TRANSFORMATION OF THE ORGANIZATIONAL STRUCTURE OF MANAGEMENT OF INNOVATIVE ACTIVITIES AT RAILWAY TRANSPORT ENTERPRISES

Abstract. The article determined that the reform of railway transport enterprises led to a violation of the structural integrity of the management system of innovative activity in the industry and a narrowing of the innovative potential of JSC «Ukrzaliznytsia», limiting its ability to maintain a sufficient level of innovative activity. It was established that even despite the reform and restructuring of the innovation management system, the functions of units responsible for producing innovations for the needs of industry enterprises remained extremely limited and were not focused on the implementation of modern tools and mechanisms for supporting innovative growth processes. It was determined that in the conditions of digitalization, the main key to the implementation of effective innovative activity is the company's ability to recognize strategically important information for its innovative growth, which will form the basis of the idea for future innovation. On this basis, the expediency is substantiated and the content, advantages, disadvantages and stages of implementation of technological scouting as a modern tool for supporting the innovative activity of companies are revealed. An approach to the transformation of the organizational structure of management of innovative activities at railway transport enterprises has been developed, which is based on the possibilities of technological scouting in increasing the innovative potential of enterprises of the industry and involves the creation of an innovation scouting center. The structure and functions of the innovation scouting center at railway transport enterprises are revealed, the key ones of which are highlighted as innovation intelligence and systematization of innovation data, formation of the innovation landscape, monitoring and forecasting of innovation changes, regulatory analysis, competitive intelligence and market research. The key areas of activity of the innovation scouting center at railway transport enterprises are characterized.

Keywords: railway transport enterprises, innovative activity, innovative activity, technological scouting, innovation scouting center, organizational approach.
**Introduction.** The ability to transform on an innovative basis and maintain a steady rate of growth of results in the field of innovative activity largely depends on the quality and progressiveness of the current organizational model of managing innovative activity.

Unfortunately, despite the large-scale and long-term attempts to implement innovative transformations at railway transport enterprises, currently the technological state of enterprises in the industry not only does not correspond to the level of innovative development of European railways, but is also at a critical limit. The lack of significant progress in the field of innovation is caused to a large extent by the low efficiency of the system of managing innovative activities at railway transport enterprises and the existence of systemic contradictions in the policy of stimulating innovative transformations in the industry.

**Analysis of recent research and publications.** The problem of transformation of the structure of management of innovative activity at railway transport enterprises is being extremely actively developed by research scientists. Important for both practice and science are the proposals of Professor V.L. Dykan, M.V. Korin, G.V. Obruch, V.O. Ovchinnikova, G.V. Ozerska, I.V. Solomnikova, and I. Tokmakova, Tolstova A.V. and others [1-7], which offer organizational tools for increasing the efficiency of innovative activity at railway transport enterprises and increasing their innovative activity. Highly appreciating the scientific achievements of the above-mentioned scientists, it is worth noting that the transformation of the operating environment of railway transport enterprises under the influence of the formation of a digital paradigm of economic growth determines the need to change approaches to the organization of innovative activities and the application of progressive tools for supporting innovative activity at enterprises of the industry.

That is why the purpose of the article is to develop an approach to the transformation of the organizational structure of management of innovative activities at railway transport enterprises through the creation of an innovation scouting center.
Presenting main material. The reform of railway transport enterprises, which has been implemented for more than 10 years, has led to a violation of the structural integrity of the management system of innovative activities in the industry. The usual transfer of the goals of reforms at railway transport enterprises from one reform program to another without adjusting them in accordance with the challenges and existing problems of the industry's functioning led to a significant underestimation of the importance of innovative activities and industry policies to achieve the goals of embodied changes. Unfortunately, neither the State target program for reforming railway transport for 2010-2019, nor the Plan of measures for reforming railway transport, approved by the order of the Cabinet of Ministers of Ukraine dated 27.12.2019 No. 1411-r. [8-9], which in fact became a reflection of the previous program, measures for the formation of a progressive system of management of innovative activities at enterprises of the industry, the functioning of which would provide railway transport enterprises with innovative development in accordance with their needs, were not defined in any way. The result of the lack of a consolidated approach to the implementation of reforms, including in the field of innovation, was that currently the key divisions, whose specialization is innovative activity, are assigned to the vertical of engineering and technical support and are entrusted with the function of forming and implementing technical policy, scientific-technical support of production processes at railway transport enterprises [10]. As a result of the implementation of reforms, 2 branches were formed from 8 enterprises that were engaged in the development of innovations for the needs of enterprises of the industry – the Scientific-Research and Design-Technological Institute of Railway Transport and the Project-Research Institute of Railway Transport. The first branch «Scientific-research and design-technological institute of railway transport» was formed on the basis of the State Research Institute of Railway Transport of Ukraine by subordinating to it separate project-design and technological bureaus of wagon, locomotive and track management. The «Project and Research Institute of Railway Transport» branch was formed by combining the assets of «Ukrzaliznychproekt»
In fact, this policy of optimizing the management system of railway transport enterprises by combining assets and focusing strategically significant for the recovery of the industry on the innovative foundations of enterprises in one structure led to the narrowing of the innovative potential of JSC «Ukrzaliznytsia» and limiting its ability to maintain a sufficient level of innovative activity. Despite the fact that the key purpose of these functional branches should be the production of innovations in accordance with the needs of railway transport enterprises, currently their functional role is mostly limited to carrying out design and research work, preparing design and construction documentation, assessing the impact of the object of work on the surrounding environment and its energy efficiency.

The situation is also complicated by the fact that, unfortunately, even despite the reform and restructuring of the innovation management system, the functions of the units responsible for producing innovations for the needs of industry enterprises have remained extremely limited and are not focused on the implementation of modern tools and mechanisms for supporting the processes of innovative growth.

It is worth pointing out that the environment of any business entity is currently covered by transformational processes. The development of Industry 4.0 technologies and the digitization of all spheres of the economy are changing both the guidelines and the mechanisms for the implementation of innovative activities by business entities. In the digital era, the process of producing innovations is no longer reduced to the traditional improvement of the characteristics of products and services, but requires the company to implement systematic research and analysis of a huge array of innovative knowledge and products that are in circulation in the environment of its operation. The main key to the implementation of effective innovative activity is the company's ability to recognize strategically important information for its innovative growth, which will form the basis of the idea for future innovation.
Today, the process of scanning the company's innovative operating environment in order to find and select priority ideas in science and practice is called technological scouting. Traditionally, technological scouting is understood as the services of consulting companies for the search of various sources of technologies potentially needed by the company for its innovative growth [11].

Also, technological scouting is considered from the point of view of a process approach and is defined as a process implemented in order to create opportunities for the company to use the best technologies on the market at the right time for its own products or product optimization [12].

For the first time, the methodology of technological scouting was formed in detail in the 90s by M. Wolfer, J. Bodel, M. Brenner and was later supplemented by R. Rohrbeck, A. Mashti, and L. Mengi [13-14].

The analysis of works [13-14] made it possible to establish that the use of the mechanism of technological scouting in the process of carrying out innovative activities allows companies to be competitive and act one step ahead compared to their competitors. This is explained as follows. Firstly, quite often within the framework of innovation chains formed as a result of the development of the company's partnership with innovation developers, their merger or licensing, the enterprise gets direct access to the idea-innovation, and therefore has the opportunity not to spend either resources or time on its development by own efforts. This, in turn, makes it possible to significantly shorten the duration of the company's innovation cycle, accelerate the introduction of innovation into the production process, and be the first to offer innovative products to the market. Secondly, the application of innovative solutions proven by the development companies allows not only to reduce costs, but also to significantly increase the value of the available range of services, to maintain the loyalty of its customers. Thirdly, the development of cooperation within the innovation chain opens the company's access to the knowledge and experience of the innovation developers themselves. Cooperation with innovators provides an opportunity for company employees to familiarize themselves with the talents and
knowledge of developers, and, accordingly, to enrich their own intellectual potential. Fourth, the work of scouts, which involves constant travel and meetings in search of innovation, enriches their inner world, and the study of new technologies and talents opens up fresh ideas for teams, promoting creativity and innovation efforts throughout the organization.

It is worth pointing out that the mechanism of technological scouting in the current conditions is used not only for the search for innovative solutions. Quite often, technological scouting capabilities are used to conduct competitive intelligence, namely, the study of competitors' products, understanding the strategy of their competitive actions and marketing tactics. Also, this research mechanism is actively used to study new markets and establish a segment of potential customers and assess the strength of competition. In addition, technological scouting allows identifying potential partners, key technologies, the implementation of which will allow qualitative transformation of business processes and company models [11].

As the analysis of scientific works suggests, in most cases the mechanism of organization and implementation of technological scouting today leads to this. At the first stage – the stage of the idea – those technological areas that relate to the company's activities are determined; choose specific industries, markets and enterprises to be studied in order to find new ideas, develop a system of criteria for evaluating a potential innovation (whether it should be the latest solution or a solution compatible with existing systems) from the point of view of maturity and market potential.

The second stage – the stage of discovery – involves the search of patent databases for the selection of ideas, the collection of information from the official websites of companies, the study and analysis of product catalogs, research reports and industry publications.

At the third stage, «Evaluation», the evaluation of the value and suitability of the selected ideas-innovations is carried out with the involvement of experts, market
trends are studied, the competitive landscape and its technical characteristics are studied, and a rating of the most valuable and potentially attractive ideas is formed.

At the fourth stage, the feasibility of using the selected innovative solutions is evaluated, namely, each idea is analyzed in detail both from the point of view of its technological capabilities and cost (time, investment, resources), then these ideas are ranked and the most significant ones are chosen.

The fifth stage – the stage of implementation – involves not only the direct implementation of the selected innovation in the company, but also establishing the feasibility of forming partnership relations, searching for sources and planning the amount of investment in such projects [15].

At the same time, companies face certain barriers to conducting technological intelligence for the purpose of finding innovations, which boil down to the following. First, the use in the process of searching for ideas and innovations of various types of patent databases, knowledge and information databases, industry publications, access to which is limited, significantly complicates the procedure for technological scouting and requires obtaining permission to use these sources. Secondly, like the innovation process itself, the procedure for finding innovations from the outside can be time-consuming and resource-consuming, demanding from the scouts dedication to the company's goals, their perseverance. Thirdly, the selection of the necessary innovations is also related to the assessment of their value and suitability for the company, which in turn requires the involvement of special knowledge and experience of specialists. Fourth, the systematic search for innovations can lead to the accumulation of a huge amount of data that is difficult to process and evaluate their compliance with the company's needs. Fifthly, the involvement of specially qualified personnel and the need for constant data search cause the technological scouting procedure to be very costly.

So, summarizing the above, it is appropriate to note that, despite the cost, technological scouting allows companies to significantly increase their own
innovative activity, as it opens access to ideas, developments and innovations that can ensure qualitative radical changes in the company's functioning system.

Taking into account the existing state of innovative activity at the railway transport enterprises of Ukraine and the low productivity of the innovation infrastructure for the needs of the industry, it is appropriate to recognize technological scouting as a promising tool for promoting the revitalization of innovative activity. It should also be noted that currently both the capabilities of industry enterprises and the state in implementing large-scale innovative projects of infrastructure development of railway transport are extremely limited. Despite this, the support of the country's European integration course and the post-war reconstruction initiatives of our country form huge prerequisites for the transformation of railway transport enterprises on an innovative basis, and at the same time, at the same time, today they require the establishment of strategic innovations necessary for digital restructuring and the approximation of the technological level of their development to the level of railways in Europe. This, in turn, determines the need for an active policy in the field of selection and formation of the base of the most significant innovations for implementation at railway transport enterprises, which will allow innovative reproduction of their transport and transit potential. That is why organizational changes in the system of management of innovative activities of enterprises of the railway industry should concern the formation of a specialized department (Department of Innovation Policy and Development of Railway Transport Enterprises) and the creation of a center that will deal with the search, selection, analysis, forecasting, evaluation and implementation of external innovations at the enterprises of the industry. Such a center should become the center of innovation scouting, in the structure of which there will be concentrated departments for both the exploration of technological innovations and departments for the search for marketing innovations.

Structurally, the innovation scouting center will combine the activities of such departments as the innovation intelligence department, the innovation partnership
department, the monitoring and forecasting department, the regulatory department, the competitive intelligence department, and market research.

In accordance with this, the range of functions of the innovation scouting center at railway transport enterprises will be reduced to the following:

− innovative intelligence and systematization of data on innovations – search, detection and selection of innovations, establishment of the potential scope of its application and work of railway transport enterprises and assessment of the level of attractiveness, analysis of patent protection and formation of a knowledge base and data on innovations by key areas of their application / implementation at enterprises industries;

− formation of the innovation landscape – search and selection of external innovation partners and suppliers of innovations, evaluation of the potential of cooperation and formation of innovation chains;

− monitoring and forecasting of innovative changes – systematic assessment of innovative trends and forecasts, forecasting of potential changes in the innovation market (investment, technological, production trends) and assessment of their impact on the innovative activity of railway transport enterprises;

− regulatory analysis – monitoring of regulatory policy in the field of innovative activity and forecasting changes in the legal regulation of the activities of partners and suppliers of innovations, assessing their impact on the innovative landscape and activity of railway transport enterprises;

− competitive intelligence and market research – monitoring of the competitive environment (detection of key signals, trends, disruptive changes and new opportunities for growth in the corporate environment in real time), development of market forecasts and identification of potential growth segments of railway transport enterprises.

The Center for Innovative Scouting will implement the following areas of activity:
– formation of a list of innovations prioritized for implementation at railway transport enterprises and maintenance of innovation databases in an up-to-date state;
– preparation of analytical reports and modeling of scenarios for the development of innovative potential of railway transport enterprises based on innovative forecasts;
– development of a strategy for increasing the innovative activity of industry enterprises, forming packages of priority innovative projects;
– organization of innovation congresses, symposia, conferences, specialized exhibitions and development of information materials regarding innovation and investment needs of railway transport enterprises;
– consultation and development of communications with stakeholders, informing the latter about the possibility of participation in innovative development projects of enterprises in the industry;
– participation in the improvement of the institutional environment for the organization of the innovation process at railway transport enterprises, including the development of proposals for the transformation of legislation in the sphere of regulation of innovation and investment activity, support for initiatives for the formation of an effective institutional basis for the development of public-private cooperation mechanisms in the projects of innovative development of railway enterprises etc.

It is also important to point out that in the course of the center's activity, the search for and attraction of innovations will not be limited to researching the market of innovative proposals for railway transport, but will also include the scanning of innovative spheres of metallurgy and energy, the chemical industry, IT solutions, in particular the markets of smart and nanomaterials, green energy, 3D printing, biofuels, bioplastics, paints and coatings, artificial intelligence, wireless technologies, etc.

**Conclusion.** Therefore, in order to increase the innovative activity of railway
transport enterprises, it is now absolutely necessary to ensure the transformation of the management structure of innovative activity. The article determined that the reform of railway transport enterprises led to a violation of the structural integrity of the management system of innovative activity in the industry and a narrowing of the innovative potential of JSC «Ukrzaliznytsia», limiting its ability to maintain a sufficient level of innovative activity. It was determined that in the conditions of digitalization, the main key to the implementation of effective innovative activity is the company's ability to recognize strategically important information for its innovative growth, which will form the basis of the idea for future innovation. On this basis, the expediency is substantiated and the content, advantages, disadvantages and stages of implementation of technological scouting as a modern tool for supporting the innovative activity of companies are revealed. An approach to the transformation of the organizational structure of management of innovative activities at railway transport enterprises has been developed, which is based on the possibilities of technological scouting in increasing the innovative potential of enterprises of the industry and involves the creation of an innovation scouting center. The structure, functions and key areas of activity of the innovation scouting center at railway transport enterprises are disclosed.

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Трансформація організаційної структури управління інноваційною діяльністю на підприємствах залізничного транспорту

Анотація. В статті визначено, що реформування підприємств залізничного транспорту привело до порушення структурної цілісності системи управління інноваційною діяльністю в галузі і звуження інноваційного потенціалу АТ «Укрзалізниця», обмеження його можливостей підтримувати достатній рівень інноваційної активності. Встановлено, що навіть попри реформи і перебудову системи управління інноваційною діяльністю, функції підрозділів, що відповідають за продукування новацій для потреб підприємств галузі залишилися вкрай обмеженими і не орієнтовані на впровадження сучасних інструментів і механізмів підтримки процесів інноваційного зростання. Визначено, що в умовах цифровізації головним ключем до реалізації ефективної інноваційної діяльності є здатність компанії розпізнати стратегічно значущу для її інноваційного зростання інформацію, що складе основу ідеї для майбутньої новації. На цій основі обґрунтовано доцільність і недоліки технологічного скаутингу як сучасного інструменту підтримки інноваційної активності компаній. Розроблено підхід до трансформації організаційної структури управління інноваційною діяльністю на підприємствах залізничного транспорту, що ґрунтується на можливостях технологічного скаутингу в нарощенні інноваційного потенціалу підприємств галузі і передбачає створення центру інноваційного скаутингу. Розкрито структуру та функції центру інноваційного скаутингу на підприємствах залізничного транспорту, ключовими з яких виділено такі, як інноваційна

Євген Миколайович Кузнецов
аспірант кафедри економіки та управління виробничим і комерційним бізнесом, Український державний університет залізничного транспорту, м. Харків, Україна

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розвідка і систематизація даних про новації, формування інноваційного ландшафту, моніторинг і прогнозування інноваційних змін, регуляторний аналіз, конкурентна розвідка та дослідження ринків. Охарактеризовано ключові напрями діяльності центру інноваційного скаутингу на підприємствах залізничного транспорту.

Ключові слова: підприємства залізничного транспорту, інноваційна активність, інноваційна діяльність, технологічний скаутинг, центр інноваційного скаутингу, організаційний підхід.