

**PRIORITIES IN THE USE OF INNOVATIVE TECHNOLOGIES IN THE PRODUCTION OF BUILDING MATERIALS AND RELATED SOLUTIONS**

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Abstract

The article examines the prospects for the development of material resource management in construction using modern information technologies and digital tools. The analysis showed that existing methods of managing material resources have their advantages and disadvantages, but their effectiveness can be improved by using modern information technologies and digital tools for project and resource management. However, for this it is necessary to develop and implement appropriate regulatory documents and train construction company personnel to use new tools for managing material resources.

Keywords: management, material resources, construction industry, just-in-time, inventory management, information technology, digital tools, regulatory framework, efficiency, project management, cost optimization.

Introduction

Material resource management is an important aspect of management in the construction industry, as material costs can account for a significant proportion of total construction costs. There are various methods of managing material resources, such as just-in-time, inventory management and others. However, the application of these methods may face a number of problems related to the imperfection of the regulatory framework, restrictions on their use, as well as the need for effective management of the flow of information about material resources [1,2].

The main idea of just-in-time is to produce goods only when they are needed, in the right quantity and at the right quality level. This allows you to reduce inventory and get rid of unnecessary costs for storage, transportation and inventory management. At the same time, companies using just-in-time are aimed at high production efficiency, process optimization and product quality improvement. The principle of just-in-time is based on the close interaction between production and supply. Suppliers of materials and components supply them to production only when they are needed, and only in the required quantity. Thus, the production process does not depend on stocks and supplies, but is determined by the needs of consumers. [4,5] In order to apply just-in-time, it is necessary to establish close cooperation between production and suppliers. It is also important to organize production processes in such a way as to minimize the time for equipment changeover and product change. The advantages of just-in-time are to increase production efficiency, reduce the



cost of storage and inventory management, improve product quality and reduce the risk of excess inventory. However, in order to apply just-in-time, careful organization of production processes is necessary, as well as a high level of coordination between production and suppliers [2,3]. A review of the literature on this topic has revealed that this problem is important for the construction industry. There are many approaches and methods of material resource management in the literature, including traditional inventory management methods, the JIT method, the ABC analysis method, and others.

One of the most common methods of managing material resources in construction is the JIT method (Just-In-Time), which involves minimizing the level of stocks of materials and component parts. This method allows you to reduce the cost of storing and transporting materials, as well as improve the efficiency of the construction process. [9,10]

Another method widely used in construction is the ABC analysis method, which is based on the classification of materials depending on their cost and significance for the project. In this way, managers can determine which materials should be given special attention and control. The literature also discusses the issues of rationing the consumption of material resources. To do this, various methods are used, such as the standard estimate method, the linear normalization method, and others.

Thus, a review of the literature shows that the management of material resources and the rationing of their consumption are complex and multifaceted tasks that require different approaches and methods [3,6].

The methodology for managing the material resources of construction organizations and rationing their consumption may include the following steps:

1. Analysis of the need for material resources: conducting an analysis of the needs for materials for a specific project. This step allows you to determine the required amount of materials and components, as well as their cost. [11,12]
2. Determination of the minimum stock level: based on the analysis of needs and identification of risks associated with a delay in the supply of materials, it is necessary to determine the minimum stock level that will ensure the smooth execution of work.
3. Using the JIT method: using the JIT method, it is necessary to determine the optimal inventory level, which will minimize the cost of storing and transporting materials, as well as improve the efficiency of the construction process.
4. Application of the ABC analysis method: for effective management of material resources, it is necessary to use the ABC analysis method, which allows you to identify materials with high cost and significance for the project. Special attention and control should be paid to these materials.
5. Rationing of the consumption of material resources: carrying out rationing of the consumption of material resources using various methods, such as the standard estimate method, the method of linear normalization and others.
6. Use of information systems: For more effective management of material resources, information systems should be used that allow you to automate the management of material resources, speed up the decision-making process and improve control over the management process. Thus, the methodology of managing the material resources of construction



organizations and rationing their consumption includes an analysis of the need for materials, determining the minimum level of stocks, using the JIT method, using the ABC analysis method, rationing the consumption of material resources and the use of information systems [7,8].

The results of the study:

1. Improving the efficiency of resource management: The use of modern methods of material resource management, such as the JIT method and the ABC analysis method, can significantly improve the efficiency of resource use. This allows you to reduce storage costs, minimize delays in deliveries and optimize material costs.
2. Reducing costs and increasing profitability: Effective management of material resources allows you to reduce the cost of purchasing and storing materials, as well as optimize the use of resources on construction projects. This leads to an increase in the profitability of the construction company.
3. Reduction of project execution time: Well-organized management of material resources allows you to reduce the execution time of construction projects. Thanks to the JIT method and optimization of supply processes, materials and components become available at the right time, which allows you to speed up the construction process and reduce time delays.
4. Improving the quality of construction projects: Effective management of material resources also affects the quality of construction projects. The correct choice of materials, their timely delivery and control over use make it possible to prevent errors and defects, which leads to an increase in the quality and durability of construction projects.
5. Reducing the negative impact on the environment: The rational use of material resources helps to reduce the negative impact on the environment. Reducing excess and waste materials, optimizing logistics and choosing environmentally friendly materials contribute to the sustainable development of the construction industry. [13-26]

Thus, the results of research on material resource management and rationing of their consumption confirm the importance of developing and applying effective methods of material resource management in construction organizations. These results provide valuable information and recommendations for practical application in the construction industry in order to improve productivity, economic efficiency and environmental sustainability of projects.

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