

**DEVELOPMENT OF A MECHANISM FOR STRATEGIC
MANAGEMENT OF INNOVATIVE ACTIVITY OF RAILWAY
TRANSPORT ENTERPRISES**

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In the conditions of high instability and rapidity of changes, which are characteristic of the modern stage of management, the activation of innovative activities of railway transport enterprises requires the systematic application of such effective strategic management tools as the mechanism of formation of favorable behavior, involvement of stakeholders and mobilization of resources to stimulate innovative transformations in the railway industry. Taking into account the conditions of operation of railway transport enterprises and the tasks of their innovative activities, as well as taking into account the positive experience gained in the organization of innovation processes, it was concluded that the basis for creating an effective mechanism of strategic management of innovative activities of railway transport enterprises should be a combination of different approaches, namely system-dynamic, process, functional and value approaches. A distinctive feature of the mechanism of strategic management of innovative activities of railway transport enterprises is the consideration of the innovation ecosystem as a management entity, which is a set of organizations that work together to achieve a common vision of innovative development and includes business entities, their relationships and the innovation environment. The spread of the value approach in the organization of innovative activities was noted, which is important for companies in the railway industry due to the social significance of their innovative projects. Attention is drawn to the fact that the valuable model of management activity is aimed at forming the general usefulness of innovations of railway industry enterprises and other participants of the innovation ecosystem in the process of managing their partner communication, which is ensured by building an adaptive configuration of the innovation ecosystem at the stages of its life cycle (initiator, accelerator, concept, pilot, project, scale).

Keywords: railway transport enterprises, innovations, innovative activity, strategic management, mechanism, value approach.

**РОЗРОБЛЕННЯ МЕХАНІЗМУ СТРАТЕГІЧНОГО УПРАВЛІННЯ
ІННОВАЦІЙНОЮ АКТИВНІСТЮ ПІДПРИЄМСТВ
ЗАЛІЗНИЧНОГО ТРАНСПОРТУ**

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В умовах високої нестабільності та швидкоплинності змін, які характерні для сучасного етапу господарювання, активізація інноваційної діяльності підприємств залізничного транспорту потребує системного застосування таких ефективних інструментів стратегічного управління, як механізм формування сприятливої

поведінки, залучення стейкхолдерів і мобілізація ресурсів для стимулювання інноваційних перетворень у залізничній галузі. Враховуючи умови функціонування підприємств залізничного транспорту та завдання їх інноваційної діяльності, а також зважаючи на набутий позитивний досвід організації інноваційних процесів, зроблено висновок, що основою для створення ефективного механізму стратегічного управління інноваційною діяльністю підприємств залізничного транспорту має стати сполучення різних підходів, а саме системно-динамічного, процесного, функціонального і ціннісного. Відмінною рисою розробленого механізму стратегічного управління інноваційною діяльністю підприємств залізничного транспорту є розгляд інноваційної екосистеми як суб'єкта управління, яка представляє собою сукупність організацій, що працюють разом для реалізації спільного бачення інноваційного розвитку та включає суб'єктів господарювання, їхні відносини та інноваційне середовище. Відзначено поширення ціннісного підходу в організації інноваційної діяльності, що є важливим для суб'єктів залізничної галузі через соціальну значимість їх інноваційних проєктів. Акцентовано увагу, що ціннісна модель управлінської діяльності спрямована на формування загальної корисності інновацій для підприємств залізничної галузі та інших учасників інноваційної екосистеми в процесі управління їх партнерською комунікацією, що забезпечується шляхом побудови адаптивної конфігурації інноваційної екосистеми на етапах її життєвого циклу (ініціатор, акселератор, концепт, пілот, проєкт, масштаб).

Ключові слова: підприємства залізничного транспорту, інновації, інноваційна активність, стратегічне управління, механізм, ціннісний підхід.

Introduction. Management of innovative activities is the most important component of the management of railway transport enterprises. At the same time, it is necessary to take into account that the modern economy is characterized by the growing instability of the external environment: events are becoming increasingly unusual and unrecognizable, the pace of changes is increasing, which significantly exceeds the speed of the appropriate response of the enterprise, the frequency of unexpected events, sudden changes, and their unpredictability is increasing. Under such conditions, it becomes impossible to carry out management by reacting to problems that have already arisen, based on previous experience or its extrapolation: for a timely and effective corresponding reaction, foresight, research and creativity are necessary, which necessitates the introduction of strategic management mechanisms for the activation of innovative activities at enterprises railway transport.

Analysis of research and

publications. Among scientists and specialists, the problem of increasing the innovative activity of enterprises, including railway transport enterprises, due to the use of tools of strategic management of innovative activity, has been discussed for a long time. Such scientists as Autio E., Bossink B., Carayannis E., Chesbrough H., Coutts J., Granstrand O., Grigoroudis E., Harald R., Holgersson M., Illiashenko S., Kapoor R., Pidorycheva I., Romero D., Steblii H., Thomas L., Turylo A. and other [1-17] devoted research to the development of theoretical and methodological foundations of strategic management of innovative activities of enterprises. At the same time, the transformation of the object, principles and tools of management requires refinement of the existing theoretical foundations for the creation of an effective mechanism of strategic management of innovative activities at railway transport enterprises.

The purpose of the article is to study the theoretical aspects of managing innovative processes and to develop an

effective mechanism for strategic management of the innovative activity of railway transport enterprises.

Presenting main material. At today's stage of economic development, as indicated by the research of scientists [1-5], the construction of a mechanism for strategic management of the innovative activity of railway transport enterprises should be based on system-dynamic, process, functional and value approaches that comprehensively reveal its content.

The provisions of the system-dynamic approach [2] reveal the innovative system of railway transport enterprises as open and changing under the influence of various factors, indicating that the main prerequisites for the success of innovative activities are both inside and outside the enterprises.

It can be concluded that the effectiveness of the mechanism of strategic management of the innovative activity of railway transport enterprises is largely determined by how quickly and successfully the enterprise adapts to the rapidly changing socio-economic conditions of business, therefore, an important role is assigned to the ability of the economic structure to self-development, self-organization and innovative activities.

The content of the general model for managerial activity indicates that, according to the system-dynamic approach, the mechanism of strategic management of the innovative activity of enterprises should be presented in the categories —subjectl, —objectl, —meansl, —processl, —conditionsl, —resultl, —systeml, which form a new qualitative characteristic due to functioning in the management cycle.

So, the structural-functional model of the mechanism of strategic management of innovative activity of railway transport enterprises can be presented as follows [3-5]:

- an object is a system that is subject to targeted influences;
- subject – one or a group of employees (specialists in the field of

management, marketing, finance, etc.) who carry out purposeful functioning of the object of management with the help of various techniques and methods of managerial influence;

- principles are the guiding rules that determine the basic requirements for the management system;

- result (conceptual aspect, formation of the general goal of the management entity taking into account forecasts of changes in the external environment);

- means (technological aspect related to the planning and implementation of object processes in the managed subsystem);

- conditions (resource, material and temporal aspects of the implementation of the general goal);

- process (organizational and management aspect that characterizes the course of strategy implementation).

As an object of strategic management of the activation of innovative activity of enterprises, scientists define innovation, innovation process, innovation activity and economic relations between the participants of the innovation market (producers, sellers, buyers), the innovation potential of the enterprise and, more recently, innovation ecosystems.

The logic of the network structure, which is determined by the interactive nature of the innovation process, requires the formation of distributed decision-making centers in the economic system, and therefore real innovation-oriented growth begins only when a special, dynamic meta-environment is formed in the economy, formed by many self-regulated network collectives, which leads to the foreground is the need to form innovative ecosystems.

Based on the essence of innovative ecosystems, it can be concluded that they most fully represent the object of the strategic management mechanism of the activation of innovative activities of railway transport enterprises (Fig. 1).

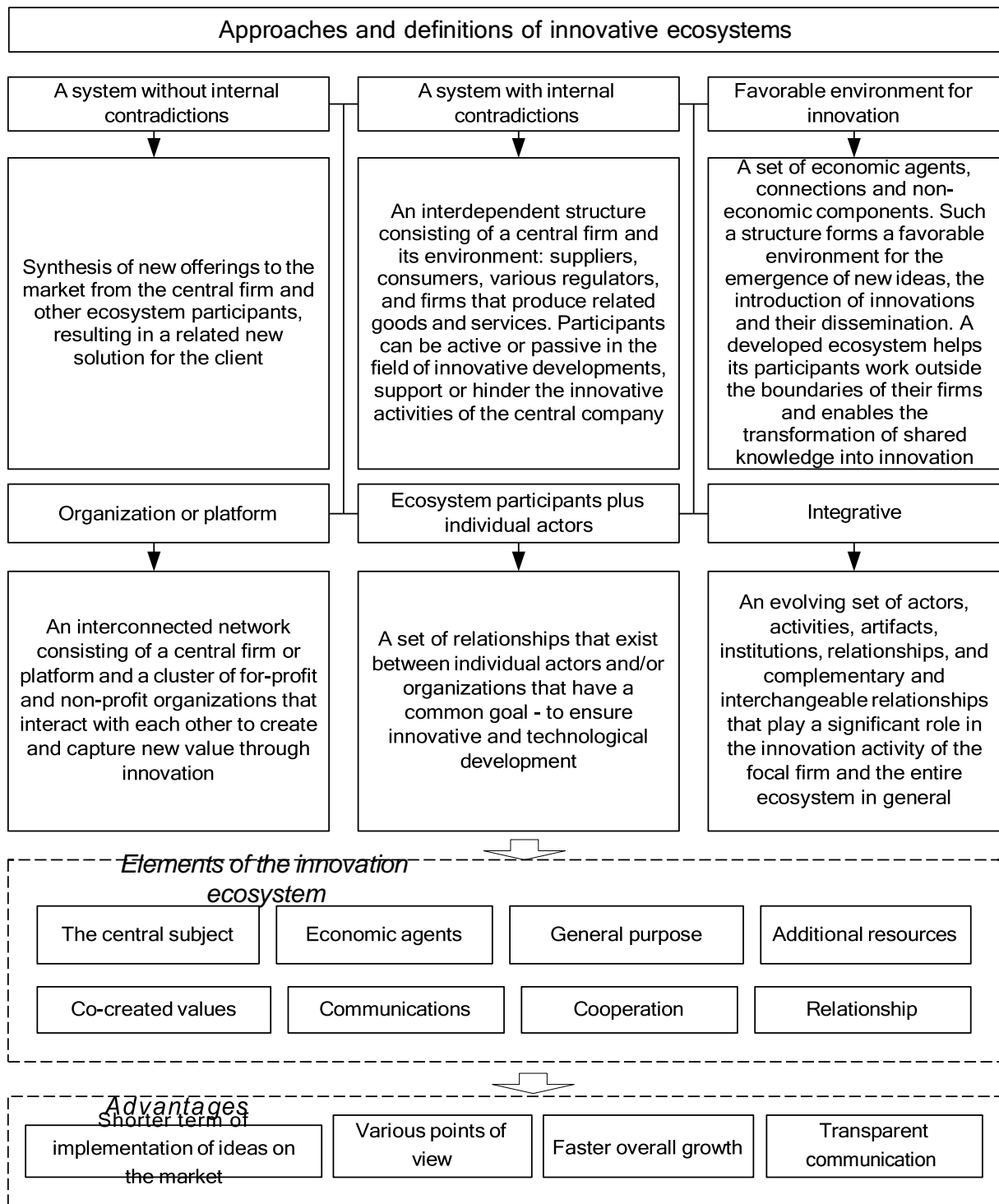


Fig. 1. The content of the innovative ecosystem (compiled by the author based on sources [6-9])

As shown in fig. 1 ecosystem approach considers innovation systems as a dynamic set of organizations and institutions together with the diversity of their internal connections. They consist of economic

agents, their relationships and an innovative environment containing ideas, technologies, rules and norms of culture and socio-economic interaction.

An innovation ecosystem is generally

a group of diverse organizations that work together to achieve a common goal and are united by a standardized data exchange or data ecosystem.

The basis of the innovation ecosystem is knowledge, which is creatively processed by innovators and embodied in a technology, product or service, which spreads further through the environment, for example, technology park structures. New knowledge is the driving force that transforms the state of the economic system, developing it, and carries out periodic qualitative transitions.

The main advantages of forming innovative ecosystems are [10-11]:

1) a shorter period of implementation of ideas on the market. A busy pipeline means bad ideas are quickly weeded out. Good ideas can be immediately connected to sponsors, media and politicians who will turn them into reality;

2) various points of view. Even the most talent-rich companies can't generate all the best ideas on their own. Large companies benefit from startups (and vice versa), and external consultants bring dynamic new perspectives. Consciously creating a community of innovation unites them all;

3) faster overall growth. From job growth to company scale and investment opportunities, joining forces to co-create always drives growth;

4) transparent communication. Deliberate mapping of the group of participants, their relationships with each other, and communication methods helps avoid duplication of effort and keeps everyone informed;

5) common value. Participants connected by common interests and goals, which encourages them to collectively develop and improve the effectiveness of cooperation, maximizing the overall utility from the created goods.

Nowadays, the innovative activities of railway enterprises must be connected with the external environment in order to effectively sense and use market opportunities. It is necessary to form such a

business model that can contribute to the joint creation of value [12]. An ecosystem brings together diverse players to create value greater than the sum of its parts. Ecosystem participants share additional data, capabilities and assets to co-create new solutions that offer better value to customers and society at large as innovative products and services meet their diverse and changing needs. For organizations, ecosystem innovation enables the creation of new value at a scale that is not possible with a closed, siloed and inward-looking approach to innovation.

Innovation ecosystems link different stakeholders together through knowledge flows and shared value creation processes [12]. The rules of ecosystems are the result of coevolution and interaction between their subjects. Companies in innovation ecosystems develop mutually beneficial relationships with various stakeholders, including, for example, customers, suppliers, and competitors. At the same time, it is necessary to take into account that joint innovation activity increases with the use of a greater number of digital tools and platforms, which positively affects the collective ability to innovate. This is explained by the fact that digital technologies allow the exchange of information between the participants of the innovation ecosystem, thus supporting the process of acquiring, disseminating and using knowledge. As a result of digitalization, innovations are increasingly based on models of system integration and joint implementation of innovations. The contributions of digital transformation and the use of digital technologies facilitate intra- and inter-organizational collaboration, which helps companies to innovate. Digitization has opened up wide opportunities for companies to interact with stakeholders, especially in terms of finding new smart solutions, new product and service offerings, or innovative processes.

Therefore, the open innovation process at railway transport enterprises primarily involves optimizing the joint use of various resources (for example, knowledge,

skills, know-how, equipment, infrastructure and finances) on the basis of a partnership of many participants. Accordingly, the strategic management of innovation activity should be based on a value approach, which reveals the features of the involvement of stakeholders in the joint creation of the value of innovations. Co-creation of value is defined as actions by which relevant actors receive financial benefits through profits or incentives, i.e. evaluation of existing service or product offerings, and non-financial benefits are shared by all relevant actors [13]. The effective management of innovation through value co-creation depends on the continuous involvement of individual stakeholders over time. As they get to know each other better, develop inter-organizational trust, and learn how best to identify the needs and expectations of all parties, they can create more comprehensive and meaningful interactions, which allows them to balance the needs and expectations of all parties and come to optimal solutions.

The advantages of the organization of innovative cooperation for railway transport enterprises in terms of creating common value are [13-15]:

1 Joint research and development. Railway companies conduct joint research and development with partners, combining their resources and experience to accelerate innovation.

2 Open innovation platforms. In the context of digitalization, the creation of platforms that allow external stakeholders, such as customers, suppliers, and even competitors, to contribute ideas and collaborate in the process of innovation is relevant.

3 Strategic partnership. Forming strategic alliances with other organizations to leverage additional opportunities and resources, foster innovation through shared goals and joint initiatives.

4 Joint creativity with clients. Involving customers in the innovation process by obtaining their feedback, ideas and preferences leads to the development of

transport services that better meet the needs of society.

5 Cooperation in the ecosystem. The rail industry's engagement with a wider ecosystem of partners, including start-ups, universities and research institutions, provides access to diverse perspectives and cutting-edge technologies.

6 Licensing and Transfer of Technology. Cooperation with other companies to license or transfer technology ensures a positive exchange of knowledge and experience for mutual benefit.

Collaboration based on the creation of shared value helps increase the flow of better ideas, reduce risk, improve quality and speed to market, reduce costs, build new skills, competencies, resources and relationship assets, improve brand image, power and influence, and build the ability to create value for the common good.

Experience indicates that the organization of innovative cooperation as a value creation tool should include such measures [16-17].

1 Foster a collaborative culture: Successful collaborative innovation requires a collaborative culture in which individuals and organizations are encouraged to share ideas, knowledge and resources. This creates an atmosphere of trust and openness, ensuring effective cooperation.

2 Leverage complementary expertise: Collaborative innovation thrives when diverse perspectives and experiences are brought together. Identify partners or stakeholders with complementary skills and knowledge that can contribute to the innovation process. This provides a holistic approach and a wider range of ideas.

3 Setting clear goals: This ensures that all parties involved are aligned and working towards a common goal. Having clear goals also helps to assess the success of a joint innovation project.

4 Encouraging experimentation and risk. Joint innovation activities often involve the search for new ideas and risk. A culture of experimentation should be encouraged

where failure is seen as an opportunity to learn. Such thinking promotes innovation and encourages participants to think outside the box.

5 Embrace open communication: Effective communication is critical to successful co-innovation. It is advisable to encourage open and transparent channels of communication between all stakeholders, as this will facilitate the exchange of ideas, leading to better collaboration and innovation outcomes.

6 Use of technologies and tools to facilitate collaboration: it is advisable to form platforms that provide real-time collaboration, document sharing and idea generation, which can increase the efficiency and effectiveness of the process of joint implementation of innovations.

When implementing a value-based approach to the strategic management of innovative activity of railway transport enterprises, it is necessary to take into account that the decisive factor for ensuring the effectiveness of cooperation is the intensity of connections between individual participants and elements of innovative systems. This indicates the need for the formation of an adaptive configuration of the innovative ecosystem, which would flexibly respond to changes and modern challenges (Fig. 2).

When analyzing the interaction of participants in the innovation process, the following points are important: a set of formal and informal rules regulating interaction; the degree of participation in the initiation, development, implementation of projects and programs; degree of interest and direction of interests of various participants in the process of introducing innovations; distribution of functions of control and evaluation of results, social effect of innovations.

At the initial stage of the —Initiator‖, potential participants of the innovative ecosystem of railway transport enterprises are scattered, and resources are not mobilized, accordingly, a strategy is needed to attract

participants, coordinate actions and define common goals and agenda. However, it must be taken into account that there is still little trust between actors and the potential of resources cannot be fully utilized.

At the —Accelerator‖ stage, it is necessary to provide employees with resources and appropriate tools, both in terms of finding and implementing new technologies and solutions, and in terms of innovative project management methods. Although the organizational form of management and processes are certainly important, it must not be forgotten that their effectiveness depends entirely on people. People, as the most important resource of any organization, must be focused on achieving the set goal, have the necessary competencies and resources, as well as the desire to achieve the results required for the company.

The —Concept‖ stage involves the use of collaboration tools to conceptualize ideas, and to date, the greatest popularity in this direction of the organization is centered around hackathons, which are a team competition where participants develop a project prototype.

The —Pilot‖ stage is implemented with the interaction of various participants of the innovation ecosystem, using their technological, material and technical, human and financial resources.

At the —Project‖ stage, innovative solutions are implemented in the activities of railway transport enterprises. At the same time, it is necessary to determine the directions of relationships, which will help to conduct an analysis of the project's stakeholders, to clarify the channels of communication with them, and to more reasonably appoint those responsible for relations with specific stakeholders, taking into account their current qualifications and competencies.

The —Scale‖ stage is associated with a partnership for scaling innovations, with the involvement of new participants and, on this basis, the formation of a new circle of innovation value growth.

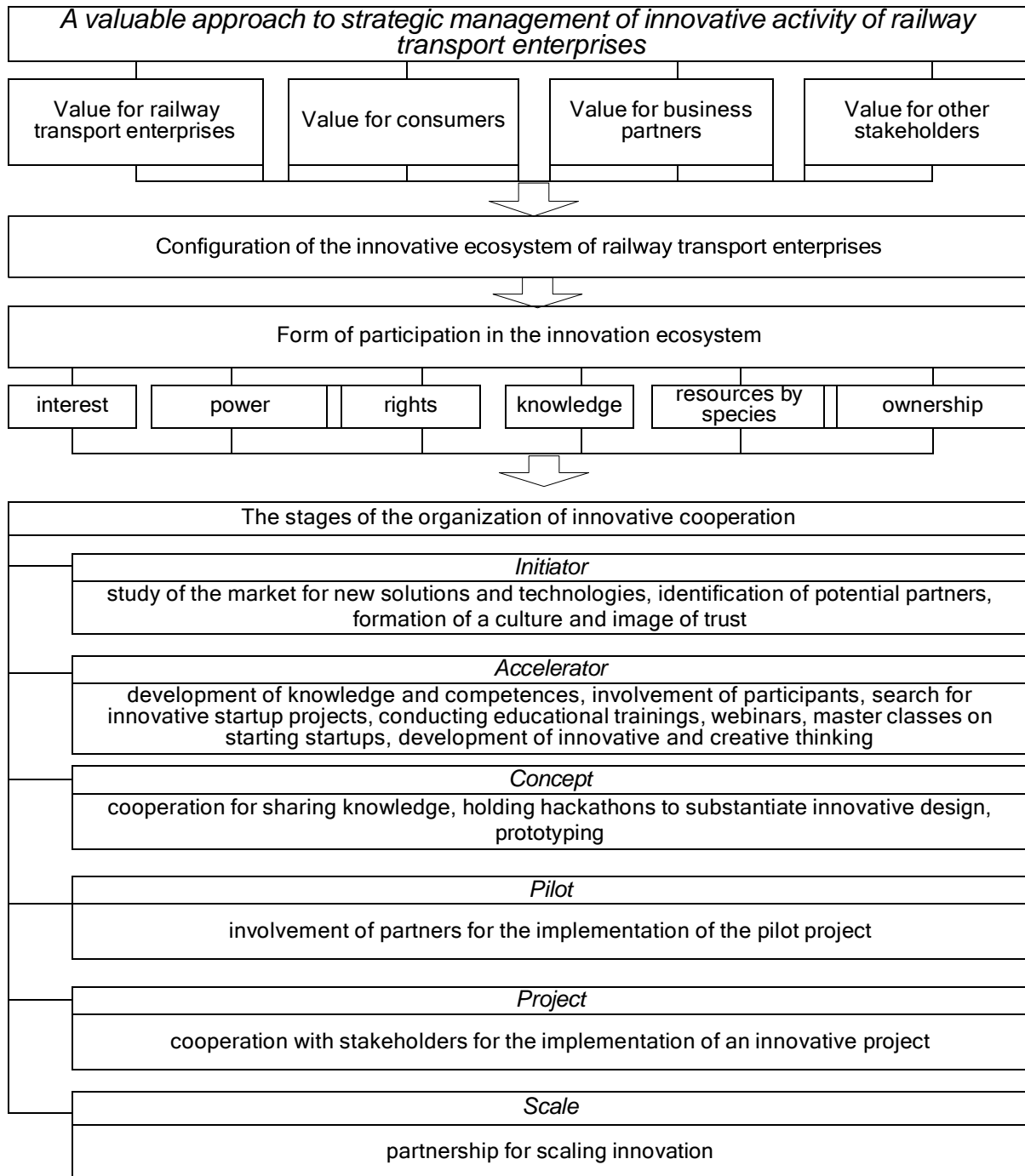


Fig. 2. Mechanism of strategic management of innovative activity of railway transport enterprises based on a value approach (author's development)

Conclusions. Therefore, a mechanism of strategic management of the innovative activity of railway transport enterprises has been formed, which is based on a value approach and provides for the formation of an adaptive configuration of the innovative ecosystem according to such stages of the organization of innovative cooperation as

initiator, accelerator, concept, pilot, project, scale. Co-created value is the driving force of innovation, which, thanks to adaptive structures, favorable interaction and empowerment, brings mutual benefit to the participants of the innovation ecosystem.

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