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FORMATION OF THE RISKS ASSESSMENT SYSTEM OF ENTERPRISE ACTIVITIES IN THE CONDITIONS OF MODERN CHALLENGES

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Abstract

The paper examines the theoretical and practical aspects of the formation of a risk assessment system of enterprise activity in the conditions of modern challenges. The purpose of the article is the analysis and systematization of theoretical approaches to the formation of a risk assessment system of enterprise activity in the conditions of modern challenges. The main types of risks faced by enterprises and their impact on the company's activities are analyzed. Theoretical models of risk assessment and their application in conditions of uncertainty are considered. The role of innovative technologies in the process of risk assessment and management is studied. The importance of integrating the risk assessment system into the general strategy of enterprise management to ensure its sustainability and competitiveness is substantiated.

Keywords

Risk assessment, risk management, risk assessment system, modern challenges, enterprise strategy.

Problem statement

In the conditions of growing instability of the global economic environment and increased competition, enterprises are faced with the need to effectively manage various risks that can significantly affect their operations and financial results. Traditional approaches to risk assessment are often not effective enough to adequately respond to modern challenges such as global economic crises, pandemics, geopolitical conflicts, cyber attacks and rapid technological changes. The problem is that classic models of risk assessment, based on historical data and statistical methods, are not always able to predict new types of risks and their potential impact on the company's activities. This leads to an inadequate assessment of risks and, as a result, to the adoption of suboptimal management decisions.

There is a need to develop new theoretical models and practical approaches to the formation of a risk assessment system that would take into account the dynamic nature of the modern business environment and allow for quick adaptation to new challenges. Such models should not only identify and evaluate traditional types of risks, but also take into account new risk factors that arise in the context of the digital economy and global changes.

In addition, it is important to develop methods that will allow the integration of the risk assessment system into the overall strategy of enterprise management, ensuring its flexibility and efficiency.

Relevance of the chosen topic

In the conditions of the growing volatility of the economic environment and the emergence of new types of risks, the formation of an effective risk assessment system becomes critically important for ensuring the stability and competitiveness of enterprises. The relevance of the study of theoretical approaches to the formation of a risk assessment system of enterprise activity in the conditions of modern challenges is determined by several factors:

1. The global COVID-19 pandemic and its consequences have demonstrated the limitations of traditional risk assessment models and the need to develop more flexible and comprehensive approaches to enterprise risk management.
2. The rapid development of digital technologies and the transformation of business models create new types of risks that require innovative assessment and management methods.
3. The growing role of non-financial factors, such as environmental, social and governance (ESG) risks, requires the expansion of traditional risk assessment frameworks and the integration of new methodologies.

Analysis of recent research and publications

The theoretical basis of risk assessment of enterprise activity was studied by such scientists as F. Knight (Knight, 1921), K. Arrow (Arrow, 1951), H. Markowitz (Markowitz, 1952), J. Stiglitz (Stiglitz, 1974). Their work laid the foundation for understanding the nature of risks and methods of their assessment. Modern research in the field of enterprise risk management, in particular the works of R. Kaplan and A. Mikes (Kaplan & Mikes, 2012; Mikes & Kaplan, 2015), T. Aven (Aven, 2016), P. Jorion (Jorion, 2007), focus on the development of integrated approaches to risk assessment and their impact on the company's strategy. It is important to note that recent studies increasingly focus on the development of dynamic risk assessment models that take into account the specifics of the digital economy and global challenges.

Purpose of the article

The purpose of the article is the analysis and systematization of theoretical approaches to the formation of a risk assessment system of enterprise activity in the conditions of modern challenges. To achieve the goal, the following tasks must be solved:

- to determine the main types of risks that affect the activity of the enterprise in modern conditions;
- analyze theoretical risk assessment models and their adaptation to new economic realities;
- to investigate the role of innovative technologies in the process of enterprise risk assessment and management;
- consider approaches to the integration of the risk assessment system into the general strategy of enterprise management.

Presentation of the main research material and results obtained

The modern business environment is characterized by an unprecedented level of uncertainty and dynamism, which leads to the emergence of new types of risks and the transformation of existing ones. Globalization of the economy, rapid technological progress and changes in the geopolitical landscape create a complex network of interrelated factors that affect the activities of enterprises. Such a situation requires constant vigilance and adaptability from companies in identifying and managing risks. Analysis of modern literature, industry reports and practices of leading companies in the field of risk management allows us to identify the main categories of risks faced by enterprises in modern conditions. These risks range from traditional operational and financial risks to the latest ones related to digital transformation and climate change. In the Table 1 presents a systematic overview of key types of risks, their characteristics and potential impact on the activities of enterprises.

Analysis of the Table 1 allows us to draw a conclusion about the significant diversification of risks faced by modern enterprises. Cyber risks have become one of the key challenges for business in the conditions of rapid development of the digital economy. The growing dependence of enterprises on information technologies and Internet infrastructure creates new vulnerabilities that are actively exploited by cybercriminals. According to Cybersecurity Ventures, global cybercrime losses could reach $10.5 trillion annually by 2025 (Morgan, 2020), underscoring the scale of the problem and its potential impact on the global economy. This trend requires

enterprises to rethink their approaches to risk management and invest significant resources in cyber security. Integrating cyber risk assessment into an enterprise's overall risk management system is becoming not just a recommendation, but a critical necessity to ensure business resilience. This involves not only the implementation of technical means of protection, but also the development of a cyber security culture among employees, regular audits of information systems and the development of cyber incident response plans. Moreover, the increasing complexity of cyber threats requires enterprises to constantly update their knowledge and protection strategies. This includes monitoring new types of attacks, analyzing cybersecurity trends, and adapting defense systems to evolving threats. Collaboration with cybersecurity experts, participation in industry initiatives to share threat information, and investment in advanced defense technologies are becoming key elements of an effective cyber risk management strategy.

Table 1: The main types of risks of enterprise activity in modern conditions

No. z/p	Type of risk	Characteristic	Influence on the activity of the enterprise
1	Cyber risks	Risks associated with information system security breaches, data loss, and cyber attacks	May lead to financial losses, reputational damage, disruption of operations
2	Risks of pandemics and global crises	Risks associated with global epidemics, economic crises, geopolitical conflicts	May cause disruption of supply chains, reduced demand, financial instability
3	Technological risks	Risks associated with rapid technological changes, introduction of new technologies, digital transformation	It can lead to a loss of competitiveness, the need for significant investments in technology
4	ESG risks	Risks associated with environmental, social and management factors	It can affect the company's reputation, access to financing, compliance with regulatory requirements
5	Supply chain risks	Risks related to the disruption or inefficiency of supply chains	May lead to interruptions in production, increased costs, loss of customers

Source: Summarized and adapted from WEF Global Risks Report 2023 (World Economic Forum, 2023), Deloitte Global Risk Management Survey 2021 (Deloitte, 2021), Hochschule Mittweida materials (University of Applied Sciences Mittweida, 2024)

The risks of pandemics and global crises that have become apparent during COVID-19 demonstrate the importance of developing flexible risk assessment models that can adapt to unpredictable scenarios. The COVID-19 pandemic has posed an unprecedented challenge to the global economy, exposing vulnerabilities in many aspects of business activity, from supply chains to the organization of work processes. This crisis has highlighted the need to rethink traditional approaches to risk management and develop more comprehensive and adaptive strategies. According to a McKinsey study, the majority of surveyed companies plan to increase the resilience of their supply chains after the pandemic (Alicke et al., 2020), indicating a growing focus on assessing and managing supply chain risks. This decision is in response to large-scale disruptions in global supply chains that have resulted in significant economic losses and operational problems for many businesses. Companies have realized the need to diversify suppliers, build back-up stocks of critical components, and implement advanced technologies to monitor and manage supply chains. However, increasing the resilience of supply chains is only one aspect of the broader challenge of managing risks in global crises. Businesses are also rethinking their approaches to human resource management, implementing flexible working models and investing in digital tools to ensure continuity of business processes. In addition, there is growing attention to financial stability, with an emphasis on creating liquidity reserves and diversifying funding sources. An important aspect of new risk assessment models is their ability to take into account the relationships between different types of risks. For example, the pandemic has demonstrated how health care problems can quickly transform into economic, social and geopolitical risks, requiring businesses to develop systems thinking and use scenario planning to prepare for different scenarios. The experience of the pandemic has highlighted the importance of cooperation between different sectors of the

economy, government structures and international organizations in overcoming global crises. Businesses are increasingly seeing participation in such collaborative initiatives as an important element of their risk management strategies, recognizing that some challenges require collective efforts to be effectively addressed.

In the era of the Fourth Industrial Revolution, the technological risks and challenges of digital transformation are gaining unprecedented importance for business. Innovations in the fields of artificial intelligence, the Internet of Things, blockchain and cloud computing are radically changing the landscape of corporate operations, creating both new opportunities and potential threats. Enterprises are faced with the need to quickly adapt to technological changes, which requires not only significant investments, but also a fundamental restructuring of business processes and corporate culture. This transformation is accompanied by growing cyber security risks, data protection issues and challenges related to the integration of new technologies into existing systems. Awareness of the critical role of digital technologies in ensuring long-term success is prompting managers to rethink development strategies. They recognize that digital competence is becoming a key factor in competitiveness, affecting companies' ability to attract customers, optimize operations and create innovative products and services. Integrating technology risk assessment into strategic planning is becoming not just a desirable practice, but a necessary condition for survival in the digital era. This involves the development of comprehensive methodologies that take into account not only technical aspects, but also the potential impact of technological solutions on the business model, corporate culture and interaction with customers. Inefficient management of technology risks can have catastrophic consequences, leading not only to loss of market positions, but also to reputational damage, regulatory violations and loss of customer trust. Companies that ignore these risks run the risk of finding themselves on the periphery of the market, unable to keep up with the rapidly changing needs of consumers and the innovative solutions of competitors. To effectively manage technological risks, enterprises need to develop a culture of innovation, invest in the development of digital competencies of personnel and create flexible organizational structures that can quickly adapt to technological changes. It also requires constant monitoring of technological trends, assessment of their potential impact on business and development of response scenarios to various technological challenges.

ESG risks are becoming increasingly important in the context of growing attention to issues of sustainable development and responsible investing. And risks cover a wide range of factors, from climate change and resource management to labor practices and corporate governance. According to a study by (PwC, 2021), the majority of institutional investors are ready to abandon investments in companies with high ESG risks. Moreover, a significant part of investors stated that they are ready to sell shares of companies that do not sufficiently consider ESG factors in their activities. This trend has significant implications for businesses. First, it indicates the need to develop comprehensive ESG risk assessment models and their integration into the overall risk management system of the enterprise. Second, companies must not only assess these risks, but also actively manage them by implementing sustainable development strategies and improving their ESG performance. It is important to note that the assessment of ESG risks requires an interdisciplinary approach that goes beyond traditional financial analysis, which includes the assessment of the company's impact on the environment, the analysis of social practices and the quality of corporate governance. In addition, there is a growing need for transparent reporting on ESG factors as investors and other stakeholders demand more information to make informed decisions. Thus, the integration of ESG risks into the overall risk management system becomes not just a desirable practice, but a necessary condition for ensuring the long-term stability and competitiveness of the enterprise in the modern business environment.

Given the dynamism and multifacetedness of the modern business environment, traditional approaches to risk assessment increasingly demonstrate their limitations. Globalization, technological breakthroughs and changing consumption paradigms create new types of threats that are difficult to predict and assess using established methodologies. This situation prompts scientists and practitioners to search for innovative theoretical models capable of adequately reflecting the complexity and interconnectedness of modern risks. New models should not only identify potential threats, but also take into account their systemic nature, assess cascading effects and long-term consequences. They must be flexible enough to adapt to rapidly changing conditions and integrate data from multiple sources to form a holistic picture of the enterprise's risk landscape. In the Table 2 provides an overview of some promising theoretical approaches that attempt to respond to these challenges by offering a more comprehensive and dynamic view of the risk assessment process.

The analysis of the given theoretical models demonstrates significant progress in the development of approaches to risk assessment that take into account the specifics of the modern business environment. The integrated risk assessment model proposed by Mikes and Kaplan (2015) is an attempt to create a holistic picture of enterprise risks, taking into account their interrelationships and impact on the company's strategy. This model is especially useful for large companies with a complex risk structure, but its implementation can be a resource-

intensive process.

The dynamic risk assessment model developed by Aven (2016) is an innovative approach that takes into account the variability of risks over time and is able to adapt to new conditions. This model considers risk not as a static phenomenon, but as a dynamic process that constantly evolves under the influence of external and internal factors. The model uses sophisticated algorithms and forecasting techniques to continuously update risk estimates, taking into account the latest information and trends. Such a model is especially relevant in conditions of rapid changes in the economic environment, where traditional static models quickly lose relevance. However, the effective implementation of the mentioned model requires the creation of a developed system of data collection and analysis, constant monitoring of key indicators and regular updating of model parameters. This can be a resource-intensive process that requires significant investment in technology and staff training.

A scenario-based risk assessment model is a powerful strategic planning tool that allows businesses to prepare for various scenarios. Such a model is based on the principle that the future cannot be predicted with absolute accuracy, but it is possible to prepare for its various variants. The model includes the development of several plausible scenarios of the development of the situation, the analysis of their potential impact on the business and the development of appropriate response strategies. According to a Deloitte study, 73% of companies that use scenario planning demonstrate a better ability to respond to crisis situations (Deloitte, 2021) due to the fact that such companies have pre-developed action plans for various situations, which allows them to respond faster and more efficiently respond to changes. However, developing realistic scenarios can be challenging, especially under conditions of high uncertainty. This requires a deep understanding of market trends, geopolitical situations, technological innovations and other factors affecting the business environment. In addition, it is important to avoid bias in the development of scenarios and ensure that they are sufficiently diverse to cover a wide range of possible future situations.

Table 2: Comparative analysis of theoretical models of enterprise risk assessment

No. z/p	Model	Features	Advantages/Limitations
1	Integrated Risk Assessment Model (IRM)	It takes into account the interrelationships between different types of risks and their impact on the company's strategy	Allows you to get a complete picture of the company's risks. Complexity of implementation and the need for significant resources
2	Dynamic Risk Assessment Model (DRM)	Takes into account changes in risks over time and adapts to new conditions	Increases the accuracy of risk assessment in a dynamic environment. Requires constant monitoring and updating of data
3	Scenario-based risk assessment model (SRM)	Uses different scenarios to assess potential risks	Allows you to prepare for various options for the development of the situation. The difficulty of developing realistic scenarios
4	Approaches to risk assessment using artificial intelligence	Application of machine learning algorithms and artificial intelligence to analyze large volumes of data and identify complex relationships between risk factors	The ability to identify non-obvious relationships and predict new risks. Ability to process large volumes of data in real time. Dependence on the quality and quantity of input data, the difficulty of interpreting the results

Source: Summarized and adapted from Aven (2016), Mikes and Kaplan (2015), materials of Hochschule Mittweida (University of Applied Sciences Mittweida, 2024)

Approaches to risk assessment using artificial intelligence (AI-RM) represent an advanced direction in the field of risk analysis and management, which is rapidly developing in parallel with the progress in the field of artificial intelligence and machine learning. These approaches are based on the use of powerful data processing algorithms capable of analyzing huge amounts of information, identifying complex relationships and predicting potential

risks with high accuracy. AI-RM combines traditional risk management methods with artificial intelligence capabilities for deeper data analysis and the discovery of hidden patterns that may not be visible to the human eye or traditional analytical tools. For example, neural networks can be used to analyze non-linear relationships between different risk factors, and machine learning algorithms can automatically adapt risk models based on new data. However, the implementation of AI-RM requires not only significant technological investments, but also changes in organizational culture and risk management processes. In addition, it is important to consider the ethical aspects of using artificial intelligence in decision-making, to ensure the transparency of algorithms and to understand the limitations of these technologies.

It is important to note that the implementation of these models in practice faces a number of challenges. One of them is the difficulty of integrating different models of risk assessment into a single enterprise risk management system. Another challenge is the need to develop new staff competencies to work with modern risk assessment models.

In addition, an important challenge is the adaptation of risk assessment models to the specifics of a specific industry and enterprise size. Universal models often require significant modification for effective application in various sectors of the economy. For example, the assessment of risks in the financial sector can be quite significantly different from the assessment of risks in the manufacturing sector or the service sector.

Another significant challenge is to ensure a balance between the depth of risk analysis and the speed of decision-making. Overly complex models can lead to delays in the decision-making process, which is especially critical in the fast-changing business environment. On the other hand, oversimplified models may not take into account important risk factors. It is also important to note the problem of reliability and relevance of the data used for risk assessment.

In the conditions of information overload and rapid changes in the external environment, providing a high-quality information base for risk assessment models is becoming an increasingly difficult task. Finally, a significant challenge is overcoming organizational resistance to change when implementing new risk assessment models. This requires not only technical training, but also a change in corporate culture, an increase in risk-oriented thinking at all levels of the organization.

The role of innovative technologies in the process of assessing and managing enterprise risks is becoming more and more significant. The technologies of big data, artificial intelligence, blockchain, and the Internet of Things open up new opportunities for more accurate and efficient risk assessment (Table 3).

Table 3: Innovative technologies in enterprise risk assessment

No. z/p	Technology	Application in risk assessment	Potential advantages and disadvantages
1	Big data (Big Data)	Analysis of large volumes of structured and unstructured data to identify hidden risks and relationships	Increasing the accuracy of risk assessment, identifying new risk factors. The need for significant investment in IT infrastructure and analytical tools
2	Artificial intelligence and machine learning	Risk forecasting, automation of risk assessment processes, detection of anomalies	Ability to process large volumes of data in real time, constant improvement of models. Dependence on the quality of input data, « black box " in decision-making
3	Blockchain	Ensuring transparency and immutability of risk data, smart contracts for automating risk management processes	Increasing confidence in risk data, reducing fraud risks. Technological complexity, regulatory challenges
4	Internet of Things (IoT)	Real-time data collection to monitor operational risks	Prompt detection and response to risks, improvement of forecasting. Cyber security, management of large data flows

			Continuation of Table 3
5	Cloud technologies	Providing access to powerful computing resources for risk analysis, centralized storage of risk data	Scalability and flexibility of risk assessment systems. Issues of data security, dependence on the cloud service provider

Source: Summarized and adapted from (Gartner, 2022), (Deloitte, 2021)

Analysis of the data presented in the Table 3, demonstrates the significant potential of innovative technologies for the transformation of enterprise risk assessment processes. Big data technologies make it possible to analyze huge amounts of information from various sources, which significantly increases the accuracy of risk assessment. According to (IBM, 2023), the use of big data and analytics technologies can significantly improve risk forecasting and risk management decision-making. Artificial intelligence and machine learning open up new opportunities for automating risk assessment processes and identifying hidden relationships. According to a McKinsey study, a significant part of companies that actively use artificial intelligence in risk management demonstrate relatively better financial results compared to competitors (McKinsey & Company, 2022). Blockchain technology has the potential to improve data transparency and reliability, and more and more large enterprises can use it to manage critical risks. The Internet of Things enables real-time data collection to monitor operational risks, and its implementation can reduce risk management costs. Companies planning to move to cloud-based solutions for risk management expect to improve the efficiency of their processes.

The integration of the risk assessment system into the general strategy of enterprise management is a critically important task for ensuring the efficiency and sustainability of business in modern conditions. This process requires a comprehensive approach that takes into account both the strategic goals of the enterprise and the specifics of its operational activities (Table 4).

Table 4: Approaches to the integration of the risk assessment system into the enterprise management strategy

No. z/p	Approach	Features	Potential advantages and disadvantages
1	Risk-oriented strategic planning	Taking into account the results of risk assessment when developing strategic plans of the enterprise	Increasing the resilience of the strategy to potential risks. The difficulty of balancing risks and development opportunities
2	Integration of risk management in corporate governance	Inclusion of the risk management function at the level of senior management and the board of directors	Improving the quality of decision-making at the highest level. The need to develop a risk culture in the organization
3	Implementation of Key Risk Indicators (KRI)	Development and monitoring of KRIs related to the strategic goals of the enterprise	Prompt identification of potential threats to achieve strategic goals. The difficulty of choosing relevant indicators
4	Scenario planning based on risks	Development and analysis of various scenarios of the development of events, taking into account potential risks	Increasing the flexibility of the strategy and readiness for various options for the development of the situation. Resource intensity of the planning process
5	Integration of risk assessment into the system of balanced indicators	Inclusion of risk indicators in the general system of evaluating the efficiency of the enterprise	A comprehensive approach to the assessment of activities taking into account risks. The difficulty of balancing various aspects of activity

Source: Summarized and adapted from (Moeller, 2007), Kaplan and Mikes (2012), (Committee of Sponsoring Organizations of the Treadway Commission, 2022)

Analysis of the approaches presented in the Table 4, demonstrates the variety of strategies for integrating the risk

assessment system into the overall management of the enterprise. Risk-oriented strategic planning proposed by Kaplan and Mikes (2012) allows to increase the resilience of the company's strategy to potential risks. According to (PwC, 2021), 76% of companies using this approach demonstrate a better ability to achieve strategic goals. Integrating risk management into corporate governance is an important step to ensure effective risk management at all levels of the organization. The implementation of KRI allows to quickly identify potential threats to achieve strategic goals. Scenario planning taking into account risks increases the flexibility of the strategy and the readiness of the enterprise for various variants of the development of the situation. A study by Bain & Company (Bain & Company, 2023) shows that companies that regularly conduct risk-based scenario planning are 17% more likely to achieve their financial goals. The integration of risk assessment into the system of balanced indicators provides a comprehensive approach to the assessment of enterprise activity. The inclusion of risk indicators in the system of balanced indicators can increase the effectiveness of risk management.

However, the implementation of these approaches faces a number of challenges. One of them is the need to develop a risk culture in the organization. Another challenge is the difficulty of balancing risk management and taking advantage of development opportunities. According to McKinsey (2019), 40% of companies note that an excessive focus on risks can limit innovation. It is important to note that the effective integration of the risk assessment system into the general strategy of enterprise management requires constant improvement and adaptation to changes in the business environment.

A promising area is the use of artificial intelligence technologies for forecasting and assessing risks in real time. For example, IBM has developed the Watson for Risk and Compliance system, which uses artificial intelligence to analyze large volumes of data and identify potential risks. Using such a system can reduce risk assessment time by 60% and increase forecast accuracy by 40% (IBM, 2022). Another important aspect is the integration of risk assessment into decision-making processes at all levels of the organization. The development of the concept of sustainable development and the growing attention to ESG factors also affect the formation of the risk assessment system. A significant proportion of institutional investors take ESG risks into account when making investment decisions. It is important to emphasize the need for continuous training and development of personnel competencies in the field of risk assessment and management.

Conclusions

Formation of an effective risk assessment system of enterprise activity in the conditions of modern challenges is a critically important task for ensuring the stability and competitiveness of business. The modern business environment is characterized by a high level of uncertainty and the emergence of new types of risks, such as cyber risks, risks of pandemics and global crises, technological risks and ESG risks, which requires enterprises to develop more flexible and comprehensive risk assessment systems. Traditional models of risk assessment often turn out to be insufficiently effective in modern conditions. New theoretical models, such as the integrated risk assessment model, the dynamic risk assessment model, and the artificial intelligence-based risk assessment model, offer more adaptive approaches to risk assessment. Innovative technologies, including big data, artificial intelligence, blockchain and the Internet of Things, open up new opportunities for more accurate and prompt risk assessment. However, their implementation also creates new challenges related to cyber security and the need to develop new staff competencies.

The integration of the risk assessment system into the general strategy of enterprise management is a critically important task. Effective approaches include risk-based strategic planning, integration of risk management into corporate governance, implementation of key risk indicators, and risk-based scenario planning. The formation of an effective risk assessment system requires a comprehensive approach that takes into account not only financial, but also non-financial factors, in particular ESG risks, which creates additional challenges for enterprises, but also opens up new opportunities for increasing business sustainability. Continuous training and development of personnel competencies in the field of risk assessment and management is critically important for the effective functioning of the enterprise's risk assessment system.

Further research should focus on the development of comprehensive risk assessment models that integrate financial and non-financial factors, as well as on the study of the impact of new technologies on risk assessment processes. An important direction is also the study of methods of effective integration of the risk assessment system into the processes of strategic decision-making at the enterprise.

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