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ARCHITECTURE OF THE INNOVATIVE POTENTIAL OF ECONOMIC SYSTEMS

The article examines the theoretical and methodological foundations of shaping the architectonics of the innovation potential of economic systems. It is emphasized that under the conditions of global competition, digital transformation, and societal challenges (including war and post-war recovery), innovation potential becomes the key determinant of the resilience and competitiveness of the national economy. The research is based on a systemic approach that integrates the analysis of resource, organizational, institutional, and social components, forming a holistic model of innovation capacity. The paper generalizes contemporary scientific approaches to innovation development: the concepts of national and regional innovation systems (B.-Å. Lundvall, Ch. Edquist), the open innovation paradigm (H. Chesbrough), mission-oriented innovation policy (M. Mazzucato), as well as institutional models of innovation environments (quadruple/quintuple helix). Particular attention is paid to the classification features of innovation potential, which make it possible to systematize its structural elements and establish interconnections at different levels of the economic hierarchy – from the enterprise to the national economy. The authors justify the use of the notion of «architectonics» as a comprehensive category that reflects the systemic nature, structured composition, and functional integration of innovation potential. The study identifies the key components of architectonics: resource-technological, human-capital and competence-based, organizational-institutional, and socio-communicative. It is demonstrated that their balanced combination ensures the adaptability of economic systems, the generation of new knowledge, and the commercialization of innovations. The practical significance of the results lies in developing a scientific and methodological basis for diagnosing and assessing innovation potential, as well as for designing effective strategies of innovation-driven development in a transformational economy. The proposed approach may be applied in the elaboration of national innovation policy, regional development strategies, and in corporate governance practices.

Key words: innovation potential, architectonics, economic systems, classification, innovation systems, open innovation, innovation-driven development.

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АРХІТЕКТОНІКА ІННОВАЦІЙНОГО ПОТЕНЦІАЛУ ЕКОНОМІЧНИХ СИСТЕМ

У статті розглядаються теоретико-методологічні засади формування архітектоніки інноваційного потенціалу економічних систем. Підкреслюється, що в умовах глобальної конкуренції, цифрової трансформації та суспільних викликів (зокрема, пов'язаних із війною та відбудовою) інноваційний потенціал стає визначальним чинником забезпечення стійкості й конкурентоспроможності національної економіки. Дослідження ґрунтується на системному підході, який поєднує аналіз ресурсних, організаційних, інституційних і соціальних складових, що формують цілісну модель інноваційного потенціалу. Здійснено узагальнення сучасних наукових підходів до розуміння інноваційного розвитку: концепцій національних і регіональних інноваційних систем (B.-Å. Lundvall, Ch. Edquist), парадигми відкритих інновацій (H. Chesbrough), місеорієнтованої політики (M. Mazzucato), а також інституційних моделей розвитку інноваційного середовища (quadruple/quintuple helix). Особливу увагу приділено класифікаційним ознакам інноваційного потенціалу, що дозволяють систематизувати його структурні елементи та встановити їх взаємозв'язки на різних рівнях економічної ієрархії – від підприємства до національної економіки. Автори обґрунтовують необхідність використання поняття «архітектоніка» як узагальнюючої категорії, що відображає системність, структурованість та функціональну інтеграцію інноваційного потенціалу. У роботі виділено ключові компоненти архітектоніки: ресурсно-технологічний, кадрово-компетентнісний, організаційно-інституційний та соціально-комунікаційний. Показано, що їх гармонійне поєднання забезпечує здатність економічних систем до адаптації, генерації нових знань і комерціалізації інновацій. Практичне значення отриманих результатів полягає у створенні науково-методичного підґрунтя для діагностики та оцінювання інноваційного потенціалу, а також для формування ефективних стратегій інноваційного розвитку в умовах трансформаційної економіки. Запропонований підхід може бути використаний при розробці державної інноваційної політики, стратегій регіонального розвитку, а також у практиці корпоративного управління.

Ключові слова: інноваційний потенціал, архітектоніка, економічні системи, класифікація, інноваційні системи, відкриті інновації, інноваційний розвиток.

Formulation of the problem. Modern economic systems operate in conditions of constant transformation caused by the challenges of globalisation, digitalisation and increased competition in world markets. In such conditions, the decisive factor for their stability and development is their innovative potential, which integrates a set of resources, competencies and management mechanisms aimed at creating and implementing innovations. Despite a significant number of scientific works exploring individual aspects of innovative potential, the issue of its architectonics as a systemic formation combining structural components, functional links and classification approaches remains insufficiently studied. Existing concepts are mostly fragmentary and do not take into account the interdependence of economic, organisational, technological and social components. This complicates the formation of a comprehensive scientific and methodological basis for assessing and developing innovation potential at various levels, from individual enterprises to the national economy. Thus, an urgent task is to conduct an in-depth study of the structure and classification characteristics of innovative potential, taking into account its architectonics, which will allow expanding scientific understanding and creating more effective mechanisms for managing the innovative development of economic systems

Analysis of recent achievements and publications.

The issue of the innovative potential of economic systems is widely covered in the works of foreign and domestic scholars. For example, B.-Å. Lundvall (1992) and Ch. Edquist (2005) developed the concept of national and regional innovation systems, which defines the interaction of institutions and organisations in shaping innovation potential. H. Chesbrough's (2003) research has actualised the paradigm of open innovation, which emphasises the importance of external sources of knowledge and inter-organisational links. A significant contribution was made by M. Mazzucato (2018), who developed a mission-oriented approach to innovation policy. Among Ukrainian scholars, it is worth noting the works of O. Amosha, V. Heyets and L. Fedulova, who analyse the peculiarities of the formation of innovative potential in the national economy.

The purpose of the article is to substantiate the architectonics of the innovative potential of economic systems by defining its structural components, systemic interrelationships and classification features, which will allow forming a comprehensive conceptual framework for assessing, developing and effectively managing innovative potential at various levels of the economy.

Presentation of the main material. Innovative potential consists of the following elements: resource, scientific, financial, market, information, production

and technical, entrepreneurial, and transformational. The maximum realisation of innovative potential occurs at the intersection of its elements. By interacting with each other, the elements of innovative potential form a synergistic effect [3].

Table 1. shows the content of the elements of innovative potential.

Table 1

Content of the elements of innovative potential

Element	Content
Resource	Reflects the totality of labour and natural resources
Scientific	Shows the availability and quality of fundamental and applied scientific research
Financial	Reflects the availability of financial and investment resources
Market	Reflects the consumer capacity of the market Information
Information	Reflects the level of informatisation, methods and technologies for using information resources
Entrepreneurial	Reflects the possibility of achieving entrepreneurial goals (profit, market share increase, revenue, implemented innovations)
Production and technical	Reflects the production and technical capabilities of the economic system
Transformational	Reflects the effectiveness of transformational processes in the context of innovative activity

The author introduces the concept of the transformational potential of the innovative potential of an economic system, which is understood as the ability to transform effectively within a changing internal and external environment. In our opinion, the quality of the innovation process depends precisely on the system's ability to transform while maintaining stability. Thus, the effectiveness of innovation as an economic system depends on the magnitude of the innovation potential and on how ready the system is to transform [5].

Figure 1 presents a model of the process of forming the potential of an innovative economic system, including at the level of the regional economic system.

The transformational potential of innovative potential is determined by innovative receptivity and innovative capacity.

At the same time, the dynamics of innovative potential are formed within the framework of the process of rejection or acceptance of innovations. Rejection of innovations means a lack of interest in the development of innovative processes, while acceptance of innovations means an interest in the development of innovative processes [4].

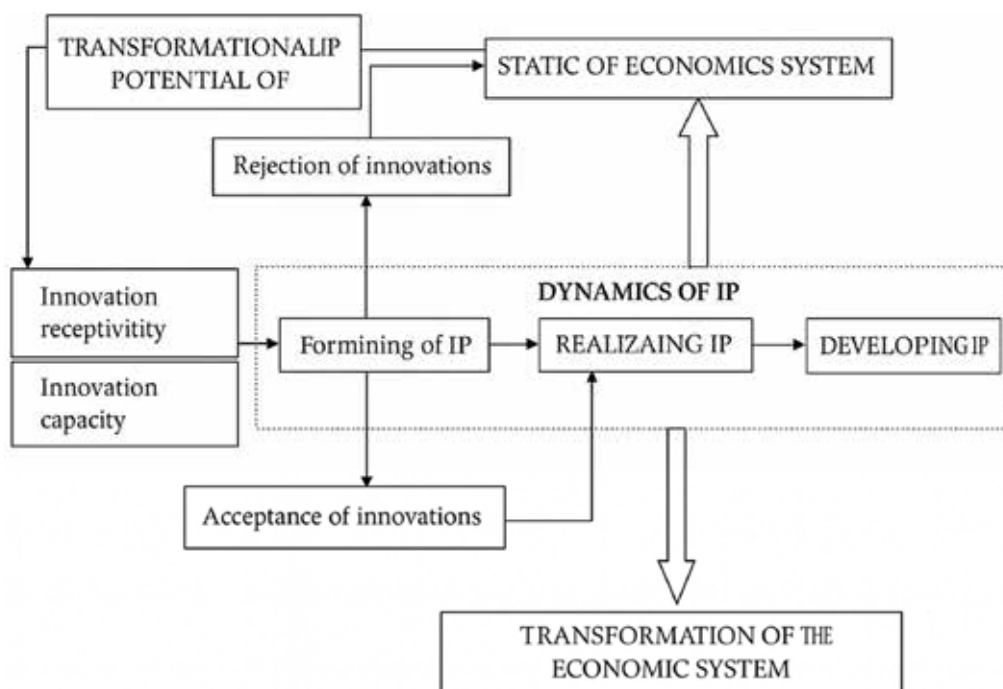


Figure 1. Model of the process of forming the potential of the economic system

Internal and external factors have a significant impact on the effectiveness of the process of forming and developing innovative potential. External factors are represented by the institutional influence of various systems (macro- and meso-level) on innovative processes. These include government policy in the field of innovation development (financial, legal, social, and infrastructural aspects). The authors separately highlight the meso level (regional level) as an important factor in the formation of the economic system's potential. Internal factors are determined by the content of the scientific and technological base, human capital, and the quality of the organisation's scientific and innovation policy.

Based on the development of the analysed approaches, the author has developed a structure of innovation potential (Figure 2).

It should be noted that this model is also relevant in the context of the formation of the innovative potential of a region, which determines the potential of RIS. We will use the subject-object and structural-institutional approaches.

Let us consider in detail the subjects of the innovation process with an indication of their functions. The main subjects of the innovation process include:

- innovators, legal entities (small innovative enterprises, R&D structures in universities or scientific organisations, engineering and manufacturing companies) or individuals engaged in the search for innovations and technology transfer;

- innovators, organisations that implement innovations in the business environment;

- financial intermediaries, organisations that carry out investment activities within the framework of innovation activities. These include the banking sector, venture capital funds, and government structures.

Thus, we identify a complex multi-level system within a unified goal-setting system aimed at the development, implementation, and promotion of innovative products, with the speed and quality of the innovation process determined by the development of innovation potential.

The objects of innovative potential include products and services (new knowledge, patents, licences, equipment, management processes, innovative projects) that are implemented in economic systems within the framework of the system of interactions between subjects of innovative activity.

Within the framework of the author's approach, the innovative potential of an economic system is a set of connections between four elements: systemic, innovative culture, resource and result.

1. Systemic element

The state. An extremely important element in the development of innovative activity, although it should be noted that state regulation and state support are extremely important for developing economies that are only just beginning to form an innovative infrastructure.

The authors determine that the development of RIS should be a strategic imperative for regional authorities.

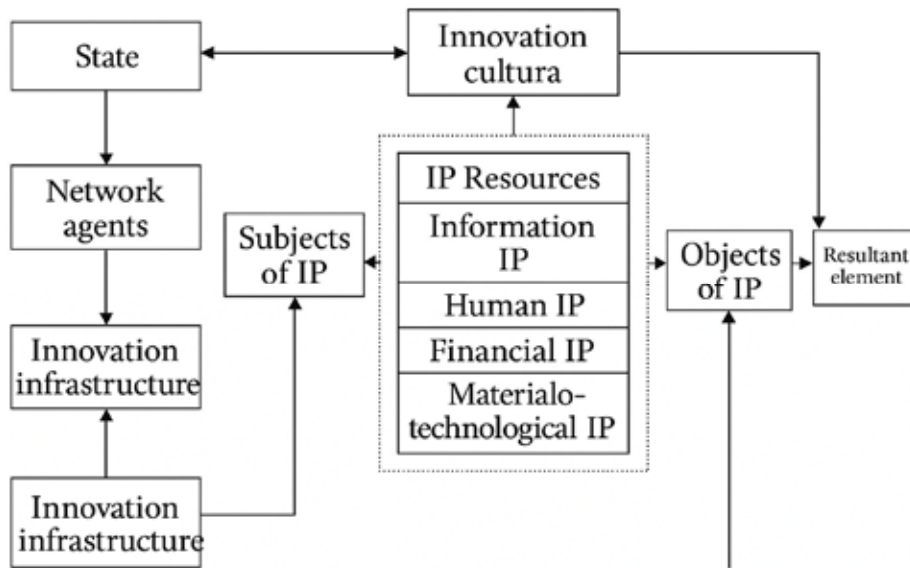


Figure 2. Conceptual model of the innovative potential of the economic system

Target indicators of RIS effectiveness, assessment of potential and development of a RIS development roadmap, as well as the appointment of responsible structures, are a necessary mechanism for the functioning of the region's socio-economic system.

Network agents. The modern economic model is a network economy of a post-industrial society, characterised by a network order based on collective self-government, the widespread use of information technologies, and a collective approach adaptation of entities to changes in the environment, a high level of uncertainty and a hypercompetitive environment. These characteristics of the network structure of the economy lead to a high level of uncertainty and the formation of a hypercompetitive environment.

Thus, we are witnessing the transition of the innovation economy from a hierarchical structure to a network model, characterised by the emergence of new forms of interaction (communication) between members of the economic system and new participants (network agents). Network agents include various network associations (formal and informal) that contribute to the formation of new institutions, models, and functions, including control of the economic system.

The formation of network agents at the regional level is one of the tasks of regional authorities, public and business structures, as well as universities as a basic element of RIS.

Innovative infrastructure is a unified system of innovative activity facilities that interact with the aim of generating innovative products. Innovation infrastructure includes financial (venture funds, state support programmes, business accelerators), human resources (universities, vocational education

organisations), and technological institutions (special economic zones, technology parks, business incubators).

The existence of a developed innovation infrastructure is a necessary condition for the realisation of innovation potential.

2. Innovation culture

The modern economy is a knowledge economy. Elements of innovation culture determine the degree to which knowledge is transformed into innovation.

Innovative culture is a system of interaction between the main stakeholders of an organisation within the framework of a set of traditions, values, beliefs, norms and behaviour patterns defined by a mission that ensures the realisation of innovative potential at a high level.

3. Resource element

The resource element is the basis for developing innovative potential and includes four main types of resources:

1. Information: a system for collecting, processing, analysing and disseminating information, a system for transforming information into knowledge.

2. Human: experience and qualifications of personnel, motivation system, flexibility of personnel.

3. Financial: financial stability, availability of financial capital and its liquidity.

4. Material and technological: fixed assets, technologies used, automation and production organisation system.

4. Resulting element

The result of the resulting element is an innovative product or service, as well as new organisational processes.

An important issue is the form of realisation of innovative potential. According to the authors, the concept of integrative innovative potential should

be added to the classification of forms of innovative potential. The concept of integrativeness is based not on achieving the integrity and unity of an object, but on ensuring the coordination of the actions of the participants in the process; not the disclosure of the real or imagined integrity of the object, but the search for unifying principles for the subjects of activity. At the same time, the integrative approach focuses on the dynamics of the process rather than on statics.

The principles of integration reflect the essence of an effective innovation process, and integrative innovative potential is understood as the maximum value of innovative activity carried out within the framework of full coordination of the formation, implementation and development of innovative resources, as well as the activities of participants in the innovation process. The introduction of the principle of integrative innovation potential will make it possible to build a systematic and comprehensive model of interrelationships between different types of resource bases of the innovation process, as well as the main actors of innovation activity, necessary to achieve a synergistic effect.

To identify the basic characteristics of innovative potential and systematise subjects and objects, we will classify this category.

Based on a number of approaches (structural, dynamic, functional), a multi-level classification of innovative potential is determined, distinguishing types and subtypes.

The classification of innovative potential as a complex system should reflect its systemic characteristics, such as functionality, organisation, manageability, structure and dynamism.

We would also add that the classification criteria should take into account the factor of measurability (quantitative or qualitative) and the applied value of the classification characteristics being developed. Based on existing approaches, the authors believe it is advisable to classify innovative potential according to the following criteria: level of scale, level of sustainability, level of

manageability, level of influence on the economic system, level of dynamics, level of development of the economic system, form of development, and resource structure.

Classification of innovation potential allows:

- effective modelling of innovation activities;
- specific recording of the role and place of each type of innovation potential in the overall structure of innovation potential for the optimal development of mechanisms for innovation processes;
- develop a strategy for the development of innovative potential, including at the regional level;
- determine the strategy for the development of the regional innovation system.

Conclusions. The study found that innovative potential is a multi-component entity that determines the ability of economic systems to adapt, develop and form competitive advantages in conditions of dynamic transformations. For its holistic understanding, it is proposed to use the category of «architectonics», which reflects the systematicity, structure and integration of all components. The key structural elements of the architectonics of innovative potential are substantiated: resource and technological, human resources and competence, organisational and institutional, and social and communication. Their coordinated functioning not only ensures the creation and diffusion of innovations, but also increases the stability of economic systems in a global competitive environment. It has been determined that an important direction for further research is to refine the classification characteristics of innovative potential, taking into account the levels of economic hierarchy (micro-, meso- and macroeconomic), as well as to develop methods for quantitative assessment of its effectiveness. This will allow the formation of practical recommendations for state innovation policy, regional development programmes and corporate strategies.

Thus, the results of the work create a scientific and methodological basis for increasing the innovative capacity of the Ukrainian economy and its integration into the global innovation space.

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