilities of their use and the ability to implement innovation ideas; determination of reserve resources and possibilities of their effective use; increasing the efficiency of innovation activities at the enterprise as a whole to achieve the strategic goals of the business entity (Kharchenko, 2012).

Since enterprises as independent business entities have the right to choose methods of managing innovation potential, it is necessary, first of all, to analyze the peculiarities of existing approaches to management through the prism of the essence of innovation potential. Currently, the professional literature presents a significant number of methodological approaches to the management of the innovation potential of the enterprise, but all of them are derived from three main approaches that have gained recognition: systemic, process, and situational (Efimova, 2014).

The systemic approach is based on the concept that any system is a set of interconnected elements. Such a system has input and output parameters, as well as internal connections between its parts. In turn, the innovation potential is seen as a complex system that includes several components. Successful innovation activity of an organization is possible only if all elements of this system are developed and used simultaneously.

Since each stage of the innovation process requires the involvement of a certain number of sources of financing, the establishment and fulfillment of innovation

potential is impossible without the use of the financial base of the enterprise. However, it should be emphasized that the use of financial resources alone does not guarantee the possibility of successful implementation of the innovation potential of the organization, as an important component for this is also a material and technical base, qualified personnel capable of generating, implementing and commercializing innovations, as well as an established and clear system of communication between the participants of the innovation process.

The systemic approach is important for the development of new concepts of management of innovation potential and has a great influence on theory and practice. However, it does not provide sufficient structuring of innovation potential management without additional mechanisms. The system approach does not determine the priority elements of the system and does not consider the macro environment and the influence of its factors on each element. Therefore, it is rational to use a process approach in the management of innovation potential (Zabarna & Peschanska, 2016)

The main feature of the process approach to management is the preponderance of the final result of the activities of the performers and the involved technologies over their direct control. At the same time, the central object of management under the process approach is the innovation process itself, in other words, a defined sequence of actions aimed at achieving the set production goal (Kornilova, 2008).

The process approach of managing innovation potential is aimed at effective distribution of responsibilities and reducing pressure on the manager, which allows the enterprise to quickly respond to changes and develop in conditions of uncertainty. This approach promotes flexibility and adaptability of the system, stimulates innovation activity and promotes business development.

However, it must be considered that the process approach requires a high level of qualification of all participants who are responsible for specific innovation processes. Executives must be motivated and interested in their work to ensure the successful implementation of innovation initiatives. A high level of qualification requirements can be a challenge for an enterprise, especially in the conditions of constant competition and a rapidly changing market environment (Bohma, 2011).



When analyzing the management of innovation potential as an integrated process, it is necessary to focus on the logical order of actions that lead to the achievement of the set goals, as well as on the system of management goals regarding the company's innovation potential. This is precisely the difference between the system and process approach, because it requires the setting of management goals. In accordance with this approach, the management of the innovation potential of the enterprise reveals a number of advantages that significantly contribute to the effective use of scientific and methodological developments. Here the emphasis is on achieving a specific goal, transparency and ease of the management process, as well as on the flexibility and ability of the system to adapt to changes in the internal and external environment.

In this context, the process of managing the innovation potential of the enterprise should be considered as a system of interconnected functions, such as organization, planning, motivation and control. These functions are aimed at achieving the set goals and the system of management goals regarding the innovation potential of the business entity. This process is carried out by influencing the management subject on the object using available management methods (Bilovodska & Kyrychenko, 2017).

One of the most modern and effective approaches to managing innovation potential is based on the use of a situational approach. The peculiarity of this method is that it involves the adaptation of specific concepts and techniques to specific situations. According to this approach, it is impossible to apply a universal theory of management of innovation development of a certain enterprise, since each system is unique and requires the selection of specific management solutions for the most effective realization of its innovation potential. Management of innovation potential requires the development of specific strategies, which can be a difficult task for the company's management. An important stage in this process is the analysis of the innovation potential of the enterprise, which helps to identify the strengths and weaknesses of innovation activity. This analysis also contributes to targeting available reserves for innovation growth and determining ways to balance the achieved level of innovation potential. The development of the innovation potential management methodology makes it possible to identify deficiencies in management decision-

making and create a system of indicators to optimize this potential and ensure the cohesion of strategic plans in the field of innovation (Prychepa, 2010).

Advantages and disadvantages of approaches to management of innovation potential are presented in the Table 1.2.

Table 1.2 – Advantages and disadvantages of approaches to management of innovation potential

The name of the approach	Advantages	Disadvantages
Systemic	<ol style="list-style-type: none"> <li>1. Considers its own innovation potential.</li> <li>2. Ensures readiness for effective use of accumulated and mobilized innovation resources</li> <li>3. Allows to adapt to changes in the external environment.</li> </ol> (Shylova, 2012)	<ol style="list-style-type: none"> <li>1. It does not provide specific methods of managing innovation potential.</li> <li>2. Does not determine the priority of system elements.</li> <li>3. Limited only to internal factors, not considering external influences.</li> </ol>
Process	<ol style="list-style-type: none"> <li>1. Distribution of responsibility between IP participants.</li> <li>2. Flexibility and adaptability of the self-regulation system.</li> <li>3. Reducing the influence of bureaucratic mechanisms.</li> <li>4. Focusing on the final product.</li> <li>5. Transparency for the comprehensibility of the IP management system.</li> <li>6. Automation of innovation potential management processes.</li> </ol> (Gerasimyak, 2012)	<ol style="list-style-type: none"> <li>1. Increasing requirements for the qualification of participants.</li> <li>2. Limited focus on the sequence of actions.</li> <li>3. Lack of consideration of internal and external factors.</li> <li>4. Lack of emphasis on strategic management goals.</li> </ol>
Situational	<ol style="list-style-type: none"> <li>1. Adaptation of concepts and techniques to specific circumstances, which maximizes management efficiency.</li> <li>2. Ensuring flexibility and adaptability in the management of innovation processes.</li> <li>3. The possibility of considering the specifics and unique features of each enterprise.</li> </ol>	<ol style="list-style-type: none"> <li>1. The need for complex development and implementation of specific management strategies.</li> <li>2. Great requirements for the qualification of personnel, who must be highly interested and motivated.</li> <li>3. Absence of a universal theory of management, which requires an individual approach to each situation.</li> </ol>

Source: summarized by the author based on the analysis of the thematic literature.

Therefore, after analyzing all the key approaches to the management of the innovation potential of the enterprise, it can be concluded that for the effective use of its capabilities, the complex application of all three methods of managing the innovation potential is necessary. This concept will create a reliable mechanism for managing innovation potential at enterprises, will allow making informed strategic decisions and reduce the risk of innovation activity. This, in turn, will increase the efficiency of the enterprise as a whole.

### 1.3 Peculiarities of managing the innovation potential of an industrial enterprise

An industrial enterprise is defined as an independent and independent entity of economic activity, which is distinguished by its organizational and economic separation. One of the key features of such enterprises is their ability to independently make economic decisions and bear responsibility for their obligations in accordance with the law. An industrial enterprise is a complex production and economic system that, on the one hand, is integrated into larger systems (territorial or national economy, industry), and on the other hand, plays a key role in the coordination and management of internal production subsystems (units, groups of workers) (Chumak, 2008).

The efficiency and development of an industrial enterprise depend on the influence of both external and internal factors. External factors include economic conditions, social changes and technological innovations. Internal factors include reorganization of the enterprise, improvement of management processes and introduction of new technologies. The interaction of these factors determines the overall efficiency of the enterprise and its ability to adapt to market changes. Thus, the state and dynamics of an industrial enterprise are formed both under the influence of the external environment and through the internal processes of self-organization of the production and economic system. Any industrial enterprise is characterized by the following features:

- production and technical unity;
- organizational unity;
- economic independence.

Production and technical unity provides for the conformity of available technological equipment and available production areas with the nature of the production of certain products; consistent connection and completeness of technological processes; availability of general auxiliary production and service economy; the unity of technical and production management in the person of the chief engineer.

Organizational unity presupposes the presence of single management bodies; the presence of a single production team; administrative separation; the relationship between the production plan and the material, technical and financial resources that ensure its implementation.

Economic independence means self-sufficiency in the means of conducting production activities; independent sales of their products; the presence of an independent complete system of reporting and accounting balance.

All these features require effective management, which is able to coordinate and optimize all processes taking place at the enterprise. In this context, industrial management plays an important role, as it directs efforts, skills and resources to increase the productivity and efficiency of the enterprise. It covers a wide range of methods aimed at optimizing time, reducing costs, which contributes to increasing the value of products. In addition, industrial management also covers such aspects as storage, organization and distribution of resources, which are integral components of the production cycle (BECOSAN, 2020).

The goal of managing the innovation potential of an industrial enterprise is to ensure effective and dynamic innovation development aimed at increasing the market value of the enterprise in accordance with changes in the external environment, considering changes in the main parameters of the innovation potential.

In turn, the potential structure of an industrial enterprise is determined by the following factors: 1) the number and quality of available resources (the number of employed workers, the main production and non-production facilities, inventory, financial and intangible resources, information, technologies); 2) the ability of managers and other categories of employees to create certain types of innovation products, namely educational, qualification and motivational potential; 3)

management's ability to optimally use the available resources of the enterprise (professional training, talent, ability to create and update the organizational structure of the enterprise); 4) the ability to create and transform information resources for use in production, commercial and management activities; 5) the ability of the enterprise for innovation activities in terms of updating the technical and technological base of production, transition to the production of new products, use of contemporary methods and forms of economic processes management. (Yarmus & Yarmus, 2023).

The formation of innovation potential at industrial enterprises includes the use of advanced achievements in scientific and technological progress, in the field of information technologies and management systems, as well as the development of new types of products and services by improving the methods of their production and application. Innovation is not limited to the research and development of new products and services, but concerns all structural divisions of industrial enterprises, their functions, and activities.

In this context, it is important to determine the impact of innovation potential on the formation and implementation of the main factors of an industrial enterprise, namely: material, technical and personnel base.

Innovation potential has a direct impact on the formation, renewal and effective use of the material base of an industrial enterprise. This influence is manifested in the enterprise's ability to introduce innovations, change technologies and effectively use its existing and hidden resources. Innovation solutions contribute to the improvement of production processes, which allows to optimize the use of material resources and reduce costs. An important influential factor is the stimulation of the search and implementation of new materials and resources, in particular environmentally friendly alternative sources of energy and resources. An important component is the development of new materials and technologies that help increase productivity and production efficiency. This approach helps to increase the competitiveness of the enterprise on the market by increasing the quality of its products and reducing production costs. In general, the innovation potential of an industrial enterprise is of crucial importance for the development of its material base and ensuring sustainable economic growth.

Speaking about the technical base of the enterprise, we note that the impact of innovation potential on it is a key element in determining the functioning and competitiveness of the enterprise. This influence consists in the need for constant implementation of advanced technological approaches and engineering solutions aimed at modernizing the technical base, which includes equipment, tools and infrastructure of production premises. This process is not limited to the replacement of outdated equipment with modern ones, but also involves the integration of the latest technologies aimed at optimizing production processes, increasing their efficiency and reducing energy consumption.

Moreover, the innovation potential creates conditions for the stable technical development of the enterprise through the constant introduction of new technologies and the improvement of the quality of the technical base. This allows not only to provide the enterprise with modern and competitive technical solutions, but also creates prerequisites for further growth of its technical efficiency.

The innovation potential of an industrial enterprise affects the personnel base in the context of R&D through a complex mechanism that involves not only the expansion of the professional expertise of the personnel, but also the optimization of its structure and functions (Yanenkova & Babkova-Pylypenko, 2015). First, innovation orientation requires the involvement of qualified specialists equipped with the latest knowledge and skills in the field of science and technology for effective R&D. This implies not only an increase in the number of personnel, but also their deep specialization and professional competence. And secondly, the implementation of innovations requires the optimization of the structure and organizational divisions of the enterprise, which ensures the maximum efficiency of the use of human resources and promotes the emergence of a creative environment for innovation activities.

In addition, the personnel component provided with appropriate professional training determines the management system of the enterprise, its flexibility and adaptability to changes in the internal and external environment. According to this, a high level of personnel competence contributes to the formation of a dynamic management system capable of responding effectively to the challenges and innovation opportunities of the market environment.

Summing up, innovation potential, as a key factor in the management of an industrial enterprise, affects the technical, material and personnel base in a complex manner. The introduction of advanced technologies and methods involves not only the modernization of technical means, but also the constant development of personnel in order to ensure high qualifications. In addition, the innovation potential determines strategies for optimization and effective use of the company's material resources in view of modern technological requirements. Summing up, innovation potential acts not only as an integral management factor, but also as a strategic perspective that ensures competitiveness and sustainability of industrial enterprise development.

## CHAPTER 2 SCIENTIFIC AND METHODOLOGICAL APPROACHES TO THE ASSESSMENT OF THE INNOVATION POTENTIAL OF AN INDUSTRIAL ENTERPRISE

### 2.1 Peculiarities of calculating indicators of innovation potential of organizations

In modern conditions, the growing influence of the development and implementation of innovation activities on the efficiency and success of the operation of the enterprise creates the need to study the existing innovation potential, methods of its management and, in general, the strategy and ways of its development. To choose the right innovation strategy, first of all, one should develop the concept of assessing the existing innovation potential of the organization, using methodological approaches that will consider the innovation potential of the enterprise as a separate operating structure.

It cannot be denied that the exact definition of the innovation potential of the enterprise and its components is key to the effective implementation of innovation activities and the successful implementation of development programs. To achieve this goal, it is critical to choose a model for evaluating the innovation potential of the enterprise, which reflects its level of implementation as objectively as possible.

A review of existing methods for assessing the innovation potential of an enterprise first requires a careful analysis of its constituent elements. Some views on this problem differ, there are different concepts regarding the structure of innovation potential, which remains a subject of debate. Some researchers consider the innovation potential of the enterprise as a single scientific and technical complex, while others consider it as a collection of different, not always interconnected elements.

The analysis of the thematic literature showed that domestic scientists mostly consider the structure of innovation potential as divided into scientific, educational, managerial, technical (or technical-technological), production and commercial components. You can also find additions to the above-mentioned structure with such components as marketing, management style, work organization, and the organizational structure of the enterprise.



Based on the analysis of existing research and approaches to determining the structure of innovation potential, the following components are proposed for consideration in this work (Figure 2.1).

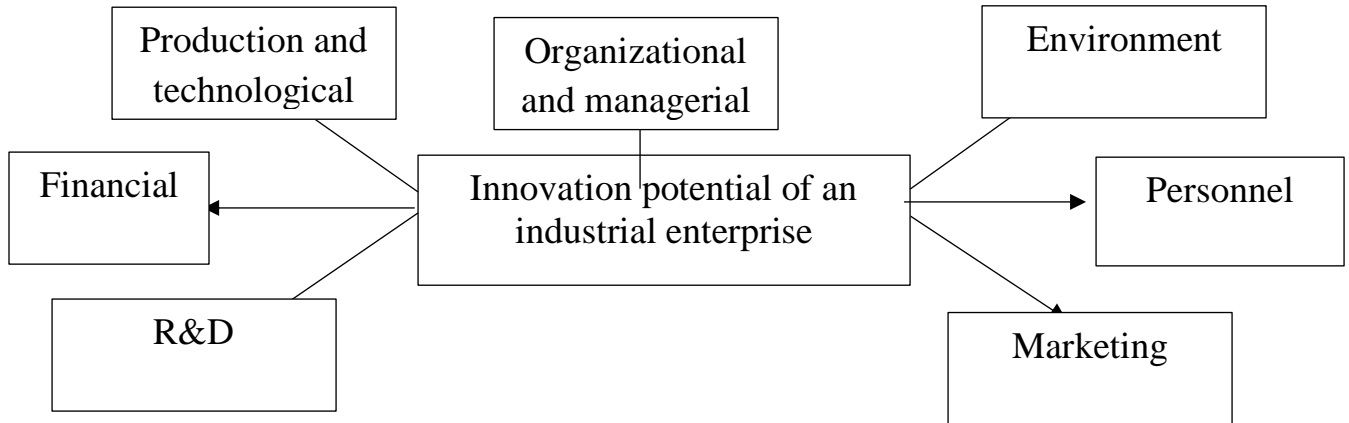


Figure 2.1 – The structure of the innovation potential of an industrial enterprise.  
Source: developed by the author

When creating this structure, the main components of the innovation potential of an industrial enterprise are determined based on the principles of the situational approach to the management of innovation potential, as well as taking into account the specifics of the machine-building enterprise itself, which is a set of methods, tools and technologies used for the adoption and implementation of management decisions, by changing activities, increasing flexibility and adaptability in order to achieve high financial attractiveness and competitiveness (Myasnikov, 2017).

According to the analysis of the case studies and the review of the materials provided by the researchers of this field, to describe each component of the innovation potential in this work, the analysis of the following indicators is proposed (Table 2.1).

Having comprehensively considered the structure of the innovation potential with the determination of possible indicators of the description of its components, there is a need to develop a systematic analysis and assessment of the above aspects. This problem is due to the need for a deeper understanding of various components that affect the innovation potential of the enterprise and its direct assessment. When approaching the analysis of these aspects, researchers must take into account a wide range of factors covering both the internal and external environment of the enterprise. Such a

comprehensive approach requires a systematic view and assessment to ensure the completeness and objectivity of the resulting analysis. It is important whether the developed methodologies would adequately take into account all aspects of innovation potential, as well as reflect their interaction and impact on the effectiveness of innovation processes in the organization.

Table 2.1 – Indicators for describing the innovation potential of the enterprise: composition and methods of determination (based on research).

Component	Characteristics for the description offered
1	2
Personnel	The number of employees engaged in research and development; The number of experts involved in the creation and implementation of innovation projects; Index of professional training of personnel (PIPP). The number of employees with higher education in the relevant field; The degree of employee satisfaction with the working environment and working conditions.
Financial	The total amount of the budget is provided for research and innovation developments; The number of involved investments for innovation activity; Access to funds to support and develop innovation activities, Investments in human capital (education and training of employees); The level of financial support from state or international innovation development programs; Financial coefficient of innovation profitability
R&D	The number of inventions or technical solutions protected by a patent or copyright certificate; The level of the technical base for research; The level of scientific papers issued by the scientific unit, including their originality, relevance and impact; Degree of cooperation with other scientific institutions; The success and significance of experimental research; The level of development of the IT infrastructure; The level of equipment of research laboratories; Level of communication infrastructure development;

Continuation of Table 2.1

1	2
Organizational and managerial	Ability to strategic planning; Monitoring and control; Quality management; Risk management; Ability to manage human resources; Management of ideas; The extent to which management supports and promotes innovation culture and initiatives at all levels of the organization; The level of quality and efficiency of communication processes within the enterprise and externally with interested parties; Effective project management; The organizational structure is the culture of the enterprise; Organizational training of personnel; Motivation and reward system; Leadership support; Degree of staff involvement; Flexibility of organizational structures; Effectiveness of the communication system; Organizational capacity for innovation (Marković et al., 2019)
Production and technological	Percentage of automated production processes; Number of applied advanced technologies in production; Effective use of available resources; The ability to quickly respond to changes in consumer requirements; Energy efficiency; The level of use of "green" technologies in production; The number and quality of implemented technological innovations for a certain period; Quality indicators of manufactured products; The level of availability of technical support for production processes; Modernization of equipment
Marketing	The level of brand recognition in the market; Level of customer satisfaction with products/services; Level of use of marketing tools to promote products/services; Dynamics of changes in the company's market share; The level of investment in marketing research and analytics; Percentage of spending on advertising and promotional activities; The level of development of the distribution network
Environment	Tax environment for business; Labor market; Cooperation with suppliers; Cooperation with clients; The level of cooperation with academic institutions; Cooperation with other companies; The legal basis for the protection of intellectual property rights; Institutional framework for public-private partnership; Consideration of environmental factors in production; Assessment of the development of transport, communication and energy infrastructure; Analysis of macroeconomic indicators; Assessment of the impact of geopolitical events and conflicts on the company's activities.

Source: developed by the author.

Analyzing the approaches of domestic and foreign researchers to the evaluation and analysis of the innovation potential of the enterprise, there is a lack of consensus and a different vision of the most optimal evaluation method. Thus, a large number of scientists, in particular G. Otlyvanska and V. Orlova, in their research adhere to the method of expert evaluations, which consists in evaluating each individual element of the system, which constitutes an innovation potential, and combining the obtained results into an integral indicator. However, at the same time, a clear algorithm for determining the indicator is not given and criteria for evaluating each element of innovation potential are not identified, which does not provide an opportunity to obtain accurate and authoritative results (Hrytsulenko et al., 2013).

Another group of researchers is inclined to use a mathematical-statistical approach using the Cobb-Douglas production function. However, this method is distinguished by the complexity of calculations and can lead to derivation of results that do not have an economic meaning depending on different contexts. A supporter of this method is, in particular, I. Karapiychyk (Karapiychyk, 2010a, Karapiychyk, 2010b).

Some approaches consist in determining indicators of growth, intensity and efficiency of innovation development at the enterprise. N. Chuhrai uses it in the course of his research (Chuhrai, 2002). However, the author does not provide comprehensive methods for evaluating the level of innovation potential for a specific period of time, which can cause an ambiguous interpretation of the actual state of the enterprise's innovation potential and make it difficult to make informed management decisions, in particular when forming an innovation development strategy.

Another existing method is aimed at determining innovation potential through a systematic assessment of its components, defined as innovation resources and their catalysts. I. Novikova, widely uses this approach in her scientific work (Novikova, 2003), and suggests taking into account weighting factors that depend on the degree of involvement of the enterprise in the innovation process, as well as the correspondence of these components to strategic goals. Determination of the level of innovation resources and their catalysts is carried out by multiplying their points by the

corresponding weighting factor. However, the author does not specify the specific algorithm or parameters by which this assessment is made.

As a result of the analysis of scientific sources, it becomes obvious that the evaluation of the innovation potential of the enterprise remains an actual economic problem, as it is due to the variety of interpretations of this concept by different researchers and the divergence of their components. In addition, many proposed methods are incomplete, which distorts the obtained results and complicates their practical implementation.

This, in turn, creates difficulties for enterprises, as it is difficult for them to objectively assess their innovation potential and identify weak points that need improvement.

## 2.2 Development of a system of indicators for evaluating the innovation potential of an industrial enterprise

Considering the peculiarities of the considered structure of the innovation potential of the industrial enterprise, and based on the analysis of existing methods and approaches to its evaluation, this paper proposes the following system of indicators and their calculated indicators with further justification (Table 2.2).

Table 2.2 System of indicators for evaluating the innovation potential of an industrial enterprise

Indicator	Characteristic	Estimated indicator
1	2	3
<b>Financial component</b>		
The share of costs for innovation research	The specific weight of costs for technological innovations in the total volume of shipped goods, performed works and services.	$K_1 = \frac{C_{ti}}{V}$
The general budget is provided for research and innovation developments	The total amount of financial resources allocated by an industrial enterprise for the implementation of research and innovation projects during a certain period.	$K_2 = \sum_{i=1}^n = C_i \cdot X_i$

Continuation of Table 2.2

1	2	3
Share of investment in human capital	The ratio of investments in human capital (education and training of employees) to the total amount of investments in innovation developments.	$K_3 = \frac{\sum_{i=1}^m C_i \cdot H_i}{\sum_{j=1}^n D_j \cdot I_j}$
Profitability of innovations	The ratio of profit received after the introduction of innovations to the total amount of costs for their implementation.	$K_4 = \frac{\sum_{i=1}^n P_i}{\sum_{j=1}^m C_j}$
Investment indicator of post-war recovery	The ratio of the projected volume of foreign investments involved to the total amount of investments involved in the field of innovation research and development	$K_5 = \frac{\sum_{i=1}^n F_i}{\sum_{j=1}^m I_j}$
<b>Personnel component</b>		
Share of employee involvement in research and development of innovations	The percentage of the company's employees who are actively involved in research and development of innovation products or technologies from the total number of employees.	$K_6 = \frac{\sum_{i=1}^n E_i}{\sum_{j=1}^m T_j} \cdot 100\%$
Index of professional training of personnel	The ratio of the number of employees who have completed specialized courses or training to the total number of employees.	$K_7 = \frac{\sum_{i=1}^n T_i}{\sum_{j=1}^m E_j} \cdot 100\%$
The share of scientific workers at the enterprise	The ratio of the number of employees engaged in research or scientific and technical activities to the total number of employees at the enterprise.	$K_8 = \frac{\sum_{i=1}^n S_i}{\sum_{j=1}^m E_j} \cdot 100\%$
Personnel turnover index	The ratio of the number of employees who left the company for a certain period of time to the average number of personnel for the same period	$K_9 = \frac{\sum_{i=1}^n L_i}{\frac{1}{m} \sum_{j=1}^m E_j}$
<b>Research and development component</b>		
Share of innovation products	The ratio of the volume of production of innovation products to the total volume of production at the enterprise, expressed as a percentage.	$K_{10} = \frac{\sum_{i=1}^n V_i}{\sum_{j=1}^m P_j} \cdot 100\%$

Continuation of Table 2.2

1	2	3
Amount of patents and inventions	The ratio of the number of patents and inventions to the total number of production units at the enterprise.	$K_{11} = \frac{\sum_{i=1}^n P_i}{\sum_{j=1}^m U_j} \cdot 100\%$
The level of cooperation with research institutions	The ratio of the number of concluded contracts or joint projects with such institutions to the total number of partnerships or initiated research during a certain period	$K_{12} = \frac{\sum_{i=1}^n C_i}{\sum_{j=1}^m P_j} \cdot 100\%$
Success and significance of experimental research	The ratio of the number of successfully completed experimental studies to the total number of experimental studies conducted by the enterprise.	$K_{13} = \frac{\sum_{i=1}^n S_i}{\sum_{j=1}^m T_j} \cdot 100\%$
The level of development of the IT infrastructure	The ratio of the number of existing IT systems and infrastructure components to the total number of components that the enterprise has.	$K_{14} = \frac{\sum_{i=1}^n E_i}{\sum_{j=1}^m T_j} \cdot 100\%$
Index of innovation activity	The ratio of the number of implemented innovation projects to the total number of projects at the enterprise.	$K_{15} = \frac{\sum_{i=1}^n I_i}{\sum_{j=1}^m P_j} \cdot 100\%$
<b>Organizational - management component</b>		
Index of strategic planning	The ratio of the number of developed strategic plans to the total number of required plans.	$K_{16} = \frac{\sum_{i=1}^n D_i}{\sum_{j=1}^m R_j} \cdot 100\%$
Quality management index	The ratio of the number of implemented quality management systems to the total number of required systems.	$K_{17} = \frac{\sum_{i=1}^n I_i}{\sum_{j=1}^m R_j} \cdot 100\%$
Index of interaction between departments	The ratio of the number of successful interdepartmental projects to the total number of projects.	$K_{18} = \frac{\sum_{i=1}^n S_i}{\sum_{j=1}^m T_j} \cdot 100\%$
Index of implementation of innovation management methods	The ratio of the number of implemented innovation management methods to the total number of required methods.	$K_{19} = \frac{\sum_{i=1}^n I_i}{\sum_{j=1}^m R_j} \cdot 100\%$

Continuation of Table 2.2

1	2	3
<b>Production and technological component</b>		
Productivity	The ratio of the volume of products produced for the period to the average registered number of employees	$K_{20} = \frac{\sum_{i=1}^n V_i}{\frac{1}{m} \sum_{j=1}^m E_j}$
Update of production funds	It characterizes the ability of an industrial enterprise to renew fixed assets	$K_{21} = \frac{\sum_{i=1}^n \Delta F_i}{\sum_{j=1}^m F_j} \cdot 100\%$
Share of acquisition and equipment costs	It characterizes the quality of expenses for innovation activities	$K_{22} = \frac{\sum_{i=1}^n C_i}{\sum_{j=1}^m T_j} \cdot 100\%$
Percentage of automated production processes	The ratio of the number of automated processes to the total number of production processes at the enterprise.	$K_{23} = \frac{\sum_{i=1}^n A_i}{\sum_{j=1}^m P_j} \cdot 100\%$
The number of applied advanced technologies in production	The ratio of the number of implemented advanced technologies to the total number of production processes at the enterprise.	$K_{24} = \frac{\sum_{i=1}^n T_i}{\sum_{j=1}^m P_j} \cdot 100\%$
Index of use of green technologies	The ratio of the number of "green" technologies implemented in production to the total number of production processes at the enterprise.	$K_{25} = \frac{\sum_{i=1}^n G_i}{\sum_{j=1}^m P_j} \cdot 100\%$
Quality indicators of manufactured products	The ratio of the number of products that meet the established quality standards to the total number of products manufactured at the enterprise.	$K_{26} = \frac{\sum_{i=1}^n Q_i}{\sum_{j=1}^m P_j} \cdot 100\%$
<b>Marketing component</b>		
The level of innovation activity in marketing	The ratio of the number of implemented marketing innovations to the total number of planned marketing innovations.	$K_{27} = \frac{\sum_{i=1}^n I_i}{\sum_{j=1}^m P_j} \cdot 100\%$
Share of spending on marketing innovations	Ratio of marketing innovation costs to total marketing costs.	$K_{28} = \frac{MI}{MC} \cdot 100\%$
Index of adaptation to market changes	The ratio of the number of successfully adapted marketing strategies to the total number of implemented marketing strategies.	$K_{29} = \frac{\sum_{i=1}^n S_i}{\sum_{j=1}^m I_j} \cdot 100\%$



Continuation of Table 2.2

1	2	3
Index of introduction of new sales channels	The ratio of the number of implemented new sales channels to the total number of planned new sales channels.	$K_{30} = \frac{\sum_{i=1}^n I_i}{\sum_{j=1}^m P_j} \cdot 100\%$
Share of market research costs	The ratio of market research costs to total marketing costs.	$K_{31} = \frac{MR}{MC} \cdot 100\%$

Source: developed by the author

A quantity of indicators used to assess the innovation potential of an industrial enterprise from  $K_1$  to  $K_{31}$  can be adjusted depending on the specific characteristics of the enterprise itself. Meanwhile, it is imperative to convert all these indicators to a dimensionless form, since they have different dimensions, in order to conduct further joint evaluation. For this, is used a non-linear function:

$$y_i = -\frac{K_a}{K_{oi}} \quad (2.1)$$

where  $y_i$  -normalized indicator,  $K_a$  – is the average value of the initial indicator for the sample,  $K_{oi}$  - is the initial indicator.

The transformation will lead to all indicators ranging from 0 to 1, with the value of  $y = 0.5$  corresponding to the average value.

Further, a generalized index can be calculated for each of the projections:

$$Y_j = \sum_{i=1}^6 \omega_i \cdot y_i, \quad (2.2)$$

where  $y_i$  – normalized  $i$  – th indicator in the projection,  $\omega_i$  - its weight.

On the basis of existing approaches the integral indicator of an innovation potential is proposed to be calculated as a weighted average of the generalized indices of individual projections according to the formula:

$$K_{int} = \sum_{j=1}^n W_j \cdot Y_j, \quad (2.3)$$

where  $Y_j$  – is a generalized index of the  $j$ th projection of the innovation potential, and  $W_j$  is a weighting factor that shows the significance of the  $j$ th.

The following integrated assessment scale is proposed for direct assessment of the enterprise's innovation potential (Table 2.3).

Table 2.3 – The scale for determining the results of evaluating the innovation potential of an industrial enterprise

The level of innovation potential, expressed quantitatively	The level of innovation potential, expressed qualitatively	Characteristics of the current innovation potential
[0; 0,25)	Critical level of potential	There is an absence to carry out innovation activities
[0,25; 0,55)	Low level of potential	There is the ability to carry out basic innovation activities
[0,55; 0,75)	Average level of potential	There is an ability to carry out innovation activities at a satisfactory level with some constraints
[0,75; 0,1)	High level of potential	There is the ability to carry out extensive innovation activities at a high level without restrictions

Source: developed by author.

The choice of indicators for evaluating the financial component of the innovation potential of an industrial enterprise is explained by their ability to provide a comprehensive assessment of the enterprise's ability to effectively manage finances in the context of innovation activities.

These indicators reflect not only the current state of financial support for innovations, but also their dynamics and impact on the overall economic performance of the enterprise. They make it possible to estimate the volume and structure of investments in research and development, which are key to the development of new technologies and products. Also, an important aspect is the assessment of the efficiency of the use of financial resources, which is reflected in the indicators of the profitability

of innovation projects. This allows you to find out how effectively the company uses its investments to create added value.

With regard to the assessment of the personnel component of the enterprise's innovation potential, it should be noted that the selected criteria make it possible to conduct a comprehensive analysis and ensure the implementation of strategic management. They reflect the enterprise's ability to form, maintain and develop human capital, which is the basis of innovation activity. The significance of these indicators lies in the fact that they provide a quantitative assessment of various aspects of personnel potential, such as the level of employee involvement in research and innovation processes, the degree of professional training of personnel, and the availability of scientific personnel. In addition, the analysis of the personnel component makes it possible to identify gaps in the knowledge and skills of employees, which can be solved through targeted training and professional development. This, in turn, contributes to increasing the efficiency of innovation processes, increasing labor productivity and accelerating the introduction of the latest technologies.

The selected indicators for characterizing the research and development component are key indicators that help in assessing the potential of innovation development of the enterprise. These indicators reflect not only quantitative, but also qualitative aspects of the enterprise's scientific and technical level, its ability to implement innovation ideas and implement advanced technologies. By analyzing these indicators, it is possible to determine which areas of research work are most successful, as well as identify areas where there are opportunities for improvement and innovation. Such an analysis contributes to the formation of development strategies, adaptation to changes in production processes, and increased competitiveness in the market.

The corresponding indicators of the organizational and management component allow to assess the level of strategic planning, quality management, interaction between departments and the implementation of innovation management methods. These indicators are indicators of the company's readiness to adapt to changes and implement new ideas, which is key to increasing competitiveness in the market. The effectiveness of their application lies in the possibility of conducting a comprehensive analysis of management activities and identifying weak points, which allows timely and well-

founded management decisions to be made. The application of these indicators in management practice helps to optimize internal processes, improve the quality of products or services, and also increase the overall efficiency of the enterprise's functioning.

The production and technological component of the innovation potential of the enterprise is of crucial importance for ensuring its competitiveness and adaptation to market conditions. The assessment of relevant indicators provides a comprehensive understanding of the technological state, productivity, innovation activity and the ability to update production processes. The use of these indicators allows for a deep understanding of internal production mechanisms, to identify critical areas for improvement and optimization, as well as to provide a general assessment of the company's technological progress. Thanks to this, the enterprise can make informed management decisions regarding the modernization of production facilities, productivity improvement and introduction of advanced technologies.

A detailed analysis of relevant indicators of the marketing component allows for a comprehensive assessment of various aspects of marketing activity, with the aim of identifying key directions that require improvement and optimization, as well as to assess the overall level of innovation in marketing activity. Such indicators contribute to the adoption of scientifically based management decisions, which are aimed at improving marketing strategies, increasing the effectiveness of marketing activities and introducing new methods of market research.

In addition, this paper proposes indicators that have not been studied before and were not considered by scientists as possible indicators for assessing the innovation potential of an enterprise. Such indicators are the Investment Indicator of Post-War Recovery and the Index of the Use of Green Technologies.

In the context of the full-scale war unleashed against Ukraine by the Russian Federation, the importance of taking into account the investment index of post-war recovery as a criterion for assessing the financial component of the innovation potential of industrial enterprises is revealed in the context of a comprehensive understanding of the economic and social challenges arising as a result of military conflicts. This indicator, expressed as a ratio of the projected volume of foreign investments involved

to the total amount of investments involved in research and innovation development, is an important aspect of strategic financial management in the context of military operations.

War, especially in the context of hybrid warfare, has complex and multifaceted economic consequences that affect various sectors of a country's economy. In this context, considering the financial component, it is necessary to take into account the dynamics of capital investments, the peculiarities of the financial market, and the corresponding changes in the investment climate. We faced significant destruction of infrastructure, loss of many production facilities and mass displacement of people. Reconstruction after the war is an urgent need to restore stability and development of the economy, industry and the country as a whole. In this context, the investment indicator of post-war recovery is an important tool for assessing the financial stability and development opportunities of an industrial enterprise after the end of the war.

For industrial enterprises, this indicator is not only an indicator of the financial component, but also a strategic tool for planning investment strategies and choosing optimal ways to restore production. By calculating this indicator, the enterprise can assess the potential of attracting foreign investment in the restoration and modernization of its activities. In addition, it provides an opportunity to determine priority areas of investment and develop strategies to maximize the use of available financial resources, including the selection of innovation technologies, the development of new products or services, as well as the modernization of production processes.

In addition, in the context of military conflict and post-war reconstruction, the Index of the use of green technologies becomes an important tool for assessing sustainable development and ensuring the environmental safety of production processes of industrial enterprises. This index determines the level of implementation of technologies that help reduce emissions of harmful substances, optimize the use of natural resources, and reduce the impact of production on the environment.

For industrial enterprises operating in the zone of active hostilities or after its termination, it is important to ensure environmentally sustainable production, which not only contributes to the conservation of natural resources and the reduction of

emissions, but also ensures increased competitiveness in the markets of green technologies. This is especially important at a time when industrial enterprises face additional economic challenges, such as infrastructure destruction, loss of production capacity and reduced investment.

The index of the use of green technologies allows industrial enterprises to determine the effectiveness of the implementation of environmentally friendly technologies in the production process. It considers such parameters as the use of renewable energy sources, efficient use of resources, reduction of CO<sub>2</sub> emissions and other parameters that reflect the environmental efficiency of production.

The application of green technologies can not only reduce the impact of production on the environment, but also provide economic benefits through the reduction of energy and resource costs, the improvement of the efficiency of production processes and the market competitiveness of products. In the face of changing conditions for exporting goods abroad, many countries introduce or strengthen environmental standards for imported goods. This means that products that do not meet environmental requirements may be subject to additional taxes or duties, which will increase their final cost and reduce competitiveness in international markets.

The lack of environmentally friendly technologies can lead to an increase in the tax burden on exported goods and limit access to key foreign markets. In the context of changes in export conditions, initiatives such as the CBAM (Carbon Border Adjustment Mechanism) in the EU impose additional duties on greenhouse gas emissions generated during the production of goods. From January 1, 2026, EU importers will be required to purchase CBAM certificates, taking into account real GHG emissions during product production.

The absence of green technologies can lead to an increase in the tax burden on exported goods and limit access to key markets. The implementation of green technologies becomes strategically important for ensuring the financial stability and competitiveness of industrial enterprises. The transitional phase of CBAM, which will last until December 31, 2025, provides enterprises with the opportunity to establish monitoring and reporting processes in accordance with European standards. (Ecodiia, 2023)

Thus, for industrial enterprises, the calculation of the Index of the use of green technologies is not only a matter of environmental responsibility, but also a strategic necessity to ensure financial stability and competitiveness in the long term.

### 2.3 Development of an algorithm for evaluating and managing the innovation potential of an industrial enterprise

Given the developed system of indicators for evaluating the innovation potential of an industrial enterprise, there is a logical need to develop an algorithm for its direct assessment and management. This will make it possible to apply the obtained results in practice for real enterprises in real conditions. The algorithm for evaluating and managing the innovation potential of industrial enterprises must take into account various components and features of this process.

The most common approaches to evaluating the innovation potential of an industrial enterprise are an integral indicator based on a complex system of indicators of innovation potential and the method of expert evaluations. The first is determined by evaluating the key technical and economic indicators of its activity. This assessment is based on the use of generalizing indicators through the system of partial indicators and the expert survey method (Chervanov et al., 1999).

The method of expert evaluations, in turn, is the process of involving qualified specialists to analyze and evaluate the object based on their expert opinion and experience in the relevant field. This method is based on collective expert opinion and allows obtaining objective, qualified assessments of complex objects, such as the innovation potential of the enterprise. By combining expert opinions and an analytical approach to object evaluation, the method of expert evaluations creates an opportunity to reduce possible biases and increase the objectivity of the evaluation process. (Hrebenikova & Natochii, 2018)

In this paper, algorithms for evaluating the innovation potential of an industrial enterprise will be proposed, based on the features of both of the above-mentioned methods. These algorithms will be developed considering the specifics of each method

and their application to assess various aspects of the enterprise's innovation potential. This approach will make it possible to develop a comprehensive approach to evaluating the innovation potential of industrial enterprises, providing a balanced and objective analysis of their innovation activity.

### 2.3.1 The algorithm for evaluating the innovation potential of an industrial enterprise using an integral indicator based on a complex system of indicators

The first stage of the algorithm for evaluating the innovation potential of an industrial enterprise involves specific steps. First, it is necessary to clearly formulate the purpose of the assessment, which consists in determining the strengths and weaknesses of the innovation activity of the enterprise and identifying directions for its further development. The main tasks include the identification and evaluation of the effectiveness of existing innovation processes, as well as the formulation of recommendations for their further improvement. This approach makes it possible to provide specific goals and objectives of the assessment, which become the basis for further actions in the process of analyzing the innovation potential of the enterprise.

The second stage of the algorithm involves data collection, which should be systematic and comprehensive. It is necessary to collect information in all key areas of the company's activity, including financial, personnel, technological, marketing and analysis of the external environment. In the process of data collection, it is important to consider the variety of types of information, such as financial reports, personnel data, technical characteristics of equipment, the results of market research, analysis of the competitive environment and other information that can affect the innovation activity of the enterprise. The obtained data are analyzed and systematized for further use in the process of assessing the innovation potential of the enterprise.

The third stage involves data normalization. The minimax and average deviation methods are used to bring the indicators to a single scale, which allows considering the diversity and importance of the components of innovation potential.



$$X' = \frac{X - X_{min}}{X_{max} - X_{min}} \quad (2.4)$$

where  $X'$  is the normalized value,  $X$  is the current value of the indicator,  $X_{min}$  and  $X_{max}$  are the minimum and maximum values, respectively. The standard deviation method is also used, which uses the mean and standard deviation to normalize the indicators.

The fourth stage includes the calculation of indices for each component. The financial index includes indicators of profitability, liquidity and financial stability. The personnel index takes into account the qualifications of employees, the level of education and personnel stability. The organizational and management index evaluates the efficiency of management processes and the level of automation. The technological index considers the level of technical equipment and innovation technologies. The R&D index includes the number of scientific projects, investments in R&D and research results. The marketing index evaluates the effectiveness of marketing strategies and market position. The external environment index analyzes the impact of external factors such as economic conditions and environmental requirements

At the fifth stage, the weighting coefficients for each component are determined. An expert method is used, which involves involving a group of experts to determine weighting factors based on importance, and an analytical method, which uses statistical data and analysis to determine the weight of each component.

The sixth stage includes the calculation of the integral indicator according to the formula:

$$I = \sum_{i=1}^n \omega_i \cdot I_i, \quad (2.5)$$

where  $I$  is an integral indicator,  $\omega_i$  is the weighting factor of the  $i$ -th component,  $I_i$  is the index of the  $i$ -th component.

The seventh stage involves an important process of analyzing the results, which includes the interpretation of the values of the integral indicator. This allows you to understand the current level of the enterprise's innovation potential and determine its

strengths and weaknesses. On the basis of this analysis, specific recommendations are formulated regarding the further development of the innovation activity of the enterprise. In addition, the analysis process considers not only internal factors, but also the external environment, competitive advantages and threats, which helps to ensure a comprehensive approach to the formulation of recommendations and strategies for the development of the innovation potential of the enterprise.

At the eighth stage, management strategies are developed, which are a key element for the further development of the enterprise's innovation potential. Strategic goals are established, providing long-term prospects for the development of innovation potential, as well as tactical measures aimed at specific actions to achieve these goals. Management strategies can include a variety of measures, such as investing in research and development, improving the skills of personnel, modernizing equipment and production processes, and entering into strategic partnerships with other companies or institutions. An important aspect of this stage is careful planning and prioritization to ensure efficient use of resources and achievement of the set goals in the innovation field.

### 2.3.2 The algorithm for evaluating the innovation potential of an industrial enterprise using by the method of expert evaluation

The first stage of evaluation by the method of expert evaluation coincides factually with the previous one and consists in determining the goals of the evaluation, which is a key stage in the development of a strategy for evaluating the innovation potential of an industrial enterprise. The main goal of this stage is to assess the level of innovation potential based on expert opinion. The tasks of this stage include the definition of assessment criteria that reflect key aspects of the enterprise's innovation potential, the formation of an expert group consisting of qualified specialists from various fields of activity, as well as the collection and analysis of expert assessments. This stage allows you to clearly define the task and direction of the assessment, as well as to ensure the objectivity and adequacy of the results.

At the second stage, an expert group is formed, which is a key element for carrying out an expert assessment of the innovation potential of an industrial enterprise. To form such a group, specialists from various spheres of the company's activity, such as finance, personnel, management, technology, research and development (R&D), marketing, are selected. Usually, the number of experts is from 5 to 10 people in order to ensure the objectivity and representativeness of the assessment.

The third stage involves the development of a questionnaire, which is a tool for collecting information from experts. At this stage, the main criteria are determined for each component of the innovation potential, which reflect the key aspects of the enterprise's activity. A standard scale is used to evaluate each criterion, for example, from 1 to 10, where each number reflects a certain level of achievement of the criterion. This approach allows you to standardize the assessment process and ensure consistency of results.

The fourth stage involves conducting a survey among experts, which is an important step for obtaining objective assessments of the innovation potential of the enterprise. When surveying experts, specially designed questionnaires are used, and the results are collected and analyzed. Where necessary, anonymity is ensured in the survey process to avoid bias and the influence of group opinion on the evaluation results.

The fifth stage involves the analysis of expert evaluations obtained as a result of the survey. At this stage, the average value of the ratings for each component of the innovation potential is calculated, and the degree of variation in the ratings is also analyzed, which makes it possible to determine the level of consensus among experts. This analysis helps to find out how experts agree in their assessments and what is the stability and homogeneity of opinions.

The sixth stage includes the calculation of the total score according to the formula:

$$I = \frac{1}{n} \sum_{i=1}^n E_i, \quad (2.6)$$

where  $I$  is the total score,  $E_i$  is the score of the  $i - th$  component,  $n$  is the number of components.

At the seventh stage of the algorithm, weighting factors are determined for each component of the industrial enterprise's innovation potential. This process includes the use of two methods: expert and analytical.

The expert method involves the involvement of a group of experts from various fields of activity to establish weighting factors based on their assessments of the importance of each component. Experts may provide their assessments based on their professional expertise and experience in their respective fields. While the analytical method is based on the analysis of statistical data to determine the weight of each component. This method uses objective data and calculations to assess the impact of each component on the overall innovation potential of the enterprise. Both methods make it possible to scientifically substantiate the weight of each component of the innovation potential, which contributes to the objective calculation of the overall assessment and the development of effective management strategies.

The eighth stage includes the calculation of the integral indicator according to the formula:

$$I = \sum_{i=1}^n \omega_i \cdot I_i, \quad (2.7)$$

where  $I$  is an integral indicator,  $\omega_i$  is the weighting factor of the  $i - th$  component,  $I_i$  is the index of the  $i - th$  component.

At the ninth stage, the analysis of the obtained results of the assessment of the innovation potential of the industrial enterprise is carried out. This includes a detailed review of the overall assessment to determine the level of innovation potential. In addition, strengths and weaknesses are identified by identifying components with the highest and lowest scores. Analysis of the results allows you to understand in which directions the company has already achieved success in innovation, and in which areas there is a need for further improvement. This provides an opportunity to develop

balanced development strategies aimed at attracting maximum resources to support strengths and address problematic aspects.

At the tenth stage, management strategies are developed that determine the course of further development of the innovation potential of the industrial enterprise. Strategic goals are set based on the results of the innovation potential analysis, and they include both long-term and short-term goals. Such goals may include investment in research and development, staff training, and modernization of equipment and production processes.

Summarizing, it can be considered that both assessment methods, as an integral indicator and a method of expert assessment, provide an opportunity to conduct a comprehensive analysis of the innovation potential of an industrial enterprise. This analysis serves as a basis for developing management strategies aimed at maximizing benefits and solving problems. Such strategies allow the enterprise to effectively use its innovation potential and make informed strategic decisions.

## CHAPTER 3 ANALYSIS AND EVALUATION OF THE INNOVATION POTENTIAL OF LLC “TEKHNOKHIM”

### 3.1 Analysis of the current state and innovation opportunities of LLC “TEKHNOKHIM”

Located in the city of Sumy, LLC «TEKHNOKHIM» is known for its extensive history and high production standards, specializing in the manufacture of special-purpose machinery and mechanical devices, as well as tractors for agriculture and forestry. The company manufactures high-tech products for narrow applications, which are widely used mainly in the chemical industry, including various specialized machines and mechanisms.

Thanks to its experience and innovation approaches, the company is deservedly considered one of the leading manufacturers in its field, providing markets with high-tech equipment used in chemical production and the agricultural sector. Highly qualified personnel, strict adherence to ISO 9001:2015 standards, and lean manufacturing principles ensure the efficiency and competitiveness of our products in the global market.

LLC «TEKHNOKHIM» demonstrates a high level of professionalism and compliance with international quality standards by actively implementing modern technologies and optimising production processes. Thanks to extensive experience and scientific and technical developments, the company successfully meets the needs of customers for high-tech equipment characterised by reliability, performance and long service life. Continuous improvement of production processes and implementation of innovation solutions allow the company to retain its leading position in the industry and contribute to the development of modern engineering.

When analysing the current state and innovation capacity of the enterprise, it is necessary to dwell on several key factors. First of all, let's look at the technological component. LLC «TEKHNOKHIM» uses modern and high-tech equipment that is systematically updated every 5-10 years, which allows the company to remain at the forefront of its industry. The equipment includes lathes and milling machines, rollers,

welding equipment, guillotine shears, lasers, in-house developed test bench equipment, balancing equipment, cranes and lifting mechanisms, etc. All these high-tech machines provide the required technical parameters stated in the technical data sheets and are maintained in working condition through regular maintenance and timely upgrades.

The high-quality standards implemented at the enterprise are confirmed by the use of advanced equipment, which ensures the reliability and durability of the products. A systematic approach to equipment upgrades helps to maintain competitiveness and compliance with market requirements, and allows the company to pursue innovation projects successfully, ensuring a high level of quality and production efficiency.

Among the negative aspects, however, is the insufficient number of implemented environmental technologies. The unavailability of green technologies at an enterprise has a number of negative consequences from an economic point of view. More and more countries are introducing strict environmental standards, especially in the European Union, requiring suppliers to meet high environmental standards. The fact that a company does not have such technologies can become an impediment to entering these markets and limit export opportunities, which directly affects its economic performance.

Second, the shortage of green technologies can lead to higher energy and waste disposal costs. Deploying technologies such as solar panels, waste management systems and energy-saving technologies can significantly reduce operating costs. Conservation of energy and resources helps to reduce production costs and increase market competitiveness.

In addition, the introduction of environmental technologies helps to increase the innovation potential of the enterprise. Eco-innovations not only reduce the environmental footprint of production, but also stimulate the development of new products and technologies that can unlock new markets and growth opportunities. The shortage of such technologies limits the ability to develop and retrofit production, which can negatively affect the long-term sustainability of the enterprise.

Importantly, "LLC" TEKHNOKHIM actively integrates innovation concepts into its production activities, which is reflected in the introduction of new technologies and products. The introduction of innovations at the enterprise is a key aspect that

contributes to increasing its competitiveness and strengthening its market position. Between 2022 and 2024, LLC «TEKHNOKHIM» mastered the production of new types of products, including dry gas seals, hermetic pumps with magnetic coupling, and flubon bushings. These products are high-tech special-purpose products used in chemical industries. The implementation of these products testifies to the high technological capability of the enterprise and its ability to adapt to modern market requirements.

Investments in the latest equipment are an important component of the company's innovation potential. The innovation equipment acquired includes a laser/engraver purchased in 2020, a laser welding machine purchased in 2024, a balancing machine purchased in 2019, and a stand for accelerated testing of dry gas seals of its own production manufactured in 2023-2024. Such equipment enables the company to enhance the accuracy and efficiency of its production processes and ensure high quality of its end products.

In addition, the construction of a galvanic shop in 2020-2021 and a glass-jet metal cleaning shop in 2019-2020 is evidence of a strategic approach to expanding production capabilities and improving technological processes. However, compared to its direct competitor, Grace Engineering LLC, TEKHNOKHIM has gaps. "Grace-engineering has a more developed system for implementing environmental technologies, which allows them to meet modern environmental safety standards and provides a competitive advantage in international markets (Grace Engineering, 2024) The absence of green technologies at TEKHNOKHIM may become a barrier to exporting products to the European Union, where environmental standards are very high. In terms of economics, non-compliance with environmental standards can lead to a loss of market share and a decrease in product competitiveness.

Grace Engineering LLC also has a wider network of suppliers, which reduces the risks associated with logistics and raw material supply. Although TEKHNOKHIM purchases materials on a just-in-time basis, the lack of significant raw material reserves can be critical in the event of supply disruptions.

When analyzing sales markets, it is important to note that LLC «TEKHNOKHIM»'s products are supplied to the markets of Ukraine, the EU, India,



Pakistan, the USA, Canada, Chile, Georgia, Uzbekistan and Kazakhstan. The company's marketing activities are outsourced. The company is a member of the power engineering cluster and the Chamber of Commerce and Industry. However, the absence of a full-fledged website significantly limits the availability of information about the company's products and services to potential customers. At the same time, the website is considered one of the main channels of communication and brand promotion on the Internet, which is widely used as a tool by the company's direct competitors, namely Grace Engineering (Sumy) and KCVT (Poland). In this case, the website is an effective tool for interacting with customers and receiving feedback, as well as for attracting and retaining talented professionals. The lack of information about the company and its products limits the opportunities to get acquainted with its products.

Furthermore, analysing the economic and human resources aspects of the company's activities, several key factors were identified that determine its functioning and development prospects. Consistent economic performance, measured by sales and net profit, confirms the efficiency of production processes and successful management of financial resources. However, comparing the economic indicators of LLC «TEKHNOKHIM» with the data of Grace Engineering, we see that according to OpenDataBot (Opendatabot, 2023a; Opendatabot, 2023b) in 2023, the volume of sales of Grace Engineering amounted to UAH 25,693,632, which is significantly higher than the volume of LLC «TEKHNOKHIM». Grace Engineering's net profit for the reporting period was UAH 1,980,423, which is also higher than that of LLC «TEKHNOKHIM». Thus, Grace-engineering demonstrates higher financial performance and efficiency in the production segment compared to LLC «TEKHNOKHIM». In terms of analysing the financial pillar of the company's innovation potential, this may be indicative of a higher innovation potential of the company, as the availability of free financial resources may prompt investment in research and development of new products, technologies and processes.

In the context of personnel, the high average age of employees at LLC «TEKHNOKHIM», which according to the company is 53 years (from 33 to 74 years), indicates significant experience and expertise, which can be both an advantage and a disadvantage. On the one hand, this ensures stability and reliability of production, as

employees have extensive experience in their field of activity. On the other hand, there is a risk of losing this experience due to retirement or other circumstances, as well as the lack of a younger generation that could bring new ideas and innovations to the production process.

In the meantime, there has been a downward trend in the number of employees since 2021. In 2021, the number of employees of the enterprise was 25 people, in 2022 - 22 people, and in 2023 - 12 people, as evidenced by the data from the open resource OpenDataBot (Opendatabot, 2023a). To date, this trend is due to various factors, including the automation of many processes, economic instability and the overall security situation in the region. This underlines the need to find optimization strategies, such as the use of new technologies and the involvement of young professionals, to maintain competitiveness and stability in a difficult environment. In the context of a full-scale war, we can expect further pressure on economic resources and the need to adapt to new conditions. This may require intensifying optimization measures, including the use of new technologies and the involvement of young professionals, to maintain competitiveness and stability in difficult conditions.

Overall, the analysis shows that LLC «TEKHNOKHIM» has significant potential for further development, but requires a systematic approach to managing both financial and human resources, taking into account current trends and challenges in the market and geopolitical context. In order to ensure stability and competitiveness in a challenging environment of economic and political instability, it is necessary to improve management strategies, implement effective financial control and planning tools, and actively develop human resources.

In particular, it is important to pay attention to the modernisation of production processes through the introduction of new technologies and automation, which will optimise costs and increase labour productivity. In addition, the active involvement of young and skilled professionals, as well as the creation of a favourable working environment, will help to foster an innovation culture and develop new ideas. Considering geopolitical risks and the impact of the external environment is also a key aspect of strategic management. Taking these factors into account will allow the

company to adapt to changes in the market and maintain its competitiveness in the face of uncertainty.

3.2 Development of a questionnaire survey of the current state of innovation potential of LLC “TEKHNOKHIM” for evaluation by method of expert assessment.

As one of the projects to assess the innovation potential of LLC “TEKHNOKHIM”, a questionnaire was developed to obtain expert opinions on various aspects of the company's activities. This survey is one of the components of a comprehensive methodology of expert assessments, which facilitates an objective determination of the company's innovation potential. The questionnaire contains questions that cover certain components of the company's innovation potential, such as research and development activities, production and technological base, organizational, managerial, financial and human resources. More specifically, the questionnaire is aimed at assessing the level of innovation culture, readiness for change, ability to adapt the latest technologies, and efficiency of innovation implementation.

The expert assessments obtained through this questionnaire will allow identifying the strengths and weaknesses of the company's innovation potential, as well as using them directly in the qualitative and quantitative assessment of the company's innovation potential using the expert assessment method. This, in turn, will make it possible to identify priority areas for further development and investment of the enterprise. An additional important aspect is that an integrated approach to evaluation, which includes different views and opinions of experts, contributes to a more accurate determination of the priority directions of development and investment of the enterprise.

The questionnaire is presented in the Appendix A, B, C, D, E, F, J, F, I, J, K, L.

The questionnaire consists of 6 sections, each of which is responsible for a specific component of innovation potential and aims to evaluate each indicator

separately. A detailed analysis of each section makes it possible to understand exactly which factors are taken into account when evaluating innovation potential.

1. General information about the expert is defined at the beginning, in the "Functional responsibilities at the company" part, in order to better understand the perspective from which the expert evaluates various aspects of the company's activity. This allows you to assess the qualification and specialization of the expert and, accordingly, the reliability of the data obtained from him .

2. The financial component also includes an analysis of the financial efficiency of innovation projects and their compliance with the company's strategic goals. Questions refer to the sources of financing for innovation, such as internal resources, loans, investments or grants. For example: "What proportion of your company's costs is allocated to innovation research?" and "What is your company's total research and innovation budget?".

3. The personnel component also includes the analysis of personnel needs for innovation activities and the evaluation of the culture of innovation in the organization. The questions determine such aspects as the availability of skills and motivation of personnel regarding innovation, with the help of a series of questions, "What proportion of employees of your enterprise is involved in research and innovation?" and "What is the index of professional training of your company's personnel?".

4. The research component includes the analysis of various aspects of research activity aimed at determining its effectiveness and impact. Questions of this component allow to establish, for example, the share of scientific workers in the total number of employees of the enterprise, as well as to determine the number of received patents and inventions, which indicates the innovation activity and competitiveness of the organization.

5. The organizational and management component allows you to determine how well innovation ideas and projects are implemented and managed in the organization. The issues of this component, for example, relate to the definition of the index of innovation activity, which assesses the overall level of innovation activity of the enterprise, as well as the index of strategic planning of innovation activity, which reflects the presence and effectiveness of strategic plans aimed at the development of

innovations in the organization. The assessment of these indicators helps to identify the strengths and weaknesses of innovation management and to determine areas for further improvement of strategies and processes.

6. The analysis of the production and technological component allows to determine how modern and productive the technologies used are, and whether there is a constant renewal of production assets. The issues of this component, for example, relate to the determination of the index of renewal of production assets, which reflects the degree of relevance of equipment and technological solutions at the enterprise, as well as the percentage of automated production processes, which indicates the level of introduction of modern technologies into production.

7. The marketing component determines how successfully new approaches and technologies are implemented in the organization's marketing strategies. The issue of this component, an index that indicates an innovation approach to marketing, as well as an index of the use of "green" technologies, indicating the level of implementation of environmentally friendly methods and approaches in the marketing strategy of the enterprise. The assessment of these indicators helps the enterprise to adapt to changes in the market environment and provides a competitive advantage in the market.

The evaluation is based on a scale of 1 to 10 for sections 1-5. Each aspect is scored on a scale from 1 to 10 (Table 3.1).

Table 3.1 – Score and the definition of the obtained results

Score	Definition
1-2 points	Completely absent or very low level of development of the component.
3-4 points	Low level of development of the component that requires significant improvement.
5-6 points	The average level of development of the component, there is potential for improvement.
7-8 points	High level of development of the component, with minor shortcomings.
9-10 points	The highest possible level of development of the component that does not require significant improvements.

Source: developed by author

Section 6 (analysis of the enterprise's external environment) has a separate scale, which is assessed by qualitative and analytical methods.

The developed questionnaire allows for a comprehensive assessment of the company's innovation potential based on various criteria, which is important for determining development strategies and innovation improvement. The score on a scale from 1 to 10 provides a clear picture of the current state of each component, which allows identifying both the strengths and weaknesses of the enterprise. In addition, the survey helps to increase the involvement of employees and stakeholders in the process of innovation development, which is important for creating a culture of innovation and supporting continuous improvement in the enterprise.

### 3.3 Development of strategic tools for managing and scaling the innovation potential of LLC «TEKHNOKHIM»

Taking into consideration the need for integrated management and scaling of the innovation potential of LLC 'TEKHNOKHIM', the enterprise should implement a set of strategic tools covering the financial component, production and technological base, scientific and technical, human resources, organisational and managerial components, environmental environment and marketing. It is recommended to pay special attention to the introduction of green technologies that will help improve the efficiency and competitiveness of the enterprise, as well as ensure the achievement of sustainable development goals within the enterprise. In addition, as part of the development of strategic instruments, it is proposed to pay attention to the development of detailed financial plans for attracting investments, modernisation of production processes with a focus on achieving sustainable development goals, constant investment in R&D, development of the human resource component through training and motivation programmes, introduction of modern management systems and automation of business processes, as well as creation of an effective marketing strategy for promoting innovations to the market.

Dwelling on each component in turn, it is important to note that financial support is the basis for the implementation of innovation projects. To improve the financial position of LLC «TEKHNOKHIM», it is recommended to develop strategies for attracting investments and optimising costs. An important step is to develop a comprehensive financial plan that would provide for a gradual growth in sales volumes through the introduction of new technologies and products. In addition, it is proposed to diversify sources of funding by attracting investments through partnerships with other enterprises, government grants, venture capital funds and bank loans on favourable terms. The development of comprehensive business plans for innovation projects that demonstrate potential profitability and reduce investor risks can be considered as a tool for attracting investors.

One of the tools to improve the financial component may be cost optimisation, which is achieved by implementing effective financial management systems that will allow for more efficient use of the company's resources. It is equally important to audit existing costs to identify and eliminate inefficient cost items. Cost optimisation can involve reducing energy consumption through the introduction of green technologies, improving logistics processes and implementing modern inventory management methods.

In particular, as part of the strategy for enhancing the company's innovation potential, it is advised to introduce tools for developing financial capabilities. This implies investing in the training of financial specialists, upgrading their qualifications and engaging experienced financial advisors. This will enable the company to manage its financial flows more efficiently and make informed decisions on investments and expenditures.

As for the strategy for the development of the production and technological component, it is recommended that LLC «TEKHNOKHIM» invest in the modernisation of production facilities, including the automation of production processes and the introduction of modern equipment. The implementation of green technologies is an important aspect of the strategy. The introduction of energy management systems will help optimise the use of energy resources, which will also contribute to cost savings. In addition, the company should develop and implement

effective systems for the disposal of production waste, which will enable it to reduce its environmental footprint and improve its environmental image and overall ability to compete in the market.

To ensure the innovation developments of LLC «TEKHNOKHIM» are successfully implemented, a detailed modernisation plan should be developed, including an assessment of the current state of production facilities, identification of priority areas for modernisation, calculation of the required investments and development of a roll-out schedule. It is also important to provide for regular monitoring and evaluation of the effectiveness of the implemented measures to adjust the strategy in a timely manner. In addition, it is advisable to create an innovation development department at the enterprise that will research the latest technologies and implement them in the production process. This will allow LLC «TEKHNOKHIM» to remain at the forefront of technological progress and quickly adapt to changes in the market.

It is also recommended to integrate the principles of the circular economy, which involves the reuse of resources and waste minimisation. This will not only improve the company's environmental performance, but also reduce dependence on external resources, which will increase the company's stability in the face of market fluctuations.

For effective personnel management in the conditions of innovation development of LLC “TEKHNOKHIM” it is necessary to apply an integrated approach. Development of employee training programs should consider the specifics of production processes and new technological trends. Extensive involvement of professionals from different fields is an important component of the HR strategy. Creating attractive working conditions, such as competitive salaries, social guarantees, possibility of professional growth and engagement in promising projects, is a strategic tool for attracting skilled talent. Cooperation with professional associations and educational institutions to organize internships and apprenticeships is an opportunity to find the necessary personnel and encourage young and promising employees of the industry to collaborate in the future.



Besides, it is recommended to deploy modern personnel management systems that allow to effectively supervise performance results, analyze training and development needs, and assess the contribution of each employee to the overall success of the company. One important component is the possibility of employee rotation and mobility, which will be implemented through the creation of rotation programs that allow employees to gain work experience in different divisions of the company and provide support for professional mobility to quickly adapt to changing market conditions. It is also recommended to introduce innovation labs and internal startups, which includes creating internal innovation labs to test new ideas and technologies, as well as supporting internal startups with resources and mentoring support to implement employee innovation projects.

In view of the successful implementation of innovations, it is pivotal to develop an innovation marketing strategy that will ensure the promotion of new products and technologies on the market. The enterprise is recommended to regularly analyze the market, which will allow it to respond to changes in a timely manner and adapt its products to the requirements of consumers. It is likewise key to expand marketing channels, including cooperating with international partners and participating in industry exhibitions and conferences. The utilization of digital technologies in marketing will improve the efficiency of communications with customers and increase product sales. An essential recommendation is the establishment of a website containing extensive information about the company's activities, the range of products, the scope of services, etc. An integral approach to marketing activities will ensure the successful promotion of innovation products and technologies on the market, increase the effectiveness of communications with customers and assist in increasing product sales.

## CONCLUSIONS

The development of the innovation potential of industrial enterprises is not only a catalyst for their competitiveness, but also a strategic factor that contributes to the transformation of the economic landscape. Innovation potential not only enables the introduction of innovation technologies and products, but is also an important component of an organization's ability to adapt to constantly changing market conditions and social context. It encourages the elaboration of new management strategies, including innovation approaches to production processes, marketing, and human resources management.

Complexity of assessing and measuring innovation potential lies in its complexity and interaction with various aspects of the enterprise. It encompasses not only technological aspects, but also financial capabilities, the current level of research and development, organizational and managerial potential, and other elements. Through analyzing its potential, an enterprise is able not only to better grasp its existing capabilities, but also to forecast and formulate development strategies to improve its competitiveness and strengthen its market position.

It is important to keep in mind that in today's environment, innovation potential is a dynamic phenomenon that changes over time and responds to changes in the external and internal environment. Therefore, constant monitoring and direct management of innovation potential requires continuous improvement and adaptation of management strategies in accordance with the qualitative and quantitative changes in each factor that affects it. It is important to avoid the risk of underestimating the importance of each component of the enterprise's innovation potential, since it is the comprehensive development and improvement of all elements of the system that can lead to positive dynamics, effective management and, accordingly, economic and innovation growth.

The practical analysis of the innovation potential of LLC «TEKHNOKHIM» revealed that the company has significant potential for further development, but demands a systematic approach to managing both financial and human resources, accounting for current trends and challenges of the market and geopolitical context.

Such an approach will ensure the long-term stability and competitiveness of the enterprise, facilitate its sustainable development and economic growth in a dynamic market economy. Among other things, financial resource management involves the reasonable allocation of investments and financial resources to implement innovation ideas and projects, with due regard for current market trends and financial needs. Implementation of strategic financial planning and analysis ensures the stability of financial flows and mitigates risks.

Human resource management requires the development of effective programs for recruiting, developing and retaining qualified personnel. It involves the implementation of modern systems of personnel assessment and motivation, creation of conditions for training and development of employees, as well as development of rotation and personnel planning strategies. A comprehensive approach will enable the company to maximize its innovation potential and achieve sustainable competitiveness in the dynamic environment of the contemporary market.

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