

USE OF ARTIFICIAL INTELLIGENCE TOOLS BY MANAGERS TO PREVENT CRISIS SITUATIONS

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Abstract. The article deals with the topical issues of using artificial intelligence tools to prevent crisis situations. The attention is directed to the theoretical study of the importance and significance of the digital tools use, including artificial intelligence, in the enterprise activities. The modernity requires entrepreneurs to implement and use the latest tools and technologies that will contribute to the improvement of the management component, which is primarily related to the prevention and quick resolution of crisis situations. Timely detection of the first signs of a crisis and the search for appropriate solutions ensure the productive and effective functioning of enterprises.

The article summarizes the main approaches to defining the essence of artificial intelligence as a key direction of scientific and technical development of the 21st century and a tool for economic growth. The main negative aspects that may occur when implementing AI are indicated. It is substantiated that with a correct and balanced approach to the use of this digital tool, enterprises can not only maintain their place in the market, but also strengthen their competitive positions. Taking into account that the focus of the study is on crisis management with the use of AI, the following categories of crises were considered and summarized: sudden crises; preventable crises; exceptional crises. The authors proved that the correct interpretation of these categories will enable enterprises to choose the necessary and accurate methods and tools for timely overcoming or prevention. The article presents aspects of digital transformation that show how an enterprise can rebuild its own business model to improve competitiveness: rethinking the work with data, improving external communication, implementing lean production. The key advantages of the AI implementation in the context of anticipatory management of the enterprise are presented, namely: quick analysis, generalization and verification of information; provision of general reports and statistics; promoting cooperation and coordination between different departments; creation of an operational and effective warning system in advance or at the beginning of a crisis.

The article offers recommendations for the effective use of AI in the context of anticipatory management, which will allow enterprises to effectively develop in a changing environment.

Keywords: digital tools, artificial intelligence, crisis situations, anticipatory management, entrepreneurship.

1 Introduction

The modernity dictates new requirements, rules and standards for conducting business. First of all, this is due to the significant variability and unpredictability of the modern world: economic and political factors, natural disasters, pandemics, and others. Thus, in an environment that is not stable, but undergoing constant change and complication, crisis is inevitable and comes without warning.

Z. Rosenblat and Z. Schaeffer (2002) define the crisis as a negative phenomenon [1], however, as noted by A. Valatskene and R. Virbickaite (2011), “it is important to note the close connection between the crisis and changes that reflect positive impulses to overcome the crisis in the successful development of the enterprise” [2]. Also, Ratsan S., Sommariva S. and Rauch L. (2020) in their works outline the concept of “crisis” as an unstable situation with various possibilities of obtaining undesirable results [3].

Let's define a crisis as a complex situation that leads to a potential threat to the functioning of the enterprise, requiring immediate intervention or reaction to reduce negative consequences, which corresponds to modern conditions. According to this definition, crisis situations are an integral part of all life and entrepreneurial activity in the modern world. Every day, business entities are faced with the unforeseen or crisis situations, which in one way or another affect the stable and harmonious operation of enterprises. Therefore, it is important for managers to always be ready for sudden changes in both internal and external environments, which can provoke the crisis in business activity. In this case, anticipatory management is an important component of the manager's activity for the successful functioning of the enterprise. After all, the main goal of the anticipatory management team is timely forecasting of crisis situations and finding solutions that will contribute to the solution of existing and possible problems.

The understanding that crisis situations are becoming increasingly difficult to predict and complex prompts the use of various digital technologies, the timing of AI. According to McKinsey Global Institute research, the implementation of artificial intelligence (AI) tools in business activities will reduce costs by 20-40% and increase productivity by 10-25%. After all, this technology has the ability to guarantee support in the decision-making process in crisis conditions. Accordingly, in the context of anticipatory management, AI can help identify risks and predict possible consequences of crisis situations [4].

The issue of using artificial intelligence technologies in the anticipatory management system was presented in the scientific works of both domestic and foreign scientists.

Thus, Kulinyak I.Ya., Kopets G.R. and Horbenko T.M. (2022) in their scientific works note that one of the options for preventing or getting out of the crisis is to strengthen the transition to more active use of digital tools in business activities [5]. In turn, Skopenko N.S., Yevseeva-Severina I.V. and Kyrychenko O.M. (2022) note that digitalization contributes to the automation of production, the creation of products and services based on digital technologies, the transition to the online of all communication activities of the enterprise, which increases its value [6].

In addition, we note the results of the research of scientists Zh. Lion, E. Bohodistov, Y. Murmann (2021), who studied the areas of business processes optimization. They consider that the introduction of artificial intelligence into the company's information systems will help reduce the workload of employees [7].

As a result, the rapid development of the “digital world” dictates new approaches to obtaining competitive advantages in the market. Rapid development of innovations contributes to an increase in the number of enterprises that introduce modern digital technologies into their operations in order to improve functioning and effective growth. After all, every 10 years the number of management problems increases in direct proportion to the rate of economic progress in the world economy [5, 6].

Therefore, based on the above, the purpose of the article is to determine the theoretical aspects and analyze the use of artificial intelligence tools in the prevention of crisis situations. To achieve the goal, the following tasks were solved: the concept of artificial intelligence was defined; categories of crises are considered; the relevance of the implementation of digital tools was analyzed and recommendations were offered for the effective use of artificial intelligence in the context of anticipatory management.

2 Statement of basic material

The beginning of research in the field of artificial intelligence dates back to 1956, when John McCarthy organized the Dartmouth Conference. Now, according to the Oxford Dictionary, “artificial intelligence” is a field of study concerned with the ability of computers or other machines to exhibit or imitate intelligent behavior. Another definition of AI is software used to perform tasks or obtain results that previously required the involvement of human intelligence [8]. Currently, there are various approaches to the definition of artificial intelligence (AI), which can be considered as a system, a type of digital technology, or a field of research (Table 1).

Table 1. Key approaches to defining the essence of artificial intelligence.

No	
1.	Key direction of scientific and technical progress of the 21st century
2.	One of the latest trends in digital technologies
3.	A unique product of technical progress
4.	Systems capable of thinking and learning
5.	Human-made systems operating in the digital world
6.	The ability of machines and programs to analyze received information in order to draw conclusions and make decisions
7.	A tool for stimulating economic growth in the world economy
8.	A unique product of technical progress

Source: made by the author based on [9]

According to Thomas Davenport (2018), AI may be the technological force with the greatest breakthrough potential today [10]. Similarly, according to E. Brynjolfsson and

McAfee A. (2017), AI is the most important general-purpose technology of our era, especially when it comes to machine learning (ML) methods [11]. Artificial intelligence can become an extremely influential digital tool in overcoming crisis situations and guaranteeing the well-being of enterprises. However, it also has many difficulties and dangers that require careful attention:

1. Prejudice – unfair or discriminatory decisions when solving crisis situations.
2. Non-transparency– decisions made by AI can be unclear, which makes it difficult to explain them.
3. Loss of control – the system may make decisions that conflict with human values or interests.
4. Abuse – AI systems can be used by attackers in order to exacerbate a crisis or to manipulate.
5. Technical risks – failure in the work of AI or a cyber attack.

Despite the existing risks of using AI technologies, it is worth noting that every enterprise that seeks to occupy leading positions in the market must implement innovative tools and technologies in its activities to maintain competitiveness, especially when predicting a crisis and managing its consequences. After conducting research, we summarized and formed the categories of crises that can arise in the process of entrepreneurial activity (see Fig. 1).

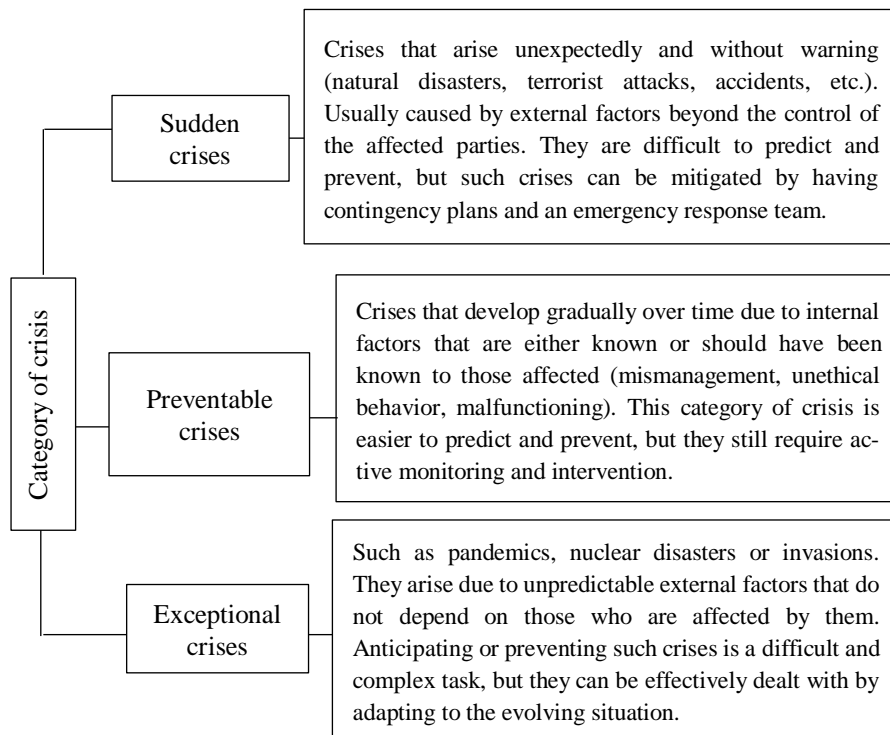


Fig. 1. Categories of business process crises.

Source: made by the author based on [9]

Drawing a conclusion from Figure 1, it should be noted that understanding the characteristics of the specified categories will allow us to choose appropriate tools for their timely overcoming or prevention. After all, properly selected means and measures will allow to obtain positive results in the fight against crisis situations in a high quality and in a short period of time and minimize the losses incurred by the business. As noted by S. Russell and P. Norvig (2016), "...we define AI as a set of technological components that collect, process and act on data in a way that imitates human intelligence. Like humans, solutions where artificial intelligence has been implemented can learn over time thanks to the acquisition of new data and information (i.e. with the help of machine learning) and adapt to changes in their environment" [12].

Taking into account the global events of 2022-2023, such as the war in Ukraine and recessionary trends in some EU countries due to high inflation and changing political climate it can be concluded that AI and ML can be one of the most promising areas for development and investment. According to Ying Lee and Yong Jae Shin (2020), ML is one of the most breakthrough innovations for modern business and a powerful factor of competitive advantage. Although ML has existed for more than 60 years, it has only recently demonstrated significant potential to transform the economy [13]. The agricultural sector, banking, production and transport are just some of the areas affected by ML. According to Accenture (2018), AI and ML can reduce costs by 20-25% in these industries [14]. Thus, currently AI and ML is one of the central innovations in anti-crisis, timely anticipatory management (see Fig. 2).

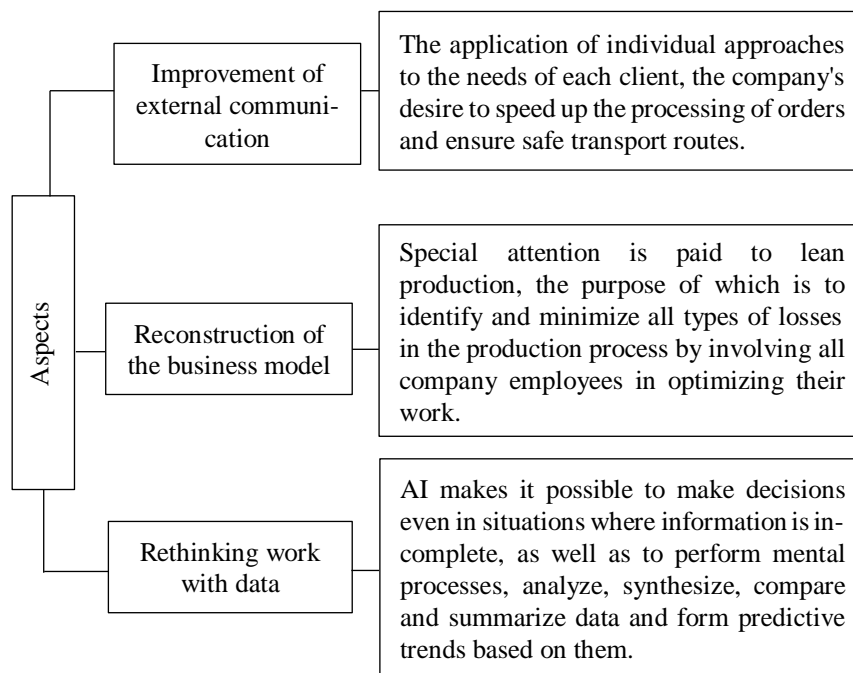


Fig. 2. The contribution of digital transformation to anticipatory management.
Source: made by the author based on [15]

AI is becoming an increasingly powerful tool for effective anticipatory management for businesses in every industry. This is because the introduction and application of AI technologies can contribute to reducing losses and improving performance in difficult-to-predict situations such as economic crisis, pandemic or military operations.

By using AI to predict and analyze risks, businesses are able to make informed decisions in the face of uncertainty. For example, a machine learning system can access a large amount of data about the financial state of the enterprise, previous crisis situations and risks. Later the obtained data can be processed and analyzed in order to highlight the key factors that provoke crisis situations [16]. Based on this data, you can develop effective risk management strategies and prepare for possible crises.

Thus, the main advantages of implementing AI in the context of anticipatory management are [17]:

1. Forecasting and recommending the best actions and strategies for responding to a crisis situation.
2. Reduction of information overload and separation of disinformation.
3. Analysis, summarization and verification of information from various sources.
4. Provision of general reports and statistics.
5. Creation of an operational and effective warning system in advance or at the beginning of a crisis, in order to timely inform employees about the current situation and offer different ways of action.
6. Facilitating cooperation and coordination between different departments of the enterprise, as well as ensuring effective communication, information exchange and distribution of tasks between employees.

Thus, having researched and analyzed the main aspects of the implementation and use of AI in anticipatory management, we note that enterprises having the correct application of advanced technologies can occupy leading positions in the market. Accordingly, we offer recommendations for the effective use of AI in the context of anticipatory management (Table 2).

Table 2. Recommendations for the effective use of AI in the context of anticipatory management.

№	Recommendations	Characteristics
1.	Choose the right tasks	<ul style="list-style-type: none"> • AI is best suited for tasks related to data analysis, forecasting and decision making. • Choose tasks where AI can supplement or replace human capabilities, not just duplicate them. • Focus on tasks where there is a high degree of uncertainty and risk, where it may be difficult for a person to make the right decision.
2.	Prepare the data	<ul style="list-style-type: none"> • Data quality is a key to the successful use of AI. • Make sure the data is clear, relevant and up-to-date. • Collect data from different sources to get a more complete picture of the problem.
3.	Choose the appropriate algorithm	<ul style="list-style-type: none"> • There are many different AI algorithms, each with their own strengths and weaknesses. • Choose the algorithm that best suits your specific task.

- Try different algorithms to compare their performance.
 - Be prepared that the AI may require refinement over time.
 - 4. Conduct monitoring and assessment
 - It is important to use AI ethically and responsibly.
 - Ensure that AI is not used to discriminate or harm people.
 - Be transparent about how AI is used.
 - Be prepared that the AI may require refinement over time.
 - 5. Follow ethical standards
 - It is important to use AI ethically and responsibly.
 - Ensure that AI is not used to discriminate against or harm people.
 - Be transparent about how AI is used.
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As a conclusion, in order to maintain the achieved positions and gradually develop enterprises in a dynamic environment, it is important to conduct an analysis of the possibility of implementing AI tools in the management component for identifying and combating crisis situations and their impact on the main performance indices of economic entities.

Thus, the introduction of AI will lead to the transformation of the ways of doing business in various spheres, which will be positively reflected in the reduction of resource consumption, speeding up the passage of processes and increasing the safety of production.

3 Conclusions

Artificial intelligence can become a powerful tool for businesses that want to increase their resilience to various types of crises. However, it is important to understand that AI is not a panacea and cannot guarantee the success of an enterprise in crisis conditions. For the effective use of AI, enterprises need to have the appropriate infrastructure and qualified personnel, so its implementation can be an expensive and time-consuming process. However, with the right approach, AI can become a valuable asset for enterprises, and its effective use is the key to the success and survival of the enterprise in difficult conditions.

Therefore, the implementation of AI in business activities will help to effectively manage crisis situations and ensure successful functioning. It is important to consider that its correct integration into the enterprise's activities must be carefully planned. This will allow enterprises to be ready for crisis situations and make effective timely decisions to reduce losses and improve performance. However, it is important to remember that AI is a tool, not a solution in itself. Its use should be accompanied by close personnel supervision.

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