

Innovative Approaches to Passenger Service Management in Railway Transport

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Abstract: In modern conditions of the development of the transport network for the movement of passengers, a special role in Russia is assigned to rail transport, as the most adapted and in demand against the background of reduced passenger air transportation due to certain restrictive measures applied. The issues of providing high-quality service to passengers on railway transport, increasing their satisfaction and loyalty are related to the most important social function of the infrastructure that this type of transport performs. Innovative projects of JSC "Russian Railways" are inextricably linked with the formation of optimal passenger service management models aimed at increasing passenger traffic in the conditions of active development of domestic tourism in the country. Attention is paid to marketing communications for the promotion of services. At the same time, in the available research papers related to the organization of passenger transportation, insufficient attention is paid to the management of passenger service on railway transport. Taking into account the importance of the influence of the level of service on the attractiveness and demand of passengers for railway transport services, the problem of forming innovative approaches to managing and improving the level of service on the railway is of particular relevance for consideration.

1 INTRODUCTION

One of the priority directions of the development of science, technology and technology in the Russian Federation of a civil nature, meeting global scientific and technological trends, is the development of transport systems. In accordance with the Concept of Long-term Socio-economic Development of the Russian Federation until 2030, accessibility and quality of transport services for all segments of the population have been identified as promising achievable goals in accordance with social standards that guarantee the possibility of movement throughout the country, while the mobility of the population will increase to 15,561 pass-km per 1 person per year, which 2.6 times higher than in 2007. The projected total volume of passenger traffic is 964.8 billion by 2030. pass.-km, including rail transport – 203.0 billion. pass.-km (Consultant Plus, <https://www.consultant.ru>).

The developed railway transport system of the Russian Federation ensures the economic security of the country. Railways, connecting the regions of the

country with each other, contribute to the creation of uninterrupted supply chains (Ignatova, 2021).

However, currently, due to changes in the external economic situation and the consequences of a pandemic nature, the estimated indicators for 2020-2021 have not been achieved, which requires adjustments to the quantitative indicators set out in the Railway Transport Development Strategy until 2030, as well as the transformation of the directions of railway transport development, including changes in the logistics of traffic flows with an increase in the south-eastern direction of movement, development of transit traffic, an increase in passenger traffic due to the active development of domestic tourism and the reorientation of passenger traffic from air services to rail transport. For example, by the end of 2020, the volume of passenger transportation by rail in long-distance trains due to objective reasons decreased to 10.6 million people, which amounted to 60.2% compared to the level of the pre-pandemic 2019.

In this case, measures of state financial support for railway transport organizations in the Russian Federation are important, according to

(Alexandrovich, 2021), as well as for individual groups of passengers by providing railway transport services at preferential tariffs, both in Russia; and with zero tariff, as in Slovenia and a number of other states (Michniak, 2018).

In order to improve the position of rail transport, according to the data of the International Competitiveness Report, (Abdullayev, 2021) notes, it is necessary to ensure the provision of high-quality rail transport services to citizens in accordance with international experience.

The purpose of the study is to develop optimistic planning management decisions related to the technological processes of passenger service on railway transport in the conditions of force majeure development of the country's economy.

2 MATERIALS AND METHODS

The materials for the study were open information resources. In the course of the study, methods of system analysis and process approach were applied in the management of passenger service in railway transport based on a comprehensive assessment of the elements and stages of management technology of service.

3 RESULTS AND DISCUSSION

Currently, the relevance of the Program "Digital Economy of the Russian Federation", approved by the Decree of the Government of the Russian Federation No. 1632-r dated 28.07.2017, is that the development of the digital (electronic) economy through "modernization of traditional manufacturing industries and service industries... creates the basis for the formation of new markets and their functioning, as well as new approaches to forecasting, analysis and, accordingly, the adoption of new management decisions accordingly" (Russian Government. <https://government.ru>).

Thus, in accordance with the passport of the Integrated Innovative Development Program (hereinafter - KPIR-2025) of the Russian Railways Holding for the period up to 2025 (approved by the Order of JSC "Russian Railways" dated 22.09.21 No. 2071/r), which was developed in accordance with the Decree of the President of the Russian Federation dated May 7, 2018. No. 204 "On national goals and strategic objectives of the Development of the Russian Federation for the period up to 2024",

the Strategy of Scientific and Technological Development of the Russian Federation until 2035, the Transport Strategy of the Russian Federation for the period up to 2030, the Strategy for the Development of Railway Transport in the Russian Federation until 2030, national programs and projects, including the national program "Digital Economy of the Russian Federation", national projects "Science", "Labor Productivity improvement and Employment support", "International Cooperation and Export", "Small and medium-sized entrepreneurship and support for individual entrepreneurial initiative", "Education", "Ecology", etc., the key performance indicators are laid down (Table 1).

The study of transport activity traditionally begins in the following areas: management of operational work in railway transport; innovative technologies in the transportation process; intelligent systems in the management of transport processes; management of reliability, safety, risks in railway transport; problems and prospects for the development of information technologies of railway transport; problems of interaction of modes of transport (Erofeev, 2021) and then proceed to the study of the needs of the potential market of consumers- passengers of Russian Railways.

In our opinion, out of the presented 13 innovative and promising projects and technologies for the development of railway transport in IPID-2025, 7 projects can be identified aimed at improving passenger service in railway transport, which, in turn, can be grouped into 2 groups: fundamental projects directly related to the architecture of railway transport and near-railway infrastructure, and customer-oriented (add-on) projects that provide service technologies. At the same time, it is necessary to take into account the vector of the direction – cargo or passenger transportation.

These projects are aimed at forming a modern model of passenger service management in transport and include: rolling stock-2025; development of the Moscow railway hub; development of high-speed communication in Russia; development of high-speed communication; development of multimodal passenger and freight transportation; customer digital services; innovative project "Engineering Center" (Table. 2) (RZD, <https://company.rzd.ru>).

Railway transport is objectively a universal way of transportation: for moving people around the country, for travelers on various tours, for tourists choosing railway tourism. The directions of St. Petersburg, Moscow, central and southern parts of

Table 1: List of key performance indicators (KPIs) of the Integrated Program of Innovative Development (IPID) of the Russian Railways Holding for the period up to 2025 (the planned indicators are set in accordance with the Decree of the Government of the Russian Federation No. 1442 of December 25, 2015).

Code	Name of the KPI, unit of change	Years				
		2021	2022	2023	2024	2025
KPI ₁	The share of R&D costs that relate to revenue from core activities, %	0,53	0,54	0,55	0,56	0,57
KPI ₂	The share of the implementation of the results of intellectual activity that have received legal protection (intellectual property objects) in the total number, %	86	86	86	86	86
KPI ₃	The share of purchases of innovative and high-tech products in the total volume of purchases, %	≥ 1010%				
KPI ₄	The share of revenue from new ones (whose age is no more than 3 years) services in the total volume of services, %	2,0	2,0	2,0	2,0	2,0
KPI ₅	The annual economic effect of the portfolio of innovative projects of the SSP KPIR-2025 of the Russian Railways holding (for projects with declared economic effects), %	10,0	10,0	10,0	10,0	10,0
KPI ₆	The average annual rate of increase in labor productivity, %	105,0	105,0	105,0	105,0	105,0
KPI ₇	Increase in the energy efficiency of production activities (compared to the previous year), % ¹	0,6	It is established by the order of the federal executive authority			
KPI ₈	Greenhouse gas emissions in CO ₂ equivalent, kg/10 thousand priv. t-km	185,5	184,3	183,1	181,9	180,7
KPI ₉	Traffic safety indicator (specific number of accidents and other events), units/million train-km	0,876	0,842	0,807	0,773	0,743
KPI ₁₀	Quality of development (updating) /implementation of the innovative development program, %	90-100	90-100	90-100	90-100	90-100

¹In accordance with the planned values of the indicator "Improving the energy efficiency of production activities" of the list of those included in the integral key indicator of the effectiveness of innovation activity

Russia, from Moscow to Vladivostok (Transsib), around the lake are popular in railway transportation. Baikal on the "Circum-Baikal Express", weekend tours are interesting.

Among all types of transport, it is railway transport that is distinguished by comfort, diversity of accommodation conditions, the possibility of providing passengers and travelers-tourists with a complex of services (transport, food, accommodation, leisure activities). The cars have increased comfort, are equipped with air conditioning, upholstered seats, panoramic windows, shower cabins. Information content during travel by rail is greater than by bus (Kosareva, 2021).

In these conditions, the issues of ensuring the quality of service and increasing the competitiveness of passenger rail transport depend on various factors that affect the implementation of management models of passenger service. JSC "Russian Railways" pays great attention to improving the quality of service and identifying the level of passenger satisfaction.

To receive feedback from passengers, it is necessary to conduct marketing research in the form of a structured personal survey, where the analyzed criteria are ticket prices, convenience of transportation, customer service, behavior of train

staff, cleanliness of the interiors of cars, frequency of proposed connections and the offer of refreshing drinks during the trip (Chocholac, 2018). For this purpose, online surveys are conducted on a regular basis on the website *opros.fpc.ru*, which allows you to get up-to-date data, reviews and ratings about trips "from hand to hand" for prompt decision-making to eliminate the identified shortcomings.

The Customer Satisfaction Index (CSI) is formed based on the following indicators:

- convenience and comfort of the ticket purchase procedure (on the website, in the mobile application, at the box office);
- fare;
- service on the way (comfort level, technical and sanitary condition of wagons, quality of bedding and road equipment, quality of work of conductors);
- availability of additional services and the quality of catering for passengers en route;
- loyalty program "RZD Bonus".

Table 2: Innovative projects in the field of improving passenger service in railway transport in accordance with KPIR-2025.

Project attribute ¹	Goal. Types of innovations	Effect
1. Rolling stock-2025		
F/S	Increasing the requirements for the purchased rolling stock and participating in the development of new models of rolling stock. Process.	Improving the operational characteristics of rolling stock, reducing the life cycle cost by up to 15%, improving safety, reliability and environmental friendliness, increasing the indicators of transportation activities (organization of driving trains weighing 7,100 tons and st. 8000 tons), the introduction of connected 2-storey passenger electric trains to reduce energy consumption – up to 10%, reducing travel time – by 5-10 %.
2. Development of the Moscow railway junction		
S	The development of transport services on the Small Ring of the Moscow Railway and the organization of transportation within the borders of Moscow and the region along diametrical routes through the city center. Product, process.	Improving the service and quality of services provided to passengers, increasing the level of loyalty and customer satisfaction, combining commuter rail systems with the transport infrastructure of large cities, switching to the design of integrated transport circuits and multimodal transportation.
3. Development of high-speed communication in Russia		
F/S	The projects are the development of the experience of creating the country's first high-speed highway on the route Moscow - St. Petersburg, the development in the future of projects on the routes Moscow-Kazan, Yekaterinburg-Chelyabinsk with their further integration in the direction Moscow-Kazan-Yekaterinburg-Chelyabinsk. Product, process.	The economic effect of exploitation for all stakeholders. Increasing customer satisfaction, attracting additional passenger traffic.
4. Development of high-speed communication		
F/S	Implementation of the system of automatic monitoring of traffic parameters, data exchange system, solutions for maintenance and operation of high-speed electric trains (automation, robotization), introduction of information technologies. Product, process.	Improving the service and quality of services provided to passengers, increasing the level of safety and labor productivity.
5. Development of multimodal passenger and cargo transportation		
S	Creation of a single digital platform for the organization of multimodal routes and a barrier-free environment for low-mobility groups of the population. Product, process.	Increasing the list of services and services provided by rail transport to increase passenger satisfaction, expanding the customer base and attracting new customers, reducing the time for processing orders, improving the quality of service, the level and satisfaction of passengers and customers, increasing the competitiveness of transport services.
6. Digital client services		
F/S	Development of new and development of existing customer digital services in the field of organization and management of freight and passenger transportation: provision of services in real time, including route planning, purchase of single tickets and booking, provision of additional services. Grocery, marketing.	Improving the quality of railway transport services, increasing the customer focus of the company's activities, providing new digital services and services
7. Innovative project "EngineeringCenter"		
F/S	Ensuring the achievement of the main performance indicators of Russian Railways, the development of high-speed rail transport, ensuring the transport security of the state, reducing dependence on imported goods and services in transport, replacing imported components and technologies in the production of rolling stock and its components. Process, organizational.	Creation of high-speed passenger rolling stock; development of electric trains with the 4th level of automation, creation of hybrid electric trains of small composition and hybrid diesel locomotive for operation in large urban agglomerations; implementation of an automated system for collecting, processing, storing information, including a high-precision coordinate system (HCS) and a spatial database of digital models of the track; design and the development of new types of rolling stock; the introduction of passenger information and entertainment systems (following the example of the already existing "Fellow Traveler" system).

¹ –fundamental – F, superstructure– S

According to the results obtained, in 2020, the passenger service quality index for rail transport amounted to 4.39 points on a 5-point system, which is 1% higher than in 2019 (Fig. 1) (Annual report of JSC «FPC», 2020).

A study aimed at determining the level of importance that passengers attach to various attributes of railway service (Sanudo, 2019) allowed us to establish that attributes related to the fare system, travel time and intermodality are the most important for improving the quality of service in railway transport. The least important attributes include very specific additional services. At the same time, it was noticed that the importance varies depending on the frequency of use of railway services. Accordingly, improving intermodality can be a cost-effective way to attract new users.

External factors of influence include the fact that railway tourism cannot be developed without the consolidation of joint actions of tour operators, travel agencies, carriers and regional/local authorities, which, along with the promotion of package tourism products, allows, according to (Timakova, 2020), to form holistic concepts of territorial marketing and branding not only of tourist destinations, but also of the territories of regions and municipalities, along which the railway tour takes place.

The fundamental elements in the passenger service system on railway transport are the

professionalism of the staff, the organization of leisure activities, catering, comfort and safety of transportation. A number of researchers note the importance of providing up-to-date information support, including through mobile interactive means of information, the possibility of unhindered connection to the high-speed Internet, etc.

In the context of increasing global competition in the markets of goods, services and capital, a structural restructuring of the world economy is taking place, associated with a change in the balance between economic centers, an increase in the role of regional economic unions and the expected spread of new technologies, which entails a change in national and global cargo and passenger flows, an increase in requirements for the quality of transport services, security and stability of the transport system (Markova, 2021).

The key characteristics of quality and competitiveness are the level of material and technical support of the transportation mechanism; the degree of information and communication services; the quality of staff work, etc. To improve the level of services on the railway, it is advisable to take into account the need of various groups of passengers not only in the quantitative provision of seats, but also in creating conditions and offering services that create comfort (Koroleva, 2020).

In order to develop management innovative approaches in the organization of passenger service



Figure 1: The Customer Satisfaction Index (CSI) of JSC "Russian Railways"(Annual report of JSC «FPC», 2020).

in order to increase the level of passenger loyalty and competitiveness of the enterprise, the NPS index is monitored. Net Promoter Score is an index of consumer loyalty to a product/service or to a company). So, in 2020, the value of the NPS index for Russian Railways was 45, which is 2 points higher than in 2019 and 1.4 times higher in the previous three years (Fig. 2) (Annual report of JSC «FPC», 2020).

The spread of a new coronavirus infection in 2020-2021 and the associated self-isolation regime led to a sharp decrease in traffic volumes and increased costs for railway passenger carriers. The spread of technology for the use of non-stop cars in passenger tourist trains is proposed as one of the possible measures to accelerate the recovery of pre-crisis traffic volumes, as well as to increase the popularity and accessibility of railway tourism for residents of various regions of Russia, notes (Isaeva, 2021)

According to Romenskaya M.V., Kalinina K.A., Ekimov A.V., in order to ensure high-quality passenger service (including those who are tourists) en route, it is necessary to introduce special technological principles for organizing tourist and passenger transportation, based on different conceptual approaches to organizing train traffic: mass transportation to resorts; traveling along historical railways on 1520 mm gauge lines and along specific railways for the purpose of organized

visits by tourists to objects of unique beauty that are inaccessible to other modes of transport; irregular cruise routes using a passenger train as the core of a tourist product, where the train becomes a hotel for tourists; visiting resorts/cities as part of cruises weekend; transportation of volley flows of guests to the venues of mass events of local, regional or all-Russian scale (Romenskaya, 2021).

Currently, rehabilitation and relaxing trips, short-term trips within regions to restore interpersonal communications and new socialization in society are becoming important, which is facilitated by the atmosphere of interpersonal communication when traveling by train (Timakova, 2021).

JSC "Russian Railways", as the largest Russian company, is actively engaged in the development and implementation of global technological innovations, and also generates demand for them, acting as a leading driver of innovative development not only of the transport complex of our country, but also of the entire Russian economy.

The strategy of innovative development of JSC "Russian Railways" involves both the development and implementation of innovative projects and the formation of innovative infrastructure. This approach assumes consistency in the implementation of various innovative projects, which is manifested in the complexity of the process of search, adaptation and implementation of innovative projects in the company's activities. The need to

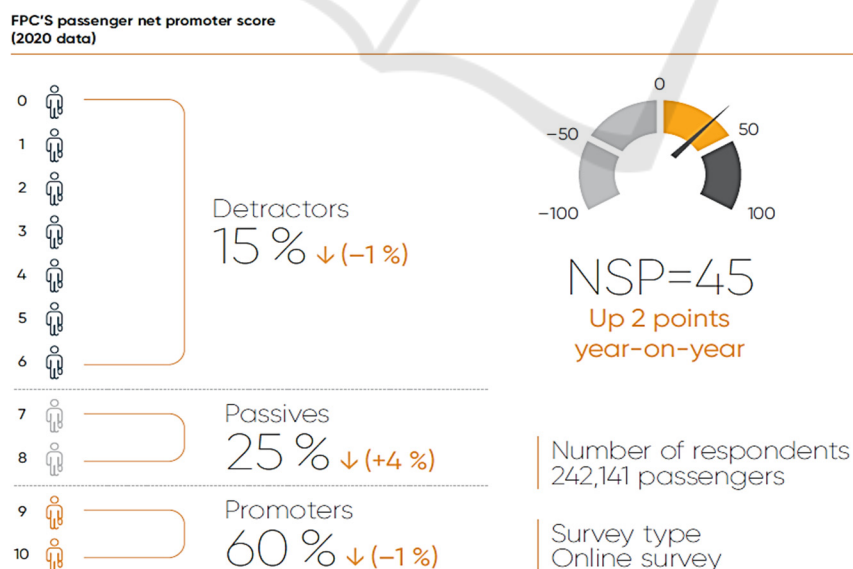


Figure 2: Loyalty Index (NPS) of passengers of JSC "Federal Passenger Company"(Annual report of JSC «FPC», 2020).

stimulate and develop domestic demand for innovations in Russian Railways in connection with unfriendly sanctions measures of Western countries, caused the need to organize methodological work to update and identify the needs of the holding for new (innovative) technical, technological and organizational solutions and products.

4 CONCLUSION

Needs (requests) formed taking into account the priority directions of scientific, technological and innovative development of the holding, of which 6% of requests for innovations relate to the direction "Development of transport and logistics systems in a single transport space based on customer orientation", which allows us to identify as priority innovative areas of passenger service at JSC "Russian Railways": the development of the service "Electronic ticket", registration of baggage, animals on the website of JSC "Russian Railways", transportation of pets in a compartment for baggage transportation, transportation of unaccompanied children, electronic store "FPC-Market", sending correspondence and parcels by trains, provision of children's travel kits, equipping trains with warning devices, information services on trains, organization of leisure activities, modernization of catering services.

The identified priority areas of innovative activity in the field of passenger service act as the basis for the subsequent organization:

- close cooperation and interaction with the elements of the innovation ecosystem – scientific, educational, research organizations to find the most effective innovative solutions to address specific requests for innovation;
- open user requests through the development of the information portal "Single Window of Innovations of JSC "Russian Railways";
- interaction with executive authorities, state corporations, external innovative companies, and other participants in the innovation environment in the implementation of various programs and events, including in the format of innovative project competitions.

5 RECOMMENDATION

The innovative concept of passenger service management provides for the offer of railway tourist

products for a certain target audience, based on different levels of wealth, in order to expand the sales market in the context of the development of domestic tourism, which requires increased work with professional participants in the tourism industry and hospitality market and marketing promotion of railway tourism. At the same time, the separation of passengers by service classes is realized when using cars of different comfort and offers of different tour packages.

Thus, an inextricable link has been established in the implementation of fundamental and client-oriented (superstructure) innovative projects. An integrated approach to the organization of passenger traffic as a result of the development and implementation of innovative management solutions aimed at the formation of customer-oriented aspects in passenger service will increase the competitiveness of passenger rail transportation. Against the background of changing geopolitics in the world, there is a high probability of strengthening the position of Russian Railways in passenger transportation and changing the logistics of the movement of passengers and travelers while providing high-quality services in the process of their maintenance on rail transport.

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