



METHODS OF FORMING REQUIREMENTS TO THE DEVELOPMENT OF A SYSTEM APPROACH IN ROAD MANAGEMENT

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ABSTRACT

The article discusses the key aspects of a systems approach in management, which is a concept aimed at managing an organization as a complex system of interconnected elements. The author analyzes the basic principles of a systems approach, including integrity, hierarchy, dynamism and goal orientation. Particular attention is paid to the requirements for the development and implementation of this approach, which include methodological, organizational, technological and cultural aspects.

Introduction

Efficient road management plays a key role in ensuring the economic and social stability of the region. Modern challenges, such as moral and physical deterioration of road infrastructure, lack of funding and increasing traffic intensity, require the use of a systems approach. The purpose of this article is to identify the key requirements for the development of a systems approach in road management to improve its efficiency.

A systems approach in management is a conceptual framework aimed at considering organizations as complex systems consisting of interconnected elements. This allows you to effectively manage processes, resources and people, ensuring the achievement of strategic goals. Currently, there are no requirements for the development of a systems approach in road management. In this regard, the definition of key requirements for the development of a systems approach in management, including methodological, organizational and practical aspects, is relevant.

Literature review

The issues of the system approach in management have been studied in many works. For example, in the research of S.V. Trusova "System approach to improving the management of the organization in modern conditions" it is emphasized that "In dynamically changing environmental conditions, the system approach is of particular importance in business, management and other human activities. Management is impossible without studying the trends and capabilities of the system." In the work of O.I. Grukhhvina "System approach in management" a characteristic of the system approach is given as "System approach in management is not a set of individual practices, but a way of holistic perception of the management process, a specific way of thinking. This approach is a universal method of analyzing systems, situations and decision-making in management." In the research of Yu.N. Kalentieva "The problem of applying the system approach and system analysis in making management decisions" it is emphasized that "the system approach and system analysis are an integral element in ensuring the effectiveness of the management decisions made." These works do not consider the requirements for the development of a systems approach in management, their principles, implementation, as well as advantages and disadvantages.

Method

To form the requirements for the development of a systems approach in management, the author used the method of content analysis, the essence of which lies in the analysis of texts - sources of information. Based on the content analysis, the following main provisions of the systems approach are formulated.

A systems approach is a methodology based on the analysis and management of objects as complex interconnected systems. In the context of road management, this means taking into account many factors, such as:

- ☒ infrastructure condition;
- ☒ traffic flows;
- ☒ economic, environmental and social aspects.

In our opinion, a systems approach should be based on the following basic principles:

1. Integrity and interconnection - the organization is considered as a single whole, where a change in one element affects the functioning of all the others.
2. Hierarchy - the organization is presented as a system with several levels of management.
3. Dynamism - systems in management change and adapt to external conditions.
4. Focus on goals – each element of the system has clearly defined tasks that contribute to the achievement of the overall goal.

In our opinion, the following requirements should be made for the development of a systems approach in management:

Firstly, methodological requirements, since for the successful development of a systems approach in management it is important to take into account the following aspects: comprehensiveness of analysis – management processes should be studied taking into account all factors influencing the activities of the organization (internal and external); integration of disciplines – a systems approach requires the unification of knowledge from various fields – economics, sociology, psychology, technology; scientific validity – all models and methods used in the systems approach should be based on theoretical and empirical data.

Secondly, organizational requirements: a clear management structure, since the development of a systems approach requires the formalization of the organization's structure with a clear definition of roles, powers and areas of responsibility; establishing connections between elements - effective information exchange and coordination between departments are the basis for achieving a synergistic effect; flexibility of management systems, i.e. organizational structures must be adaptive in order to quickly respond to changes in the external environment.

Thirdly, technological requirements: the use of IT tools - modern management systems require the implementation of information technologies for process automation, data analysis and performance monitoring; process modeling - for forecasting and control, it is necessary to develop models that describe the behavior of the system in various conditions; digital transformation - the implementation of digital technologies helps to increase the transparency of processes and improve resource management.

Fourthly, psychological and cultural requirements: taking into account the human factor, i.e. management should be based on the principles of motivation, involvement and personnel development; formation of a corporate culture - the values and norms of the organization should promote systems thinking among employees; personnel training and development - continuous professional development of management personnel plays a key role in the implementation of the systems approach.

Results and analysis

The analysis of the current situation shows that the modern road industry faces the following problems:

1. Deterioration of the road network: according to various studies, up to 30-40% of roads in some regions require major repairs.
2. Limited resources: budgets for infrastructure maintenance often do not cover all needs.
3. Lack of data integration: management is based on disparate data, which reduces the effectiveness of decisions.

The practical implementation of the developed systems approach consists of implementation stages, which cover: diagnostics of the current system, i.e. analysis of the structure, processes and resources of the organization - strategy development, i.e. setting goals, defining key elements of the system and their interrelations; implementation of changes - implementation of new approaches, organizational charts and technologies, performance assessment - monitoring results and correcting actions, as well as tools and methods called SWOT analysis, which helps to identify the strengths and weaknesses of the organization, as well as the opportunities and threats of the external environment; BPM (Business Process Management) methodology, which ensures the management of business processes within the system; system modeling, used for the construction and analysis of dynamic models.

Conclusions

1. The systems approach to management has both advantages and disadvantages. The advantages include increased coherence of actions within the organization, improved resource and process management, and the ability to adapt to changes in the external environment. The disadvantages of the systems approach to management are the complexity

of implementation in large organizations, the need for highly qualified personnel, and the high cost of developing and implementing a systems approach to management.

2. The systems approach to management is an integral part of modern management. Its successful implementation requires compliance with a number of requirements, from methodological analysis to the development of a corporate culture. Organizations that use this approach gain a competitive advantage, ensuring sustainable development and achieving strategic goals.

3. The use of a systems approach in the road industry allows solving current management problems, increasing the efficiency of resource use and ensuring sustainable development of the road infrastructure. For the successful implementation of this approach, it is necessary to focus on data integration, the use of modern technologies and improving the quality of road planning and management.

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