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ANTI-CRISIS MANAGEMENT OF THE ENTERPRISE: HISTORICAL HERITAGE AND THE MODERN DIGITIZED PARADIGM

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anti-crisis management, digitalization, anti-crisis management tools, strategic management, preventive measures, anti-crisis management department, dashboard, indicators, risks, artificial intelligence.

The scientific article explores the development of the theory of anti-crisis management from classical approaches to the modern digitized paradigm. Particular attention is paid to the role of digitalization, innovations, artificial intelligence, and process automation at the stages of prevention, response, and overcoming crisis phenomena and conditions in enterprises. Considerable attention is devoted to the transformation of anti-crisis management under the influence of digitalization: it is shown that the introduction of ERP/MES systems, digital twins, analytical platforms, and early-warning systems enables the shift from reactive to proactive anti-crisis management at enterprises. A conceptual model of anti-crisis management is proposed, built on the ODAL cycle (Observe – Diagnose – Act – Learn), which ensures continuity of monitoring, adaptive decision-making, and organizational learning. The necessity of implementing anti-crisis strategies, risk-oriented management systems, and crisis response structures at enterprises is substantiated, which is especially relevant under the conditions of martial law in Ukraine. It is proven that digital transformation not only improves diagnostic and response tools but also forms a new philosophy of anti-crisis management-preventive, integrated, and data-centric. The study substantiates that one of the key problems of Ukrainian enterprises remains the lack of systemic integration of anti-crisis mechanisms into strategic decisions, insufficient development of a risk-oriented thinking culture, and the fragmented use of digital tools. Against this backdrop, the transition to a comprehensive model of anti-crisis management becomes particularly relevant. This model includes such elements as: digital risk audit, automated diagnosis of financial dysfunctions, scenario modelling of crisis development, formation of adaptive response mechanisms, creation of crisis headquarters, implementation of information security protocols, and contingency planning. The research results may be used to increase enterprise resilience, improve risk management mechanisms, and shape a modern system of anti-crisis management under conditions of global instability.

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АНТИКРИЗОВЕ УПРАЛІННЯ ПІДПРИЄМСТВОМ: ІСТОРИЧНЕ НАДБАННЯ ТА СУЧАСНА ДІДЖИТИЛІЗОВАНА ПАРАДИГМА

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Ключові слова:
антикризове управління, діджиталізація, інструменти антикризового управління, стратегічне управління, превентивні заходи, відділ кризового менеджменту, дашборд, індикатори, ризики, штучний інтелект.

У науковій статті досліджено розвиток теорії антикризового управління від класичних підходів до сучасної діджиталізованої парадигми. Особлива увага приділяється ролі діджиталізації, інновацій, штучного інтелекту, автоматизації процесів на етапі попередження, реагування та подолання кризових явищ та станів на підприємствах. Значну увагу приділено трансформації антикризового управління під впливом цифровізації: показано, що впровадження ERP/MES-систем, digital twin, аналітичних платформ та систем раннього попередження створює можливість переходу від реактивного до проактивного управління кризами на підприємствах. Запропоновано концептуальну модель антикризового менеджменту, побудовану на циклі ODAL (Observe – Diagnose – Act – Learn), яка забезпечує безперервність моніторингу, адаптивність прийняття рішень та організаційне навчання. Обґрунтовано необхідність запровадження на підприємствах антикризових стратегій, систем ризик-орієнтованого управління та структур кризового реагування, що є особливо актуальним в умовах військового стану в Україні. Доведено, що цифрова трансформація не лише удосконалює інструменти діагностики та реагування, а й формує нову філософію антикризового управління – превентивну, інтегровану та даноцентричну. У дослідженні обґрунтовано, що однією з ключових проблем українських підприємств залишається відсутність системної інтеграції антикризових механізмів у стратегічні рішення, недостатня сформованість культури ризик-орієнтованого мислення та фрагментарність застосування цифрових інструментів. На цьому тлі особливо актуальним є перехід до комплексної моделі антикризового менеджменту, яка включає такі елементи, як: цифровий аудит ризиків, автоматизована діагностика фінансових дисфункцій, сценарне моделювання розвитку кризових явищ, формування механізмів адаптивного реагування, створення антикризових штабів, упровадження протоколів інформаційної безпеки та резервного планування. Результати дослідження можуть бути використані для підвищення стійкості підприємств, удосконалення механізмів управління ризиками та формування сучасної системи антикризового менеджменту в умовах глобальної нестабільності.

Statement of the problem

Ukraine is currently in a state of prolonged martial law, which creates a unique challenge for enterprises-namely instability of supply chains, security risks, currency fluctuations, infrastructure destruction, workforce reduction, market globalization, rapid development of digital technologies, and more. All these factors determine the necessity to search for and study effective mechanisms of anti-crisis management of enterprises under modern conditions of digital technology development. Traditional approaches, based primarily on financial indicators, increasingly prove insufficient for timely identification of threats and prevention of crisis situations. At the same time, digitalization of the economy and business processes in all sectors creates new opportunities for diagnosing, forecasting, and managing crisis processes through the use of large volumes of data, analysis of trends and their dynamics, and further forecasting and planning of economic, financial, and social indicators by means of software solutions and tools based on artificial intelligence, analytical platforms, and digital management models. The core problem lies in combining

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historically established principles of anti-crisis management with new digital tools to form a flexible system capable of responding to modern challenges of the economic environment.

Analysis of recent studies and publications

The issues of studying the essence of anti-crisis management, information support, and digital tools of anti-crisis management have been considered in the works of: Almashi Ya. [1, pp. 66–69], Brovko L. [2, pp. 36–40], Dokunina K. [3, pp. 113–116], Kalinichenko Z. [4, pp. 90–100], Mekhlovych S. [5, pp. 45–48], Sova O. [6, pp. 43–47], Shumylo O. [7, p. 750], Vatsenko V. [8, pp. 38–43], Ėri D. [9, pp. 1185–1205], Korotun Yu. [10, pp. 21–26], Tarasova N. [11, pp. 1405–1420], Cherep A. [12, pp. 134–144], Cherep A. [13, c. 504–516], Cherep A. [14, c. 15–21], Cherep A. [15, c. 27–32], Cherep A. [16, c. 504–516].

Objectives of the article

The purpose of the scientific article is to examine the evolution of anti-crisis management from traditional to modern digital approaches, to identify the relationship between historical achievements and new management tools, and to develop a conceptual model of effective anti-crisis management of enterprises under digitalization.

The main material of the research

The current stage of development of the world economy is characterized by dynamic and unpredictable changes caused by globalization processes, geopolitical challenges, technological shifts and active digitalization of all spheres of social life. In conditions of constant transformations, enterprises are faced with new types of risks and uncertainties, which often take on a crisis character. That is why the issue of timely detection, prevention and overcoming of crisis phenomena is of paramount importance both in scientific theory and in business practice. Anti-crisis management in the context of digitalization is extremely important for the formation of a new paradigm of enterprise management, capable of ensuring its stable development, innovation and competitiveness in the digital era.

Anti-crisis management as a scientific direction was formed in response to the objective need of society and business to respond to economic shocks that accompany the development of a market economy. The first signs of a systemic approach to anti-crisis management appeared in the 19th century, when periodic economic cycles began to appear in the world economy, described in the works of K. Marx, K. Zhuglyar, M. Tugan-Baranovsky. They first drew attention to the fact that crises are not random phenomena, but a natural element of economic development, which stimulates the renewal of production and the restructuring of economic systems.

The evolution of the concept of anti-crisis management reflects the change in economic paradigms, scientific approaches and technological capabilities of different historical periods. For more than a century, scientists have interpreted the nature of the crisis and the role of management in overcoming it in different ways, which allows us to distinguish several key stages in the development of this category – from the macroeconomic-cyclical interpretation to the modern digital paradigm of preventive management.

The first scientific approaches to understanding crises were focused mainly on the plane of macroeconomic fluctuations. K. Zhyuglyar, M. Tugan-Baranovsky and other representatives of the cyclical theory considered crises as an integral element of the economic cycle, while not actually distinguishing the concept of anti-crisis management at the level of an individual enterprise. The focus of attention of these authors was on the objective laws of economic development that lead to ups and downs, and management in their understanding was reduced to reactive measures – restructuring of production, changing the capital structure, and correcting investment flows. The strengths of this approach lie in the scientific substantiation of the cyclical nature of crises, which made it possible to build macroeconomic stabilization instruments. The weakness is that almost no attention was paid to the micro level – the behavior of specific enterprises and internal management decisions. In modern conditions, such an approach is too general, since it does not take into account complex internal processes, risks and management reactions.

A significant intellectual shift in the understanding of crises was made by J. Schumpeter, who interpreted the crisis not only as a destructive phenomenon, but as a source of "creative destruction". In his concept, anti-crisis management should contribute to the transition to new technological systems, stimulate innovation, product change, and review of business models. The strength of this approach is the emphasis on long-term transformation and innovation as the main mechanism for overcoming the crisis. The weakness is insufficient attention to the operational aspects of risk management, which creates a certain gap between the philosophical depth of the approach and the needs of a real enterprise, especially in periods of sharp external shocks.

Further development of the concept of anti-crisis management is associated with the works of I. Ansoff, G. Mintzberg, and P. Drucker. These researchers expanded the interpretation of the crisis from the economic to the managerial level. In their opinion, the crisis is not only an objective phenomenon, but also the result of weaknesses in strategic planning, management organization, and leadership.

I. Ansoff defined the crisis as a consequence of the turbulence of the external environment and the shortcomings of the strategic response. He considered anti-crisis management as a part of strategic management, which includes forecasting, early warning and development of response scenarios.

G. Mintzberg focused on managerial roles in crisis conditions: coordination, communication, speed of decision-making.

P. Drucker emphasized the role of innovation, human capital and adaptability of the organization.

These approaches strengthened the managerial component of anti-crisis management, but they still remained dependent on the subjectivity of managers, lacked a clear

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tool base, and did not take into account digital capabilities that became available only in the 21st century.

In the 1980s–2010s, an approach was clearly formed in the economic literature that identified anti-crisis management with financial rehabilitation and bankruptcy procedures. The focus was on restoring solvency, debt restructuring, interaction with creditors and judicial authorities. The advantage of such an approach is the clarity, formality and legal certainty of the instruments. The disadvantage is that it is activated too late, when the enterprise is already in a state of crisis, and the possibilities of strategic or preventive influence are significantly limited.

A significant contribution to the development of the theory and practice of anti-crisis management was made by Cherep A.V., whose research is aimed at forming a systemic and integrative approach to overcoming crisis phenomena at enterprises. The central element of her scientific concept is the combination of early diagnostics, indicator monitoring and algorithmized procedures for management decisions, which ensures the transition from reactive to preventive management. It pays special attention to the institutionalization of anti-crisis mechanisms, the synthesis of financial and operational analysis, as well as the training of managers on the basis of clearly structured methodological tools. This approach is distinguished by its complexity, logical completeness and high degree of practical applicability. Thus, the contribution of Cherep A.V. significantly deepens existing concepts, supplementing them with system-organizational and methodological components that enhance the effectiveness of modern anti-crisis management.

Ukrainian scientists O. Tereshchenko, I. Blank, L. Ligonenko and others made a significant contribution to the development of the financial and rehabilitation theory of anti-crisis management. They considered the crisis as a violation of the financial equilibrium of the enterprise and developed financial diagnostic methods, liquidity recovery models, rehabilitation and restructuring tools.

The emergence of artificial intelligence technologies, machine learning, digital twins, integrated ERP+MES systems led to the formation of a new paradigm of anti-crisis management. In the works of modern researchers (Gorbenko T., Morozov E., Yepifanova I., Oranska N., Prokopyshyn O.S., Kryvovyaziuk I.V., Cherep A.V., Shumilo O.S., etc.), the crisis is interpreted as a phenomenon that can be predicted, modeled, and analyzed in a digital environment.

In this approach, anti-crisis management is transformed into a permanent function of digital monitoring, where the key tools are: predictive maintenance models, algorithms for detecting anomalies in financial flows, digital twin production, digital panels of the manager (Crisis Dashboard), early warning indicators (KCI), automatic response triggers. The advantage of this approach is the high speed of threat detection, automation of decision-making, the ability to model "what if" scenarios. The disadvantage is the dependence on digital infrastructure, the need for data protection, and the high cost of implementation for individual enterprises. The most modern direction of development of anti-crisis management is an approach that integrates the capabilities of digital analytics with expert knowledge of specialists. In modern scientific publications, such a model is justified as optimal for complex systems with a high level of uncertainty, where algorithmic solutions need to be supplemented by human interpretation. Anti-crisis management is interpreted here as a cyclical logic in which: machine analysis provides speed, scale and accuracy of threat detection; expert assessment adds context, industry knowledge and institutional logic; feedback forms the learning of the system and increases its resilience.

Thus, the evolution of the concept of anti-crisis management demonstrates the transition from reactive to proactive, and therefore to digital models that predict a crisis before it actually occurs. The modern paradigm is based on the integration of data, algorithms and expert solutions, which allows the enterprise to form an adaptive, self-learning management system capable of functioning in conditions of constant instability.

The essence of anti-crisis management lies in a system of measures aimed at preventing, localizing and overcoming crisis phenomena, ensuring the stability and further development of the enterprise. It involves not only a reaction to an existing crisis, but also creating conditions for its prevention through constant monitoring of the internal and external environment. Anti-crisis management has evolved from purely financial instruments to a comprehensive strategic management system that takes into account organizational, social, psychological and technological aspects of an enterprise's activities. In modern conditions, this system is undergoing transformation under the influence of digitalization, which opens up new opportunities for early diagnosis and forecasting of crises.

Unlike traditional management, which focuses on planning and controlling current activities, anti-crisis management in the context of digitalization involves a proactive approach – identifying potential threats before they materialize, creating a system for monitoring internal and external risk factors, and developing flexible response scenarios. In modern conditions of economic development, digitalization significantly expands the tools of anti-crisis management: digital technologies, analytical platforms, big data, artificial intelligence and machine learning make it possible to conduct early warning of crisis states through: analysis of financial and non-financial indicators in real time; modeling of scenarios; automated risk assessment and forecasting of their consequences; identification of hidden trends and anomalies in business processes.

Based on the analysis of the interpretation of the concept of anti-crisis management by different scientists at different times, we can carry out our own interpretation of its essence as an integrated definition that combines the strengths of the above-mentioned approaches.

Anti-crisis management of an enterprise is a systemic, continuous and preventive-adaptive management subsystem that combines early detection and diagnosis of crisis symptoms based on an integrated information space, operational decision-making and implementation of response measures, as well as cyclical learning and improvement of procedures. The goal is to ensure the stability and ability to restore the enterprise, minimize economic, social and reputational losses through a comprehensive combination of

ISSN Print 2786-5150
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financial, operational, personnel and technological tools. This definition synthesizes the systemic nature, financial and diagnostic depth, strategic and scenario planning, organizational culture and roles, digital capabilities.

Thus, the evolution of the modern anti-crisis paradigm is based on the integration of data, algorithms and expert solutions, which allows the enterprise to form an adaptive, self-learning anti-crisis management system capable of functioning in conditions of constant instability.

The need to develop a conceptual model of effective anti-crisis management of enterprises in the context of digitalization has always existed, but in wartime it becomes even more relevant and necessary. In today's conditions, the economy of Ukraine, its financial and economic potential are under the high influence of various risks that can occur at any time and lead to the collapse (collapse) of individual elements of the economic system. That is why anti-crisis management should become a permanent function of the enterprise, and not a reaction to individual shocks. To do this, it is necessary to form anti-crisis control centers with delegated powers; ensure round-the-clock readiness for decision-making in the event of external risks (changes in logistics, power outages, loss of suppliers, increased staff turnover, increased prices for resources, etc.); integrate crisis monitoring into the regular corporate governance system; develop an anti-crisis strategy containing clear scenarios ("loss of a production facility", "decline in customer solvency", "disruption of supply chains", etc.); in each scenario, identify: responsible persons, response time limits, financial reserves, digital coordination tools; conduct daily risk monitoring, implement scenario planning, which includes identifying key uncertainties, developing the scenarios themselves, evaluating strategies and making decisions; annually review the anti-crisis strategy taking into account changes in the military-economic situation.

Anti-crisis management at the enterprise should be clearly structured and documented, for this it is proposed to develop a document "Anti-crisis Strategy 2026-2028", containing:

– scenarios: "One supplier lost", "Line 1 stopped", "Cyberattack", "30% demand decrease";

– for each scenario – responsible persons, time limits, resources, control points;

– include digital initiatives: monitoring platform, automatic inventory review unit, management dashboard.

The implementation and control of the implementation of the anti-crisis strategy should be under the constant supervision of responsible persons, in the event of negative changes at the enterprise, the occurrence of at least one of the risks, the information should be reported to senior management for decision-making on further actions to prevent the development of the crisis at the enterprise or take measures to mitigate its impact on the financial condition of the enterprise within the appropriate time frame. To prevent crisis situations, it is important to create a dynamic system for monitoring key indicators, which allows you to detect signals of future threats at an early stage and ensures prompt response in accordance with predefined triggers.

It is recommended to implement the following elements of constant monitoring at the enterprise:

– SCM/ERP data (supply lead time, inventory), financial systems (cash flow, accounts receivable);

– Manager's dashboard: real-time monitoring of key indicators (for example: supply lead time >15 days, %defects >2%, critical resource inventory <10 days);

– triggers: when the indicator exceeds the threshold – automatic notification of responsible persons;

– create an early risk diagnosis system that collects information from financial, production, supply and external sources;

– use digital analytics tools – Power BI, ERP analytics, inventory monitoring systems, ML models to detect deviations in cash flows or production;

– introduce signal indicators: a drop in turnover >10%, an increase in receivables >20%, an increase in inventory turnover time >15%, etc. – as triggers for operational verification.

An effective anti-crisis management system in modern conditions is not a one-time response to a crisis event, but a continuous adaptive process built on the logic of the proposed cycle "Observe – Diagnose – Act – Learn" (ODAL). This cycle is a fundamental response architecture that combines digital analytics, management decisions and organizational learning. Each stage has its own goal, methods, responsible persons and digital support tools. The initial stage of the anti-crisis management system – observation ("Observe") – consists in collecting, processing and visualizing data from all business processes of the enterprise. Its key function is to provide management with reliable, operational and analytically structured information about the current state of production, financial, personnel and security systems. Modern observation is based on integrated digital systems, such as ERP (Enterprise Resource Planning), MES (Manufacturing Execution System), IoT (Internet of Things), HRM (Human Resource Management System), CRM (Customer Relationship Management). Each of them plays a separate role in the formation of a single information space:

– ERP provides financial and logistical indicators;

– MES – displays the status of production lines in real time;

– IoT sensors monitor physical parameters (temperature, vibration, energy consumption);

– HRM systems monitor staff presence, workload and turnover;

– CRM – provides information on changes in demand, customer complaints, risks of losing contracts.

The collected data is automatically transmitted to the Crisis Dashboard digital panel, where they are displayed in the form of dynamic graphs and KPI/KCI indicators. This allows the company's management to see the "pulse of the organization" in real time. At this stage, an important task is to set threshold values (triggers) for each indicator. Deviation from the norm is automatically recorded by the analytical system, which becomes a prerequisite for moving to the diagnostic stage.

Thus, the "Observe" phase is an enterprise's sensor system that ensures early detection of potential threats. Its effectiveness is determined not only by the volume of data,

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but also by the quality of its interpretation, the speed of receipt, and the depth of integration of various sources.

After fixing the deviation, the "Diagnose" diagnostic stage is triggered, which involves establishing the causes, sources and potential consequences of crisis symptoms. The main task of diagnostics is not just to state the fact of the problem, but to determine why it arose, which processes were affected, and what level of threat it poses to the enterprise.

Within this stage, an analytical group of the anti-crisis management department (CMD) is formed, which uses two main tools:

1. Analysis of the root causes of the crisis (APPKK) – a method of identifying the root cause of the problem through the analysis of the sequence of events that led to it.

2. Predictive crisis analytics (PAC) – the use of machine learning models to identify patterns and predict the likelihood of a deepening crisis.

The diagnostic process consists of several steps:

– analysis of time series and trends of deviations;

– determination of relationships between indicators (for example, a decrease in productivity due to a shortage of personnel or power outages);

– assessment of the degree of influence of each factor on overall stability;

– formation of a short report with an assessment of potential consequences (financial, operational, reputational, security).

To ensure the objectivity of the diagnosis, the "Data + Expert Fusion" model is used, where the results of machine analysis are combined with expert conclusions of specialists. As a result, the VKM receives an analytical report, which is the basis for making a management decision. The "Diagnose" phase converts the "raw data" from the observation stage into the knowledge necessary for taking effective measures that minimize the likelihood of erroneous management decisions in the process of anti-crisis management.

The "Act" phase is the central phase of the anti-crisis cycle, because it is here that management decisions are made and practical response measures are implemented. Whether a separate deviation (crisis phenomenon) will develop into a full-scale crisis depends on the speed, coordination and validity of actions.

Based on the analytical report, the VKM initiates one of two action scenarios:

1. Plan A (operational correction) – local actions to eliminate short-term deviations: redistribution of resources; attraction of additional reserves; change of supplier; maintenance of equipment; transition to alternative energy sources, etc.

2. Plan B (crisis escalation) – is activated if the risk exceeds the permissible threshold. This plan provides for the creation of a crisis headquarters, the introduction of emergency management modes, the suspension of non-core processes, the temporary preservation of individual units, as well as the search for external sources of financing or partner support.

For each type of response, time limits are determined: operational response – up to 12 hours; tactical stabilization – up to 36 hours; strategic correction – up to 96 hours. Each step is recorded in a crisis log, which allows for implementation control, monitoring of the effectiveness of measures and subsequent audit. The "Act" stage is the moment of implementing management knowledge into practical action, where the synergy of analytics, leadership and organizational discipline becomes the decisive factor.

The final stage of the "Learn" cycle is reflective and educational in nature. After stabilizing the situation, it is necessary not only to restore normal functioning, but also to acquire new skills, knowledge from the crisis to increase the future resilience of the enterprise.

This process is implemented in the format of After-Action Review (AAR) – a methodology developed in military management, which involves a critical analysis of all stages of the response. During the AAR, four questions are answered:

1. What was planned to be done?
2. What actually happened?
3. Why did the deviations occur?
4. How to do better next time?

Based on this analysis, the following are updated: threshold values of indicators; response algorithms; communication system between departments; training programs for personnel. The Learn stage turns the crisis into a mechanism for organizational development, forming an "enterprise immune system" – the ability to quickly adapt to changes and prevent the recurrence of similar situations in the future. Learning becomes not a final, but a cyclical phase, which returns the system to the initial observation stage, but already at a new, qualitatively higher level of competence. The deployment of the full Observe – Diagnose – Act – Learn cycle at the enterprise ensures the transition from reactive to proactive management. This makes it possible to: identify crisis symptoms before they lead to losses; make decisions based on data, not intuition; reduce time loss on diagnostics and communication; accumulate knowledge for future crisis scenarios; form a culture of responsibility, learning and digital transparency.

In wartime, such a system becomes vital, as it allows maintaining stability even in the absence of predictability of the external environment. The key factor for success is not only the availability of technical tools, but also the willingness of management to think in the logic of constant observation, analytics, action and learning.

Thus, ODAL architecture is a modern paradigm of anti-crisis management – an intelligent management system that combines data, people and solutions to ensure the continuous stability of the enterprise in dynamic conditions of global instability.

Conclusions

Anti-crisis management has evolved from macroeconomic and legal procedures to a complex management function, which in the context of digitalization acquires the features of a permanent operational service. Modern digital tools (AI/ML, digital twins, ERP+MES) open up fundamentally new possibilities for early warning, scenario modeling and automated response; however, their effectiveness largely depends on the quality of data, cyber resilience of

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the infrastructure and integration with human decisions. The hybrid model "Data + Expert Fusion" is the most promising for enterprises in a military context: it combines the speed and scalability of algorithms with contextual interpretation by experts, which allows reducing the risks of wrong decisions. Implementation of the proposed recommendations (implementation of ODAL architecture, formation of VKM, creation of financial and material buffers, digital monitoring panels) will contribute to increasing the resilience of enterprises and provide competitive advantages in the post-war period. Further research should be aimed at empirically verifying the role of AI/ML and digital twins in real-world production cases, especially in conditions of limited resources and the risks of combat operations.

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