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Model for Evaluating the Effectiveness of the Organizational Management Structure of Construction Firms

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Abstract: The article highlights one of the reasons for the inefficiency of existing approaches to managing the activities of construction firms. It is noted that this is due to the insufficient development of this issue in scientific literature. Based on the research results, it is noted that a crucial step in developing a strategy for the activities of a construction firm is assessing its financial condition. This assessment allows for identifying its strengths and weaknesses, viewing its strengths as opportunities to develop management in the desired direction, and devising measures to address shortcomings in management organization in areas that represent the firm's weak points. It is noted that effective management of construction firms involves analyzing their financial and material resources, approaches to evaluating management costs, and potential options for reducing these costs to ensure profit growth.

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1. Introduction

The main directions for improving the organizational management structure in construction firms should be determined considering emerging trends in residential construction development and achieving economic independence in the context of innovative economic growth.

When forming the organizational management structure in construction firms, the following key principles should be adhered to: comprehensive coverage of all functions of the construction firm's management apparatus; the absence of task duplication at all levels of management; adherence to rational management norms; minimization of management costs; the establishment of independent divisions within the construction firm, considering a rational combination of administrative and economic management methods and forms.

Literature review on the research. Construction firms, especially those in rural areas, do not focus on improving management practices. Therefore, it is considered advisable to establish a specialized unit for the rationalization and regulation of management processes. This is driven, on the one hand, by the need to ensure the completeness of

interconnected functions, and on the other, by the goal of achieving balanced workloads across the management blocks of the proposed structure.

The evaluation of the effectiveness of a particular decision regarding the structure of a managed system should be based on the established criterion of the economic efficiency of management structure improvement. The optimization of the organizational management structure of a construction firm aims to achieve additional profit by reducing non-productive expenses, improving interaction methods between structural divisions, and generating extra revenue.

In some cases, optimizing the organizational management structure of a construction firm may lead to an increase in current costs due to the redistribution of functions, while the increased workload of personnel is generally associated with the growth of motivational factors.

In practice, achieving ideal efficiency is almost impossible. It can be achieved during the implementation of new equipment and technologies in the construction firm. Even in this case, implementation should be accompanied by a temporary decrease in efficiency, followed by its adaptation and stabilization.

Changes in the organizational management structure of a construction firm are associated with partial modifications of certain structural divisions. Another approach to improving the efficiency of a construction firm's organizational structure is the optimization of information technologies and the implementation of automation in the systems of standardization, planning (forecasting), and management. In all cases, making decisions on optimizing the organizational structure requires sufficient justification. The variety of approaches to developing performance indicators for management systems indicates a lack of a unified perspective on this issue and insufficient development of its methodological foundations.

2. Materials and Methods

The research utilized methods such as analytical approaches, mathematical modeling, statistical analysis, forecasting, and comparison to develop strategies for improving the management systems of construction firms and enhancing their economic efficiency.

3. Results and discussion

To evaluate the economic efficiency of measures aimed at improving the organizational management structure in construction firms, a traditional method of efficiency calculation widely used in economic literature should be applied. This is the ratio of the annual economic effect to the costs of improving the management of the construction firm. Analytically, this ratio can be determined using formula (1):

$$\Delta K_{\text{эф}} = \sum \text{Э}_{\text{э}} : \sum \text{З}_{\text{с.у}}, \quad (1)$$

where: $\Delta K_{\text{эф}}$ - the efficiency coefficient of management improvement in the construction firm;

$\text{Э}_{\text{э}}$ - the total annual economic effect achieved as a result of the measures implemented by the construction firm;

$\text{З}_{\text{с.у}}$ - the costs associated with measures to improve the management of the construction firm.

$$\sum \text{З}_{\text{с.т}} = \sum \text{Э} - \sum \text{Э}_{\text{с.у}} \times \Delta H_{\text{коэф}}, \quad (2)$$

where: $\sum \text{Э}$ - annual savings from measures to improve the management of the construction firm;

$\Delta H_{\text{коэф}}$ - the normative efficiency coefficient of the construction firm.

The methodological basis for evaluating the economic efficiency of improving the organizational structure of a construction firm at various management levels can be the comparison of the resulting economic effect with the costs of improving the firm's management structure. In this case, it is necessary to consider not only the savings from improving the organizational management structure but also the increased efficiency of all the firm's operations (formula (2)). The socio-economic effect of improving customer service, reducing the time required for housing acquisition, increasing the volume and range of services offered, and enhancing housing quality must also be taken into account.

The amount of savings achieved in the management sphere ($\Sigma \mathfrak{Z}_y$) can be determined using formula (3):

$$\Sigma \mathfrak{Z}_y = \Sigma \mathfrak{Z}_{\text{до}} - \Sigma \mathfrak{Z}_{\text{посл}}, \quad (3)$$

where: $\Sigma \mathfrak{Z}_{\text{до}}$ and $\Sigma \mathfrak{Z}_{\text{посл}}$ – the annual amount of management expenses, respectively, before and after implementing measures to improve the management structure of the construction firm.

Similarly, savings from the improvement of construction firms or the enhancement of service quality at various levels of the firm's operations can be calculated.

The analysis of the functioning of various construction firms shows that improving the organizational structure of construction firms has a significant impact on their performance indicators. As a rule, this is accompanied by an improvement in the quality of services provided to the public and a reduction in transportation costs.

The performance of management functions is possible through the use of various forms of organizing the labor of the management staff in construction firms, which are expressed in different variants of organizational management structures. Therefore, there is a need to create the most efficient organizational management structure for a construction firm, capable of ensuring the timely adoption of high-quality management decisions and their communication to the executors. The fulfillment of this requirement largely depends on the formation of the informational environment within the construction firm's management system and the topological parameters of the firm's organizational management structure.

The management system of a construction firm is an information and management environment, as the subject and result of the work of the firm's management staff is information. Information and decision-making are interconnected through a complex system of direct and feedback links. The decision-makers' capabilities in processing information are subject to both qualitative and quantitative limitations. Quantitative limitations are due to the fact that acquiring and transmitting information, as well as making decisions, require a certain amount of time. The total of these costs cannot exceed the maximum working time of the decision-makers. The presence of qualitative limitations is related to the necessity of having various specialized knowledge that allows for the assessment of information and the making of management decisions.

Furthermore, as the main element of any socio-economic system, including the management system of a construction firm, a person has certain physical and psychological limitations in terms of their ability to perceive and process information, which must be taken into account when improving the firm's management system. The diversity of organizational management structures in construction firms brings to the forefront the issue of evaluating their effectiveness. Practice shows that finding a direct correlation between the organizational management structure of a construction firm and the results of its management, carried out within this structure, is quite difficult.

4. Conclusion

Existing approaches to evaluating the effectiveness of construction firm management, regardless of their merits and drawbacks, describe the management system without addressing the comparative features of organizational structures. In construction firm management practice, comparisons are most often made between the existing or proposed structure and a standard organizational structure. Comparative assessment of the considered variants of organizational management structures in construction firms using such indicators is difficult. In addition to indicators related to comparisons with regulatory standards, cost-based indicators, such as labor efficiency within the organizational structure, are also widely used.

Thus, to affirm that the organizational structures of construction firms contribute positively to organizational effectiveness, it is necessary to be confident in the abilities and motivations of those who have the authority to design them. The structure of construction

firms undoubtedly impacts organizational effectiveness, even though the exact nature of this influence may be difficult to determine.

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