

Effectiveness of the Management System in the Conditions of Military Operations and Crisis Situations

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Abstract. The management system is a complex multifactorial process. Analysis of management processes allows you to determine a set of influencing factors to ensure results in accordance with the set goals and tasks of a strategic and operational nature. In conditions of external instabilities, management processes are implemented in the system of new requirements and requests. Theoretical approaches to defining the concept of management as a system are considered. The article examines management models in conditions of instability and external challenges, compares them, and determines research directions. The trends in the development of management systems are analyzed, new trends in the development of management systems are determined, which are determined under the influence of external factors the pandemic of the coronavirus infection and the full-scale military aggression of the Russian Federation against Ukraine. By implementing the method of expert assessments, the ranking of risk management factors as a basic element of management in conditions of instability was developed and carried out. Based on a survey among experts, a risk ranking matrix was proposed. Based on the developed risk ranking matrix, a model of anti-crisis management in conditions of instability and external challenges was developed. Methodological recommendations on the practical implementation of the developed model into the management system are given. The theoretical-methodical and scientific-practical aspects of the implementation of the risk management model are analyzed. The possibilities of implementing risk management processes as a basic model of the anti-crisis management system by overcoming risks, preventing them, or minimizing risks that cannot be avoided have been identified.

Keywords: Management, Management system, Risk management, Management effectiveness, Anti-crisis management.

JEL: M10, M12, M16.

INTRODUCTION

The effectiveness of the management system is complex. Management can be divided into functions: planning, organization, motivation, and control. Strategic (in the long term) and tactical (goals and tasks in the short term) can be defined as specific directions. Management areas are distinguished separately: personnel, finance, operational and business processes, procurement, quality, and other areas. However, in the conditions of crisis phenomena and instability, all areas

of management are considered based on the provisions of the risk management system. A risk event is considered a potentially possible occurrence of certain situations that can negatively or positively affect business processes. Traditionally, risks are considered negative phenomena that bring business losses. However, a broader understanding of the concept of "risk" makes it possible to form not only approaches to the prevention of negative events but also to create tools for the realization of potential opportunities that arise in the business entity in the process of transformations of the external environment. With the onset of the coronavirus pandemic, which has become a global challenge for the international economy and socio-political and social systems, risk management has increased its relevance. In particular, it is expedient to identify global challenges to the global health care

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system, global trade, the tourism industry, and hospitality, which were actively developing before the start of quarantine restrictions. Only a business that had high indicators of financial stability, solvency, profitability, and margin of safety ensured stable functioning. With the beginning of the full-scale military aggression of the Russian Federation in Ukraine, the world found itself in conditions of new challenges. For Ukraine and the world, this has become the biggest challenge since the Second World War. More than 8 million refugees have increased the burden on the social welfare systems of Ukraine and European countries. The amount of emergency financial assistance for Ukraine from the International Monetary Fund amounted to 1.4 billion US dollars. The indicators of spending on defense needs became a record. All these factors have determined risks for social and economic systems around the world. The transition from the resource dependence of the European Union to the fuel and energy resources of the Russian Federation affected inflationary expectations and market conditions, which were able to level off only at the beginning of 2023. The military aggression of the Russian Federation against Ukraine, which began in 2014 and the full-scale military invasion of 2022, had serious consequences for both countries and the world community in general. The death of thousands of people and the displacement of the population as forcibly displaced persons, which was the largest in Europe since the Second World War. Ukraine's economy was seriously undermined as a result of the war. Military actions and the occupation of Crimea led to a decrease in the investment climate in the country, a decrease in trade volumes and other problems that negatively affected the economic situation of Ukraine. This determines the need to find new effective mechanisms for managing the processes of economic development and investment attractiveness. These challenges and risks of social transformations require the search for effective management mechanisms that would allow overcoming risks and ensure the development of economic systems.

The purpose of the article. So, considering the relevance of anti-crisis management processes, the article sets a goal: to model risk management processes as a basic element of management in conditions of global challenges and instability.

To achieve the goal of the study, the following tasks were performed:

- an analysis of research works dedicated to the analysis and development of management models in the conditions of crisis phenomena was carried out,
- trends in the development of social systems are determined,
- a risk ranking matrix in the risk management system was developed,
- a crisis management model was built,
- developed methodological recommendations for the practical implementation of the anti-crisis management model in the business process management system.

LITERATURE REVIEW

The development of management systems in the context of crisis phenomena determines the set of management models

developed by the authors through research analysis and practical implementation. For further research, it is proposed to choose the best practices for building effective management systems in crisis conditions by analyzing the developed models and methods.

In the conditions of crisis phenomena, the management system works under new requirements. The duration of crisis challenges determines the need for a complex approach to solving the tasks. The model of anti-crisis management should be defined as a system of tools aimed at creating conditions for effective work in the processes of transformations and social turbulence. It is appropriate to note that the first tool that most managers begin to implement in the context of crisis phenomena is the restructuring and reduction of costs of the economic entity. However, strategic tasks can be implemented only if the focus is on development and scaling, and not on reduction and closure. Considering the expectations and forecasts of stakeholders, it is possible to determine the tools of a comprehensive, long-term, rational approach, focused on overcoming risks and crisis phenomena. Therefore, it is expedient to determine the projection of new forms of internal and external cooperation as a task of management in crisis conditions [Larreina, M. and Gartzia, L. (2017), Allal-Chérif, O. and Maira, S. (2011)].

An interesting example of the formation of anti-crisis management tools is the formation of youth leadership. The system of youth leadership is the basis of the formation of the future effective management system. Analyzing youth leadership in the context of crisis phenomena, the elements of the management model in the context of crises were highlighted: systematicity, complexity, multifunctionality, mobility, adaptability, structuring of influencing factors, and the search for management tools for each factor. The analysis of the case of youth leadership as an element of the anti-crisis management system determines the company's transformations, the company's path in 2014 after the start of the anti-terrorist operation, the economic crisis, the coronavirus pandemic since 2019, and the full-scale military invasion of the Russian Federation in 2022 is investigated. The management tools that were reflected in the management model of the analyzed company should be defined as follows: the transformation of business models in accordance with requirements and requests, construction and development of corporate culture, creation of a development ecosystem, and use of outsourcing services. The analysis of the work of enterprises in the conditions of the pandemic identified a number of management tools aimed at overcoming its consequences, which were combined into the following groups: economic, social, intellectual, technical, information, and human capital [Grieco, C. (2022)].

One of the elements of the management system is the organizational structure. Organizational provision of management tools plays an important role, especially in the conditions of crisis phenomena. It is worth noting that the restructuring of organizational structures in crisis conditions can lead to even more negative consequences. Some researchers determined the impact of risk factors and crisis situations on the management system and its effectiveness. The hypothesis has been proven that any organizational changes and transformations in themselves are a crisis factor that has an even

greater impact on the current situation. Therefore, it is advisable to consider the possibility of not restructuring the organizational system, but its rationalization, which will lead to the less negative impact and will not have negative psychological effects on the team, which is the basis of stress resistance in conditions of risky situations and crisis phenomena. The hypothesis was proven by analyzing restructuring processes in international companies during the economic crisis of 2007 [Appelbaum, S.H., Keller, S., Alvarez, H. and Bédard, C. (2012)]. The use of a conceptual analytical model for energy-efficient management of the national economy (Borodina, O., Kryshchal, H., Hakova, M., Neboha, T., Olczak, P., & Koval, V., 2022), and the application of innovative approaches in developing human potential in public administration (Semenets-Orlova, I., Shevchuk, R., Plish, B., Grydiushko, I., & Maistrenko, K., 2022). The human-centered approach remains the main one in new trends in the development of public administration (Semenets-Orlova, I., Shevchuk, R., Plish, B., Moshnin, A., Chmyr, Y., & Poliuliakh, R., 2022), and in management activities of education managers (Semenets-Orlova, I., Klochko, A., Tereshchuk, O., Denisova, L., Nestor, V., & Sadovyi, S., 2022).

Numerous of the research are devoted to issues of structuring the management system in various crisis periods:

- the initial period involves the formation of conditions to ensure the stability of the economic system,
- the height of the crisis involves the implementation of management mechanisms aimed at extinguishing negative fluctuations and ensuring the survival of the economic system,
- the final stage of the crisis determines the search for new opportunities for a qualitatively new state of the economic system.

Each stage involves different specifics of modeling management processes, which are associated with different requests and one or another stage of the crisis [Adăscăliței, D. and Guga, Ș. (2018)].

An interesting study is devoted to the search for universal mechanisms for the implementation of an anti-crisis management system at the level of cooperation between the public and private sectors. The model of public-private anti-crisis management involves the implementation of the following algorithm:

- analysis and assessment of the problem,
- development of the stakeholder structure,
- conducting discussion sessions to ensure the search for opportunities to overcome the crisis,
- development of a plan of measures to overcome the crisis,
 - regulatory and contractual regulation of the processes of ensuring partnership,
- the creation of specific cooperation projects,
- implementation of projects,
- analysis of results and determination of directions for further cooperation.

Such an algorithm makes it possible to present a cyclical model of anti-crisis management at the level of cooperation between public authorities and the private sector, which is relevant in the context of socio-political and socio-economic transformations [Basílio, M. (2017)].

Analyzing the challenges of the coronavirus pandemic, a number of scientific studies determine the following management tools, which can be used as a basis for the formation of an anti-crisis model of management and risk management:

- prevention and minimization of operational and strategic failures in business processes,
- development of organizational stability,
- the creation of a hierarchical model of potential sources of the company's adaptability.

Determination of the role of the factors described above and the hypothesis about the effectiveness of their application are proven by using the methods of Pareto analysis, Gray's theory, and by using full interpretive structural modeling. The results of the study identified the main sources of risk management during crisis events: financial sources, digitalization, and supplies. These three elements of the model create conditions for ensuring the stability of the economic entity in conditions of instability [Matysek-Jędrych, A., Mroczek-Dąbrowska, K. and Kania, A. (2022)].

Confirmation of the hypothesis about the need to create conditions to ensure the stability of economic systems made it possible to determine the priority directions of management: ensuring financial stability, solvency, and profitability. Operating financial indicators allow you to determine the role of the results of financial and economic activity in ensuring anti-crisis management [Coletto, D. and Guglielmi, S. (2018)].

The analysis of the impact of various methods of financing on investment in assets and, as a result, the impact on the formation of GDP determines the interrelationships of the financial sector at the micro-level and macroeconomic indicators of activity results. The methodology is based on three formations of three equations using the combined ordinary least squares method. The following hypotheses for the formation of anti-crisis management were confirmed by means of mathematical calculations:

- the positive impact of private domestic lending on state fiscal resources,
- the negative impact of private domestic lending on GDP growth,
- the impact of internal private lending on the reduction of investment activity of external investors and the negative impact on the structure of non-financial assets [Mehar, M.A. (2022)].

Numerous of researches determine the methodological, conceptual, and practical side of the issue of anti-crisis management. In particular, the methodological principles of anti-crisis management determine the need to implement methods of analysis, assessment, planning, organization, and monitoring. Conceptual approaches determine the formation and structuring of the prerequisites for the development of anti-crisis management systems. The practical implementation

consists in finding effective practical mechanisms and tools for implementing the proposed methodological approaches during real business processes [Fotou, M. (2021), Rao, P., Verma, S., Rao, A.A. and Joshi, R. (2022)].

New challenges for society, which are the biggest since the Second World War, have become the challenges of security architecture, international relations, geopolitical spaces, and economic and financial instability, which have become the consequences of the beginning of the full-scale military aggression of the Russian Federation against Ukraine. In particular, a number of authors offer risk management models based on the analysis of the military conditions of the development of socio-economic and socio-political institutions [Olena Uhodnikova, Kostiantyn Viatkin, Sergii Gordiienko, Roman Viatkin & Natalia Moroz (29 November 2022), Oxford Analytica (2022)]

Therefore, theoretical and theoretical-methodical approaches to determining the specifics of management were analyzed, requests to management systems in the context of crisis phenomena were identified, and advantages and disadvantages of business process management models in the context of crisis phenomena and challenges and transformations were analyzed, and determined through comparative analysis. However, it is expedient to analyze modern challenges of a socio-political and socio-economic nature, in order for the model developed in the study to meet modern demands. For the analysis of challenges and risks, reports and open information on analysis from international organizations were accumulated [Official website of the organization UN, European Parliament]. It is appropriate to highlight the following:

- security risks of the spread of the military conflict to larger territories, in particular, the European continent, or going beyond the borders of the continent,
- threats of increasing prices for fuel and energy resources,
- threats to food safety,
- migration crisis,
- social security crisis,
- the growth of the poverty level and the threat of hunger in the world,
- violation of transport and logistics routes,
- an imbalance of the world trade system,
- rising prices for food, utilities,
- consumer crisis.

Conducting further research will be based on the results of a literature review and comparison of management methods and models in the context of crisis phenomena, as well as by considering the challenges and risks that are the results of a full-scale military invasion of the Russian Federation into Ukraine.

METHODOLOGY

The article analyzes literary sources, which made it possible to determine management models proposed by numerous authors. The analyzed models consider the challenges of the

external environment of a global nature, that is, they can be practically implemented in conditions of instability. The purpose of the developed models is to ensure the stable development of business processes and minimize the consequences of risks. Trends in the development of business systems were determined by analyzing crisis phenomena and their consequences. The analysis was carried out by accumulating official reports of international organizations, their analysis, and empirical research methods. The article presents the results of an expert survey aimed at forming a risk management system. In particular, the selection and ranking of risks were carried out by experts. An expert survey was conducted among the top and middle managers of Ukrainian companies of large and medium-sized businesses in the period of September-October 2022. 50 experts participated in the survey. The requirements for experts put forward in the study were as follows: work as a manager for more than 5 years, work in crisis conditions (during a pandemic or a full-scale military invasion), and work in large and medium-sized companies. The experts were asked to evaluate a set of risks formed by analyzing literary sources and conducting a literature review. Experts rated each risk on a 10-point scale based on two indicators – the probability of occurrence and scale of consequences. To ensure the relevance of the assessment, the method of correlation analysis of the results was applied and the critical minimum and critical maximum indicators were discarded. As a result of the ranking, each selected risk was assigned a rank as the sum of experts' assessment indicators. Based on the analysis, a risk ranking matrix was developed, where three risk categories are defined for further support of management processes. On the basis of analysis and modeling, by confirming the hypotheses that were put forward based on the results of the analysis of literary sources, and confirmed by the method of expert evaluations, methodological recommendations were developed for the practical implementation of the anti-crisis management model in the business process management system.

So, the methodology of the effectiveness of the management system in the conditions of military operations and crisis situations is based on a risk-oriented approach, considering certain factors that can affect management processes. To achieve management efficiency in such conditions, the following actions must be performed:

- Risk assessment: analysis of potential negative and positive consequences of crisis phenomena for business processes. For example, in the context of military operations, risks can be related to damage and destruction of infrastructure, problems with personnel and business processes.
- Development of risk management strategies: development of plans and procedures that allow you to manage risks and minimize their impact on business processes.
- Implementation of a risk management system: the creation of internal control and ensuring compliance with risk management plans in management processes.
- Monitoring and analysis of results: monitoring the effectiveness of risk management plans and their analysis, which allows for improvement the management system and reduce risks.

- Prepare for unforeseen situations: create backup plans that can be used in case the plans developed for risk management do not allow to ensure the security and stability of business processes.

RESULTS

The analysis of literary sources made it possible to determine the main directions of anti-crisis management:

- assessment and analysis of the current situation,
- projection of development trends by forecasting the further course of events,
- determination of managing risks in conditions of instability,
- development of management approaches and management tools to minimize, avoid, and overcome risks and their consequences in case of risk occurrence,
- ensuring the implementation of strategic and operational goals and objectives by introducing anti-crisis management.

The study of the reports of international organizations made it possible to determine the structure of risks as elements of crisis phenomena, in particular, the study proposes the following set of risks with their grouping according to certain characteristics:

- financial and economic risks: currency exchange rate fluctuations, macroeconomic instability, inflationary expectations, market deficit, food crisis, banking sector rate crisis, the rising cost of fuel and energy resources.
- technical and technological risks: energy crisis, the crisis of information technology development, the crisis of transport

and logistics schemes for the supply of high-tech materials, the crisis of development of intellectual potential,

- security risks: the crisis of the spread of a full-scale war, the crisis of the security architecture, the risks of prolonging the military conflict in Ukraine, the crisis of the imbalance of weapons systems,
- geopolitical risks: the introduction of sanctions, the breaking of international agreements, disregard for the norms of international law, trade wars, political and military conflicts,
- social risks: decrease in the quality of the provision of medical services, decrease in the quality of the provision of educational services, the collapse of the medical system, a decrease in the level of support for socially vulnerable segments of the population, a decrease in the standard of living of the population,
- digital space risks: cyber security, protection of personal data, prevention of cyber-attacks, hacking, information policy.

The definition of risk groups was compiled into a questionnaire for conducting an expert survey. Experts determined the assessment of the probability of occurrence and consequences of potential risks on a 10-point scale (where 1 is the minimum probability and the minimum scale of consequences, 10 is the maximum probability of occurrence and the maximum scale of consequences). A correlational analysis of the ratio of experts' opinions was conducted, the answers were averaged, the results of calculations and expert assessments are presented in Table 1. By finding the sum of the results of the survey on two indicators, the risk rank was formed.

Table 1. Summarizing Results of Expert Survey and risk Ranking.

Risk	Probability of Occurrence	the Scale of the Consequences	Sum of Indicators	Rank
Financial and Economic Risks				
currency exchange rate fluctuations	9	10	19	1
macroeconomic instability	9	8	17	1
inflationary expectations	8	9	17	1
market deficit	6	7	13	
food crisis	8	9	17	1
banking sector rate crisis	7	7	14	2
rising cost of fuel and energy resources	9	9	18	1
Technical and Technological Risks				
energy crisis	9	9	18	1
crisis of information technology development	7	9	16	2
crisis of transport and logistics schemes for the supply of high-tech materials	6	7	13	2
crisis of intellectual potential development	7	8	15	2
Security Risks				
the crisis of the spread of a full-scale war	7	8	15	2

the crisis of the security architecture	8	9	17	1
the risks of prolonging the military conflict in Ukraine	4	9	13	2
the crisis of the imbalance of weapons systems	6	8	14	2
Geopolitical Risks				
introduction of sanctions	9	8	17	1
rupture of international agreements	6	8	14	
disregard for international law	8	7	15	2
trade wars	8	9	17	1
political and military conflicts	9	9	18	1
Social Risks				
decrease in the quality of the provision of medical services	8	9	17	1
decrease in the quality of the provision of educational services	7	8	15	2
the collapse of the medical system	6	9	15	2
a decrease in the level of support for socially vulnerable segments of the population	7	7	14	2
a decrease in the standard of living of the population	8	6	14	2
Risks of the Digital Space				
cyber security	9	9	18	1
personal data protection	9	9	18	1
prevention of cyber attacks	7	9	16	2
hacking, information policy	8	8	16	2

* Source: developed by the author based on the analysis of the results of the method of expert evaluations and correlation analysis

Table 2. Risk Ranking Matrix.

Rank	Sum of indicators	Gradation	Characteristic	Management tools
1	20-17	Critical	the risk has high indicators of the probability of occurrence and scale; therefore it requires a priority response	implementation of preventive management tools
2	16-13	Important	the risk has high indicators of the probability of occurrence and scales, therefore, it requires an analysis of the possibility of applying management tools	implementation of preventive management tools
3	13-10	Significant	the risk has average indicators of probability of occurrence and scale, so it is recommended to take it into account in the management system	implementation of monitoring
-	less than 9	unimportant	The risk has insignificant indicators of probability of occurrence and scale, so it may not be considered or considered as prospectively possible	management tools may not be used

* Source: developed by the author.

The selected risks were ranked using the assessment matrix developed by the author - Table 2.

As a result of the analysis of expert assessments and the creation of a risk ranking matrix, a model of the formation of management tools for anti-crisis management was developed - Fig. (1)

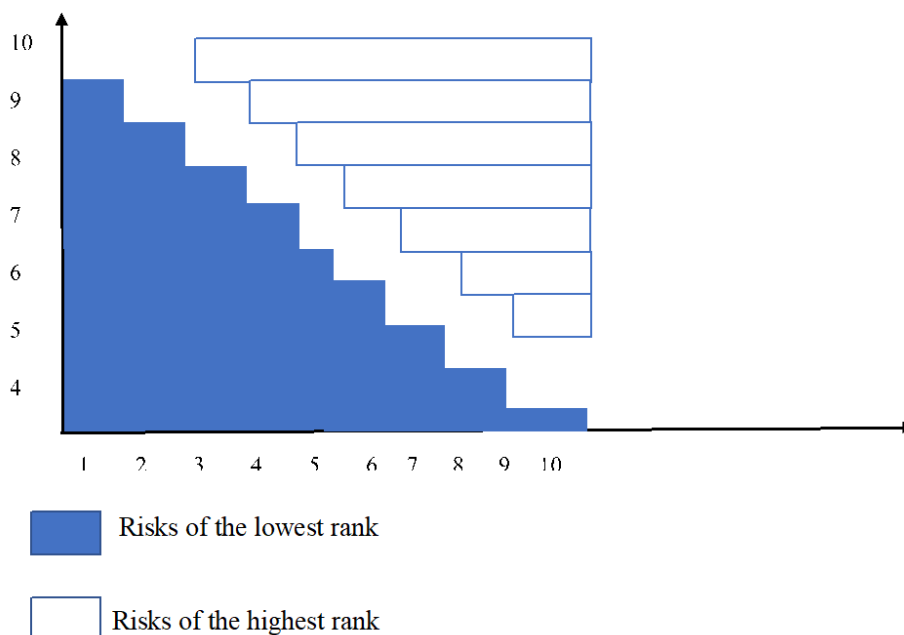


Fig. (1).

* Source: developed by the author.

Using the risk ranking model in practical activities, it is possible to visually determine the place of risk in the risk management system by conducting an expert survey and further ranking according to the algorithm developed in the article.

According to the rank of the risk, management tools are developed aimed at overcoming it, preventing, or minimizing its consequences.

DISCUSSION

As a result of the conducted research, models of management in crisis situations were accumulated. Based on the analysis of trends and trends, it was determined that the pandemic and the full-scale military aggression of the Russian Federation against Ukraine have recently become the main challenges for the management system. The main consequences of global challenges were social issues, security issues (military security architecture, digital security, information security), and financial and economic challenges associated with military aggression: food security, fuel, and energy crisis, and resource delivery crisis. The risk management model, developed because of the research based on the analysis of expert opinions and correlation analysis, structured risks, ranked them and developed a model that allows determining management tools depending on the risk rank. The following management tools are offered for each risk rank:

Rank 1 – critical risks include the following management tools:

- current critical analysis of the situation (internal and external environment),
- constant monitoring of the current situation: operational processes and business processes,

- increasing indicators of solvency and financial stability (if risks are prevented),
- adjustment of strategic plans,
- adjustment of interest rate, deposit/loan rate for financial institutions,
- the creation of a system of transformation of the organizational structure to prevent the outflow of personnel,
- use of the insurance system.

Rank 2 – risks include the following management tools:

- creation and development of depreciation funds,
- formation of conditions for increasing investment attractiveness,
- strategic planning and operational planning,
- current monitoring,
- insurance.

3rd rank of risks – risks involve the following management tools:

- implementation of strategic and operational plans,
- analysis, evaluation, and decision-making based on relevant information,
- forecasting and modeling of development processes.

Risks that have a minimum rank may not be considered.

The method developed in the article makes it possible to analyze, evaluate, and rank risks and based on the risk management model, determine the most effective anti-crisis management tools. Practical implementation of the developed model and evaluation and ranking system allows for effective anti-crisis management aimed at prevention, mini-

mization, and avoidance of risks, which is especially relevant in the conditions of crisis situations and challenges. The discussion point of the study is the development of the proposed management tools, which can be supplemented and improved. The topic of further research can be the analysis of anti-crisis management processes in specific spheres of economic activity because they have their own peculiarities and specifics.

CONCLUSION

As a result of the conducted research, it was determined that the management system should be transformed in accordance with external challenges, be more flexible and adaptive. Using the example of the analysis of situations with the global challenges of the pandemic and the full-scale military aggression of Ukraine, it was determined that in conditions of external instability, management should be based on anti-crisis approaches, that is, the risk management process, which is implemented in parallel to all areas of management, becomes basic. The article has developed a risk management model based on risk ranking. The developed model makes it possible to identify priority areas of management and remove those areas that are not relevant. Graphic representation of the model allows you to practically implement it without special knowledge and skills-specific skills. The article proposes management tools that can be applied according to the analyzed risk rank. Risk management as an anti-crisis management system, developed in research, aimed at the prevention, minimization, or prevention of risks.

Today, when the threat of crisis situations is becoming more and more urgent, management systems must be able to coordinate emergency response efforts and quickly allocate resources effectively.

Indeed, natural disasters, pandemics and terrorist attacks can strike any country and destroy the most precious thing we have - human life. Therefore, it is important to have a management system that will allow you to quickly and effectively respond to a crisis situation and coordinate the work of all departments and services.

One of the important aspects of effective management in crisis situations is the rapid distribution of resources. Each situation may require a different level of material and financial resources, so it is important to have a system that will allow flexible and efficient allocation of resources according to needs.

It is also important to coordinate the work of all institutions and stakeholders. Each of them has its own functions and tasks that must be performed in a crisis situation. Therefore, the management system must be able to effectively cooperate with all departments and services to avoid duplication of work and use resources as efficiently as possible.

Therefore, the main criteria for the effectiveness of the management system in crisis situations are the speed of reaction, the accuracy of decision-making, and the coordination of efforts. It is necessary to prepare for possible crisis situations in advance by developing action plans and conducting training on armed conflicts, evacuation, countering terrorist acts and other possible threats.

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