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Artificial Intelligence as a Tool for Anti-Crisis Management of Socio-Economic Processes in Ukraine

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ABSTRACT

The relevance of this study is determined by the growing scale of crisis phenomena in the public sector, especially under the conditions of military and economic challenges in Ukraine, which require improving the effectiveness of public administration. Modern scientific research focuses on the essence, principles, and mechanisms of anti-crisis management; however, the integration of digital tools, particularly artificial intelligence (AI), remains insufficiently developed. The purpose of the article is to substantiate theoretical foundations and practical approaches to anti-crisis management in the public sector and to analyze the potential of AI technologies for improving decision-making efficiency. The methodological basis of the study includes a systemic approach, methods of analysis and synthesis of scientific sources, comparative analysis, generalization, and structural-logical modeling. It is proven that anti-crisis management should be considered as a continuous process aimed at risk identification, timely response, and the use of crises as opportunities for development. Global trends in AI implementation are analyzed, confirming its growing role in forecasting, risk management, and ensuring the resilience of public systems. The feasibility of applying three groups of AI models – predictive, classification, and clustering – is substantiated, and key data sources for their implementation in Ukraine are identified. It is established that AI contributes to increasing forecast accuracy, optimizing resource allocation, reducing managerial errors, and enabling the transition to a proactive governance model. The study proves that the integration of artificial intelligence into anti-crisis management is a strategic direction for strengthening the resilience of Ukraine's public sector. The proposed approach ensures early detection of threats, improves the validity of management decisions, and supports the development of an effective early warning system. The results highlight the necessity of developing national digital infrastructure and further implementing intelligent analytical systems in public administration.

KEYWORDS

anti-crisis management, public sector, public administration, artificial intelligence, digitalization, crisis phenomena, management decisions, forecasting, socio-economic development, state resilience.

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Штучний інтелект як інструмент антикризового управління соціально-економічними процесами в Україні

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СТАТТЯ

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АНОТАЦІЯ

Актуальність статті обумовлена зростанням кризових явищ у публічному секторі, особливо в умовах воєнних та економічних викликів в Україні, що потребує підвищення ефективності державного управління. Сучасні дослідження зосереджені на сутності, принципах і механізмах антикризового управління, однак питання інтеграції цифрових інструментів, зокрема штучного інтелекту, залишається недостатньо розробленим. Метою статті є обґрунтування теоретичних і практичних підходів до антикризового управління в публічному секторі та визначення можливостей використання технологій штучного інтелекту для підвищення ефективності управлінських рішень. Методологічну основу дослідження становлять системний підхід, аналіз і синтез наукових джерел, порівняльний аналіз, узагальнення та структурно-логічне моделювання. Доведено, що антикризове управління має розглядатися як безперервний процес, спрямований на виявлення ризиків, оперативне реагування та використання криз як можливостей розвитку. Проаналізовано глобальні тенденції впровадження штучного інтелекту, що підтверджують його зростаючу роль у прогнозуванні, управлінні ризиками та забезпеченні стійкості державних систем. Обґрунтовано доцільність застосування трьох груп моделей ШІ: прогнозних, класифікаційних і кластеризаційних, а також визначено ключові джерела даних для їх побудови в Україні. Встановлено, що використання ШІ сприяє підвищенню точності прогнозів, оптимізації ресурсів, зменшенню управлінських помилок і переходу до проактивної моделі управління. Доведено, що інтеграція штучного інтелекту в систему антикризового управління є стратегічним напрямом підвищення стійкості публічного сектору України. Запропонований підхід дозволяє забезпечити своєчасне виявлення загроз, підвищити обґрунтованість управлінських рішень і сформувати ефективну систему раннього попередження криз. Результати дослідження підтверджують необхідність розвитку національної цифрової інфраструктури та подальшого впровадження інтелектуальних аналітичних систем у практику державного управління.

КЛЮЧОВІ СЛОВА

антикризове управління, публічний сектор, державне управління, штучний інтелект, цифровізація, кризові явища, управлінські рішення, прогнозування, соціально-економічний розвиток, стійкість держави.

1. Introduction

The global crisis events of recent years have confirmed that the economic systems of any state require effective and adaptive state regulation, especially in sectors with a high level of risk and uncertainty. That is why crisis management is becoming a natural element of the development of state institutions, as it allows not only to overcome the negative consequences of crises, but also to identify opportunities for transformations. An important element of influence on the anti-crisis management of the public sector is artificial intelligence technologies, which are actively used in the field of public administration to prevent crisis phenomena. Current trends in the use of AI in the public sector demonstrate its strategic role in increasing the effectiveness of anti-crisis management, which is especially relevant for Ukraine in conditions of war, economic shocks and the need to ensure the stability of the state.

2. Literature Review

The issue of anti-crisis management in the public sector is widely presented in Ukrainian scientific research, in which scientists focus on the content, principles, tools and organizational features of the state's response to crises. The works of Batrakova T. I. and Sardak A. O. [3] substantiate the mechanisms for implementing the state's anti-crisis strategy, identify key areas of anti-crisis measures and emphasize the need for a systematic approach to overcoming the negative consequences of crises in public administration. The study of Bezena I. M. [4] is devoted to the formation of anti-crisis management mechanisms at the regional level in conditions of decentralization, where the author emphasizes the importance of adapting management decisions to territorial differences and local development requirements. Durman M. O. and Durman O. L. [7] analyze the essence of anti-crisis management and determine the key principles of its implementation, drawing attention to the need to take into account the specifics of state institutions and social factors. A significant contribution to the study of the issue was made by Adamovska V. [1], who considers anti-crisis management in the context of state and regional development, emphasizing the need for early detection of threats and strategic risk analysis. Kuchinka T. V. [13] explores promising areas for increasing the effectiveness of anti-crisis management of the socio-economic development of the region, focusing on the integration of anti-crisis measures into the general system of regional management. In turn, Petruk I. P. [22] reveals theoretical and methodological approaches to assessing anti-crisis management of the national economy and offers approaches to determining the level of balance of management decisions in periods of instability. Despite significant scientific achievements, a comprehensive methodology for combining anti-crisis management with modern digital tools, in particular artificial intelligence technologies, remains insufficiently developed, which opens up prospects for further research in the field of decision optimization and forecasting socio-economic processes in public administration.

3. Problem Statement

In the context of increasing global instability, economic turbulence, and ongoing military challenges in Ukraine, the public sector faces complex and multidimensional crisis phenomena that significantly affect the effectiveness of public administration. Crises in economic, social, demographic, and energy spheres create systemic imbalances, reduce the efficiency of governance mechanisms, and complicate the implementation of sustainable development strategies. Under such conditions, traditional approaches to anti-crisis management, which are often reactive and fragmented, are no longer sufficient to ensure a timely response and long-term resilience of the state.

Despite the significant contribution of existing scientific research to the development of theoretical and methodological foundations of anti-crisis management, there remains a lack of a comprehensive and integrated approach that would combine classical management tools with modern digital technologies. In particular, the potential of artificial intelligence as an instrument for forecasting, risk assessment, and optimization of management decisions in the public sector is still insufficiently explored and systematized.

Moreover, the current system of public administration in Ukraine is characterized by limited use of advanced analytical tools, insufficient integration of diverse data sources, and a lack of unified digital

infrastructure capable of supporting real-time decision-making processes. This creates additional challenges in identifying early signals of crisis situations, modeling possible scenarios, and ensuring effective coordination of government actions.

Therefore, the key problem addressed in this study is the need to develop a conceptual and methodological framework for integrating artificial intelligence technologies into the system of anti-crisis management in the public sector. Solving this problem will contribute to enhancing the adaptability, efficiency, and resilience of public administration, as well as to the formation of a proactive model of governance capable of preventing and mitigating the negative consequences of crisis phenomena.

4. Methods and Materials

The article uses a set of theoretical and applied research methods. The theoretical basis is scientific works that highlight the essence of crisis phenomena in public administration and approaches to anti-crisis management, including the adaptation of private sector technologies to the needs of public administration. To systematize the types of crises and interpretations of anti-crisis management, methods of comparative analysis and generalization were used. The empirical base was formed on the basis of statistical data on the dynamics of global investments in AI, forecasts for the development of the crisis management technology market, as well as macroeconomic indicators of Ukraine during the war. Visual and analytical methods (graphic analysis, construction of structural and logical diagrams) were used to demonstrate the impact of AI on the effectiveness of anti-crisis management and the socio-economic development of the state. The forecasting method was used to assess the potential for integrating AI into state processes, taking into account global trends and Ukrainian realities.

Within the applied part, a conceptual approach to the classification of artificial intelligence models by functional purpose is applied, in particular, predictive time series models, classification and risk-oriented models, as well as clustering and segmentation algorithms are highlighted. To summarize the results, tabular and logical-structural methods are used, which allow demonstrating the relationship between data sources, analytical models and management decisions.

5. Results and Discussion

The global crisis events of recent years have shown that the economic systems of any state require effective state regulation, especially those sectors that are characterized by significant risks and uncertainty. According to many researchers, the most developed countries actively and comprehensively responded to crisis challenges, using various anti-crisis management tools Adamska, [2], Maly et al., [15]. The crisis acts as a destructive force that changes the state of the socio-economic system and transfers it to a different quality. Most authors emphasize that crisis phenomena have similar features - the emergence of significant problems, dynamic and unpredictable development of events, chaotic processes and the need to use non-standard management solutions Boguslavska et al., [5]; Mykhaylova & Mykhaylov, [17]. Table 1 provides a description of the types of crises in the country's public sector.

Table 1. Typology of crisis phenomena in public administration

Type of crisis	Manifestation	Characteristic
Economic	Inflation, budget deficit	It is associated with a disruption of the stability of economic processes, which affects the financial stability of the state.
Social	Unemployment, migration	It arises due to the aggravation of social problems that affect the standard of living of the population and social balance.
Demographic	Aging population, declining birth rate	It is associated with changes in the population structure, which create additional burdens on the public administration system.
Energy	Energy shortages, power outages (likely manifestations)	Refers to disruptions in the functioning of the power system, which affects the economy and livelihoods of the population.

Source: Compiled by the authors based on [2; 15; 17].

Crises in public administration can be of different natures and cover the economic, social, demographic and energy spheres, which indicates the multidimensionality of the risks that the state faces. Their emergence is due to a disruption of stability in key life support systems, and the consequences affect both the effectiveness of management and the well-being of the population. Awareness of the types of possible crises allows for early detection of threats and the formation of a more sustainable and adaptive model of public administration.

The crisis of public administration is a specific state of activity of the system of government bodies, which is manifested in the aggravation of internal contradictions, imbalance of work, leading to a decrease in the effectiveness and efficiency of managerial influence on socio-economic processes. At the same time, the crisis not only complicates the stable development of the system, but also creates opportunities for its improvement; it can be considered as a natural element of evolution along with stable development.

Since economic crises are a natural stage of the development of a market economy, regional management cannot be limited to short-term measures to stabilize the situation. At the regional level, anti-crisis management should be a permanent component of the management system, focused on identifying, preventing and minimizing negative consequences, as well as using crisis opportunities to implement strategic goals of socio-economic development of the region and the state. In conditions of uneven development of territories, it is local governments that become key subjects of anti-crisis management and customers for the development of the appropriate methodology.

So, Table 2 presents the interpretation of crisis management in the country's public sector.

Table 2. Interpretation of anti-crisis management in the public sector in scientific literature

Author	Treatment
Batrakova T. I., Sardak A. O. (2015) [3]	An ongoing management process aimed at recognizing, preventing, and overcoming crises in the public sector.
Bezena I. M. (2020) [4]	Adaptation of private sector anti-crisis technologies to the needs of public administration.
Durman M. O., Durman O. L. (2021) [7]	Using management methods taking into account social orientation, political pressure, and the specifics of state structures.
Adamowska V. (2016) [1]	Management that ensures early detection of threats, risk analysis, minimization of negative consequences and use of crisis opportunities.
Kuchinka T. V. (2017) [13]	A permanent integrated part of regional management aimed at responding to crises and seeking development opportunities.
Petruk I. P. (2019) [22]	Reaction to disruptions in the balance and efficiency of government activities caused by crisis processes.

Source: Compiled by the authors based on [1; 3; 4; 7; 13; 22].

In scientific research, crisis management in the public sector is considered as a multidimensional phenomenon that combines constant monitoring of threats, the ability to respond promptly to crisis events and use them as an element of development. Researchers emphasize the need to adapt tools borrowed from the private sector to the conditions of public administration, taking into account the social mission of the authorities, political factors and the peculiarities of the organizational structure. Crisis management is interpreted not only as a set of measures to overcome negative consequences, but also as a constantly operating element of regional and state policy, ensuring the stability and ability of the system to transform. As a result, scientists agree that effective crisis management involves simultaneously solving the problems of imbalance in the work of government bodies, timely identification of risks and creating conditions for further development even in periods of instability.

Therefore, it is advisable to consider anti-crisis management as a process of responding to certain situations, which allows the management system to comprehensively analyze, predict, prepare and implement a set of interrelated actions to make prompt and effective decisions regarding urgent challenges in the field of public administration.

Next, it is advisable to consider the integration of artificial intelligence technologies into public sector crisis management, but first it is necessary to analyze the scope of AI use in crisis management (Figure 1).

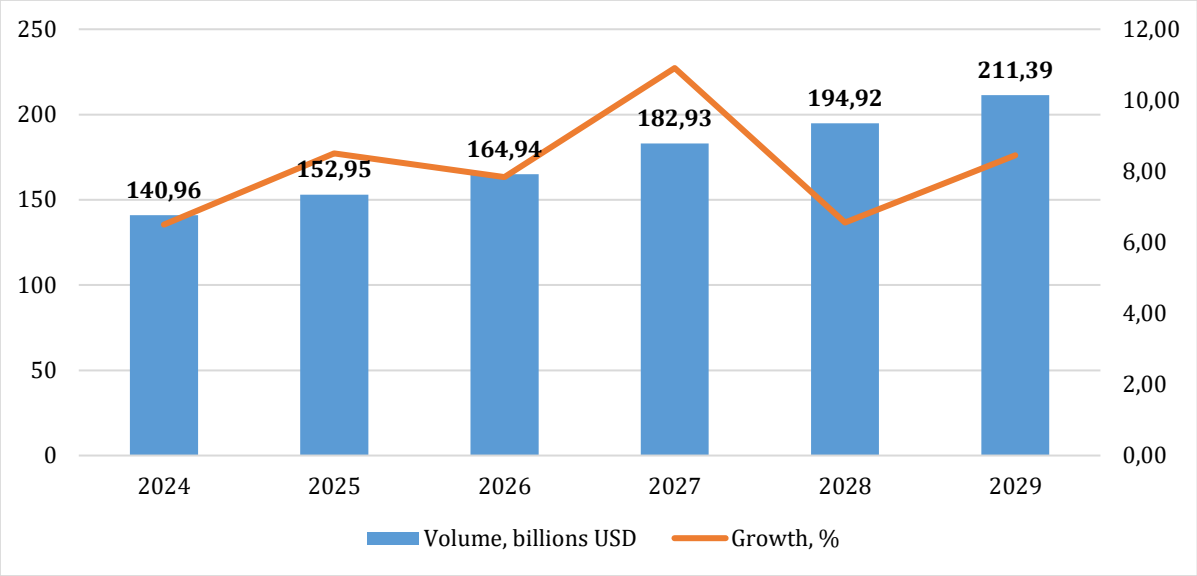

Figure 1. Forecast dynamics of AI use in global crisis management (2024–2029)

Source: Compiled by the authors based on [26].

Analyzing Figure 1, it is seen that the market volume is growing from 140.96 billion USD in 2024 to 211.39 billion USD in 2029, which indicates its strategic importance for governments, international organizations and the private sector. The growth rates range from 6.34% to 10.91%, with the sharpest jump occurring in 2027, when the highest growth rate is expected. The overall dynamics demonstrate that artificial intelligence is becoming a key element of early warning systems, risk management, emergency coordination and ensuring the continuity of critical infrastructure. In fact, this confirms the global trend of transition from reactive to proactive anti-crisis management, when decisions are made based on forecasts, risk behavior modeling and automated analysis of large data sets.

Table 3 shows the main areas of use of AI in public sector anti-crisis management.

Table 3. Characteristics of the areas of use of AI in anti-crisis management in the public sector

Direction	Application	Results
Internal operations of government bodies	Using predictive models, process automation, real-time event detection	Increasing the speed of response to emergencies, efficient allocation of resources, reducing time spent on bureaucratic procedures
Public policy development	Using analytical models, scenario forecasting, big data analysis	Sound planning of anti-crisis measures, formation of preventive policies, adaptation of decisions to rapidly changing circumstances
Providing public services in times of crisis	Personalization of services, automated interaction with citizens, intelligent decision support	Accelerate access to critical services, improve public support, and reduce the burden on civil servants in emergencies
Monitoring and control in crisis conditions	Application of AI for violation detection, real-time control, risk analysis	Increasing transparency and preventing abuse, quickly detecting threats, controlling resource usage
Assessing the effectiveness of decisions and policies	Data analysis, modeling the results of government actions, creating intelligent reports	Improving the quality of anti-crisis planning, correcting actions in real time, increasing the effectiveness of state policy
Maintaining security and law and order	Using tools for recognition, prediction, and risk detection	Improving public safety, faster response to threats, optimizing the work of special services
Critical infrastructure management	Optimization of systems operation, failure prediction, real-time analysis	Reducing the risk of man-made disasters, stability of vital facilities

Source: Compiled by the authors based on [20; 25].

These results demonstrate that AI enables governments to accelerate internal operations, increase the accuracy of risk forecasting, improve the quality of policy development and ensure a rapid response to emergencies. Analytics and automation technologies contribute to a better allocation of resources, reduce human errors and create conditions for providing more personalized and accessible services to the population. At the same time, the use of AI enhances transparency and control of government processes, which is important for maintaining the trust of citizens. Taken together, these capabilities form a new model of public administration, focused on proactivity, speed of response and increased resilience to crises.

The effectiveness of the use of AI in public administration is also confirmed by the growth of investments in this sector by countries around the world (Figure 2).

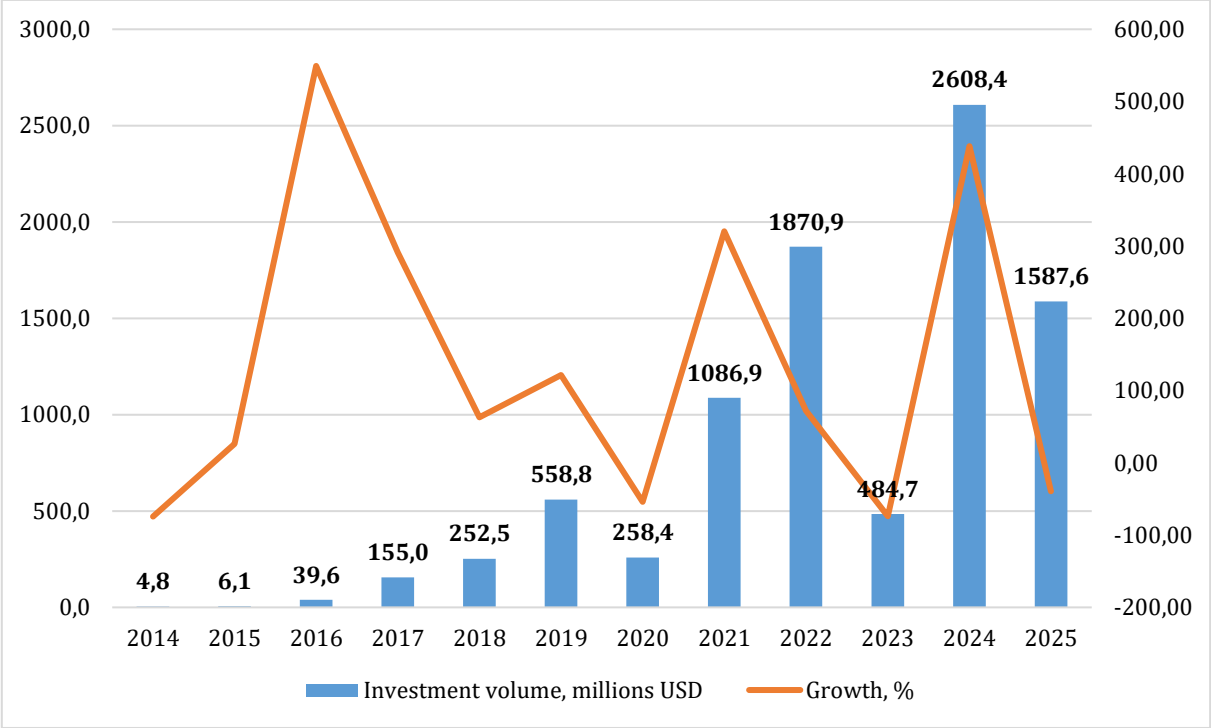

Figure 2. Dynamics of investments in AI in public management worldwide in the period 2013–2024, million US dollars

Source: Compiled by the authors based on [21]

Based on the analysis of Figure 2, it is clear that after the decline in investments in 2013-2014, there is a gradual and then rapid growth, especially in 2016-2019, which is associated with the strengthening of analytical capabilities of governments and the emergence of more accessible and powerful algorithms. Periodic declines in 2020 and 2023 coincide with global crises, which shows the sensitivity of government budgets to economic shocks, but at the same time, further sharp increases in 2021, 2022 and especially in 2024 confirm the strategic importance of investing in AI to strengthen state resilience.

In the context of crisis management, such investments are a response to the need to analyze risks more quickly, improve monitoring systems, improve management decisions, and ensure the continuity of state services in times of instability. For Ukraine, which is experiencing a full-scale war, economic turmoil, and the constant threat of crises, the global dynamics of investments confirm the importance of actively implementing AI in state structures, which will strengthen the civil protection system, enhance cybersecurity, optimize resources, and improve the quality of emergency management.

Figure 3 shows a visualization of the impact of the use of AI by governments on their economic development indicators.

Thus, international experience demonstrates that investments in AI are becoming a key factor in increasing the state's resilience, and for Ukraine they are not just desirable, but critically necessary in the context of a protracted war and structural economic challenges (Table 4).

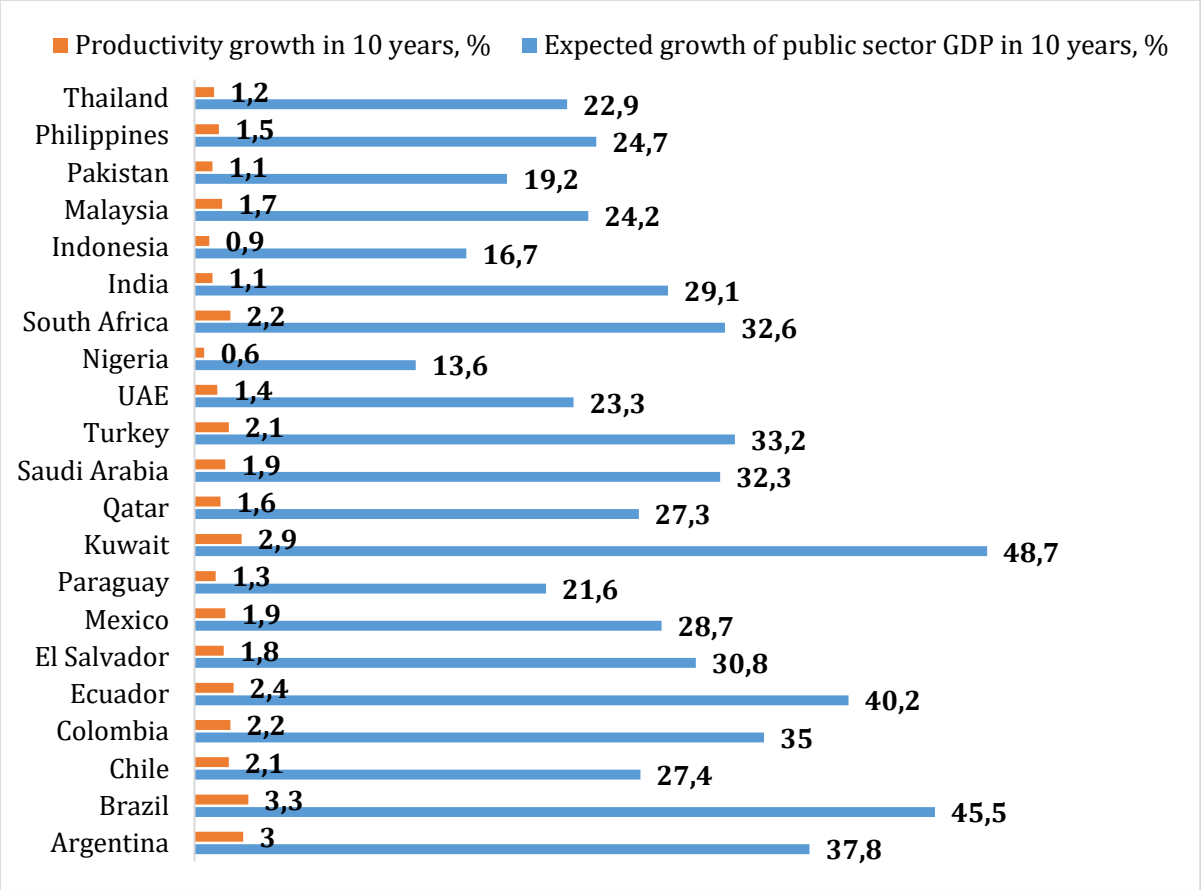

Figure 3. Expected impact of AI in anti-crisis public management on the socio-economic development of countries

Source: Compiled by the authors based on [23]

Table 4. Dynamics of the war crisis on key economic indicators of Ukraine in the period 2020–2024

Indicator	Period					Growth rate, %			
	2020	2021	2022	2023	2024	2021/ 2020	2022/ 2021	2023/ 2022	2024/ 2023
GDP, billion UAH	4194.1	5459.57	5191.03	6537.83	7658.66	30.17	-4.92	25.94	17.14
Consolidated budget revenues, total, billion UAH	1376.67	1662.33	2196.63	3104.82	3588.59	20.75	32.14	41.34	15.58
Consolidated budget expenditures, total, billion UAH	1595.4	1845.37	3043.87	4441.36	4945.68	15.67	64.95	45.91	11.36
Deficit/surplus, billion UAH	-218.72	-183.03	-847.24	-1336.55	-1357.09	-16.32	362.90	57.75	1.54
Consolidated budget revenues, total to GDP, %	32.82	30.45	42.32	47.49	46.86	-7.22	38.98	12.22	-1.33
Consolidated budget expenditures, total to GDP, %	38.04	33.8	58.64	67.93	64.58	-11.15	73.49	15.84	-4.93

Source: Compiled by the authors based on [20; 25].

Analyzing Table 4, it is clear that despite the sharp decline in economic activity in 2022, the country gradually restored production and budget revenues in the following years. A significant expansion of government spending, primarily on defense, social support, and infrastructure restoration, led to a significant budget deficit and an increase in the share of public finances in the GDP structure. In such conditions, the government's ability to stabilize the macroeconomic situation, contain inflationary pressures, and ensure the continuous operation of key sectors has become critically important.

At the same time, these challenges increase the need to implement modern digital solutions, in particular artificial intelligence systems, in the field of public administration. The use of AI will make it possible to form more accurate economic forecasts, model scenarios of events, timely identify potential risks and calculate the consequences of budgetary and management decisions. Thanks to the analytical capabilities of AI, state bodies can respond faster to changes, optimize the use of resources and prevent crises, which is especially relevant during the period of military instability and the upcoming post-war recovery. Thus, the integration of artificial intelligence becomes an important element of increasing the resilience of the public administration system and ensuring the sustainable development of Ukraine. Therefore, Figure 4 suggests a diagram of the impact of AI technologies on the anti-crisis management of the public sector of Ukraine.

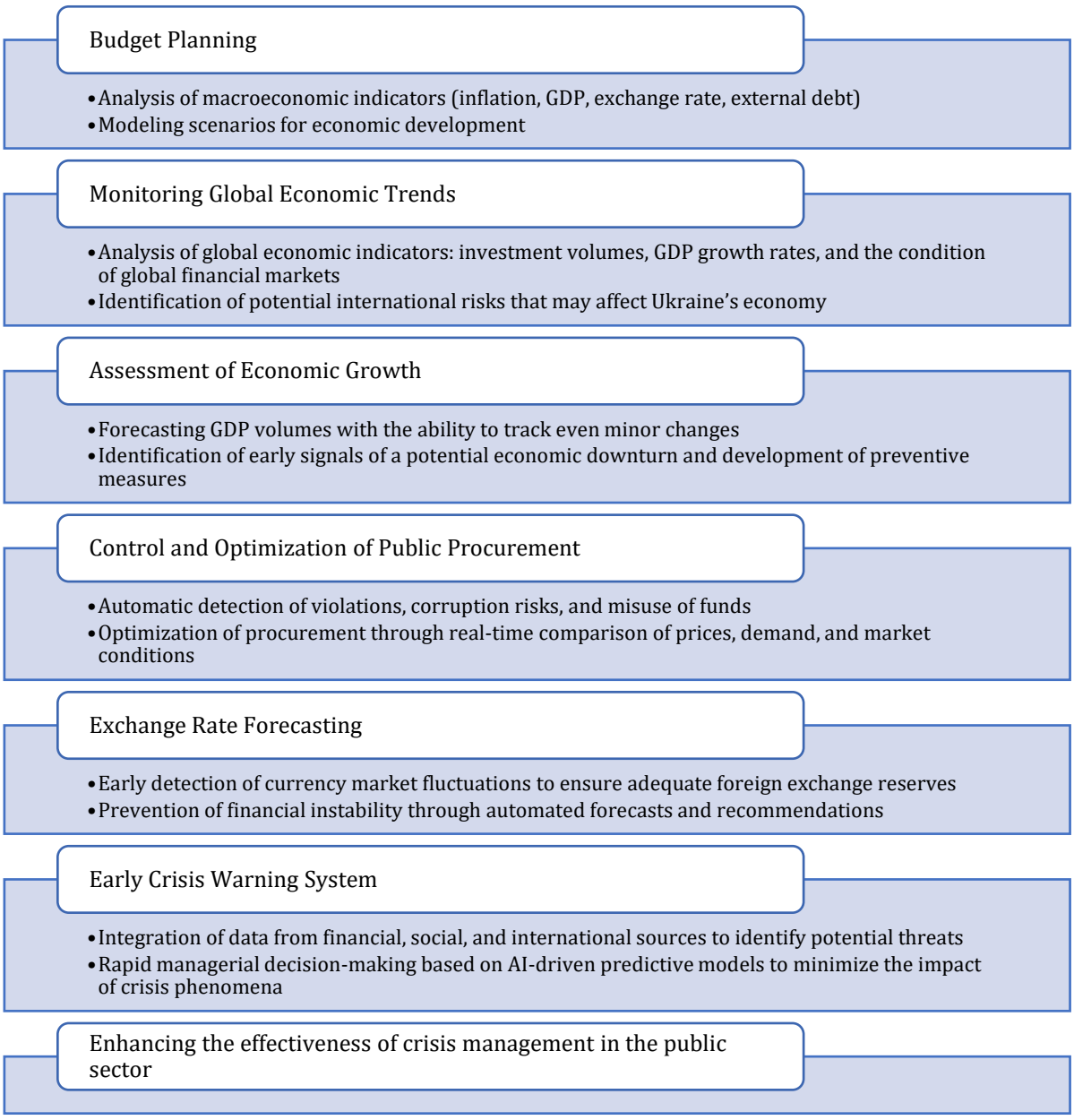

Figure 4. Flowchart of the impact of AI on the effectiveness of crisis management in the public sector of Ukraine

Source: Compiled by the authors based on [23]

The introduction of artificial intelligence into the anti-crisis management system of the public sector of Ukraine can significantly increase its efficiency through in-depth data analysis and the formation of accurate forecasts. The use of AI in budget planning will allow taking into account the influence of external and internal factors, such as inflation, exchange rate, external debt, GDP dynamics and other macroeconomic indicators, which will provide the opportunity to create more realistic and adaptive budget programs that take into account risks and scenario forecast models of the development of the economic situation.

In addition, the integration of AI into public procurement will increase transparency and efficiency in the use of public resources. Artificial intelligence systems can automatically detect anomalies, procedural violations, risks of corruption and misuse of funds, and optimize procurement processes by analyzing needs, price fluctuations, and market offers.

An important advantage of implementing AI is the ability to quickly analyze global economic trends, in particular, global investment flows, GDP growth rates of leading countries, and the dynamics of international markets, which will allow predicting the likelihood of international crises that may have a direct or indirect impact on the economy of Ukraine. The use of AI to forecast the exchange rate will contribute to the formation of timely foreign exchange reserves and the prevention of financial gaps. Analysis of forecast GDP volumes will allow detecting even minor fluctuations in economic growth, which may signal the potential approach of a crisis. Thus, artificial intelligence can contribute to the development of a comprehensive early warning system, increase the accuracy of management decisions, and ensure the more sustainable development of Ukraine in the context of a war crisis.

In the practice of crisis management, it is advisable to distinguish three functional groups of artificial intelligence models: predictive time series models, classification and risk-based models, and clustering and segmentation models.

Predictive time series models are used to analyze the dynamics of socio-economic indicators and form forecasts of their further development. Common approaches include ARIMA and SARIMA models, which allow to identify stable trends, cyclical fluctuations and seasonal patterns in such indicators as the level of inflation, budget revenues, energy consumption, or employment of the population Hyndman & Athanasopoulos, G. [11]. The use of these models allows for assessing possible scenarios of the development of the socio-economic situation and increasing the validity of management decisions.

In conditions of increased instability and the presence of a significant number of irregular factors, neural network approaches, in particular recurrent neural networks (RNN), become effective. Such models can analyze complex time dependencies and adapt to changes in the data structure, which is important for predicting processes characterized by high variability and uncertainty Goodfellow et al. [9]; Hochreiter & Schmidhuber [10]. Their use allows for more flexible forecasts of socio-economic indicators in the medium and long term.

The practical significance of predictive models lies in the possibility of timely detection of potential crisis trends, in particular, the growth of unemployment, migration flows, inflationary pressure or budget burden. The obtained forecasts can be used by public authorities to develop preventive measures, optimize resource provision and increase the efficiency of strategic planning, which corresponds to the principles of proactive public management Makridakis et al [14].

Classification models are focused on assigning management objects to certain groups or levels of risk. In the field of public administration, such objects can be regions, sectors of the economy, social groups, or infrastructure facilities. The use of modern machine learning algorithms allows combining economic, social and financial indicators to assess the probability of crises and identify areas of increased vulnerability Bezena [6].

In practice, the classification results can be used to generate risk maps of territories, determine budget funding priorities, and justify management decisions to support the most vulnerable sectors or communities. This contributes to a more rational allocation of resources and increased efficiency of public policy in conditions of limited opportunities, European Commission [8], OECD [19].

Clustering models are used to group objects by common characteristics to identify typical patterns of socio-economic development. This approach allows for the formation of generalized profiles of regions or communities in terms of the level of economic activity, social stability, infrastructure provision, and demographic structure Kitchin [12].

In the field of crisis management, clustering enables the transition from unified management decisions to targeted support programs focused on the specific needs of individual groups of territories

or the population. This creates the prerequisites for increasing the adaptability of state policy and more effective use of available resources OECD [19].

In order to illustrate the practical basis for the implementation of the above artificial intelligence models in the conditions of Ukraine, it is advisable to outline the main data sources that can be used to build predictive, classification and segmentation models. Table 5 provides an example of key information resources that form the empirical basis of analytical systems of public administration and provide the possibility of integrating socio-economic, financial and spatial indicators. The presented list of sources allows demonstrating the potential of using open and departmental data to support anti-crisis management processes, and also serves as a guideline for the formation of a comprehensive information infrastructure.

The use of these classes of artificial intelligence models requires the formation of a reliable information base that ensures the completeness, relevance and representativeness of data. The quality of input data directly affects the accuracy of forecasting, the stability of algorithms and the reliability of managerial interpretations. In the practice of public administration, the integration of disparate sources of information - official state statistics, financial indicators, open registers, as well as alternative digital sources, in particular satellite and mobile data, is of particular importance.

A comprehensive approach to the formation of data sets allows combining macroeconomic, social, demographic and spatial characteristics, which creates the prerequisites for building multidimensional models of analysis and forecasting. For anti-crisis management, this means the possibility of simultaneously taking into account both quantitative indicators (employment level, income, budget expenditures, foreign exchange reserves) and behavioral parameters of the population, which reflect real processes of socio-economic dynamics.

Table 5. Example of datasets for building AI models in Ukraine

Source	Key indicators	Management use
State Statistics Service of Ukraine	Employment, income, inflation, demography	Forecast of socio-economic stability
National Bank of Ukraine	Foreign exchange reserves, exchange rate, lending, inflation expectations	Macroeconomic security
Ministry of Finance of Ukraine	Budget revenues and expenditures, deficit, public debt	Fiscal planning
Open Data Portal OpenData.gov.ua	Social registers, infrastructure, services	Monitoring service availability
Satellite and mobile data	Migration, population mobility	Crisis logistics, humanitarian planning

Source: Compiled by the authors based on [16; 18; 24].

In addition, an important aspect is the standardization, cleaning and synchronization of data in time and territorial dimensions, which ensures the correct operation of machine learning algorithms. The use of unified data formats and automated procedures for updating and verifying information contributes to the formation of a holistic analytical infrastructure capable of supporting management decision-making in a mode close to real time. It is such an integrated information base that creates the basis for the practical application of artificial intelligence models in the anti-crisis public management system.

6. Conclusions

The conducted research allowed to comprehensively characterize the nature of crisis phenomena in the public administration system and to substantiate the feasibility of using artificial intelligence technologies as a tool for increasing the sustainability of management decisions. The main types of crises covering the economic, social, demographic and energy spheres were summarized, and their systemic impact on the stability of the functioning of state authorities and the socio-economic development of the state was also established. The analysis of scientific approaches allowed us to consider anti-crisis management as an integrated, dynamic process aimed at early identification of risks, timely response to threats and the use of crises as a factor in updating management mechanisms.

An assessment of current global trends in the development of artificial intelligence confirmed its transformative potential for the public sector, in particular in the field of forecasting socio-economic

processes, optimizing management procedures, and increasing transparency and efficiency of resource use. It was found that the introduction of intelligent analytical tools contributes to the transition from a reactive management model to a proactive one, focused on preventing crisis phenomena and forming sustainable strategic decisions. An analysis of the macroeconomic dynamics of Ukraine in the context of military challenges demonstrated the limitations of traditional management approaches and the need to supplement them with modern digital solutions.

The study systematizes the main classes of artificial intelligence models that can be used in anti-crisis management, in particular, predictive time series models, classification and risk-based models, as well as clustering and segmentation approaches. Their functional purpose in the processes of forecasting socio-economic trends, identifying areas of increased vulnerability and forming targeted management programs is substantiated. Key data sources are outlined that can form the information basis for building appropriate models in Ukrainian conditions, which creates the prerequisites for the development of a national digital forecasting system.

The developed logical-structural scheme of the impact of artificial intelligence on anti-crisis management in the public sector reflects the relationship between data, analytical models and management decisions and confirms the potential of digital technologies in strengthening economic stability, improving the quality of strategic planning and forming mechanisms for early warning of crisis threats, which is especially relevant during the period of war and post-war transformation of Ukraine. The obtained results confirm the feasibility of integrating artificial intelligence into the system of anti-crisis public administration in Ukraine as a strategic direction of digital transformation of governance.

Prospects for further research are related to expanding the empirical base of artificial intelligence models, integrating data from various sources, improving methods for interpreting forecasting results, and adapting European experience in implementing digital analytical systems in public administration. It is advisable to further investigate the possibilities of using ensemble models, scenario modeling, and digital platforms to support management decisions in order to form a comprehensive, sustainable, and adaptive anti-crisis management system in Ukraine.

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