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**FORMATION OF THE SYSTEM OF PLANNING OF INNOVATION ACTIVITY AT ENTERPRISES**

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**ФОРМУВАННЯ СИСТЕМИ ПЛАНУВАННЯ ІННОВАЦІЙНОЇ ДІЯЛЬНОСТІ НА ПІДПРИЄМСТВАХ**
The article generalises and deepens theoretical aspects of formation of the system of planning of innovation activity at enterprises. It generalises problems and peculiarities of planning of innovation activity at the enterprise. It is shown that the system of planning innovation activity at the enterprise is intended to ensure the choice of directions of strategic and technological innovation development, setting and adjusting the goals of innovation activity, choosing mechanisms and specific ways to achieve them, developing and implementing strategies, programmes for achieving goals and allocating resources. In order to effectively manage the innovation activity of an enterprise, a model of the system of planning the innovation activity of an enterprise has been proposed. In order to achieve the planned results, the expediency of allocating an innovation component in the strategic vision of the enterprise, which reflects the results of the enterprise's activities necessary to ensure compliance with the current and projected requirements of stakeholders, has been substantiated. The stages of stakeholder requirements analysis in an enterprise are generalised. An algorithm for assessing the technological level of the enterprise has been formed. The stages of search and selection of options for achieving the goal of innovation activity of the enterprise in the system of its planning are characterised, namely: identification of options for achieving the goal of innovation activity and description of scenarios of their implementation; comparison and selection of the most promising options for achieving the goal of innovation activity.

In order to implement the strategy of innovation activity at an enterprise, it is advisable to detail its implementation in the form of a set of interdependent programmes and plans. Therefore, it is proposed to use an enterprise's innovation activity programme, which is a set of scientific, technical, organisational, managerial, financial and economic measures and projects coordinated in terms of resources, timing and executors that ensure achievement of the goals of this activity, as well as a set of programmes and plans for individual innovation projects, as mechanisms for implementing the strategy. The author proposes a number of measures to be taken when formulating a plan and programme for the development of
У статті узагальнено та поглиблено теоретичні аспекти формування системи планування інноваційної діяльності на підприємствах. Узагальнено проблеми та особливості планування інноваційної діяльності на підприємстві. Доведено, що система планування інноваційної діяльності на підприємстві призначена для забезпечення вибору напрямів стратегічного та технологічного інноваційного розвитку, постановки та коригування цілей інноваційної діяльності, вибору механізмів та конкретних способів її досягнення, розробки та реалізації стратегії, програм досягнення цілей і розподілу ресурсів. З метою ефективного управління інноваційною діяльністю на підприємстві запропоновано модель системи планування інноваційної діяльності підприємства. Для досягнення запланованих результатів обґрунтовано доцільність виділення інноваційної складової у стратегічному баченні підприємства, яке відображає результати діяльності підприємства, необхідні для забезпечення відповідності поточним та прогнозованим вимогам заінтересованих сторін. Узагальнено етапи аналізу вимог заінтересованих сторін на підприємстві. Сформовано алгоритм оцінки технологічного рівня підприємства. Охарактеризовано стадії пошуку та вибору варіантів досягнення мети інноваційної діяльності підприємства у системі її планування, а саме: ідентифікація варіантів досягнення мети інноваційної діяльності та опис сценаріїв їх реалізації; порівняння та відбір найбільш перспективних варіантів досягнення мети інноваційної діяльності; вибір критеріїв та відбір найбільш ефективних варіантів досягнення цілей інноваційної діяльності для формування інноваційного портфеля. З метою реалізації стратегії інноваційної діяльності на підприємстві її здійснення доцільно деталізувати у вигляді сукупності взаємозалежних програм та планів. Тому запропоновано в якості механізмів реалізації стратегії застосовувати на підприємстві програму інноваційної діяльності, що є сукупністю науково-технічних, організаційно-управлінських
Formulation of the problem in general terms and its connection with important scientific or practical tasks. Forecasting and planning of an enterprise's innovation activity are important elements of effective management of its innovation development. Today, forecasting methods are sufficiently developed and covered in the scientific literature, while methods of planning the long-term development of enterprises with due regard for the implementation of innovations in them need to be improved.

Analysis of recent research and publications. The problems of planning innovation activities at enterprises are the subject of scientific works of many domestic and foreign economists. Thus, O. Nedbaliuk, V. Urbanovych [1] and D. Simonenko [2] considered the problems of planning and organisation of innovation activities of enterprises. S. Breus and L. Shatnenko [3] studied the theoretical and methodological aspects of strategic planning of innovative development of an enterprise. I. Goncharenko and Xu Jingyu [4] presented the basic principles of planning innovation activities, described the main plans for innovation activities of industrial enterprises and identified the prerequisites for the effectiveness of their implementation. E. Didenko and A. Andrushko [5] defined the basic features of strategic planning of innovative development of an enterprise, presented a scheme
of the process of strategic planning of innovative development of an enterprise, revealed the features of its main stages, which are carried out in a certain sequence and allow to achieve key economic results. P. Khariv, O. Boyko, M. Oleksiyiv studied the planning of innovative development of industrial enterprises in conditions of uncertainty [6]. O. Kravchenko and A. Kichygin identified the prerequisites of innovation planning in modern conditions [7]. The treatise of A. Thompson and J. Strickland [8] examines the nutrition of strategic management and systems planning.

At the same time, it is advisable to generalise and deepen the theoretical aspects of formation of the system of planning of innovation activities at enterprises.

**Formulation of objectives of the article (statement of task).** The aim of the research is to generalise and deepen the theoretical aspects of formation of the system of planning innovation activity at enterprises.

**Presentation of the main research material.** Innovative transformations should ensure that the requirements of stakeholders are met, which determines the need to form a system of planning innovation activities of an enterprise.

O. Nedbaliuk and V. Urbanovych note that the problems of planning innovation activities at the enterprise are: introduction of new rules of corporate governance, insufficient attention of managers to innovative development of enterprises, savings on indirect costs that do not allow to develop innovations [1, p. 314]. D. Simonenko considers the problem of planning and organisation of innovation activity of enterprises as the problem of choosing a certain type of innovation strategy, which is most acute for large commodity producers with a high scientific and technical potential and a satisfactorily formed production base [2, p. 193].

S. Breus and L. Shatnenko point out possible problems that hinder the development of the enterprise during the implementation of the goals of the strategic plan [3, p. 293].

When planning innovation activities, the basic principles of this process should be followed. I. Goncharenko and Xu Yingyu [4, p. 71] define the main principles of
innovation planning as: the principle of scientific validity of innovations and optimality of planned decisions; the principle of ensuring the prospective character (dominance of strategic aspects); the principle of programme-target; the principle of complexity of planning; the principle of continuity; the principle of flexibility and elasticity; the principle of complexity; orientation to market needs; provision of information.

The main conditions for effective strategic planning of innovative development of an enterprise are: complex nature of innovations necessary to ensure sustainable development of an enterprise; diversity of goals of the innovation process and close connection between the set of tasks of innovation activity and strategic goals of an enterprise; multivariate selection of innovations; long-term nature of results of innovation activity [5].

When planning the innovative development of enterprises in conditions of uncertainty, a number of features of planning innovative development should be taken into account: dependence on the stages of the enterprise life cycle; innovative development determines all other directions of enterprise development; consideration of external and internal factors of innovative development; focusing on the experience of innovatively active advanced enterprises; covering all aspects of the enterprise; focusing on the development and mastery of new products, improvement of their quality, implementation of new technologies.

O. Kravchenko and A. Kychyhin [7] note that the planning of innovation activity of an enterprise should be carried out in the context of four basic types of management activities, namely resource allocation, adaptation to the external environment, internal coordination and strategic organisational foresight.

In our opinion, the system of innovation activity planning in an enterprise should ensure the selection of directions of strategic and technological innovation development, the setting and adjustment of innovation activity goals, the selection of mechanisms and specific ways to achieve them, the development and implementation of strategies, programmes for achieving goals, and the allocation of resources (Fig. 1).
Fig. 1. Model of the enterprise innovation activity planning system

Source: Systematised, generalised and grouped according to [8-11].
The planning of innovation activities in an enterprise should be carried out using modern approaches to planning the long-term development of enterprises on the basis of innovations, which are consistent with the provisions of the classical theory of strategic management and provide for the formation of a strategic vision of enterprises [8; 9].

In the strategic vision of the enterprise it is advisable to allocate an innovative component, which contains a system of views on its future state, which can be ensured only as a result of implementation of innovative transformations in the enterprise.

The strategic vision reflects the results of the enterprise's activities necessary to ensure compliance with the current and planned requirements of stakeholders. In this case, the formation of the innovation component of the enterprise's strategic vision should be based on information about the requirements of stakeholders, forecasts of changes and analysis of the external and internal environment, and the results of the assessment of the enterprise's technological level.

The analysis of stakeholder requirements in an enterprise involves certain stages (Fig. 2).

**Fig. 2. Stages of analysing stakeholder requirements at an enterprise**

Source: systematised, generalised and grouped according to [8; 9].

Common tools for stakeholder engagement that are currently used at most enterprises include: classifications (checklists, ratings, stakeholder cards); graphical representations of interests, stakeholder positions on the company's goals and methods of their implementation; international standards confirming that stakeholder interests are
taken into account in the company's activities based on an independent assessment conducted by a third party (certification body); and brainstorming methods.

The assessment of the technological level of the enterprise is based on its comparison with similar companies and the level of scientific and technological development. The procedure for assessing the technological level of an enterprise should be carried out in accordance with the following algorithm [10]: 1) planning the assessment of the technological level; 2) searching and registering data for the assessment of the technological level of the enterprise; 3) analysing information; 4) comparing the technological level of the enterprise with the relevant parameters of the assessment subjects (Table 1).

**Table 1. Algorithm for assessing the technological level of an enterprise**

<table>
<thead>
<tr>
<th>Assessment stage</th>
<th>Stage description</th>
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<tbody>
<tr>
<td>Planning of the technological level assessment</td>
<td>It consists in defining the requirements for the assessment, describing the stages and relevant work, sources and methods of data acquisition, information exchange, etc. The procedure for assessing the technological level of an enterprise involves: selecting the objects of assessment – essential parameters and characteristics that reflect the current state of the enterprise for further comparison with the subjects of assessment; selecting the subjects of assessment – comparison companies and determining the requirements for them; identifying and analysing the parameters and characteristics (technological, organisational, managerial, marketing) of processes, products, research and development areas specific to the subjects of assessment and the objects identified by the enterprise</td>
</tr>
<tr>
<td>Search and registration of data for the assessment of the technological level of the enterprise</td>
<td>It involves: assessing the need for data and information for the assessment; selection of sources, methods and tools for collecting data and information; collection and processing of data and information about the subjects of the assessment by indicators, processes, areas of research and development, technologies, essential parameters and benefits provided by the technology (scientific, technical, commercial, social, environmental, etc.); interpretation and transformation of the data obtained into information for assessing the technological level of the enterprise</td>
</tr>
<tr>
<td>Conducting information analysis</td>
<td>It includes: process benchmarking – identification of the most efficient production and business processes specific to the subjects of the assessment; benchmarking of indicators – comparison and identification of the best indicators of the relevant subjects of the assessment; technology benchmarking – identification of the best technologies, their indicators and advantages for the subjects of the assessment.</td>
</tr>
<tr>
<td>Comparison of the technological level of the enterprise with the relevant parameters of the subjects of the assessment</td>
<td>It means comparing the technological level of the enterprise for the selected objects with the relevant parameters and characteristics of the valuation subjects</td>
</tr>
</tbody>
</table>

*Source: compiled based on [10].*
Based on the results of the assessment, a list of technological capabilities of the enterprise should be formed, containing information on existing technologies that can be used to implement innovative changes in the enterprise, which is used to identify and select options for achieving goals and developing a strategy for innovation. It is suggested to create the list taking into account the ranking of technologies identified during the technological level assessment according to the classification reflecting the attractiveness of technologies as investment objects depending on the stage of their life cycle: new, advanced, key, basic and obsolete technologies.

Since the peculiarity of the country's innovative development is the need to comprehensively address the tasks of eliminating the “technological gap”, making a “technological breakthrough” and forming competitive advantages for further development, it is advisable to distinguish the following in the innovation component of the company's strategic vision: 1) the basic scenario – reflects the parameters and characteristics describing the state and results of the company's activities, ensuring compliance with the requirements of stakeholders, adaptation to changes and use of opportunities in the company's external environment in the short and medium term. 2) the perspective scenario – reflects the parameters and indicators describing the state and results of the company's activities that meet the projected requirements of stakeholders and take into account adaptation to changes and use of opportunities.

The transformation of the innovation aspect of the strategic vision of enterprises into the goals of innovation activity should be carried out by consistently comparing the relevant parameters and characteristics of their current state (indicators of quality, safety, efficiency, environmental friendliness, energy efficiency, management efficiency, etc.) with the baseline and perspective scenarios with the identification of a gap between them, using GAP analysis, which forms the basis for
choosing the directions of strategic and technological innovation development of the enterprise and setting the goals of innovation.

The direction of strategic and technological development of an enterprise is a specific type of activity of the enterprise, which characterises any area of the identified gap, the improvement or development of which will ensure compliance with the parameters of the basic and perspective scenario of the strategic vision of the enterprise. It is advisable to set the goals of the enterprise's innovation activity taking into account the management model based on the results of the SMART model (according to P. Drucker) [10; 11].

The requirements for the formation of goals of innovation activity in accordance with the proposed SMART model are as follows:

- specificity (correspondence of the goal to the expected result from its implementation; clarity and unambiguity of interpretation; implementation of the requirements of stakeholders, peculiarities of the technological level of the enterprise, combination of catching-up and advanced development mechanisms in the goal of innovation activity);

- measurability (availability of an efficiency indicator set in % or absolute values in relation to the benchmark, to the current state of the enterprise);

- consistency (consistency of innovation activity goals: with the strategic goals of the enterprise; with each other and with the investment, technical, procurement, asset management policies of the enterprise, etc.; in terms of the timing of implementation of innovation activity goals; with the executors responsible for their achievement);

- simultaneity of achievement (possibility of simultaneous achievement of the innovation activity goals while realising the planned efficiency from the implementation of each of them);

- synergy of objectives (the possibility of using the results of achieving one objective of innovation activity to achieve others);

- achievability (compliance with the enterprise's capabilities: the enterprise's innovation policy; available financial and other resources; the level of development
of the enterprise's innovation potential; availability of relevant measures and innovation projects in the strategy and programme of the enterprise's innovation activity);

- time certainty (availability of a starting time and a clearly defined duration of the period for achieving the objectives of the enterprise's innovation activity).

Taking into account the need to implement the basic and perspective scenarios of the enterprise's strategic vision, it is advisable to allocate the following goals of innovation activity:

1) goals of performance improvement – goals, the implementation of which will ensure compliance with the enterprise's performance requirements, overcome the gap with the level of technologically developed countries and ensure compliance with the world level of technological development;

2) innovative development goals – goals, the implementation of which will ensure compliance with the projected requirements of stakeholders, technological breakthroughs and the creation of long-term competitive advantages in the future.

The identification of the areas of R&D in enterprises should be carried out on the basis of the determination of their key competences – current and necessary in the future activities of the enterprise that ensure the fulfilment of the requirements of stakeholders and provide for the concentration and development of resources in these areas [10; 11].

The core competence model, which is widely used and forms the basis of the enterprise development strategy, is based on strengths. According to this approach, competitiveness in the long term is determined by the ability of an enterprise to form and develop key competences, which are a specific combination of resources and technologies, create the basis for a sustainable competitive advantage in the long term, supported by the availability of specific experience, skills, knowledge, know-how and resources.

Implementation of innovative changes requires identification of specific technologies that can be used to achieve the goals of the enterprise's innovation activities, taking into account the available resources and the level of development of
its innovation potential. In order to reduce uncertainty and risk, it is proposed to plan innovation activities using a situational approach based on the alternative of achieving the same goal [10]. At the same time, the task of searching and selecting options for achieving the goal of innovation activity involves: identification of options for achieving the goal of innovation activity and description of scenarios for their implementation; comparison and selection of the most promising options for achieving the goal of innovation activity; selection of criteria and selection of the most effective options for achieving the goals of innovation activity for the formation of an innovation portfolio (Table 2).

Table 2. Stages of search and selection of options for achieving the goal of innovation activity

<table>
<thead>
<tr>
<th>Stages of search and selection of options</th>
<th>Methods and ways</th>
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<tbody>
<tr>
<td>Identification of options for achieving the innovation goal and description of scenarios for their implementation</td>
<td>Identification of specific technologies that are necessary to achieve the goal of innovation activity, their assessment as an investment object in terms of long-term competitive advantage; identification or selection of mechanisms for obtaining technologies, including technology transfer and (or) initiation, participation of the enterprise in R&amp;D, including those that improve technologies purchased on the market; identification of risks associated with the implementation of various options for achieving the goal of innovation activity; formation of risk-cost-benefit scenarios, which</td>
</tr>
<tr>
<td>Comparison and selection of the most promising options for achieving the innovation goal</td>
<td>Implemented using existing economic methods and models for assessing the effectiveness of investment projects, including those used by enterprises to evaluate investment projects</td>
</tr>
<tr>
<td>Selection of criteria and selection of the most effective options for achieving the goals of innovation activity to form an innovation portfolio</td>
<td>Implemented using special portfolio management methods aimed at minimising the risk of portfolio implementation and allowing to consider all projects in its composition in aggregate</td>
</tr>
</tbody>
</table>

Source: author's compilation based on [10; 11].

Achievement of the goals of innovation activity, comprehensive solution of the tasks of modernisation and innovative development of an enterprise should be ensured on the basis of formation of the innovation activity strategy – a long-term plan for achieving goals, which is carried out using the method of problem-oriented roadmaps [12]. It is proposed to focus the roadmap on fulfilling the requirements of
stakeholders, while reflecting the relationship of these requirements with the goals of innovation, mechanisms and means of achieving them, and the necessary resources.

The strategy of innovation activity, which covers large stages of achievement of the relevant goals in the short, medium and long term, for effective implementation requires detailing in the form of a set of interdependent programmes and plans for the implementation of innovation activity at the enterprise. Therefore, as mechanisms for its implementation, it is proposed to use an enterprise innovation programme, which is a set of scientific, technical, organisational, managerial, financial and economic measures and projects coordinated in terms of resources, timing and executors that ensure the achievement of the goals of this activity, as well as a set of programmes and plans for individual innovation projects.

It is also proposed that enterprises formulate a plan and programme for the development of innovation potential, taking into account the problems identified and hindering their development, which includes the following measures:

- improvement of processes and methods of strategic management of innovation activities;
- formation of an organisational structure for managing innovation activities;
- information support of innovation activities and development of the technological monitoring system;
- formation and improvement of the regulatory and methodological framework of innovation activity;
- development of the management system and knowledge bases at the enterprise;
- training and professional development of personnel in the field of innovation management;
- improvement of infrastructure and development of information technologies;
- formation of technology transfer networks within and outside the enterprise.

Effective management of innovation activities at an enterprise to achieve the planned results requires the creation of special management and planning systems that support the implementation of the goals and strategy of innovation activities.
Conclusions and perspectives for further research in this area. Planning of innovation activities for the benefit of improvement and development of enterprises should be considered from the point of view of inclusion of the innovation component in the processes of their strategic management and development, taking into account the requirements and interests of stakeholders, forecasts, status and changes in the business environment of enterprises.

Establishment of special innovation planning systems in enterprises will, in practice, allow to formulate the policy, goals and strategy of innovation activities of the enterprise, ensuring its planned strategic and technological innovation development and performance improvement in accordance with the requirements of stakeholders.

The implementation of the policy, goals and strategy of innovation activities in the enterprise requires the creation of special management and planning systems, which make it possible to adapt the existing management and planning systems of the enterprise to new, previously uncharacteristic tasks and to integrate innovation activities into them.

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