

Risk Management in the Implementation of Smart Building Projects

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Abstract. This article contains the results of a study of the risk control structure in the implementation of smart building projects, which are presented herein in the form of an operational risk management mechanism developed by the author and an improved definition of the risk management system. The mechanism is developed based on the analysis of a review of the current state of the construction sector and the existing organizational structures of construction companies, as well as based on the identification of new necessary functions and objectives of risk management systems. The results of the study can be used in the process of development and integration of risk management systems by the existing construction companies specialized in the construction of smart buildings.

1 Introduction

In the consideration of the risk management terminology, it was noted that term "risk management system" is understood and developed in different ways. The most common definition of this term is the following: "a risk management programme is a system developed at the organizational level for planning, providing and organizing actions that are required for minimization of loss caused by casual events" [1].

In the author's opinion, at the current stage of development of the construction sector, the area of application of the definition of risk management system must have a more prominent place in the company's activity and include new aspects and objectives. A risk management system must be developed at the organizational level in the manner that would ensure the required stability and protection of the company's structural form and activity from internal and external impact [2].

The authors propose the following definition: an integrated risk management system is a flexible multilevel structure with the functions of continuous analysis, information supply, provision of the required actions and control of their fulfillment, which is used for minimizing the probability of undetermined loss and considered an integral part of the managerial decision-making at all levels of the organization.

2 Methods

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Let us consider this definition in reviewing the existing understanding of the stages of risk management and the mechanism of functioning of the risk management service (fig. 1). The system represents cyclic movement of information and managerial decisions from the management towards the specialist substructures, then, to the risk management service, and then again, to the top management.

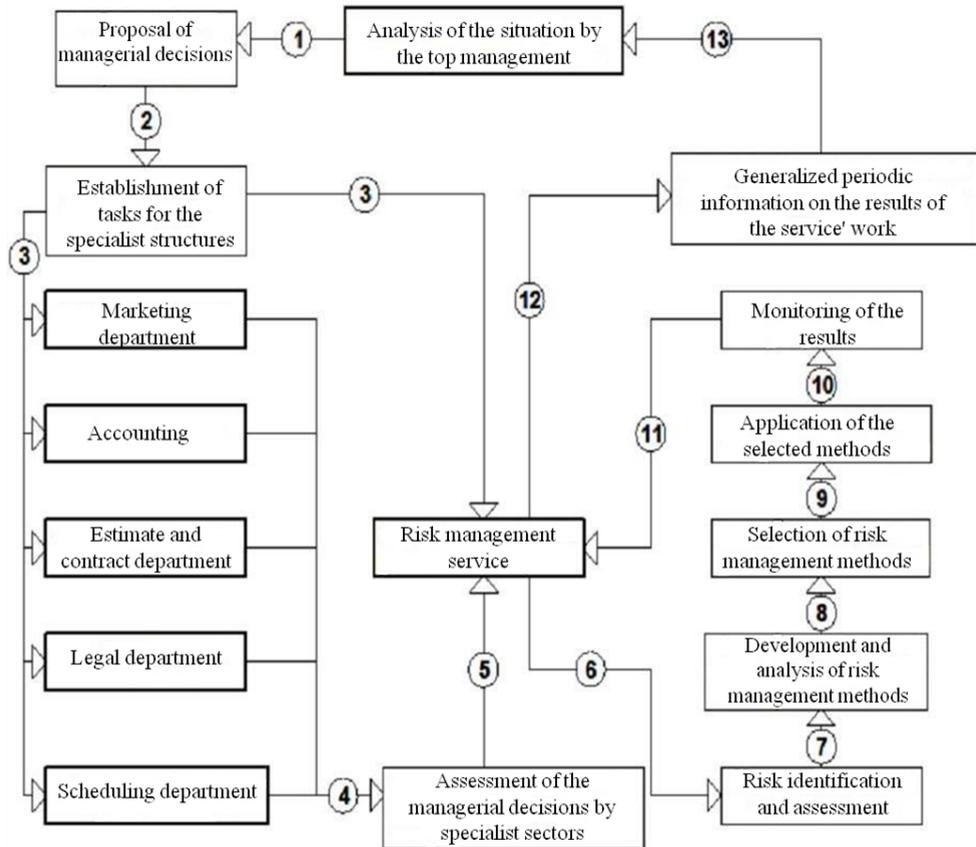


Fig. 1. Conventional theoretical and practical structure of the operational mechanism for risk management at construction companies

It is needed to agree with the logical interconnection between the stages of risk management, i.e. with the connections 6-11, separating them from the mechanism of risk management operations.

Although this system may seem simple and functional, it does not take into account the required new aspects, which makes such systems practically unsuitable for actual integrated use or complicates severely their functioning [3, 10].

Main disadvantages of such operational mechanism:

1) Construction activity is associated with a large number of risks. In case of use of such management system, for their actual assessment, the risk management service will need a large and diverse group of experts, which will cause additional costs

2) This system will impede prompt managerial decision-making due to multiple stages of communication between the structures

3) The communication of a final decision regarding the risks to the company's top management, which cannot lead to optimal decision-making due to the top management's lack of full vision of the situation and heavy workload and due to the line management's

withdrawal from managerial decision-making, which will also cause temporal and operational risks

4) This system is hard to integrate in a real company, since it does not provide a clear understanding of the chain of managerial decisions and personal responsibility, and does not take into account the individuality and the needs of each company

To provide efficient work of the risk management service within a construction company, the managerial decision-making in respect of risks should be divided by levels, and the operational risk management mechanism should be applied in different ways, based on the risk origin. The authors are aware of the fact that a fully clear division of risks by management levels cannot be achieved due to the impossibility of full autonomy of decision-making by the line management, the internal substructures and even the top management, and the impossibility of considering the risks separately without taking into account their influence on each other. Therefore, we consider such division conditional in order to be able to build a system, and then to be able to individually integrate it in construction companies [4].

The system presented by the author includes 3 levels of implementation of risk management: top management level (making decisions in respect of external and strategic risks), specialized substructures level (making decisions in respect of substructure risks), line management level (making decisions in respect of personal risks).

3 Results

The fundamental difference between the levels consists in the redistribution of the stages of risk management among the company's structures, despite the identity of these stages. This need is determined by the present-day conditions, where "the operational management of risks must be performed in the place of their occurrence" [5, 6].

Let us consider each one of these levels (fig. 2).

Level 1. To manage the external and the strategic risks, the "environment" of the company and the final decision-making by the company's top management must be analyzed continuously. To do that, the management stages must be distributed in the following manner: the risk management service must be in the state of continuous analysis of the construction market and communication (connections 1-5). If there is a need to make a strategic decision (whether initiated by the risk management service or by the top management), joint assessment of the situation will be carried out, methods for decision implementation will be selected and the tasks will be established for the specialist substructures (connections 6-8). Then, the selected methods will be applied, the results will be monitored and the data will be communicated to the risk management service, based on which a conclusion regarding the efficiency of the measures taken will be made [7, 11].

Level 2. At this level, the substructure risks are managed. The first peculiarity will consist in the division of the risk identification and assessment. The risk management service will provide information regarding the occurrence of internal risks based on the analysis of market conditions, and the specialist substructures will do the same analyzing the internal work (connections 1'-2'). The key feature of the level 2 consists in the delegation of the responsibility for the decisions concerning the main stages of risk management (connections 3'-7') to the specialist substructures. This decision has been taken by the authors based on the need to increase the personal responsibility and the maximum use of the key competences of the substructure managers. At the last stage, the actions of the specialist substructures will be assessed by the risk management service, and the information will be communicated to the top management.

Level 3. Here, the risk management service will perform the entire cycle of the stages of personal risk management on its own. The personal risks include the following:

qualification and ethical risks, loss of personnel, labor safety risks and personnel workload risks.

In most academic papers, personal risks are unreasonably disregarded. The importance of identifying personal risks as a separate group is due to the following:

- their quantitative and qualitative diversity
- wide range of possible ways to manage such risks
- need to liberate the rest of the organizational structures from this activity
- possibility to build a separate organizational substructure with its specific tasks outside the general sector of activity of the company around them

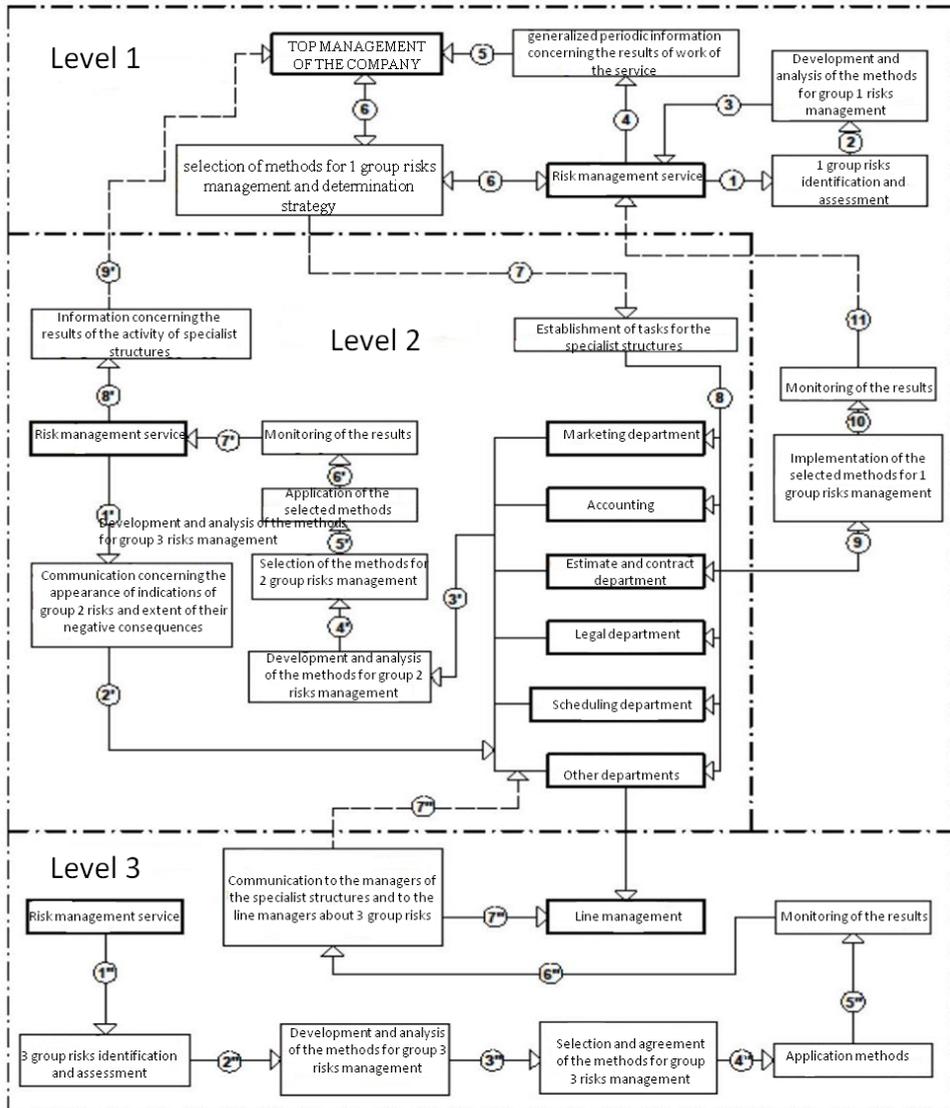


Fig. 2. Mechanism for risk management within construction companies

Therefore, we will get a combined mechanism of risk management operations by uniting different levels. This mechanism will include the following required additional aspects:

1)System flexibility. It is the ability to change the structure and to promptly make managerial decisions in the conditions of dynamic change of the external and internal factors

2)Multi-level structure. It is a clear decentralization and a distribution of the responsibility for possible decision-making in respect of the risks by levels based on the required information provided and the analysis from the general risk management structure

3)Consideration of risk not only in the context of a negative phenomenon, but of a positive one as well. This implies that "scientifically based and qualified management allows to consciously accept risks and respond to them in an adequate manner, which contributes to the business success even more than full refusal of risks" [8].

4 Discussion

The interestedness is the implementation and the distribution of functions and the efficient interaction of the risk management system with the rest of the company's organizational structures.

The obvious advantages of such approach include the following:

1)The understanding of the risk management system as the company's acting and not as actions of a separate substructure of the company.

2)Deep integration of the risk management system in the managerial decision-making and "non-interference" in the activity of the specialist substructures at the same time, which will accelerate considerably the internal processes.

3)Division of the risk management service into substructures, which allows to either distribute it among substructures or even outsource part of the functions.

4)Personalized responsibility, which allows to considerably reduce the risk management service staff. The main advantage is the possibility to shift the focus of the activity of the risk management service to the external and strategic risks as the main source of critical risks, as well as assign it the functions of the internal control and external audit service, which will also allow to reduce the staff's workload and accelerate the business processes [9].

5 Conclusions

This approach will stimulate the development of the integration of risk management services in the existing organizations. Moreover, it will create a significant diversity in the possibilities of building an organizational and operational structure of a company based on its financial possibilities, strategy and objectives, as well as on the conditions of the construction sector. If the activity of the risk management system shifts towards the control of external risks control, the top management of the company will have a lot of time to concentrate on the internal risks.

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