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INTEGRATION OF STAKEHOLDER MANAGEMENT AND RISK MANAGEMENT METHODS IN PROJECTS OF HOUSING AND COMMUNAL SERVICES PROVIDERS

The object of research is stakeholder and risk management processes in the projects of housing and communal services providers. In conditions of constant change and uncertainty, such management becomes key to ensuring the success and sustainability of projects in this area. The problem addressed by the study is the development and analysis of an integrated model that combines stakeholder management with risk management, with an emphasis on innovation and performance improvement.

The essence of the obtained results is the identification of key points of interaction between stakeholders and risks, as well as the development of complex strategies for their effective management. The model is based on a combination of qualitative and quantitative methods of analysis, including structural-logical analysis, SWOT analysis, as well as the use of expert evaluation methods.

The results are explained by the need for a deeper integrated approach to stakeholder and risk management, especially in the context of housing and communal services (HCS), where the interaction between these elements directly affects the success of projects. This approach allows not only to identify potential problems at an early stage, but also to respond to them more effectively.

The innovativeness of the proposed model lies not only in its comprehensive approach to the analysis and management of stakeholders and risks, but also in the possibility of its scaling and adaptation to various conditions and projects in the field of housing. The application of this model includes the intensive use of modern analytical tools, which contributes to more accurate forecasting of risks and more effective solving of problems related to stakeholders. This, in turn, allows utilities providers to increase the quality and reliability of the services provided, strengthening trust and satisfaction among users. Also, the model provides for the active involvement of stakeholders in the project management process, which ensures greater openness, transparency of actions and the ability to quickly adapt to changing market conditions.

The research results can be used in practice in the field of housing and public utilities to optimize project management, increase their efficiency, and reduce risks. This will be especially relevant in cases where an integrated approach to management is needed, considering both the requirements and expectations of stakeholders, as well as potential risks.

Keywords: *project optimization, stakeholder analysis, project management, risk management, stakeholder interaction, risk modeling.*

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1. Introduction

In the conditions of constant change and uncertainty in today's world, effective management of risks and stakeholders becomes critical for the success of projects of housing and utility service providers. The need to integrate these two aspects is due to their mutual influence on project results [1].

The relevance of the study of the specified problem of stakeholder and risk management in the field of public utilities is confirmed by the works of researchers from different parts of the world who consider these issues from multiple perspectives. The use of best practices in risk and stakeholder management in the utility sector plays a key role in increasing efficiency and meeting the needs of end users. Special attention is paid to the need to adapt global experience to local conditions to optimize processes and reduce costs. Studies [2–8], which cover various aspects of management in this area, including the integration of the latest technological solutions, effective interaction between stakeholders, and the implementation of holistic approaches

to risk management, demonstrate a wide international interest and diversity of approaches to improving management in the utility sector. Ukrainian scientists have already developed a few methodological approaches [9, 10] that consider the specifics of the local housing market, but it is possible to face the task of adapting and integrating international experience to ensure global competitiveness and management efficiency in this field.

Studies show that many projects fail [11, 12] due to insufficient attention to stakeholder management or incorrect risk assessment. However, integrated approaches to solving these issues in the context of housing and communal services are still not sufficiently developed.

The aim of research is development of a theoretical model of stakeholder and risk management integration based on the analysis of existing approaches and practices. This will make it possible to develop methodological recommendations for the implementation of an integrated model of stakeholder and risk management in the activities of housing and communal services providers.

2. Materials and Methods

The object of research is stakeholder and risk management processes within the projects of housing and utility service providers. The methodological basis of the research is a combination of quantitative and qualitative methods of analysis, including structural-logical analysis, SWOT analysis and methods of expert evaluations. Business process modeling tools were also used to reproduce interactions between stakeholders and risks, which reflects modern approaches to risk analysis and management, similar to those described in [10].

3. Results and Discussions

In this work, the mechanisms of interaction between stakeholders and risks in the projects of housing and communal services providers are investigated. The analysis is based on the understanding that stakeholders and risks are interrelated elements that affect the success of projects.

Stakeholders, such as municipalities, residents, service providers, and regulators, can influence the level of risk in projects through their demands, expectations, and decisions. For example, changing regulatory requirements can lead to increased compliance risks. Associations of co-owners of high-rise buildings can influence the risks associated with financing through their decisions about investment in the infrastructure of buildings.

Risks such as project delays, cost overruns or technical failures can have a significant impact on stakeholders. For example, delays can reduce residents' satisfaction and undermine trust in municipalities. Cost overruns can lead to financial difficulties for service providers and reduce the availability of funds for future projects.

Analysis of the interaction between stakeholders and risks requires the use of methods of both quantitative and qualitative analysis. Methods such as stakeholder impact analysis, a risk matrix, and interviews and surveys with key stakeholders were used to gather data on their perception and impact of risks.

The results of the analysis make it possible to identify the key points of interaction between stakeholders and risks, as well as to develop strategies to optimize the management of these interactions. This includes developing communication plans, stakeholder engagement strategies, and risk assessment and mitigation techniques.

Effective communication promotes the involvement of residents in decision-making, reduces conflicts between municipalities and service providers, and increases the transparency of project management. For example, regular meetings with residents and electronic feedback platforms allow feedback to be collected and project plans to be adapted according to community needs.

Systematic risk management reduces the probability of cost overruns and project delays. Tools such as a risk matrix help identify and assess potential threats and risk response plans prepare the team to effectively address issues.

A close link between communication and risk management ensures quick identification and response to changes in projects. For example, regularly informing stakeholders about the status of risks increases trust and allows to attract additional resources to minimize them.

The analysis of internal processes was carried out through the study of project documentation, interviewing participants, and observing the progress of project implementation. Data on communication channels and risk management methods were collected to assess their effectiveness.

The research revealed the relationship between the quality of communication and the effectiveness of risk management, as well as provided examples of successful practices and recommendations for their application in future housing and communal services (HCS) projects.

The integrated model for optimizing the interaction of stakeholders and risks in the projects of housing providers is shown in Fig. 1. The central place in the model is occupied by stakeholders – from residents, local authorities, resource providers, to public organizations and investors. Stakeholder management methodologies, such as PMBOK®, PRINCE2®, Agile/Scrum methods, and ISO 21500 standards, which interact with different risk categories, are grouped around them. This structure allows to identify, assess, and effectively manage risks, while involving all important stakeholders in the project management process.

The model includes tools for optimizing interaction between stakeholders and risk management, including Stakeholder Mapping, Salience Model, Power/Interest Grid, SWOT Analysis, and Risk Matrix. These tools contribute to a deeper understanding of potential risks and better adaptation of management strategies to the needs and expectations of stakeholders. Thanks to this, the model not only reduces the possibility of critical situations in housing projects, but also increases the overall efficiency and resistance of projects to external and internal changes.

Unlike traditional methods, this model integrates stakeholder and risk management, providing a holistic view of project challenges.

Integration allows for a more detailed analysis of how interactions between stakeholders can affect risks, and vice versa.

The model provides greater flexibility in detecting and responding to unexpected changes, which is critical in dynamic environments.

While it is possible to adapt approaches such as PMBOK, PRINCE2, and Agile, this model goes beyond their traditional application because they usually do not focus on such close integration.

The model is particularly effective in conditions of uncertainty, where the ability to quickly adapt to change is key. On the other hand, an integrated approach may require more complex management and involvement of participants with higher analytical and communicative competence.

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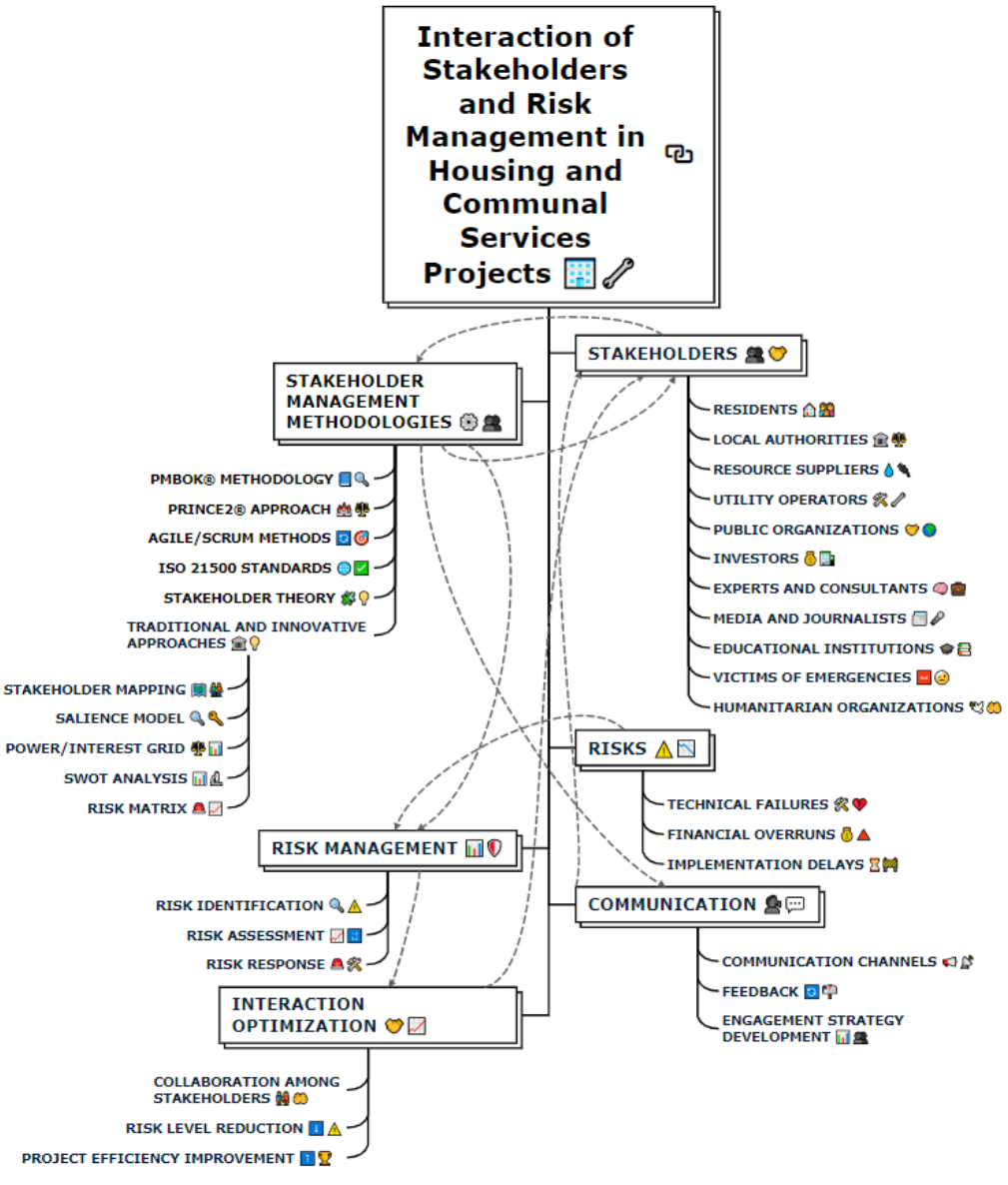

Fig. 1. An integrated model for optimizing the interaction of stakeholders and risks in the projects of housing providers

Given the flexibility and adaptability that this model provides in detecting and responding to changes, it is important to note that it can also be successfully integrated with traditional project management methodologies and approaches. This expands the possibilities of its application, allowing the use of time-tested strategies and approaches together with the innovative solutions offered by this model. Such traditional methods include Stakeholder Mapping, Salience Model, Power/Interest Grid, SWOT Analysis and Risk Matrix, each of which has its own unique advantages and can be adapted for use in conjunction with this integrated model.

Next, let's consider each of these approaches in more detail:

– *Stakeholders Mapping:* the key value of this approach is the identification of various stakeholders and determination of their influence and interests in the project. This helps identify which stakeholder groups need to be more actively engaged or informed.

– *Salience Model:* This model analyzes stakeholders through three key attributes: power, legitimacy, and urgency. This allows for the development of more targeted strategies for the involvement of each group of stakeholders.

– *Power/Interest Grid:* this tool helps to develop strategies for interaction with stakeholders, based on an assessment of their power and interest in the project.

– *SWOT Analysis:* the analysis of strengths and weaknesses, opportunities and threats of the project is important for understanding the internal and external context in which the project is implemented.

– *Risk Matrix:* an important tool for identifying, assessing, and managing project risks, which helps reduce potential threats to project success.

The use of these traditional approaches in combination with the proposed integrated model creates a comprehensive solution for managing stakeholders and risks that meets the modern requirements of dynamic project management.

The practical significance of developing an integrated stakeholder and risk management model:

1. Increasing the efficiency of project management:

– *Adaptive solution:* The model provides project teams with the tools to adapt to changing conditions and

stakeholder needs in real time, which increases flexibility and speed of response to unexpected changes.
– *Optimization of resources:* An integrated approach allows to allocate resources more efficiently, avoiding unnecessary costs and maximizing the initial value of the project.
2. Improving interactions with stakeholders:
– *Better understanding of needs:* Through deeper analysis and classification of stakeholders, project teams can better identify and satisfy their needs and requirements.
– *Improving communication:* The model supports the development of effective communication strategies, which contributes to the preservation of transparency and openness in projects, as well as increases trust and satisfaction among stakeholders.
3. Reduction of project risks:
– *Identification and assessment of risks:* Early identification and assessment of risks helps project teams anticipate potential problems and develop strategies to minimize or eliminate them.
– *Flexible risk management:* Integrating risk management with stakeholder strategies provides a more comprehensive approach to addressing potential issues.
4. Innovative approach to project management:
– *Integration with traditional methods:* Applying an integrated model together with traditional methodologies, such as PMBOK or Agile, opens new opportunities to combine proven approaches with innovative solutions.
– *Increased competitiveness:* Implementation of such an integrated model can provide companies with an advantage in the market, as they are able to more effectively manage complex projects and satisfy the demands of stakeholders.
5. Expansion of application in various fields:
– *Flexibility for different projects:* The model can be adapted to different types of projects, including housing and communal services, construction, IT, and other industries.
– *Use in different organizational structures:* The model is effective for both small and large organizations, adapting to their unique needs and challenges.

In general, the development and implementation of such an integrated model in project management stakeholder and risk management offers significant benefits for project management practice, providing a better understanding and effective response to complex project challenges.

Limitations of the study: limited representativeness of the data. The study is based on a sample of a limited number of projects in the field of housing, which may not fully reflect the diversity of situations in the general context of project management.

The influence of martial law conditions. Although martial law did not directly affect the availability and quality of data, it greatly reinforced the need to conduct research on housing service providers as a key part of critical infrastructure. The extraordinary challenges faced by this sector in wartime conditions gave the research a special relevance and importance.

Prospects for further research in the context of the integration of stakeholder management practices with risk management in the projects of housing providers:

1. Development of a deeper understanding of stakeholder interaction and risks:
– In-depth study and modeling of interactions between different stakeholders and risks in the context of housing and communal services, with special emphasis on different types of risks, including military actions, natural disasters, technological accidents, economic changes, etc.
2. Adaptation of the model to different geographical and socio-economic conditions:
– Development and testing of the model in different regions and countries to assess its universality and adaptability to local conditions.
– Analysis of socio-economic factors influencing the interaction between stakeholders and risks.
3. Application and evaluation of the effectiveness of the model in real conditions:
– Implementation of pilot projects using the developed model in the management of specific projects of housing providers to assess its practical effectiveness and possible areas for improvement.
– Collection and analysis of data on performance, cost effectiveness and stakeholder satisfaction.
4. Expansion of research areas to new aspects of housing management:
– Study of the influence of the latest technologies (digitalization, IoT, artificial intelligence) on the management of stakeholders and risks in housing and communal services.
– Consideration of environmental aspects and sustainable development in the context of risk management and interaction with stakeholders.
5. Development of educational programs and trainings for professionals:
– Development of educational courses and training programs aimed at expanding knowledge and skills in the field of stakeholder and risk management integration for housing and utility specialists.
– Studying the effectiveness of different approaches to training and their impact on the practical use of new management techniques.

The specified areas of further research will allow not only to improve the existing models of stakeholder and project risk management of housing providers, but also to adapt them to the rapidly changing conditions of the modern world, as well as to respond to new challenges facing the industry.

4. Conclusions

1. Obtained results:
– A theoretical model is developed that integrates stakeholder and risk management, based on the analysis of existing approaches and practices.
– The key points of interaction between stakeholders and risks are identified, including ways of their influence on the success of projects in the housing industry.
– Strategies are developed to optimize the management of these interactions, including communication plans, stakeholder engagement strategies, and risk assessment methods.
2. Interpretation of results:
– The results are explained by the interdependence of stakeholders and risks in housing projects. The analysis shows that effective management of these aspects can significantly increase the success of projects.
– Integrating stakeholder and risk management is found to be more effective than traditional, isolated approaches.
3. Benefits of the results:
– *Theoretically:* Expansion of theoretical knowledge in the field of housing project management, especially

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in the context of integration of various aspects of management.

– *Practical:* Provision of tools and strategies for practical application in real-life projects of housing providers, which can lead to reduced risks, improved communication with stakeholders and overall improvement of project efficiency.

– Implementation of the model can help reduce the probability of project overruns and delays, as well as increase stakeholder satisfaction.

4. Quantitative and comparative assessments:

– Project implementation time, percentage of cost overruns, stakeholder satisfaction indices, and other indicators of project success.

– Compared to traditional methods, the integrated model strives to provide greater flexibility, responsiveness to change, and efficiency in problem solving.

Conflict of interest

The authors declare that they have no conflict of interest in relation to this study, including financial, personal, authorship, or any other, that could affect the study and its results presented in this article.

Financing

The study was conducted without financial support.

Data availability

Data will be provided upon reasonable request.

Use of artificial intelligence

The authors confirm that they did not use artificial intelligence technologies when creating the presented work.

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