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## Digital tools for anti-crisis management of enterprises: the Ukrainian case

### Herramientas digitales para la gestión anticrisis de las empresas: el caso Ucraniano

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#### Abstract

The political and economic situation in Ukraine has led to an increase in the likelihood of crisis phenomena at enterprises, which is manifested in a decrease in financial results or even losses, reduced financial stability and production volumes, deteriorating quality of services and products. Many enterprises, which have become uncompetitive, unfortunately, are now bankrupt. The ability of business entities in time to analyze the financial condition and develop anti-crisis measures, as well as the implementation of necessary anti-crisis solutions help to reduce the likelihood of bankruptcy or crisis phenomena, which will allow businesses to restore their solvency, improve financial stability and emerge from this state with the lowest major tasks of crisis management. Given the presentation, the main purpose of the work is to summarize the theoretical material and develop right Business process modeling according to IDEF.0 standard was used as the main digital toolkit. Modeling of business processes with the use of these digital

#### Resumen

La situación política y económica de Ucrania ha provocado un aumento de la probabilidad de que se produzcan fenómenos de crisis en las empresas, que se manifiestan en una disminución de los resultados financieros o incluso pérdidas, una reducción de la estabilidad financiera y de los volúmenes de producción, y un deterioro de la calidad de los servicios y productos. Desgraciadamente, muchas empresas que han dejado de ser competitivas están en quiebra. La capacidad de las entidades empresariales en el tiempo para analizar la situación financiera y el desarrollo de medidas contra la crisis, así como la aplicación de soluciones necesarias contra la crisis ayudan a reducir la probabilidad de quiebra o crisis fenómenos, lo que permitirá a las empresas a restablecer su solvencia, mejorar la estabilidad financiera y salir de este estado con las tareas principales más bajas de gestión de crisis. Dada la presentación, el objetivo principal del trabajo es resumir el material teórico y desarrollar derecho Modelado de procesos de negocio de acuerdo con

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tools will allow to take into account all potential factors of anti-crisis management of Ukrainian enterprises, focusing on the flow of information, the validity of decisions, and the direct effectiveness of crisis management.

**Keywords:** crisis management, digital tools, sustainable development, business process, management decision-making.

## Introduction

The process of crisis management for modern enterprises comes first in the context of general financial management, since today in the world there are more and more risks and threats to business entities, which determines the importance of both classical crisis management and preventive management. The article considers approaches to crisis management in a sequential manner. The first stage was to identify the signs of a crisis in order to determine whether there are threats to the financial balance of an enterprise and its further stable development. The author also specifies the sequence of stages of analysis to identify a crisis at an enterprise, which will also allow for determining the causes of the existing crisis and taking a more balanced approach to the problem of forming an anti-crisis program. The next step in the work is to analyze the business processes of crisis management using the IDEF0 standard, which allows for a clear identification of the sequence of stages of crisis management at an enterprise. Further, approaches to building an anti-crisis strategy for an enterprise that is able to ensure the stable development of the enterprise in the long term with a focus on overcoming crisis phenomena were identified.

The article develops a comprehensive approach to the implementation of anti-crisis financial management for Ukrainian companies, which will allow identifying the manifestations of the crisis at an early stage and determining the ways to overcome it.

## Theoretical Framework or Literature Review

In modern literature, the concept of “crisis at the enterprise” is interpreted as various negative factors: from existing problems that worsen the financial condition of the enterprise to the impossibility of normal functioning and bankruptcy.

la norma IDEF.0 se utilizó como el principal conjunto de herramientas digitales. El modelado de procesos de negocio con el uso de estas herramientas digitales permitirá tener en cuenta todos los factores potenciales de la gestión anti-crisis de las empresas ucranianas, centrándose en el flujo de información, la validez de las decisiones y la eficacia directa de la gestión de crisis.

**Palabras clave:** gestión de crisis, herramientas digitales, desarrollo sostenible, proceso empresarial, toma de decisiones de gestión.

Analysis of scientific sources, namely: Emilova (2022), Aleksieienko & Poltina (2020), Buriak, Petchenko (2021), Katamadze (2022), Loginov et al., (2021), Nani & Safitri (2021), Zinisha, Kharchenko, Avdeev, Pavlova, & Maltsev (2021), Khalina, Bazyliuk, Chornenka, Krasilych & Korzh (2019), Mocanu (2018), Usova et al., (2021) Voskolupov, Balanovska, Havrysh, Hohulia & Drahnieva (2021) and Ihnatenko (2022) showed that the most relevant to the presented research is to understand the essence of the concept of crisis as an objective process that can be both an impetus to optimize the work of the enterprise and lead to fatal consequences in case of inability to adapt to new conditions and develop. The analysis of the works of domestic and foreign scientists has demonstrated the existence of two approaches to the definition of the term “crisis”, namely: positive and negative. The content of the positive approach is to perceive the crisis as a turning point in the development of enterprises and an objective process that is characteristic of each life cycle. Supporters of this method are: Bieńkowska & Tworek (2022), Feshina, Konovalova & Sinyavsky (2019), Sylkin et al., (2019), Melnyk, Shuprudko, Kolosovska, Berest & Pasichnyk (2020) and Starosta (2014). In turn, Akhmetshin, Brager, Pokramovich, Andreyko & Alenikova (2018), Christa & Kristinae (2021), Lobova, Bogoviz & Alekseev (2022), Lowe (1971), Popova (2020) and Yessenbekova & Turezhanov (2021) adhere to a negative approach and believe that the crisis is a serious threat to the viability of enterprises and, as a result, an increase in the risk of possible bankruptcy. Thus, the concept of “crisis” is associated with such categories as a contradiction, loss, danger, threat, critical period, completion or turning point in any process, etc.

In our opinion, the point of view of Metelenko (2018) on the unpredictability of the crisis is controversial, since the crisis process is preceded by a number of negative factors, actions, and

factors; no global crisis was foreseen. Therefore, it is logical to state that the crisis is an objective process, but the occurrence of which can adversely affect the activities of the enterprise and be an obstacle to adapting to new conditions and opportunities for development.

For the activity of the enterprise, crisis phenomena have a double meaning, but usually, it is a negative impact, which often leads to bankruptcy. Crisis phenomena are moments of aggravation that arise in the correlation between individual elements of the enterprise as a system

and with its environment. Fig.1. shows the signs of the crisis state of the enterprise

For forecasting and timely detection of crisis phenomena at the enterprise, the probability of bankruptcy is first diagnosed, if the results of the study revealed unsatisfactory results, then the causes of this situation are analyzed (Fig. 2).

The next step should be the analysis of losses from the consequences of the crisis and the development and justification of an anti-crisis program based on the resource capabilities of a particular enterprise.

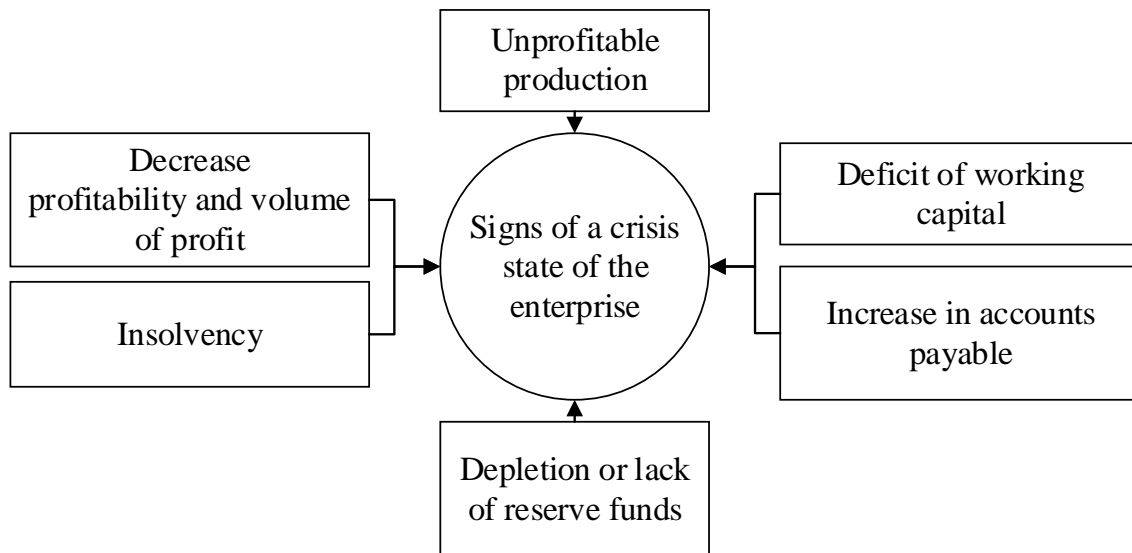


Figure 1. Signs of the crisis of the enterprise.

Source: created by authors

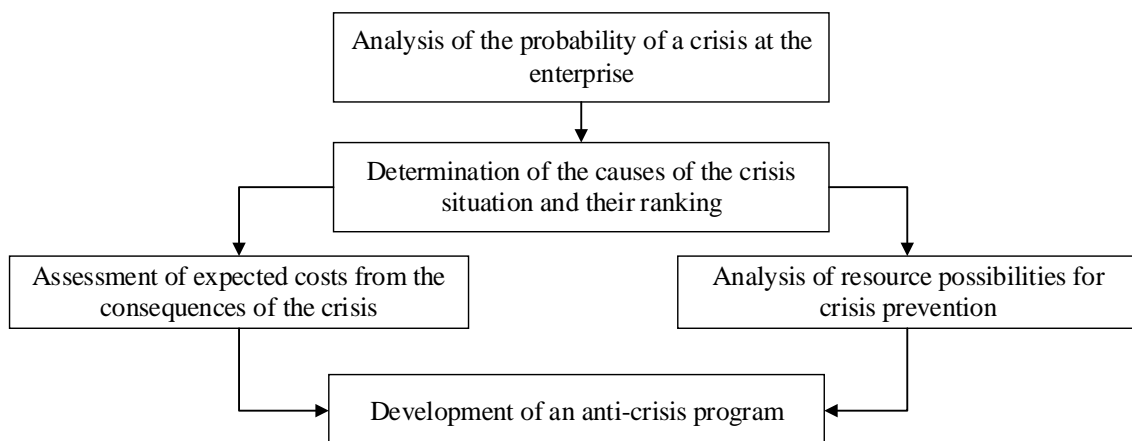


Figure 2. Sequence of analysis to identify the crisis at the enterprise.

Source: created by authors

The crisis is a complex phenomenon and requires multidirectional and corrective actions and, above all, preventive ones. There is no single best

way out of the crisis. Each enterprise should have its own crisis prevention strategy, use a set of complex actions and efforts of different parts of

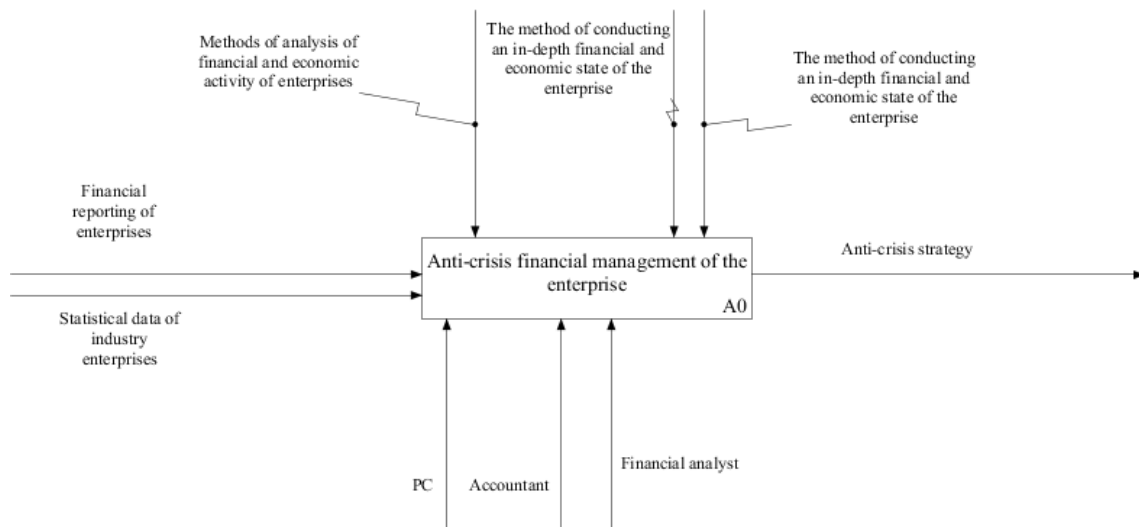
the enterprise which should be adapted to the causes and symptoms of crisis. The important attention at the enterprise should be paid to the construction of an effective system of anti-crisis management. Anti-crisis financial management is a comprehensive system of management, the purpose of which is to prevent a financial crisis at the enterprise, as well as elimination of negative consequences. According to the authors, the process of implementation of crisis management at the enterprise should be defined as a system of measures, which is developed for each enterprise separately, taking into account the specifics of activity, organizational form, stage of crisis process, and aimed at preventing the crisis and eliminating threats to the normal functioning and development of enterprises. The crisis management mechanism involves the following: the object (crisis phenomena arising under the influence of changing internal and external environment and expressed in a deviation of the actual performance of the enterprise from the planned, normative) and the subject of management (responsible bodies of crisis management, depending on the specific organizational structure of the enterprise), the formation of target management processes, its resource provision (material, labor, financial, information resources, etc.), choice of measures. The object of crisis management is the crisis itself, resulting from the influence of external and internal factors on the activities of the enterprise. Subjects are competent employees or bodies who study and eventually decide on a crisis management program which one to choose depending on the specifics of activity, purpose, chosen methods, and level of resources of the enterprise. The objectives of crisis management are to get out of the crisis, to avoid or neutralize the consequences.

## Methodology

In conditions of market uncertainty, one of the primary tasks of management is to identify, form and analyze the current and future opportunities of the enterprise. This process requires the processing of significant amounts of information, which can only be achieved by using modern digital tools, among others which include the construction of business models detailed in Aleksieienko, Leliuk & Poltinina (2020). One of the most common methods of modeling today is the use of the structural-functional method, whose task is to establish the elements required to perform the functions of a particular system, identifying the relationship between them. The structural-functional analysis focuses on identifying the overall flow of information, its typification, selection from a large array of qualitative and quantitative sides of the phenomenon the most essential, important, and outstanding. This method according to the IDEF.0 standard is described in detail in Aleksieienko, Poltinina & Leliuk (2020). The peculiarity of the IDEF0 standard is that it allows to present the improvement algorithm by means of a diagram, to visualize the sequence of actions of forming the main directions. The structural and functional model is an approach in describing and explaining systems, in which their elements and dependencies between them within a single whole are studied, individual social phenomena perform a certain function in maintaining and changing social systems.

## Results and Discussion

As a result of the study, the model of the anti-crisis management business process for Ukrainian enterprises was built using digital tools, namely the Ramus software environment - fig. 3.

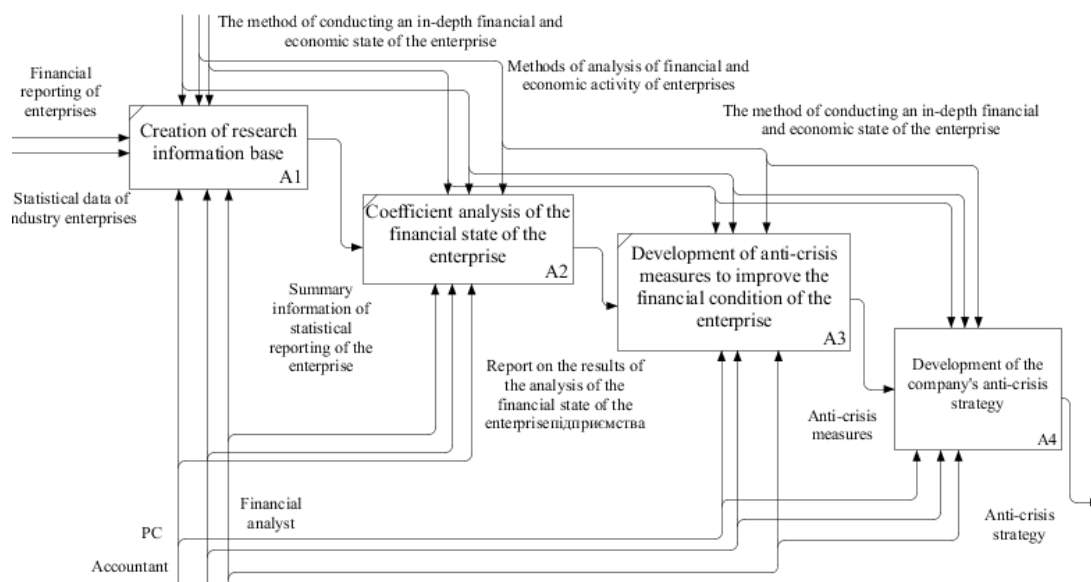


**Figure 3.** Context diagram of the business process model of crisis management for Ukrainian enterprises. Source: created by authors

As can be seen from Fig. 3, today the enterprises carry out the anti-crisis financial management, guided by methodological recommendations to analyze the financial condition based on financial statements data and information on the state of development of the industry. In this case, the result of implementing the process of crisis financial management is the formation of anti-crisis strategy of the enterprise, which, in turn, is one of the components of the development strategy of the enterprise.

Directly the process of crisis management, implemented at the enterprise, needs to be detailed in order to be able to identify its advantages and disadvantages, and in the future to consider its advantages and disadvantages and to optimize, in accordance with the needs of the market.

To detail the stages of crisis management, the context diagram decomposition approach is used (Fig. 4).



**Figure 4.** Decomposition of the AS-IS context diagram “Anti-crisis management in the enterprise” Source: created by authors

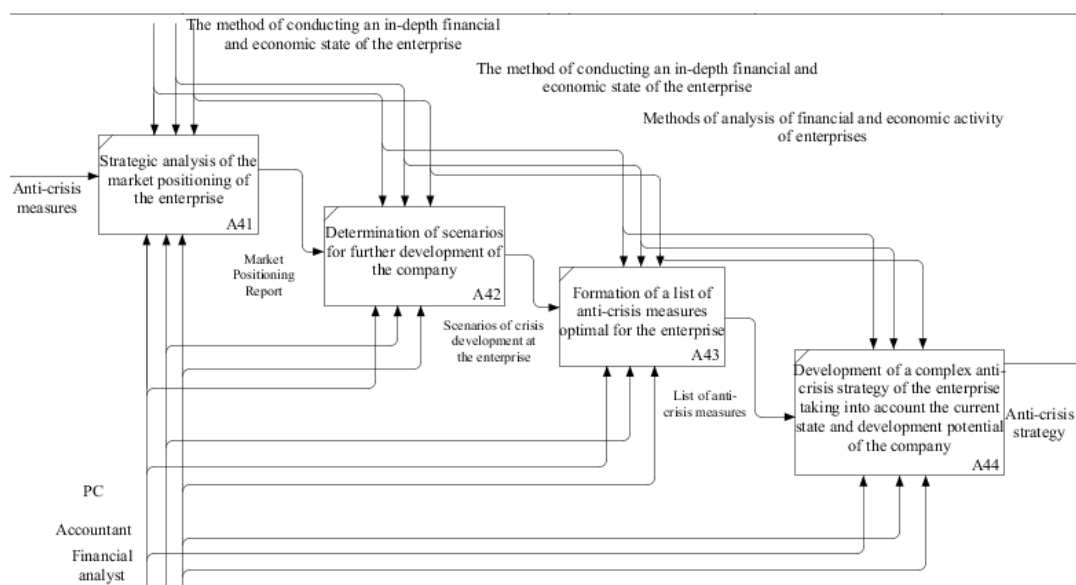
From Fig. 4 shows that the process of anti-crisis financial management consists of four blocks:

Creation of the information base of the research (A1);  
 coefficient analysis of the financial condition of the enterprise (A2);  
 development of anti-crisis measures to improve the financial condition of the enterprise (A3);  
 development of anti-crisis strategy at the enterprise (A4).

In Fig. 4 the aspect that is important is that it is proposed to perform crisis management functions not only to the accountant but also to the financial analyst, who is able to understand the financial problems of the enterprise more comprehensively and make more informed financial decisions. In general, crisis management significantly differs from traditional management, has its own specifics associated with significant changes in the operating environment of the enterprise, as well as the unpredictability of the situation and new management problems that arise in the environment of functioning of Ukrainian enterprises, in particular under martial law.

The task of overcoming of crisis and the financial and economic stability of enterprises cannot be

considered as one-time business practice compressed in time, or as a set of necessary active actions of enterprise specialists with the application of tools for the elimination of debtor's insolvency. This is a dynamic process in which the management of the enterprise after the crisis has a separate functional purpose, therefore, it is not logical to carry it out exclusively at the level of accounting functions, that's why in the business process financial analyst is shown as a full-fledged participant of anti-crisis management, that is considered in Yankovskaya, Mustafin, Endovitsky & Krivosheev (2022). The next step is to proceed to the decomposition of the business process to develop an anti-crisis strategy of the enterprise - Fig. 5. In general, diagnosis of crisis phenomena is carried out at the first stage to determine the need for anti-crisis management, as well as to clarify its form and type. The main tools of diagnostics are: express-diagnostics; monitoring and evaluation of general indicators of financial situation; diagnostics with the application of financial analysis and methods of evaluation of the probability of bankruptcy; methods of evaluation of enterprise potential (competitiveness of enterprise); implementation of other additional measures.



**Figure 5.** Decomposition of the block “Development of anti-crisis strategy of the enterprise” within the business process of anti-crisis management of the enterprise  
 Source: created by authors

After all stages of assessment and analysis the development of the anti-crisis strategy of the enterprise is carried out - fig. 5, focused on the system development of the enterprise and its

adaptation to the unstable external environment. In general, the main goal of anti-crisis measures is an improved financial condition in the future, which is possible to change in relation to the

present and worth, desirable or necessary to achieve. However, today it is very difficult to predict the potential state of the enterprise, as it is also very difficult to predict the prospect of military action in Ukraine and its impact on the national economy and domestic enterprises.

Development and adoption of management decisions are made in accordance with the purpose of anti-crisis measures - prevention, neutralization (stabilization), or overcoming (elimination) of crisis phenomena in the enterprise.

At the prevention of crisis, the key direction of strategic decisions is realized within the framework of the strategy of formation of financial resources, financial support of accelerated growth, financial maintenance of stable growth, achievement of financial safety. Herewith orientation of management measures is focused on support of investment into production processes; motivation of shareholders; substantiation of the feasibility of investment projects; support of solvency by means of control of payments of customers; optimization of production costs; revision of money management system; formation of reserve funds of accumulation of financing of necessary increase of current and non-current assets for providing of high rates of production volume growth; control of dynamics of short-term liabilities. The development of a complex anti-crisis strategy can become a key direction of the formation of optimal measures, aimed at overcoming of crisis or preventing its occurrence.

The preparation and subsequent implementation of an anti-crisis financial strategy involves the implementation of the following basic measures:

- Diagnosis of processes and trends leading to crisis states;
- Forecasting the emergence, development, and possible consequences of crisis situations
- Anti-crisis support (revealing of processes and tendencies that lead to crisis situations)
- making preparations in advance for emergencies (crisis prevention);
- organization and coordination of effective actions to overcome crisis situations and their consequences.

Consequently, when developing an anti-crisis strategy, it is the directions and measures that should be taken into account. And further implementation of the strategy will be aimed at the most effective use of the potential of the

enterprise and the implementation of effective measures to minimize external and internal threats.

Thus, in modern conditions, the introduction of crisis management in the practice of domestic enterprises becomes a necessary condition for bringing them out of the financial crisis. Successful anti-crisis management requires the use of different methods. According to the causes of the crisis, the enterprise should choose the method that best helps to eliminate the internal causes of the crisis or neutralize external ones. In addition, when implementing an anti-crisis policy, it is necessary to refer to foreign experience and to take measures which would help the leading countries' economies to come out of the crisis. And it is extremely important to observe a certain mechanism of anti-crisis measures, which will allow not only to react to crisis phenomena in time but also to prevent their development.

### Conclusions

The analysis of the essence of crisis management allowed to determine that the process of implementation of crisis management at the enterprise should be understood as a system of measures developed for each enterprise separately, taking into account the specifics of its activities, organizational form, stage of the crisis process and aimed at preventing the crisis and eliminating threats to the normal functioning and development of enterprises.

In order to improve the process of anti-crisis financial management of the enterprise, implemented the use of digital tools implemented for modeling business process according to standard IDEF0, built a model which reflects the basic direction of optimization of the crisis management process. The uniqueness of the model consists that anti-crisis management at the enterprise is offered to carry out through the construction of an anti-crisis financial strategy which provides realization of such basic measures, as: diagnostics of processes and tendencies which lead to crisis conditions; forecasting of occurrence, development, and possible consequences of crisis situations; realization of anti-crisis support (discovery of processes and tendencies which lead to crisis situations); carrying out the advance preparation for the case of occurrence of anti-crisis situations; realization of the anti-crisis strategy. The improved model allows, based on complex research of the crisis development level at the enterprise, to develop a strategy of anti-crisis

financial management and form a system of measures to overcome the crisis at the enterprise. That's why the implementation of the anti-crisis strategy will allow to realize the complex approach of anti-crisis management.

### Bibliographic references

- Akhmetshin, E., Brager, D., Pokramovich, O., Andreyko, M., & Alenikova, M. (2018). Modern theoretical and methodological approaches to personnel management in manufacturing enterprises. *Revista Espacios*, 39(31), 11–15. <https://www.revistaespacios.com/a18v39n31/18393111.html>
- Aleksieienko, I., Leliuk, S., & Poltinina, O. (2020). Information and communication support of project management processes and enterprise value. *Development Management*, 18(3), 1–13. [https://doi.org/10.21511/dm.18\(3\).2020.01](https://doi.org/10.21511/dm.18(3).2020.01)
- Aleksieienko, I., Poltinina O., & Leliuk S. (2020). Information support of the management process of the economic entity. *Modern science: problems and innovations: II Intern. scientific-practical. conf. (3-5 May 2020, Stockholm)*. Stockholm, 2020. <http://repository.hneu.edu.ua/bitstream/123456789/26133/1/15.pdf>
- Ayu Nani, D., & Dina Safitri, V. A. (2021). Exploring the relationship between formal management control systems, organisational performance and innovation: The role of leadership characteristics. *Asian Journal of Business and Accounting*, 14(1), 207–224. <https://doi.org/10.22452/ajba.vol14no1.8>
- Bieńkowska, A., & Tworek, K. (2022). Controlling and its influence on organizations' functioning under conditions caused by the COVID-19 pandemic. *Sustainability*, 14(24), 16644. <https://doi.org/10.3390/su142416644>
- Buriak, I., & Petchenko, M. (2021). Analysis of the dilemmas of building an accounting system for the needs of future economic management. *Futurity Economics & Law*, 17–23. <https://doi.org/10.57125/fel.2021.03.25.3>
- Christa, U. R., & Kristinae, V. (2021). The effect of product innovation on business performance during COVID 19 pandemic. *Uncertain Supply Chain Management*, 151-158. <https://doi.org/10.5267/j.uscm.2020.10.006>
- Emilova, I. (2022). The Anti-Crisis Management in The Process of Global Integration. *LUMEN Proceedings*, 18, 45-50. <https://doi.org/10.18662/lumproc/gidtp2022/05>
- Feshina, S. S., Konovalova, O. V., & Sinyavsky, N. G. (2019). Industry 4.0—transition to new economic reality. In *Industry 4.0: Industrial Revolution of the 21st Century* (pp. 111–120). Springer International Publishing. Doi: 10.1007/978-3-319-94310-7\_11
- Ihnatenko, R. (2022). Technologies of targeting advertising: the essence and effectiveness. *Financial and Credit Activity Problems of Theory and Practice*, 1(42), 428–435. <https://doi.org/10.55643/fcaptop.1.42.2022.3715>
- Katamadze, G. (2022). Business entity's preventive-anti-crisis strategy model and possibilities of its implementation in Georgia. *Economics. Ecology. Socium*, 6(2), 38–45. <https://doi.org/10.31520/2616-7107/2022.6.2-4>
- Khalina, O., Bazyluk, V., Chornenka, O., Krasilych, I., & Korzh, M. (2019). Formation of organizational support for the management of the economic security of engineering enterprises: Methodical and practical aspects. *Business: Theory and Practice*, 20(0), 317–328. <https://doi.org/10.3846/btp.2019.30>
- Lobova, S. V., Bogoviz, A. V., & Alekseev, A. N. (2022). Sustainable AI in environmental economics and management: Current trends and post-COVID perspective. *Frontiers in Environmental Science*, 10. <https://doi.org/10.3389/fenvs.2022.951672>
- Loginov, M., Usova, N., & Nedorostkova, E. (2021). Developing digital retail services as a tool of ensuring consumer market sustainable development in the Sverdlovsk region. *SHS Web of Conferences*, 94, 01028. <https://doi.org/10.1051/shsconf/20219401028>
- Lowe, E. A. (1971). On the idea of a management control system: Integrating accounting and management control. *The Journal of Management Studies*, 8(1), 1–12. <https://doi.org/10.1111/j.1467-6486.1971.tb00833.x>
- Melnyk, S., Shuprudko, N., Kolosovska, I., Berest, I., & Pasichnyk, M. (2020). Anti-crisis personnel management in the process of ensuring the economic security of the enterprise. *Business: Theory and Practice*, 21(1), 272–281. <https://doi.org/10.3846/btp.2020.11438>
- Metelenko, N. (2018). Conceptual model for assessing financial safety in the system of





- economic security of industrial enterprise. *Management and Entrepreneurship Trends of Development*, 4(06), 95–110. <https://doi.org/10.26661/2522-1566/2018-4/06-11>
- Mocanu, N. (2018). Implementation of anti-crisis management technologies. *International Journal of Innovation in the Digital Economy*, 9(4), 11–23. <https://doi.org/10.4018/ijide.2018100102>
- Popova, Y. (2020). Economic or financial substantiation for smart city solutions: a literature study. *Economic Annals-XXI*, 183(5–6), 125–133. <https://doi.org/10.21003/ea.v183-12>
- Starosta, A. (2014). Anti-crisis Management Strategies. The case of companies in the Greater Poland Voivodeship. *Management*, 18(1), 255–266. <https://doi.org/10.2478/manment-2014-0019>
- Sylkin, O., Kryshchanovych, M., Zachepa, A., Bilous, S., & Krasko, A. (2019). Modeling the process of applying anti-crisis management in the system of ensuring financial security of the enterprise. *Business: Theory and Practice*, 20, 446–455. <https://doi.org/10.3846/btp.2019.41>
- Usova, N.V., Loginov, M.P., & Nedorostkova, E.E. (2021). Anti-crisis strategies of the digital retail services market development. *Benefit*, 4(41), 23–29.
- Voskolupov, V., Balanovska, T., Havrysh, O., Gogulya, O., & Drahnieva, N. (2021). Marketing management as a tool for preventing crisis of agricultural enterprises. *Financial and Credit Activity Problems of Theory and Practice*, 5(40), 410–417. <https://doi.org/10.18371/fcaptop.v5i40.245192>
- Yankovskaya, V. V., Mustafin, T. A., Endovitsky, D. A., & Krivosheev, A. V. (2022). Corporate social responsibility as an alternative approach to financial risk management: Advantages for Sustainable Development. *Risks*, 10(5), 106. <https://doi.org/10.3390/risks10050106>
- Yessenbekova, Z., A., & Turezhanov, S. (2021). Circular bioeconomics: conceptual aspects. *Economic Annals-XXI*, 193(9–10), 45–53. <https://doi.org/10.21003/ea.v193-05>
- Zinisha, O., Kharchenko, E., Avdeev, Y., Pavlova, N., & Maltsev, I. (2021). Features of application of International Financial Reporting Standards (IFRS) by international companies. *Economic Annals-XXI*, 188(3–4), 188–194. <https://doi.org/10.21003/ea.v188-22>