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METHODOLOGICAL APPROACHES TO FORMING DEVELOPMENT STRATEGY FOR SERVICE LOGISTICS IN ROAD CONSTRUCTION

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Abstract

The article considers the existing methodological schemes for organizing activities and explores their main components. The author's definitions and approaches to the methodological organizing the activities are studied. The basic scheme of the methodological structure of the activity arrangement is presented. The organizational factors of the enterprise are classified, taken into account when developing the methodological provisions for the service logistics strategy in road construction. It has been established that the field of road construction has three areas of logistics (the material and technical supply market, where purchases are made for the needs of road construction; the production of construction, repair, reconstruction and other additional works; the operation and maintenance of road facilities), where the digital logistics service in road construction finds its applicability. A comparative characteristic of the methods of organizing road-building processes is compiled. The role of logistic tools in the methods of organizing road-building processes is revealed. A basic scheme of the structure of methodological provisions in the formation of the strategy of service logistics in road construction has been developed. The paper will be useful for studying the theoretical foundations, forming a strategy for service logistics in road construction. In practical road construction activities, the main provisions of the article can find their applicability in the planning and implementation of the strategy of service logistics in road construction. The article is relevant for the study of the theory and the implementation of practical road construction.

Keywords: Logistics, logistics strategy, logistics services, digital logistics services, road construction.

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1. Introduction

Effective organization of road construction requires comprehensive planning and forecasting of road construction processes, as well as the development of methodological provisions for the formation of a service logistics strategy. These areas of work are able to optimize the implementation of road construction processes. Therefore, the study and improvement of methodological approaches, the formation of a strategy for the development of service logistics in road construction in the digital economy, are becoming relevant in the theory and practice of road construction.

A digital logistics service for road construction is a complex of logistics services and information technologies offered to participants in a road construction project, with the aim of managing key processes implemented on the principles of logistics and information integration and to meet the needs of participants in a road construction project (Skovorodneva, 2019).

2. Problem Statement

Considering the essence of methodology, it is necessary to separate the theoretical and practical orientation. Theoretical methodology studies the relationship of the object, subject and knowledge in the processes of cognitive activity, and thus represents a branch of philosophy that provides the theory of knowledge.

The theoretical methodology aims to create a model of ideal knowledge in the given conditions. The practical methodology is focused on solving practical problems and purposefully transforming the external and internal environments, and is an algorithm, a set of techniques and methods of how to achieve the desired practical goal and not offend against the truth, or what is considered to be true knowledge.

The effectiveness of any scientific method is verified by practice, by solving scientific and practical problems — that is, by searching for principles, ways and methods for achieving the goal, implemented in a complex of real cases and circumstances. Many researchers define the concept of “methodology” in relation to their field of activity and the position of their scientific interests. Krayevskiy (2001) defines the concept of “methodology” as a means of connecting science and practice. Masyukova (2014) defines “methodology” as a means of helping science and practice. Novikov and Novikov (2007) understand “methodology” as the doctrine of organizing activities.

Researchers classify the methodology according to its focus (game-learning-work). In this regard, the methodologies of gaming, training, labor, professional activity are distinguished. Professional activities are classified by the authors on:

- practical in the field of material and spiritual production (the most common area of employment);
- specific forms of professional activity (science, art, etc.).

Basic methodological principles can be the basis for the study of the road construction industry.

The methodology of service logistics in road construction can be defined as theoretical and methodological tools for the effective organization of service logistics activities and its digital component.

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A number of factors influence the organization of the logistics service of road-building enterprises. Conventionally, they can be divided into factors of the external and internal environment.

Applying the methodology of service logistics of road construction for the effective organization of the strategy of service logistics activities and its digital component, it is necessary to consider in more detail the constituent elements of the internal organization of the road construction company.

Increasing competition in the market of logistics services, increasing complexity of logistics systems, increasing requirements to maintain a given level of logistics services are causing increased interest and the practical importance of research in the development of methodological approaches to the formation of a strategy for the development of service logistics in road construction.

Features of the formation of the development strategy of logistics services are considered in the works of such scientists as Bochkarev (2009), Terenina et al. (2019), Zaytsev and Shurpatov (2011) and others.

The internal organization of a road construction enterprise is understood, firstly, as internal orderliness, coordination of autonomous and differentiated parts of a road construction enterprise, due to its structure, main and additional activities. In this case, the main and additional activities in the form of finished construction projects are understood as the result of road construction activities. Secondly, the internal organization of a road construction enterprise includes a set of processes and actions leading to the formation and improvement of the relationship between the parts and components of a road construction enterprise in the process of functioning. In this case, the internal organization of a road construction enterprise is understood as a process or a set of processes that affect road construction activities. Thirdly, a road construction project is an association of road construction participants acting on the basis of certain procedures and rules that jointly implement a certain road construction project that has its own program and purpose. In this case, the internal organization of a road construction enterprise is understood as an association of persons in the management of road construction activities. In this regard, the complexity and specificity of the internal organization of enterprises in the field of road construction is noted, which requires special attention when developing methodological provisions of the strategy of service logistics of road construction. It should be noted that the above-mentioned elements of the internal organization of road construction enterprises have a direct impact on the formation process and the final strategy of road construction service logistics.

The methodology of service logistics in road construction is necessary for the effective organization of service logistics activities, the selection and implementation of the necessary digital technologies, and other additional operations. Organization of logistics service activities involves the creation of an integrated system with certain parameters and clear characteristics, a systematized structure, a specific algorithm for its implementation, and an assessment of the level of the proposed service logistics activities. Previously, it was revealed that the logistics service is regulatory in road construction, has a coordinating effect on road construction activities. In this case, it seems necessary to consider the definition of “management methodology” and consider the main structural components identified by other researchers.

Gaponenko (2016) identifies the approach as the main element of the management methodology, which determines the set of use of the remaining elements. In practical activities, the system, process, program, target, and project approaches are the most widely used. Also, one can distinguish such

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approaches as: marketing, information, network, integration, cybernetic, humanistic, which have found their application in certain types of activities that have their own professional guidelines.

Barmashova and Viktorova (2012) singled out the paradigm as the fundamental basis of the management methodology, which has a conceptual scheme, indicators of the current situation of reality, requiring the selection of certain methods, models for posing and solving problems. This interpretation finds the greatest applicability in scientific activity, adaptation of research categories to practical activities.

Novikov and Novikov (2007) offer a basic outline of a methodology for organizing activities, with a standard set of additional components. This scheme is filled out depending on the specifics of the activity. In addition, the researchers reviewed the methodology of organizing practical activities, in which the basic methodological scheme can also be applied. The structure of the logical structure of activity includes the following components: subject, object, topics, forms, means, methods of activity, result. External characteristics include: features, principles, conditions, norms. The temporal parameters of the organization of activity include: phases, stages, steps. The results of the activity cycle are determined by three phases, such as: the design phase, where the organizational model of the created system is built, the implementation scheme; technological phase in which the system is implemented; reflective phase, in which an assessment of the implemented system is carried out, determination of the need for adjustments, or the need to design or implement a new project.

Having studied this standardized scheme of the methodology of organizing activities, its versatility and applicability in many areas of economic activity can be noted. The field of road construction has three areas of logistics (the logistics market, where purchases are made for the needs of road construction; construction, repair, reconstruction and other additional works; operation and maintenance of road facilities) (Grigor'yev et al., 2014).Features of the implementation of work at each stage of road construction activity (construction, repair and reconstruction, maintenance of road facilities); the use of common and unique digital technologies necessary for the organization of service logistics for each area of road construction logistics demonstrates the complexity of many road construction processes. This suggests that this basic scheme of the structure of the methodology for organizing activities finds only partial application and requires significant improvements. It is advisable to consider existing methods of organizing road construction processes, identify the role of logistics management, and consider the conditions for organizing logistics services in each of them. In this regard, works on the integration of service flows conducive to achieving the organization's strategic goals are of interest (Baliga et al., 2000; Beckmerhagen et al., 2003; Chehrehpak et al., 2012).

3. Research Questions

There is a need for a detailed study of the organization of road-building activities and the development of a general scheme-structure of the methodology for the strategy for organizing service logistics activities in the road-building sector.

There are six methods for organizing road construction processes: in-line, parallel, sequential, cyclic, rotational, and rotational-expeditionary (Alenicheva, 2004). In road construction, the flow method, the parallel method, and the cyclic method were used. Logistic optimization is able to improve the above methods of organizing road construction processes in many respects. Logistic optimization involves

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changing the parameters of road building processes to ensure the best performance. These may include: reduction of construction time, minimization of the duration of road construction works, minimization of time periods for certain types of work, minimization of the construction cost of a road object, minimization of the cost of operation and maintenance of a road object, maximization of labor productivity, increase in the level of quality of road construction works, monitoring and control over the implementation of road construction processes and other areas of logistics optimization. Having studied the basic methods of organizing road construction processes, highlighting the main directions for logistics optimization, the role of digital technologies of logistics services in the maintenance and operation of road facilities, it is important to note the complexity and specificity of road construction activities. The standard methodological scheme of activity is partially applicable for the formation of a strategy for the logistics service of road construction. It is advisable to draw up a basic diagram of the structure of methodological provisions in the formation of a strategy for service logistics of road construction. This circuit is shown in Figure 1.

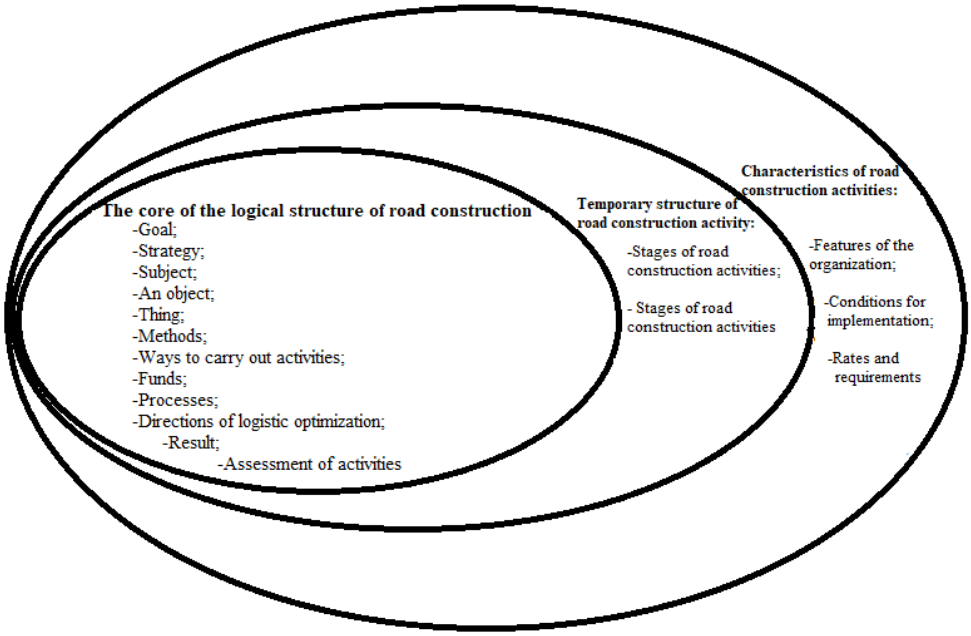

Figure 01. The basic scheme of the structure of methodological provisions in the formation of the service logistics strategy in road construction

4. Purpose of the Study

It is advisable to explain in detail the main elements and their role in the basic structure of the methodological provisions in the formation of the service logistics strategy in road construction.

The information is given in Table 01.

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Table 01. The main elements of the structure of methodological provisions in the formation of the service logistics strategy in road construction

Main elements	**Content and types**
The core of the logical structure of road construction activities	
Purpose	The main goals of the implementation of road construction activities. Quantitative (increase in the number of construction, repair, operation and maintenance of road construction objects; maximization of profit; increase in market share, etc.). High-quality (tender activity, PPP, effective cooperation with contractors, etc.).
Strategy	Formation of own road-building strategy or selection of an existing road-building strategy (lean, dynamic, minimizing the overall logistics costs, improving the quality of the logistics service, minimizing investments in logistics infrastructure, logistics outsourcing, etc.).
Subject	Service logistics divisions and departments of road-building enterprises, specialized service logistics intermediaries, intermediaries with a full cycle of logistics service maintenance, etc.
Object	Consumer of logistics services (individuals, legal entities), inventory items of the road construction industry.
Subject (products, work, services, service)	Logistic services, additional logistics services, integrated logistics services for road construction processes.
Methods	Methods of organizing road-building processes (sequential, parallel, in-line, etc.) and their logistics component.
Ways to carry out activities	Independent organization and implementation of logistics service activities, logistics service outsourcing, service of logistics operators, etc.
Means	Digital means of logistic service, technical means of logistic service, technological means of logistic service, labor, information, organizational, financial, etc.
Processes	Aimed at the field of logistics of road construction: providing, functional, operational. By nature: managerial, coordinating, controlling, optimizing, etc.
Logistic optimization direction	Reducing construction time, minimizing the duration of road construction works, minimizing the timing of certain types of work, minimizing the construction cost of a road facility, minimizing the cost of operating and maintaining a road facility, maximizing labor productivity, increasing the quality level of road building work, monitoring and controlling the implementation of road -building processes and other areas of logistics optimization.
Result	Ready-made road construction facility that meets the stated requirements, with optimized logistic parameters.
Assessment	Assessment of the logistics service provided.
Temporary structure of road construction activities	
Stages of road construction activity	The initial, main, final stages of road construction activities.

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Steps of road construction activities	Designing the organization of road construction activities, the direct implementation of road construction works.
Characteristics of road construction activities	
Features of the organizing activities	Features of the organization of the construction of road facilities; repair and reconstruction of road facilities; maintenance and operation of road facilities, roadside territories, and organization of roadside service.
Terms of implementation	State, corporate, PPP, economic, financial, labor, information, etc.
Standards and requirements for road construction activities	Normative legal acts regulating road construction activities, standards, Construction Norms and Regulations, contracts, rules, labor protection requirements, safety requirements, environmental standards etc.

The developed methodology can be expanded with additional components depending on the features of the organization and implementation of road construction activities.

5. Research Methods

For the implementation of road construction activities, this methodology will require additional transformations. For the organization of a logistic service in the implementation of repair and reconstruction works, maintenance and operation of road facilities, this methodology may be the base. This can be established by considering the Order of the Ministry of Transport of the Russian Federation of November 16, 2012 N 402 “On approval of the Classification of works on overhaul, repair and maintenance of roads” (as amended on November 13, 2018). Having considered an extensive list of works on the overhaul, repair and maintenance of roads, it can be noted that the logistics service and digital services find their applicability in road construction activities and provide ample opportunities for optimizing many processes. The state standard GOST R 50597-93 “Roads and Streets” defines the requirements for the operational condition of road construction objects (GOST R 50597-93, 1993). The standard has regulatory references to related standards, building codes, instructions. Having become acquainted with these standard and additional regulatory sources, it can be noted that the achievement of most of the tasks set can be optimized by means of the road construction logistics service.

6. Findings

A digital logistics service is able to monitor and control the operational status of road facilities. As a result, it becomes possible to timely eliminate shortcomings and inconsistencies of road objects with the requirements of the standard.

7. Conclusion

The developed scheme of the structure of methodological provisions, the strategy of service logistics allows you to organize effective road construction activities. A modern logistics service with digital components provides ample opportunity to optimize the road construction industry.

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