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MAGNANIMITAS Assn.

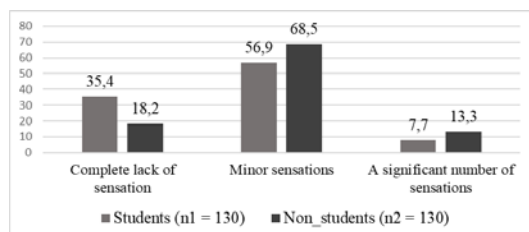


Figure 4. Perception of Physical Discomfort Among Student Respondents and Non-Student Respondents (in % for each group)

It should be noted that the trend observed regarding the perception of physical discomfort, its presence or absence, is characteristic of all scales in the corresponding questionnaire that indicate somatic manifestations of nervous-psychic tension.

The vast majority of students assess the following as entirely normal: temperature sensations (78.5%), muscle tone (73.1%), movement coordination (88.5%), motor activity (85.4%), sensations related to the cardiovascular system (83.85%), gastrointestinal manifestations (74.6%), respiratory symptoms (85.4%), urinary system manifestations (88.5%), and sweating (86.2%), among others. It is evident that all indicators fall within the range corresponding to a normal state of nervous-psychic tension. In comparison with data from the cluster of respondents who are not students, a clear difference emerges: responses from this group are clustered at an average level of nervous-psychic tension, with some indicators suggesting a high level of nervous-psychic tension.

A similar trend is observed regarding sensitivity to external stimuli. For example, 88.5% of students report normal reactions to external stimuli and do not perceive them as overly sensitive. In contrast, among non-student respondents, there are 1.5 times fewer individuals who report normal sensitivity, and three times more who report moderate sensitivity (see Figure 5).

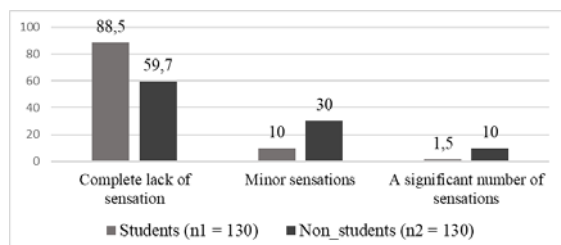


Figure 5. Sensitivity to External Stimuli Among Members of the Student Community and Non-Students (in % for each group)

On an emotional level, students demonstrate relative stability, with the overwhelming majority not experiencing either anxiety or fear (76.15%). Only about 7% of students report feeling fear. These figures differ significantly from those in the second subsample, which includes non-student respondents. Among them, there are three times as many who experience fear and twice as many who feel anxiety (Figure 6).

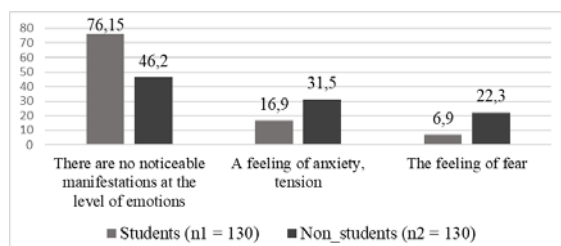


Figure 6. Emotional Responses Among Students and Non-Students (as % within each group)

At the level of cognitive processes, the group of student respondents also shows more positive than negative trends. For instance, the vast majority (80.8%) report that their memory has not changed and they assess it as normal. Memory improvement is noted by 8.5% of respondents, while 10.8% report a decline. It is important to highlight that among non-student respondents, those observing a decline in memory are almost four times more numerous—42% (Figure 7).

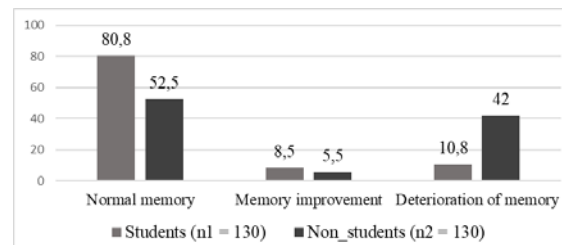


Figure 7. Memory Characteristics Among Student Respondents and Non-Student Respondents (in % for each group)

A similar trend is observed regarding the attentiveness of student respondents: 80% report that their attentiveness has not changed, 8% feel that they have become more attentive, and 11.5% feel that they have become less attentive. Among non-student respondents, approximately 20% fewer believe their attentiveness has remained the same, and nearly three times more believe their attentiveness has worsened. Regarding alertness, 82.3% of students believe their alertness has not changed, with only 4.6% reporting a decline in alertness. Among non-student respondents, nearly four times more—18%—report a decline. A similar situation is observed with cognitive performance: 85.4% of students assess it as normal, 10.8% report improved cognitive performance, and 3.85% report a decline. Among non-student respondents, those who notice a decline in cognitive performance are five times more—19.3%.

The overall assessment of their mental state by students is relatively high: 76.15% rate their state as normal, 10.8% report increased focus, and 13.1% feel fatigued. Interestingly, among non-student respondents, those who feel fatigued are three times more—39.8%. Compared to non-students, students exhibit a significantly lower prevalence of stress indicators (Figure 8).

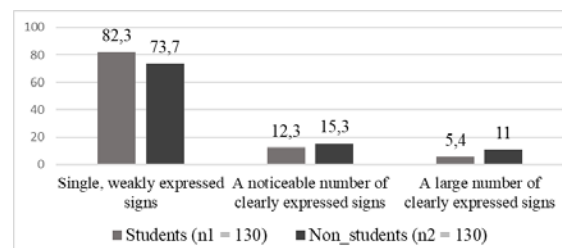


Figure 8. Prevalence (Generality) of Stress Among Student Representatives and Non-Students (in % for each group)

Students exhibit significant differences in the frequency of experiencing stress. Specifically, 62.3% of students report that the frequency of stress is minimal. About one-third of students (32.3%) note that stress only occurs when there is an objective reason (e.g., bombing in the area where the student lives, informational threats regarding enemy advances, etc.). Only 5.4% of students indicate that stress occurs frequently and can arise without an apparent cause. Among non-student respondents, there are twice as few who report minimal frequency of stress, and at the same time, twice as many who experience stress when there are objective reasons, as well as those who experience stress without any apparent cause.

The data on the duration of stress also shows significant differences. The vast majority of students report that their stress dissipates very quickly (81.5%), 14.6% note that stress lasts as long as the situation that caused it and then disappears

immediately, while only 3.85% state that stress lasts for a very long time and does not depend on the current situation. Among non-student respondents, there are more than 2.5 times as many who link the duration of stress to the length of the situation that caused it, and twice as many who experience stress that does not depend on any particular situation.

The overall level of stress among students is generally close to normal (78.5%). 19.2% rate their stress as moderately pronounced, while only 2.3% consider it to be strongly pronounced. This distribution differs significantly from that observed in the group of non-student respondents. In this group, the majority of respondents (51.8%) report moderate stress levels, 42.7% describe their stress as normal with no pronounced symptoms, and 5.5% report strongly pronounced stress.

Thus, it can be concluded that the generalized indicators of neuropsychological stress among Kharkiv students tend to be at the first (normal) stage.

Turning to the results obtained using the methodology for detecting post-traumatic stress disorder (PTSD) symptoms, it should be noted that this methodology is the most comprehensive and includes more than 100 scales. Due to the constraints of a single article, the results can only be presented in a very condensed and generalized form, focusing on the most prominent indicators of PTSD.

For example, about 57% of students feel either completely normal or relatively normal and do not startle at sudden noises. Among non-students, this figure is significantly lower, at 29.5% (see Figure 9).

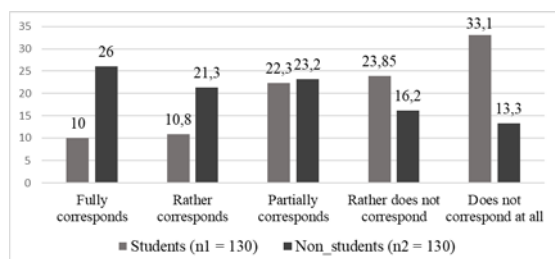


Figure 9. Responses of student community members and non-student respondents to the question "To what extent do you experience startle reactions to sudden noise?" (in % for each group)

Student irritability can be described as generally moderate but tending towards lower levels. Specifically, 30% of students consider themselves "somewhat irritable," while more than 55% do not perceive themselves as irritable. In this regard, students and non-students are quite similar.

Students are not prone to uncontrolled outbursts of anger. Most (42.3%) report that they are not at all prone to uncontrolled outbursts of anger without any apparent reason. About 27% report a very low tendency towards this. A somewhat different trend is observed among non-student respondents. These differences are detailed in Figure 10.

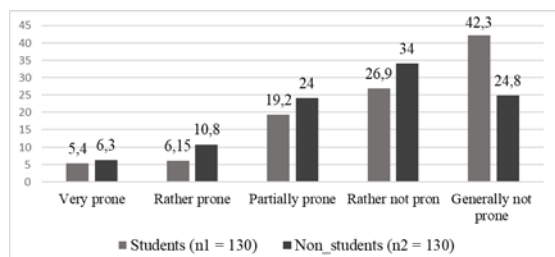


Figure 10. Responses of students and non-student respondents to the question "To what extent are you prone to displaying uncontrolled anger without any reason?" (as a % for each group)

Students show a strong desire to help others. Specifically, 61.6% of students rate this desire as very strong or strong, while 33.85% consider it moderately strong. Only 4.6% of students report feeling this desire to a minimal extent or not at all. A similar trend is observed among non-student respondents.

It is important to note students' perceptions of dangerous situations. All surveyed students reside in Kharkiv or the Kharkiv region, areas that are subjected to hostile bombings almost daily, resulting in severe negative consequences such as civilian casualties, destruction of critical infrastructure, and damage to residential buildings. Despite this, more than half of the surveyed students (52.3%) believe they have not recently encountered a very dangerous situation, while only 10% acknowledge having done so. Interestingly, responses from non-student respondents differ noticeably, with these individuals being more likely to perceive situations as life-threatening (Figure 11).

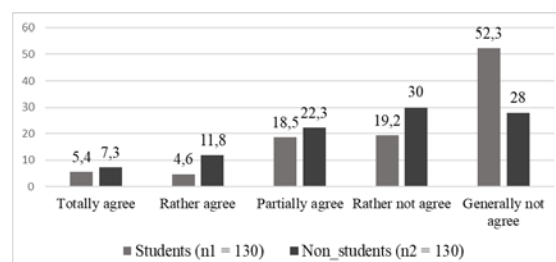


Figure 11. Responses of student and non-student respondents to the question "To what extent do you agree that you recently had to face a very dangerous situation?" (in % for each group)

It is important to emphasize that a relatively large proportion of students (23.85%) experience loneliness at a high or very high level. Additionally, 23.1% of students feel some degree of loneliness. This means that nearly half of the surveyed students experience loneliness at a moderate level or higher. A similar trend is observed among non-student respondents, but it is more pronounced among students. This is likely related to the fact that students are studying exclusively online. Many have lost friends and companions who have moved to other cities in Ukraine or abroad. Entertainment venues, shopping centers, and other places where students could socialize and enjoy themselves are closed for most of the day in Kharkiv and the surrounding area due to the threat of bombings. All these factors contribute to feelings of sadness and loneliness. However, based on the results obtained from the subjective well-being and neuropsychological stress methodologies, it can be concluded that the existing feelings of loneliness do not, at least for now, lead to depression or other negative states.

Interestingly, the overwhelming majority of students feel they are undergoing a transformation and believe they are "becoming a new person." About 30% of students experience this transformation very strongly or strongly, while 40% feel it to a moderate extent. A similar trend is observed in the non-student group, with the main difference being that there are 10% fewer individuals who partially experience this transformation and approximately 7% more who feel little to no transformation.

Despite all the hardships of war, students have not lost hope and believe in a bright future. Approximately 60% strongly or very strongly believe in a happy future, while 34.6% partially believe in it. Only one student (0.8%) does not believe at all. A similar distribution is observed among non-student respondents, although there is a slightly higher proportion who do not believe in a happy future at all (5.9%) or believe very weakly (9.3%).

Furthermore, it can be noted that, in general, students have largely retained their ability to enjoy life, believe in the triumph of justice, are confident they have good friends, consider themselves to be balanced individuals who prefer to resolve conflicts peacefully, and feel secure. For all these aspects, students' responses largely align with those of non-students.

However, it should be noted that among students, there are twice as many who feel confident at the highest level, whereas among non-student respondents, those who feel confidence as "somewhat" predominant.

4 Conclusion

Based on the conducted research, the following key conclusions can be drawn:

- gender influence: although weak, the gender of students does impact some indicators of their mental health. Female students tend to be somewhat more emotional, more stressed and anxious, and exhibit more pronounced memory issues.
- subjective well-being: the subjective (psychological) well-being indicators of students are sufficiently high, despite the ongoing stress factors related to the proximity of combat operations and constant bombings by the Russian aggressor.
- nervous-psyche tension: the overall indicators of nervous-psyche tension among students generally lean towards the first (normal) level. When comparing these results with data from a cluster of non-student respondents, a clear difference is observed: responses from this group tend to be at the medium level of nervous-psyche tension, with some indicators showing a high degree of tension.
- post-traumatic stress: It is not possible to provide a generalized picture of post-traumatic stress due to the nature of the methodology and the complexity of the mechanism and principles for calculating results. However, based on specific indicators, it can be hypothesized that severe consequences and manifestations of post-traumatic stress are not characteristic of students.
- hope and resilience: Despite the hardships of war, students do not lose hope and believe in a happy future, which is an important indicator and resource of psychological resilience.
- loneliness: nearly half of the surveyed students experience loneliness at medium and above-average levels. A similar trend is observed among non-student respondents, but it is more pronounced among students. This is likely primarily due to the specifics of remote learning (with universities in Kharkiv conducting classes exclusively online) and the fact that entertainment venues, shopping centers, etc., where students could socialize, are closed for most of the day due to the threat of bombing.

Thus, the results of this study indicate that the most pronounced issue for students in wartime conditions is loneliness. Although, based on the results obtained using the subjective well-being and nervous-psyche tension methodology, it can be concluded that the current feeling of loneliness has not yet led to serious mental health issues, the prolonged nature of the war, extended complex security situation, and continued remote learning may contribute to deepening the feeling of loneliness and result in the spread of depressive and other negative states among the student population.

Given the problem of loneliness, it is necessary to highlight some potential solutions:

- hybrid learning: implement a mixed learning format, allowing students to choose between attending university in person and participating in classes remotely.
- reducing isolation: eliminate isolation by creating conditions to establish, maintain, and activate social connections (e.g., setting up safe communication spaces, introducing new programs to engage youth in community initiatives, etc.).
- promoting psychological support services: increase awareness of psychological support services, including those provided by mental health support services operating in universities. Encourage students to use these services, potentially by conducting mandatory sessions for all

students to identify those who are particularly vulnerable and provide them with regular psychological support.

Literature:

1. Altinyelken, H. K., Hoek, L., & Jiang, L. (2020). Improving the psychosocial wellbeing of international students: The relevance of mindfulness. *British Journal of Guidance and Counselling*, 48(4), 524–536. <https://doi.org/10.1080/03069885.2019.1600189>
2. Borets, Y. V., & Shlimakova, I. I. (2018). On the issue of mental health of higher education students. *Criminal-Executive System: Yesterday. Today. Tomorrow*, 1, 159–169.
3. Chmeliuk, K. (2024, April 19). Life of Ukrainian students between neoliberalism and war. Retrieved from <http://surl.li/yaxoms>
4. Chuiko, H. V., & Koltunovych, T. A. (2024). Mental health of students – future psychologists in wartime conditions. *International Scientific Journal "Grail of Science"*, 38, 348–350. <https://doi.org/10.36074/grail-of-science.12.04.2024.061>
5. Copeland, L. A., Finley, E. P., Rubin, M. L., et al. (2023). Emergence of probable PTSD among U.S. veterans over the military-to-civilian transition. *Psychological Trauma: Theory, Research, Practice, and Policy*, 15(4), 697–704. <https://doi.org/10.1037/tra0001329>
6. Farhood, L., Dimassi, H., & Lehtinen, T. (2006). Exposure to war-related traumatic events, prevalence of PTSD, and general psychiatric morbidity in a civilian population from southern Lebanon. *Transcultural Nursing*, 17, 333–340. <https://doi.org/10.1177/1043659606291549>
7. Frounfelker, R., Gilman, S. E., Betancourt, T. S., Aguilar-Gaxiola, S., Alonso, J., Bromet, E. J., et al. (2018). Civilians in World War II and DSM-IV mental disorders: Results from the World Mental Health Survey Initiative. *Social Psychiatry and Psychiatric Epidemiology*, 53, 207–219. <https://doi.org/10.1007/s00127-017-1452-3>
8. Galea, S., & Wortman, K. (2006). The population health argument against war. *World Psychiatry*, 5(1), 31–38.
9. Helpman, L., Besser, A., & Neria, Y. (2015). Acute posttraumatic stress symptoms but not generalized anxiety symptoms are associated with severity of exposure to war trauma: A study of civilians under fire. *Anxiety Disorders*, 35, 27–34.
10. Hrankina-Sazonova, N. V. (2018). Psychological well-being and resilience of psychology students as important factors of their professional development. *Psychological Journal. Collection of Scientific Papers*, 7(17), 23–42. Retrieved from <http://www.apsijournal.com/index.php/psyjournal>
11. Jain, N., Prasad, S., Czárth, Z. C., Chodnekar, S. Y., Mohan, S., Savchenko, E., et al. (2022). War psychiatry: Identifying and managing the neuropsychiatric consequences of armed conflicts. *Primary Care Community Health*, 13, 215–223. <https://doi.org/10.1177/21501319221106625>
12. Karam, E. G., Mneimneh, Z. N., Dimassi, H., Fayyad, J. A., Karam, A. N., Nasser, S. C., et al. (2008). Lifetime prevalence of mental disorders in Lebanon: First onset, treatment, and exposure to war. *PLoS Medicine*, 5, 60–77. <https://doi.org/10.1371/journal.pmed.0050061>
13. Karam, E., & Ghosn, M. (2003). Psychosocial consequences of war among civilian populations. *Current Opinion in Psychiatry*, 16, 413–419.
14. Karamushka, L., Tereshchenko, K., & Kredentser, O. (2022). Adaptation of the methods "The Modified BBC Subjective Well-being Scale (BBC-SWB)" and "Positive Mental Health Scale (PMH-scale)" on a Ukrainian sample. *Organizational Psychology. Economic Psychology*, 3-4(27), 85–94.
15. Kashdan, T. B., Morina, N., & Priebe, S. (2009). Post-traumatic stress disorder, social anxiety disorder, and depression in survivors of the Kosovo war: Experiential avoidance as a contributor to distress and quality of life. *Anxiety Disorders*, 23, 185–196. <https://doi.org/10.1016/j.janxdis.2008.06.006>
16. Kharkivshchyna sered lideriv v Ukraini za kilkistiu studentiv u zakladakh vyshchoi osvity. Retrieved from <http://surl.li/fnxlac>
17. Kichula, M. Y., Zavorotna, V. M., Trushchenkova, L. V., Vyshnovskiy, A. V. (2023). Mental health of students during

- martial law as a social paradigm. *Bulletin of Social Hygiene and Organization of Health Care of Ukraine*, 4(98), 23–28. <https://doi.org/10.11603/1681-2786.2023.4.14422>
18. Koren, D., Norman, D., Cohen, A., et al. (2005). Increased PTSD risk with combat-related injury: A matched comparison study of injured and uninjured soldiers experiencing the same combat events. *American Journal of Psychiatry*, 162, 270–278.
19. Kurapov, A., Pavlenko, V., Drozdov, A., Bezliudna, V., Reznik, A., & Isralowitz, R. (2022). Toward an understanding of the Russian-Ukrainian war impact on university students and personnel. *Loss & Trauma*, 28, 167–174. <https://doi.org/10.1080/15325024.2022.2084838>
20. Kurapov, A., Danyliuk, I., Loboda, A., Kalaitzaki, A., Kowatsch, T., Klimash, T., & Predko, V. (2023). Six months into the war: A first-wave study of stress, anxiety, and depression among students in Ukraine. *Frontiers in Psychiatry*, 14, 119–125.
21. Kuzmenko, T. V. (n.d.). Essential characteristics and classification of social groups: Reference group: Types and functions. Retrieved from <http://surl.li/dkrsrm>
22. Larin, D. I. (n.d.). Questionnaire of nervous-psyche tension (Nemchin T.A.). Retrieved from <http://surl.li/pdfrv>
23. Levchenko, K., & Kharytonova, N. (n.d.). State of mental health of student youth during the war: Consequences of psychotraumatic situations one year after the start of the full-scale invasion. Retrieved from <http://surl.li/epcmck>
24. Maercker, A., Brewin, C. R., & Bryant, R. A., et al. (2013). Diagnosis and classification of disorders specifically associated with stress: Proposals for ICD-11. *World Psychiatry*, 12(3), 198–206. <https://doi.org/10.1002/wps.20057>
25. Maizhe, 96% vyshchyykh navchalnykh zakladiv Kharkova zaznaly ushkodzhenn pid chas viiny. Retrieved from <http://surl.li/tvbbxd>
26. Mikulincer, M., Florian, V., & Weller, A. (1993). Attachment styles, coping strategies, and posttraumatic psychological distress: The impact of the Gulf War in Israel. *Personality and Social Psychology*, 64, 817–826. <https://doi.org/10.1037/0022-3514.64.5.817>
27. Naichastishi zapytannia uchasnykiv opytuvannia «Studentstvo v umovakh viiny» ta vidpovidi orhanizatoriv. Retrieved from <http://surl.li/jjwkyy>
28. Nechitailo, I. S. (2007). Education as a factor of socio-class differentiation in modern Ukraine. *Herald of the International Slavic University*, 10, 19–25.
29. Pavlenko, V., Kurapov, A., Drozdov, A., Korchakova, N., Reznik, A., & Isralowitz, R. (2022). Ukrainian “help” profession women: War and location status impact on well-being. *Loss & Trauma*, 28, 90–95. <https://doi.org/10.1080/15325024.2022.2105482>
30. Pedrelli, P., Nyer, M., & Yeung, A. (2015). College students: Mental health problems and treatment considerations. *Academic Psychiatry*, 39, 503–511. <https://doi.org/10.1007/s40596-014-0205-9>
31. Pinchuk, I., Goto, R., Pimenova, N., Kolodezhny, O., Guerrero, A. P., & Skokauskas, N. (2022). Mental health of helpline staff in Ukraine during the 2022 Russian invasion. *European Psychiatry*, 65, 45–57. <https://doi.org/10.1192/j.eurpsy.2022.2306>
32. Pro skhvalennia Kontseptsii rozvytku okhorony psykichnoho zdorovia v Ukraini na period do 2030 roku vid 27 hrudnia 2017 r. № 1018-p. Retrieved from <http://surl.li/uismcb>
33. Kolesnichenko, O. S., et al. (2020). Psychodiagnostics in the National Guard of Ukraine: Methodological guide. Kharkiv: NANGU. 388 p.
34. Sandler, J., Dreher, A. U., & Drews, S. (1991). An approach to conceptual research in psychoanalysis, illustrated by a consideration of psychic trauma. *International Review of Psychoanalysis*, 18, 133–141.
35. Seo, D., Ahluwalia, A., Potenza, M. N., & Sinha, R. (2017). Gender differences in neural correlates of stress-induced anxiety. *Neuroscience Research*, 95(1-2), 115–125. <https://doi.org/10.1002/jnr.23926>
36. Sokołowska, E., Zabłocka-Żytka, L., Kluczyńska, S., & Wojda-Kornacka, J. (2016). What mental health promotion do university students need? *Polish Journal of Applied Psychology*, 14(3), 53–72. <https://doi.org/10.1515/pjap-2015-0062>
37. Tاملina, L., Inatenko, Y., & Hohol, O. (n.d.). What allows young people to feel happy during the war? A study of life satisfaction among students of higher educational institutions in Ukraine. Retrieved from <http://surl.li/adpeee>
38. Tsymbaliuk, M., & Zhyhailo, N. (2022). Formation of stress resistance in students in wartime for legal and Eurointegration processes. *Bulletin of Lviv University. Series: Psychological Sciences, (Special Issue)*, 128–136.
39. Unified Clinical Protocol of Primary and Specialized Medical Care for Acute Stress Reaction. Post-Traumatic Stress Disorder. Adaptation Disorders. (2024). Approved by the Ministry of Health of Ukraine Order No. 1265, July 19, 2024. 35 p.
40. Vlasenko, I. A., & Reva, O. M. (2020). Model of preserving psychological health of student youth in Ukraine. *Scientific Bulletin of Kherson State University*, 3, 90–99.
41. All-Ukrainian Scientific-Practical Conference "Ukrainian Students in the Conditions of War with Russia". Retrieved from <http://surl.li/febjlj>
42. Higher educational institutions of Kharkiv. Retrieved from <http://surl.li/ncywdy>
43. Yeremenko, N. P., Kovalova, N. V., & Uzhvenko, V. A. (2023). Mental health of student youth in Ukraine during the war: Materials of the International Scientific-Practical Internet Conference "Trends and Perspectives of Science and Education Development in the Context of Globalization". *Collection of Scientific Papers*, (92), 90–93.
44. Yevdokimova, O. O., Nechitailo, I. S., Brusakova, O. V., et al. (2024). Psychological consequences of the war: An interdisciplinary essay on Kharkiv region and its inhabitants. Kharkiv: Fakt. 411.

Primary Paper Section: A

Secondary Paper Section: AN, AO, AQ

PARTICIPATION OF THE STATE IN INTERNATIONAL COMMERCIAL TRANSACTIONS (INTERNATIONAL COMMERCIAL ACTIVITY): IMMUNITY ISSUES

^aYEVGEN POPKO, ^bVADYM POPKO, ^cVIKTOR KALAKURA

^{a-c}Taras Shevchenko National University of Kyiv, Institute of International Relations, 36/1, Juriya Illenka Str., 04119, Kyiv, Ukraine

email: ^ayevgenpopko@gmail.com, ^bvadympopko@gmail.com, ^cvik.kalakura@gmail.com

Abstract: The article examines current trends in the development of state immunity in international commercial relations. The author characterizes and defines the concept of a commercial transaction while identifying the peculiarities of the state's participation in these relations as a subject of private international law. International legal instruments and national legislation in this area are analyzed. The author substantiates the necessity of applying limited immunity in international private law relations and places special emphasis on court practices.

Keywords: international private law relations, limited immunity, commercial activity, commercial transaction.

1 Introduction

The increasing level of economic integration among various states is a long-standing trend that significantly impacts the development of international and domestic state law. It is evident that states are among the most powerful, influential, and active participants in private international law. There are an increasing number of forms of state participation in global economic activity. States may be represented by various entities, including government bodies, sovereign wealth funds, state-owned enterprises, and state-controlled joint-stock companies, each of which has distinct legal regulatory peculiarities.

The modern global economy is characterized by a well-developed sphere of international trade, labor migration, capital movement, and technology transfer, as well as an independent international financial sector. Historically, international trade has been the first and most significant form of economic relations between countries and peoples, reflecting the interactions between commodity producers of different nations and expressing their mutual economic dependence. Since the mid-twentieth century, there has been a substantial increase in state participation in international civil legal relations, including dealings with counterparties that are subjects of private law in other states. At the same time, states are increasingly interested in transactions with such entities, which typically agree to engage in these transactions only if there is assurance of the states' property liability in the event of non-fulfillment or improper fulfillment of their obligations under the agreements. This necessitates thorough legal regulation of these relations, which is currently inadequate. Notably, the UN Convention on Jurisdictional Immunities of States and Their Property, adopted in 2004, has yet to be ratified due to the unfulfilled conditions of Article 30 [24] of this Convention, and the law in Ukraine concerning jurisdictional immunities of states remains only a draft [7].

2 Materials and Methods

The methodological foundation of the study consists of general scientific methods, including the dialectical and system-structural approaches, as well as methods of induction and deduction. In addition, special methods are employed, primarily formal-legal, comparative-legal, and historical-legal methods. The primary research methods are formal-legal and historical-legal analyses, which are utilized to investigate current trends in the development of state immunity in private international law, conceptual approaches to the fundamental principles guiding the evolution of this institution, and their reflection in legal norms.

3 Results and Discussion

Your text is well-written, but there are a few areas where the vocabulary, grammar, and style could be improved for clarity and flow. Here's a revised version:

International economics can be understood in both broad and

narrow senses. "In the broad sense, international economics is a theory used to study the economy of the modern interdependent world. In a narrower sense, international economics is a branch of market economy theory that examines the patterns of interaction between economic entities of different nationalities in the areas of international trade in goods and services, the movement of production factors and financing, and the formation of international economic policy" [3]. In the international economy, there are two main categories of activities: a) commercial (entrepreneurial) activities, and b) non-commercial activities. The basis for this classification is the primary objective of the activities of international economic actors. Commercial activity is oriented toward profit-making. Non-commercial activities, on the other hand, serve different purposes, such as the advancement of science, education, culture, charity (e.g., the activities of the Soros Foundation), and so on. In domestic civil law, the criterion of profit is fundamental to distinguishing between commercial and non-commercial economic activities, which necessitates consideration of the specific legal regime governing these types of activity. The state engages in economic activity, particularly in civil transactions, not as a private entity but as a sovereign state, which is the bearer of public authority.

In international economic activity, the state functions as an active, independent participant alongside individuals and legal entities. In commercial activities, the state often acts not as a sovereign power, but as a "trader" or "merchant" in relation to foreign merchants and corporations. Meanwhile, commercial relations between states (for example, the sale and purchase of goods) are governed exclusively by public international law. In several countries, commercial activities are regulated by commercial codes (Austria, Argentina, Bulgaria, Brazil, Estonia, Poland, Romania, the United States, France, Japan, etc.). As Professor O. Merezko notes, "according to the theory of international law, an agreement between a state and a foreign individual or legal entity is not an international treaty governed by the rules of international treaty law, but a commercial contract governed by the rules of the national law of the state" [16]. This conclusion was similarly reached by the International Court of Justice, for example, in the case of the Anglo-Iranian Oil Company in 1952 [1].

The state's participation in international economic relations of a private nature introduces a peculiarity, namely the issue of jurisdictional immunity concerning the state. The general principle of state immunity is well-known: *par in parem non habet imperium* (an equal has no power over an equal), but the application and interpretation of this principle in practice often present significant challenges.

The doctrine of international law recognizes two primary concepts regarding the legal immunity of states: the concept of absolute state immunity and the concept of functional (or limited) state immunity, both of which are currently acknowledged in national legislation and judicial practice [13]. Absolute immunity grants a state the right to exercise its sovereignty fully, without being subject to the laws and jurisdiction of another state; this is particularly effective in the public law sphere of state activity. According to the theory of absolute sovereignty, a state cannot be sued in the courts of another state without its explicit consent, even in cases of breach of a commercial contract by the state. Functional (limited) sovereignty, on the other hand, applies to a state acting as a participant in international private legal relations, especially in the realm of foreign economic law, when it engages in commercial activities. The concept of limited sovereignty is now widely recognized in the theory and practice of many states. Its core principle is that a state's immunity extends to actions performed as acts of sovereign power (*de jure imperii*) but does not apply to actions undertaken by the state in a private capacity (*de jure gestionis*).

found in the special national laws of various states and are commonly reflected in court practice. When engaging in commercial activities, the state operates on an equal footing with other entities.

Literature:

1. Anglo Iranian Oil Co. Case, ICJ Reports, 1952, p. 112.
2. Arbitral Award of January 14, 1982 by Prof. Goldman in *Elf Aquitaine Iran v. National Iranian Oil Co.* 1986. *Yearbook of Commercial Arbitration*, 11, 104.
3. Bakhchevanova, N. V., & Makukha, S. M. 2010. *International economic relations: A textbook* (Prof. A. P. Golikov, Ed.). Kharkiv: V.N. Karazin Kharkiv National University.
4. Bouchez, L. J. 1979. The nature and scope of state immunity from jurisdiction and execution. *Netherlands Yearbook of International Law*, 10, 16.
5. Decision of the U.S. Court of Appeals for the Federal Bank of Nigeria, F.2d, 647, 1981.
6. Delaume, G. R. 1988. *Law and practice of transnational contracts*. New York: Oceana Publications.
7. Draft law "On Jurisdictional Immunities and Liability of Foreign States". Reg. March 2015 No. drafted by the Cabinet of Ministers of Ukraine and submitted to the Verkhovna Rada of Ukraine.
8. Donoghue, J. E. 1992. Taking the "Sovereign" out of the Foreign Sovereign Immunities Act: A functional approach to the commercial activity exception. *Yale Journal of International Law*, 17, 489–500.
9. European Convention on the Immunity of States (ETS No. 74) Basel, May 16, 1972. Retrieved from https://zakon.rada.gov.ua/laws/show/994_060#Text
10. Fox, H. (2008). *The law of state immunity*. Oxford: Oxford University Press.
11. Hillier, T. 1994. *Public international law*. London: Cavendish.
12. In particular, Australia, Austria, the United Kingdom, France, the United States, Italy, the Netherlands, and Germany. A/47/3.
13. International Public Law: Textbook: in 2 vols. Vol. 2: The main branches. 2019. Kharkiv: Pravo; Korniiichuk, E. V. Jurisdictional immunities of states and their property: Trends in international and domestic law: Monograph (2nd ed.). Odesa: Phoenix; Fox, H. *The law of state immunity*. Oxford: Oxford University Press, 2008; Brohmer, J. *State immunity and the violation of human rights*. Dordrecht: Martinus Nijhoff Publishers, 1997; Sucharitkul, S. *State immunities and trading activities in international law*. London: Stevens & Sons Limited, 1959.
14. Korniiichuk, E. V. 2019. *Jurisdictional immunities of states and their property: Trends in international and domestic law* (2nd ed.). Odesa: Phoenix.
15. Legal encyclopedia: In 6 vols. Vol. 3: K-M. 2001. Y. S. Shemshuchenko (Ed.). Kyiv: M.P. Bazhan Ukrainian Encyclopedia Publishing House.
16. Merezko, A. A. 2002. *Transnational trade law* (lex mercatoria). Kyiv: Takson.
17. Paasivirta, E. 1990. *Participation of state in international contracts*. Helsinki: Lakimiesliiton Kustannus, Finnish Lawyers' Publishing Company.
18. Rederiaktiebolaget Amphitrite v. R 1921. 3 KB, 503; Fellner v. Minister of Interior. 1954. 4 SA (A), 536; Norman v. Baltimore and O Railroad. 1935. 294 US 240, 55 S Ct Reports, 427.
19. Republic of Argentina v. Weltover, 504 US 607. 1992. 614-615, 100 ILR 509.
20. Schreuer, C. H. 1988. *State immunity: Some recent developments*. Cambridge: Grotius Publications Limited.
21. Stewart, D. P. 2005. The UN Convention on Jurisdictional Immunities of States and Their Property. *American Journal of International Law*, 199.
22. The Law of Ukraine "On International Commercial Arbitration" of 1994, No. 4002-XII of February 24, 1994 (new version of December 15, 2021). Retrieved from <https://zakon.rada.gov.ua/laws/show/4002-12#top>
23. UK State Immunity Act. Retrieved from <http://www.la.w.berkeley.edu/faculty/ddcaron/courses/rpid/rp04038.html>
24. UN Convention on Jurisdictional Immunities of States and Their Property of December 2, 2004. UN General Assembly Resolution 59/38 of December 16, 2004. Retrieved from https://zakon.rada.gov.ua/laws/show/995_e50#Text
25. UNIDROIT Principles of International Commercial Contracts of January 1, 1994. Retrieved from <https://ips.ligazakon.net/document/MU94386>
26. United States Foreign Sovereign Immunity Act No. 94-583 of October 21, 1976 [H.R. 11315]. Retrieved from <http://sco.de.house.gov/download/pls/28C97.txt>
27. UN.org. Retrieved from <http://www.un.org/law/ilc/>
28. According to this doctrine, the US courts are prohibited from reviewing the validity of acts of foreign state authorities if the scope of these acts is limited to the regulation of legal relations in the territory of the state that adopted the act to be applied.

Primary Paper Section: A

Secondary Paper Section: AG

experience of contemporary wars shows that victory in complex or hybrid conflicts cannot be achieved through the strategies of conventional warfare, nor can it be reduced to tactics or tactical operations [11].

- Changes in the forms of war – While traditional wars between states were (openly) symmetrical, the illegitimacy of aggression under international law and opposition from the international community have led to an increasing reliance on asymmetric warfare. Asymmetric conflicts often take the form of small wars, hybrid wars, terrorism, insurgencies, proxy wars, and metawars [12].
 - Delegitimization of war – This involves a shift in the paradigms of how asymmetric wars are officially justified. Rather than targeting specific states, the stated objectives are often framed as combating terrorism, extremism, nationalism, etc. Nevertheless, the real target remains a particular state, with the goal being regime change or altering the course of the targeted state's policies [16].
 - Changes in the form of victory – While past world wars concluded with one coalition's clear victory over another, formalized by acts of unconditional surrender, the nature of transnational military operations today makes such outcomes increasingly unattainable [20].
- 3) Transformations in the domain of geopolitical conflict, specifically its virtualization, where symbolic realities increasingly dominate over actual events. This shift significantly, and sometimes decisively, influences how victory in war is interpreted. A military victory, therefore, becomes less important than its portrayal or "war for its own sake," which is constructed through the mass media and embedded in the collective consciousness of societies in the warring states. A particular pattern emerges: purely "technical" victories in asymmetric wars may be tactically effective in traditional terms, but they offer no guarantees of achieving the war's strategic objectives, which are always political in nature and pursued through the state's diplomatic and strategic efforts. This regularity provides a valuable framework for analyzing the history of warfare, particularly in understanding the necessary and sufficient conditions for achieving victory [17].
- 4) 4) Interaction of five levels of war strategy. The concept of designating the following levels of warfare, each with its own distinct reality, was introduced by U.S. researcher Edward Luttwak [10]:

- technical level – where one type of weapon is opposed by another, and the development of countermeasures is subordinate to the methods of warfare at the tactical level.
- tactical level – reflects the use of specific types of weapons in combat.
- operational level – involves the interaction of multiple units on both sides, with outcomes depending on the efficiency and effectiveness of tactical-level combat operations. While operational-level developments may cover a broad scope, they are never fully autonomous as they are entirely dependent on the coordination of forces within the theater of war.
- theater strategy level – reflects the overall consequences of individual operations and shapes the general deployment of offensive and defensive forces within the theater of military operations.
- grand strategy level – encompasses the broader perception of war, taking into account domestic politics, international diplomacy, economic activity, and all factors that can either weaken or strengthen national power.

Since the ultimate objectives and outcomes are realized only at the level of grand strategy, the final result of military actions is determined exclusively at this highest level. Even a successful conquest may serve as a preliminary outcome, which could be negated by diplomatic interventions from more powerful state actors. Conversely, even a significant defeat can be mitigated through the intervention of new allies, who may seek to restore the balance of power due to concerns about the weakening of the losing side.

These five levels of strategy form a recognizable hierarchy, but they do not simply flow from top to bottom; rather, they interact dynamically. Technical efficiency is important only insofar as it has tactical implications (e.g., skilled pilots may shoot down more advanced enemy aircraft). However, tactical actions are heavily influenced by available technology. Similarly, most tactical events that shape the operational level also affect its outcome, but they, in turn, are influenced by the operational framework. Likewise, actions at the operational level generate outcomes at the theater strategy level, which defines their purpose. All military efforts ultimately influence the grand strategy level, even though it is this highest level that determines the overall outcome of the war.

- 5) Russia's Transition from Hybrid to Total War has significantly influenced the strategies and tools employed in the war against Ukraine. Specifically, during the Russian-Ukrainian total war, Russia aims to achieve its political, military-political, and military objectives.

According to the concept of total war [25], Russia has implemented measures to achieve these objectives during the Russian-Ukrainian conflict:

1) Political Objectives of Total War:

- Overthrow of the Ukrainian Government: To this end, Russia is engaging in a campaign of missile and aerial bombardment against the Ukrainian population, which, under certain conditions, could lead to socio-political destabilization in Ukraine and potentially result in a coup d'état or the toppling of the constitutional order [2].
- Establishment of Geopolitical Control: Russia seeks to assert control over the territory of Ukraine.

In pursuit of these political objectives, Russia regularly conducts extensive missile strikes and bombardments targeting civilian, critical, energy, military, economic, and transport infrastructure in Ukraine. This strategy creates conditions conducive to provoking a domestic crisis, which may lead to a loss of legitimacy for the government, potential changes in state power, or capitulation in the war, as well as the international isolation of Ukraine. A more detailed analysis of this issue can be found in [2].

2) Military and Political Objectives of Total War:

- international Isolation of Ukraine: Russia aims to deprive Ukraine of military aid from the anti-Putin coalition and diminish international support for the protection of state sovereignty and the restoration of territorial integrity.

To achieve these objectives, Russia employs several strategies:

- nuclear Blackmail: Targeting Western democracies to deter military aid to Ukraine.
- escalation of Military Conflict: Heightening tensions in Europe and the Middle East.
- provocation of a Global Food Crisis: Undermining Ukrainian grain exports to African countries.
- formation of Negative International Public Opinion: Creating a highly unfavorable perception of Ukraine globally.

3) Military Objectives of Total War:

- destruction of Military Potential: The aim is to disarm national military formations in Ukraine.
- termination of Resistance: This involves the complete cessation of Ukraine's resistance to the aggressor state.
- establishment of Military Control: Russia seeks to exert control over the entire territory of Ukraine.

Therefore, the Russian Federation is waging a total war against Ukraine, with the primary goal of completely dismantling the

Ukrainian state and its people. The objectives of Russia in this war are as follows:

1. Liquidation of the Ukrainian State and Its Leadership.
2. Destruction of Critical and Civil Infrastructure: This includes Ukraine's economic and transportation systems.
3. Genocide of the Ukrainian People: This is aimed at the population across the entire territory of the country.
4. Ethnic Cleansing: This involves purges in the northern, eastern, and southern regions of Ukraine, along with the forcible deportation of Ukrainian citizens to Russia.
5. Erasure of Ukrainian History and Culture: Efforts are made to obliterate the cultural heritage of the Ukrainian nation.
6. Disabling the Ukrainian Armed Forces: This objective seeks to deprive the Armed Forces of Ukraine of the capacity to engage in armed resistance against the Russian Federation, the aggressor state [25; 26].

It is important to note that in the official discourse surrounding Ukraine's national security during the Russian-Ukrainian war, President Volodymyr Zelensky has articulated several perspectives on what constitutes victory for Ukraine. In particular, during a meeting with Ukrainian journalists on April 5, 2022, Zelensky reiterated that the only acceptable outcome in the national conflict with Russia is victory, which he defines as follows [22]:

- 1) Preserving Ukraine's State Sovereignty.
- 2) Safeguarding the Lives of Hundreds of Thousands of Ukrainian Citizens.
- 3) Restoring Temporarily Occupied Territories: Specifically, Crimea and Donbas must return to the jurisdiction of the Ukrainian state.

President Volodymyr Zelensky of Ukraine emphasized several key factors that must be considered when making crucial military and political decisions:

- a) The current developments in the war theater and the combat readiness of the Armed Forces of Ukraine.
- b) The presence of nations that guarantee the security of Ukraine.
- c) A complete mistrust of Russia in security matters following the blatant acts of genocide committed on Ukrainian territory (Bucha, Irpin, Mariupol, and other cities and towns).

On June 29, 2022, President Volodymyr Zelensky of Ukraine stated in an interview with NBC that Ukraine's victory in the war with Russia will be a collective victory for the entire democratic world [21].

In [23], the evolution of Volodymyr Zelensky's vision of Ukraine's victory in the Russian-Ukrainian war is highlighted:

May 2022: Advancing to the line of contact that existed until February 24, 2022, and initiating diplomatic negotiations;

December 2022: Realizing the aspirations of generations from the era of Bohdan Khmelnytskyi to the national liberation struggles of the 20th century;

June 2023: Restoring state sovereignty within internationally recognized borders without restrictions on sovereign rights, as well as ensuring the return of all prisoners of war and deportees;

August 2023: Acknowledging the impossibility of future wars against Ukraine;

December 2023: Achieving the liberation of the entire territory of Ukraine from invaders, including Crimea and Donbas.

Currently, the national official discourse presents the "Peace Formula" proposed by Volodymyr Zelensky. This formula is grounded in the key principles of the UN Charter and international law, emphasizing respect for state sovereignty and

territorial integrity within internationally recognized borders [22].

The "Peace Formula" includes the following points [15]:

1. Radiation and Nuclear Safety and Security.
2. Food Security.
3. Energy Security.
4. Release of All Prisoners of War and Deportees.
5. Implementation of the UN Charter and Restoration of Ukraine's Territorial Integrity and World Order.
6. Withdrawal of Russian Troops and Cessation of Hostilities.
7. Restoration of Justice.

It is important to note that the implementation of the "Peace Formula" proposed by President Volodymyr Zelensky of Ukraine requires coordinated measures across the military, political, economic, and international dimensions of Ukraine's national security policy. Additionally, it is noteworthy that the Ukrainian state has managed to preserve constitutional order, mobilize nations within the anti-Putin coalition for military assistance [8; 9; 18], and uphold the paradigm of "Ukraine's victory" [13]. Today, the concept of "Ukraine's victory" is viewed by the majority of international partners as a promising scenario for stabilizing European security and maintaining the international balance.

To formulate the conclusions of this study and justify the proposals, we employed a phenomenological model of victory in war, which allows us to clarify the essence of victory in military, political, and praxeological contexts [20]. According to M. Shevchenko, the essence of victory in war is:

- in the military context: Defeating the enemy and achieving the political and military-strategic goals of the war by one of the warring parties;
- in the political context: Subordinating the adversary nation to the goals and objectives of the diplomatic and strategic efforts of the victorious nation;
- in the praxeological context: Achieving a better peace than before the war for the victorious state.

We should specify these provisions regarding the essence of victory in the context of the Russian-Ukrainian war, which currently exhibits characteristics of a total war.

In our opinion, Ukraine's victory in the war with the Russian Federation can be understood in substantive terms as follows:

- in the military context: The defeat of the enemy and the cessation of hostilities on Ukrainian territory;
- in the political context: The restoration of Ukraine's territorial integrity;
- in the international political context: Ukraine achieving victory, along with obtaining guarantees of state sovereignty, territorial integrity, and the inviolability of borders from NATO and the EU, as well as establishing peace without Russia's geopolitical dictate—peace based on the power of international law rather than on the power of force.

5 Conclusion

1. It has been demonstrated that a military victory in the tangible realm becomes less significant than its representation in the virtual realm, which can be shaped by propaganda in the collective consciousness of a particular society. Thus, in addition to the traditional military context for interpreting the concept of "victory" in modern warfare, it is important to emphasize the political and praxeological contexts. This approach will provide a comprehensive understanding of the challenges associated with achieving victory in war.
2. It has been established that the factors influencing the dynamics of scientific discourse regarding ideas of victory in modern warfare include the transformation and

profanation of the institutions of state, war, peace, national security, and international law, all within the context of evolving paradigms of international relations and conflict. Furthermore, the factors shaping the dynamics of a specific state's official discourse regarding concepts of victory in modern warfare and the methods for achieving it are grounded in the realities of diplomatic, strategic, and military efforts.

3. It has been determined that the essence of Ukraine's victory in the total Russian-Ukrainian war is:
 - in the military context: Defeating Russia and achieving Ukraine's political and military-strategic goals in a national and just war;
 - in the political context: Subordinating Russia to the diplomatic and strategic objectives of the Ukrainian state aimed at restoring its territorial integrity;
 - in the praxeological context: Achieving a better peace for Ukraine than existed before the war.
 - The victory of Ukraine in the total war unleashed by Russia, in substantive terms, is:
 - in the military context: The defeat of the Russian armed forces and the cessation of hostilities on Ukrainian territory;
 - in the political context: The restoration of Ukraine's territorial integrity;
 - in the international political context: Ukraine achieving victory alongside guarantees of state sovereignty, territorial integrity, and inviolability of borders from NATO and the EU; a peace that is free from Russia's geopolitical dictate, based on the authority of international law rather than the use of force.

We see prospects for further research in the theoretical substantiation of options for Ukraine's victory in the Russian-Ukrainian war.

Literature:

1. Abramov, V. I. (2017). *Hybrid war as a form of interstate conflict: A strategy for victory*. In L. M. Shypilova (Ed.), *Challenges and threats to national security in the conditions of hybrid warfare: Minutes of the scientific and practical seminar* (pp. 17-22). Kyiv: NASU.
2. Abramov, V. I., & ZiuZIA, O. V. (2022). An improved basic model of interstate conflict taking into account modern trends of the Russian-Ukrainian war. *Public administration: Improvement and development*, (5). <http://www.dy.nayka.com.ua/?op=1&z=2679>
3. Doroshko M. (2018). *Russia's undeclared war against Ukraine in the 20th and early 21st centuries: Causes and consequences*. K.: Nika-Center, P. 196.
4. Holovchenko, V., & Doroshko, M. (2016). *Russia's hybrid war against Ukraine: A historical and political study*. (M. S. Doroshko, Ed.). Kyiv: Nika-Center.
5. Horbulin, V. (2020). *How to defeat Russia in the war of the future*. Kyiv: Bright Books.
6. Hybrid war: in verbo et in praxi: *monograph* / [A group of authors]; under general editorship of Prof. R.O. Dodonov, Vinnytsia: NilanLTD LLC, 2017. P. 412
7. Kirylenko, V. I., & Shevchenko, M. M. (2023). Comparative analysis of the Arab-Israeli wars: Lessons for Ukraine. In *Ukrainian army: Modernity and historical retrospect: Proceedings of the 3rd International Scientific and Practical Conference* (pp. 242-244). Kyiv: NUOU.
8. Korneev, I. (2024). EU plan for Ukraine's victory approved by European Parliament. <https://top.today.ua/plan-yes-dlya-peremogi-ukrayini-zatverdila-najbilsha-u-yevroparlamentni-grupa-deputativ/>
9. Kubilius, A. (2024). EU plan for Ukraine's victory: What should change in military aid to Kyiv. <https://www.eurointegration.com.ua/experts/2024/02/23/7180259/>
10. Luttwak, Y. N. (2012). *Strategy: The logic of war and peace*. (Translated from English). Moscow: Dmitry Pozharsky University.
11. Mahda, E. V. (2015). *Hybrid warfare: Surviving and winning*. Kharkiv: Vivat.
12. Mandrahedia, V. A. (2003). *Causes and nature of wars (armed conflicts): Philosophical and sociological analysis: Monograph*. Kyiv: EU Publishing House.
13. Mishchenko, A. B., & Teremko, V. V. (2022). The future geopolitical status of Ukraine in modern Europe. *International relations: Theoretical and practical aspects*, (9), 55-73. <http://international-relations.knukim.edu.ua/article/view/265454/2251>
14. On the decision of the National Security and Defense Council of Ukraine "On the National Security Strategy of Ukraine": Decree of the President of Ukraine of September 14, 2020 No. 392/2020. <https://www.president.gov.ua/documents/3922020-35037> (date of application: 03.06.2024)
15. "Peace Formula". <https://www.google.com/search?q=10%D0%BF%D1%83%D0%BD%D0%BA%D1%82%D1%96%D0%B2+%D1%83%D0%BA%D1%80%D0%B0%D1%97%D0%BD%D1%81%D1%8C%D0%BA%D0%BE%D1%97+%D1%84%D0%BE%D1%80%D0%BC%D1%83%D0%BB%D0%B8+%D0%BC%D0%B8%D1%80%D1%83&aq=10+%D0%BF%D1%83%D0%BD%D0%BA%D1%82%D1%96%D0%B2+&aqs=chrome.2.69i57j0i512i6.259292257j0j15&sourceid=chrome&ie=UTF-8> (access date: 06/01/2024).
16. Pereplytsia, H. M. (2017). *Ukraine - Russia: War in the conditions of existence: Monograph*. Kyiv: Stylos.
17. Pocheptsov, H. (2016). *Meanings and wars: Ukraine and Russia in information and sense wars*. Kyiv: Kyiv-Mohyla Academy Publishing House.
18. Republicans in the USA announce a plan for Ukraine's victory. (2024). <https://inshe.tv/important/2024-01-11/820977/>
19. Russia's aggression against Ukraine: Historical prerequisites and modern challenges. (2016). (P. P. Hai-Nyzhnyk, Ed.). Kyiv: MP Lesya.
20. Shevchenko, M. M. (2018). Winning the wars of the post-industrial era: New contexts and interpretations. *Gilea: Scientific bulletin: Collection of scientific works*, (130), 321-325.
21. The victory of Ukraine in the war with Russia will be a joint victory of the entire democratic world - the President in an interview with NBC. <https://www.president.gov.ua/news/pe-remoga-ukrayini-u-vijni-z-rosiyeyu-bude-spilnoyu-peremogoy-76117> (date of application: 01.06.2024).
22. Volodymyr Zelensky spoke with representatives of Ukrainian media, April 5, 2022. <https://www.youtube.com/watch?v=xIw0vJScEJo>
23. "What is Ukraine's victory?": How Zelensky's vision changed. <https://www.slovoidilo.ua/2024/01/04/infografika/polytyka/take-peremoha-ukrayiny-yak-zminyuvalosya-bachennya-zelenskoho> (access date: 01.06.2024).
24. World hybrid war: Ukrainian front. (2017). (V. P. Gorbulina, Ed.). Kyiv: NISD.
25. Zozulia, O. S., Lepikhov, A. V., Khrapach, H. S., & Shevchenko, M. M. (2022). The Russian-Ukrainian war: Peculiarities of the implementation of threats to the state sovereignty of Ukraine and prospects for exiting the war. *Collection of scientific works at the Center for Military and Strategic Studies of the Ivan Chernyakhivskiy National Defense University of Ukraine*, (2), 6-15.
26. ZiuZIA, O. V., & Khrapach, G. S. (2019). Research of Russian geostrategic goals in relation to Ukraine through the prism of structural analysis of the armed conflict in Donbas. *Collection of scientific works of the Center for Military-Strategic Research of the National Defense University of Ukraine named after Ivan Chernyakhovsky*, (3), 130-135. <http://znp-cvsd.nouu.org.ua/article/view/197944/198149>

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HOLISTIC EDUCATION IN THE EUROPEAN SOCIO-CULTURAL SPACE IN THE EARLY MODERN PERIOD

^{a,c}MARYNA GRYNova, ^bRUSLAN BASENKO, ^cVASYL FAZAN, ^dDMYTRO LOBODA, ^eMARYNA ZUYENKO

^{a,c} *Poltava V.G. Korolenko National Pedagogical University, 2, Ostrohradsky Str., 36000, Poltava, Ukraine*

^b *Open International University of Human Development*

"Ukraine" Poltava Institute of Economics and Law, 6, Monastyrska Str., 36000, Poltava, Ukraine

email: ^d*grinovamv@gmail.com*, ^b*basenko_ruslan@ukr.net*,

^e*Fazanvv@gmail.com*, ^d*dmitry.lobod@gmail.com*,

^e*marinazuenko1406@gmail.com*

Abstract: The article presents a historical-pedagogical analysis of the content and development of the humanistic idea of holistic education in the European socio-cultural space during the Early Modern Period. It traces the value-based interpretations of the idea of holistic education within both secular (Renaissance humanism) and religious (Christian humanism) worldviews of the early modern era. The study reveals that the concept of holistic education was formulated within the philosophical and cultural discourse of Renaissance humanism. It is noted that the Renaissance ideal of holistic education was based on three key components: first, the virtues of broad erudition, intellectual culture, and the art of rhetoric; second, moral principles focused on the ideals of goodness, virtue, modesty, and personal inner culture, as well as Christian priorities of love and compassion; third, the recognition of the individual as the highest value, grounded in the dignity and rights of the person, and the idea of comprehensive and harmonious development of one's abilities and talents. This also includes the Renaissance virtues of active engagement, initiative, industriousness, persistence, and the appreciation of physical beauty and courage. It is shown that the institutionalization of the idea of holistic education was carried out through the educational activities of Protestant gymnasiums, Jesuit colleges, brotherhood schools, and other educational institutions founded in the context of Protestant Reformation, Catholic Reformation, and religious reforms in the East Slavic lands. The article outlines the civilizational and human-creative significance of the concept of holistic education for the formation of modern European civilization.

Keywords: holistic education, humanism, Early Modern Period, Renaissance humanism, Protestant humanism, post-Tridentine humanism, East Slavic (Orthodox) humanism, comprehensive and harmonious personal development.

1 Introduction

The formation of the value-based foundations of modern European civilization was largely shaped by the worldview shifts experienced by European countries during the Early Modern Period. The 16th century marked a time of complex and, at times, contradictory synthesis between Renaissance humanism and various religious systems, primarily the Protestant Reformation and the Catholic Reform. Alongside the search for answers to the contemporary challenges regarding the structure of the universe, the essence of existence, and the place and role of humans in the world, education and upbringing took a prominent place in the cultural-humanitarian discourse. The new era required a new kind of individual, the one capable of successfully and effectively contributing to the development of a new political-legal, socio-economic, and spiritual-cultural order.

One of the key pedagogical ideas that played a significant role in institutionalizing the modern educational paradigm was the humanistic concept of holistic education. By reviving the ancient notion of a well-rounded individual based on the principle of "καλοκάγαθία" (kalokagathia), Renaissance thinkers, religious leaders, educators, and philosophers gradually developed a modern understanding of holistic education. Its educational philosophy was founded on humanistic culture and anthropocentrism - first Christian (religious) and later Renaissance (secular) humanism.

Despite the ideological differences among the major worldview systems of the time - Renaissance, Reformation, Catholic (post-Tridentine), and East Slavic (Orthodox) - a common ideological trajectory emerged - humanism. This humanism underwent numerous transformations, the culmination of which was the implementation of the idea of holistic education into broad socio-cultural practice.

2 Materials and Methods

The theoretical and practical origins of the holistic education concept undoubtedly date back to Antiquity, with its scientific and theoretical enrichment taking place throughout the entire course of civilizational progress. Thus, it is quite natural that a rich thematic narrative exists regarding the issues of holistic education, encompassing historical-pedagogical, educational-philosophical, and cultural perspectives. The main vectors of historical-pedagogical analysis of holistic education were laid down in the fundamental works of V. Andrushchenko, I. Bekh, H. Vasianovych, L. Vakhovskyi, S. Honcharenko, B. Hod, M. Hrynova, N. Hupan, N. Dichek, M. Yevtukh, V. Ilchenko, S. Klepko, O. Kozlova, O. Lavrinenko, N. Nychkalo, A. Sbrueva, S. Sysoieva, O. Sukhomlynskyi, Ye. Khyrkov, and other scholars who examined pedagogical dimensions of the development of modern European civilization. Among numerous scholars, particular attention should be given to such researchers as E. Clark, R. Martin, J. Miller, R. Miller, R. Nava, D. Phillips, C. Flake, S. Forbes, A. Harris, and others. The studies of these scholars present a modern understanding of the aims and content of holistic education, offer various approaches to analyzing its principles and conceptual foundations, and outline promising paths for implementing the key ideas and philosophy of holistic education.

The aim of this article is to analyze the content and development features of the humanistic idea of holistic education in the European socio-cultural space during the Early Modern period, and to outline its civilizational and humanistic significance for the construction of modern European civilization.

2 Methods

The historical-pedagogical study of the development of holistic education idea within European secular and religious worldview systems during the Early Modern period is based on a comprehensive set of methods, both general-theoretical and specialized. Alongside the use of description, analysis, synthesis, induction, deduction, systematization, explanation, comparison, and interpretation, special methods, such as the method of historical-pedagogical comparative studies and the terminological method, play an important role. The methodology of historical-pedagogical comparative studies serves as the structural guideline for the research, which is a systematic comparison of pedagogical approaches to understanding the humanistic idea of holistic education and the ways of its implementation in various contemporary secular and religious cultural-philosophical systems: the European Renaissance, the Protestant Reformation, the Catholic Reform, the philosophy of rationalism, and Ruthenian-Ukrainian philosophical thought. This comparative-contrastive approach provides the necessary conditions to reveal the specific interpretations of the idea of holistic education, to understand its nature and civilizational significance, and to describe the changes experienced by the humanistic paradigm of education in various secular and religious worldview systems of the Early Modern period.

3 Results and Discussion

It has been previously noted that the origins of the idea of holistic education for the individual can be traced back to ancient civilization, whose creators proposed the ideal of kalokagathia and defined humans as the measure of all things. At the same time, the modern interpretation of the concept of holistic education for the individual was first formulated by Europeans during the Early Modern period (late 15th – mid-17th century). During this time, Europe underwent significant sociocultural changes, driven by modern secular and religious cultural-philosophical systems, including the Renaissance, rationalist philosophy, the Protestant Reformation, the Catholic Revival, and in the East Slavic lands, the reformed Orthodox tradition [10]. Namely within these worldview systems, the idea of

holistic education was not only constructed and theoretically substantiated but also vigorously pursued for implementation among broad segments of Early Modern society [3].

The idea of holistic education proposed by humanists in the Early Modern period was characterized by its internal unity and systematic implementation. Despite its various interpretations, contemporary thinkers provided its systematic characteristics, which have been analyzed through the following vectors: 1) teleological (goals and objectives), axiological, and meaningful foundations of contemporary philosophical teachings regarding the pedagogical ideal of holistic education; 2) content and methodological aspects of implementing the idea of holistic education in the European educational space of the Early Modern period; 3) organizational-pedagogical foundations for implementing the idea of holistic education, and the practice of reforming the European educational space during the Early Modern period; 4) reinterpretation of Early Modern notions of holistic education in the innovative development of human capital and the enhancement of the modern educational space [5].

In Early Modern European society, the idea of holistic education developed and was enriched within several secular and religious worldview systems, whose leaders not only provided philosophical-pedagogical justifications for holistic education but also made significant efforts to institutionalize it.

Renaissance Humanism

The value-based and semantic foundations of the idea of holistic education were developed within the philosophical and cultural discourse that historical-pedagogical thought identifies as Renaissance humanism. The Renaissance-humanist educational system was the first to form among all the educational paradigms of the Early Modern period, as its origins can be traced to the European Renaissance of the mid-14th century. In Renaissance humanism, the understanding of the idea of holistic education was based on a triadic interpretation of humanism:

First, the content of humanistic pursuits became a broad literary, intellectual, and artistic movement, whose external manifestation was a fascination with the literature, educational traditions, and art of classical antiquity. As a result, corresponding pedagogical ideas from antiquity were regarded as foundational elements of general spiritual education, with the priority given to virtues such as high erudition, intellectual culture, refined taste, the art of eloquence, public speaking, and debate. The code of exemplary virtuous behavior became particularly important in this context.

Second, by considering humanism as a broad aspiration toward humanity and a worldview that acknowledges the individual's right to benevolence and the alleviation of suffering associated with the contradictions of human nature and life's finitude, Renaissance humanists proclaimed goodness, virtue, modesty, respect for elders, inner culture, and the Christian ideals of love and compassion as key educational values.

Third, understanding humanism as a worldview principle based on the belief in the individual as the highest value, recognizing human dignity and rights, and the idea of the comprehensive and harmonious development of individual's abilities and talents, individualism became a central component of the ideal of holistic education. Among Renaissance virtues, active human engagement, initiative, concern, industriousness, and persistence gained prominence. Talent and human abilities acquired new evaluative significance, and society began to focus on physical beauty and strength. There emerged an interest in proper recognition and social reward for inspired labor [2].

Thus, the central idea of the Renaissance-humanist interpretation of holistic education was humanism, with the educational ideal being the comprehensive and harmonious development of the individual. The anthropocentrism of Renaissance humanism allowed for the first rehabilitation of the individual, reviving ancient notions of humanity as the center of the world and the

measure of all things. As European Renaissance scholar B. Hod noted, "The new and progressive educational ideal was a reasonable, educated, cultured, and harmoniously developed individual, active and engaged in earthly life, adapted to living in society. The significance of purposeful education (essentially decisive) for social progress was recognized" [6].

Protestant Humanism

The Reformation educational system was established within the context of European Reformation. The teachings of Martin Luther, John Calvin, and Huldrych Zwingli initiated spiritual renewal and gradually broke the dominance of the Catholic Church and its monopoly on spirituality. A corresponding new educational doctrine emerged, grounded in a synthesis of classical antiquity and Christian rationalism. Contemporary scholar P. Kotliarov noted that the core idea of the Protestant educational system was "the combination of fundamental Christian values with secular scholarship", and the main content of the educational Reformation was "the creation of a coherent educational system that organically connected acquired knowledge and provided for a progressive movement from elementary to advanced learning" [8]. Within the Reformation, the idea was substantiated that the acquisition of knowledge and education is the primary path to knowing God, making the establishment of educational institutions one of the key tasks of the reformers.

A valuable aspect of Protestant humanism's educational philosophy was its foundation on the concept of "perfect person" (*perfectio hominis*). This approach motivated the reformers to focus on the necessity of holistic education and the development of the individual, emphasizing the need to harmonize religious education, as the priority of that time, with the development of other aspects of the person. The humanist philosophy was significantly shaped by the pedagogical views of Martin Luther and Philip Melancthon, under the considerable influence of the prominent humanist Erasmus of Rotterdam, with whom the young reformers corresponded. The reformers were guided by the value-based foundations of Erasmus's maxim of "educated piety" (*pietas litterata*), which centered on three virtues: knowledge of Latin, active piety, and the ability to behave properly in all circumstances [1].

The reformers' holistic pedagogical approach to the education of individual was reflected in their understanding of the importance of comprehensive development of a person - intellectual, familial, moral, physical, aesthetic, and civic. The novelty of the religious-pedagogical approach of the founders of Protestantism lay in their emphasis on the social role of education and the proclamation of the need for a radical reform of late medieval educational practices. Moreover, their educational philosophy was based, as it was mentioned above, on the concept of "perfect person" (*perfectio hominis*), which aligned with the humanist idea of "educated piety" (*pietas litterata*), grounded in the three above mentioned virtues. The pedagogical ideas of the Reformation leaders were based on two key values: "piety and erudition" (*pietas et eruditio*) and "liberal erudition" (*liberali eruditione*), which provided realistic opportunities for building a renewed educational system founded on humanist philosophy [1].

Post-Tridentine (Catholic) Humanism

In contrast, the reformed Catholic educational system emerged within the framework of the Catholic Reformation, which on the one hand aimed to counter the Protestant Reformation, and on the other, facilitated a deep internal reform of the Catholic Church. This renewal enabled the Church to significantly modernize and adopt new approaches to spiritual service that were in line with historical realities. While the Reformation initiated educational reforms, the Catholic Church, along with the Jesuit order it established, was able to extend these reforms further, securing its role as the "school order". The Jesuits, significantly transforming humanist teachings, made the idea of "educated piety" the foundation of a new educational system and

developed a broad youth policy, attracting young people to their educational institutions across many European countries [9].

Following the humanists, the Jesuits institutionalized the pan-European Renaissance program of “educated piety” (*pietas litterata*) in their colleges. This educational ideal was based on three above mentioned virtues: knowledge of Latin, which at the time was equated with education, active piety, and the ability to conduct oneself properly in all situations. The Renaissance program demanded high moral standards and proper education from individuals, urging them to develop their abilities and talents through the effort of will, intense work, and dedication. The cultivation of these virtues was declared by the Jesuits as the fundamental priorities of their efforts to shape the young generation of Europe [11].

In addition to fostering Renaissance-humanist virtues such as erudition, high education, intellectual culture, and professionalism, the Jesuits also considered the cultivation of virtuous customs an important component of youth policy. These virtues enhanced and refined individuals, promoting dignified and proper behavior, and instilling the norms of Christian morality.

Particular attention should be given to the Jesuit pedagogical notion of the “good arts” (*bonae artes*). This concept intellectually standardized ideas of education and ethical upbringing, realized through the “humanistic studies” (*studia humanitatis*), which aimed to achieve Erasmus’s educational ideal of “educated piety” (*pietas litterata*). This also reflected the humanist ideal of uniting teaching and upbringing practices, emphasizing the moral-didactic aspects of education.

Therefore, it is not without reason that some scholars claim that Jesuit pedagogy, based on Ignatius Loyola’s idea of the holistic education of the individual, which includes intellectual and religious development as well as the maximization of one’s talents, aimed to form the complete person. Jesuit educational practices transformed Renaissance humanism from an elitist phenomenon into a mass movement, achieving the educational revolution envisioned and discussed by the intellectuals of the European Renaissance. The Jesuits pedagogically interpreted the Renaissance-humanist intellectual heritage, incorporating several semantic and conceptual elements of humanism into the development of virtues among their order’s youth. Understanding humanism as “imitation of the ancients” and as the revival of classical models of education, the Society of Jesus proclaimed as the core virtues of its youth policy: erudition, refined Latin language, intellectual culture, sophisticated taste, eloquence, mastery of scholarly discourse, public speaking, and virtuous conduct. From the Renaissance-humanist priorities of individualism, the Jesuit code of virtue was enriched with active piety, diligence, industriousness, creative zeal, initiative, decisiveness, care, rationality, and prudence. The Jesuits greatly valued talent and ability in young people, paying attention to the need for physical health and well-being as well. In the Jesuit educational priorities, humanism’s etymological interpretation as humanity corresponded to the tasks of cultivating virtues such as modesty, politeness, composure, tolerance, respect and attentiveness toward elders, kindness and love, ethics of partnership, and unity. Thus, in Ignatian youth initiatives, all conditions were created for the realization of Erasmus’s ideal of “educated piety”. By announcing in the 16th and 17th centuries their mission to instill the “good arts” in European youth, the Jesuits laid the foundation for the unity of educational and moral priorities, focusing on moral and ethical values in their care for the younger generation. It is therefore understandable that the development of this set of virtues placed the Jesuits at the forefront of early modern practices for nurturing the European youth of the time [4].

East Slavic (Orthodox) Humanism

The East Slavic lands, quite naturally, experienced the influence of all three European movements - Renaissance, Reformation, and Catholic Reformation. These challenges impacted not only religious life (the Kyiv Metropolis) but also education [12]. As a

result, a new and distinct educational system - the Rus’-Orthodox system - emerged. This system was founded on the European humanist tradition, synthesizing both Western (primarily Jesuit) and Eastern (local) pedagogical traditions. Western influences allowed the East Slavic lands to engage with early modern scholarship, humanist ideas, and new approaches to the organization of education and upbringing. A new educational system was formed that successfully combined Greek and Latin educational traditions. Undoubtedly, the educational model of the Kyiv-Mohyla Academy became the exemplar, quickly establishing itself as a center of educational, spiritual, and cultural life in Ukraine at the time.

The Ukrainian educational-pedagogical tradition of the early modern era developed on a broad ideological and conceptual foundation. This foundation included the ideological heritage of the Greco-Byzantine world, local Orthodox-conservative tradition, Renaissance-humanist ideas, Protestant influences, the Unionist struggle, and the spread of Jesuit schooling. In each of these worldviews (whether secular or religious), the educational component was clearly expressed, and at times, it became a central idea. Consequently, within the framework of ideological and worldview interactions and mutual influences of these highly diverse systems, the worldview self-identification of Ukrainian society was gradually constructed, particularly in its educational and pedagogical dimensions.

The thoughts of Ukrainian historian Ya. Kalakura regarding the significance of sociocultural changes at the time, which opened up opportunities for renewing the mentality of Ukrainians, are interesting. This mentality, as Kalakura states, “... did not build a wall between the sacred and the secular, thus bringing religious and educational values closer to the individual and opened possibilities for the interaction of the old and the new” [7]. The ideas of the Renaissance, Reformation, Catholic Reform, and later the Enlightenment allowed for the formation of a new type of culture in Ukraine - a culture of openness. The Ukrainian mentality thus had the opportunity to “... settle into the European world, integrate into its space while simultaneously beautifying it and influencing the formation of Ukrainian society” [7].

The spread of humanist ideas of comprehensive and harmonious personal development in the Ukrainian early modern intellectual, educational, and pedagogical landscape not only integrated Ukrainian schooling into “innovative” humanist ideas but also successfully transformed its own educational system. This transformation effectively responded to the challenges of the time, skillfully structuring the pedagogical dynamics in accordance with the new social needs of the early bourgeois society.

4 Conclusion

As it can be seen, throughout the historical development of humanity, the idea of holistic education has always held a special place in upbringing. Its theoretical and conceptual foundations, initially grounded in the ancient educational ideal of *kalokagathia* (καλοκαγαθία), were further enriched by the Renaissance paradigm of *pietas litterata* and ultimately shaped in the postmodern concept of “holistic education”. The historical transformations that unfolded in the 16th century not only radically reformed socio-political life and re-evaluated values and cultural priorities, but also led to significant reforms in the field of education. The traditional religious scholastic model of education was not only thoroughly reconsidered, but new educational systems were built, with humanism and a belief in the transformative power of knowledge - and thus, education - becoming central themes.

The early modern educational systems developed in different ways, but their pedagogical strategies shared a common “denominator”: holistic education in its various meaningful dimensions. This included both the aspiration to ensure the comprehensive development of the individual and the focus on creating a well-rounded and progressive learning experience. The strategic and tactical approaches to organizing educational

spaces, formed during the early modern period, remain relevant today and require reinterpretation and new understanding.

Taking into account the historical and pedagogical approach allows for the construction of the modern concept of holistic education. Among the key priorities of holistic education, there are the principles of Educating for Human Development, Honoring Students as Individuals, The Central Role of Experience, Holistic Education, Freedom of Choice, Educating for a Participatory Democracy, Educating for Global Citizenship, Educating for Earth Literacy, and Spirituality and Education. These principles help structure contemporary education on the foundations of respect for each individual's uniqueness and the continuous, well-rounded development of all their potential capabilities.

Literature:

1. Basenko, R. (2023). Martin Luther and Philip Melanchthon: The idea of holistic education of the individual in the pedagogical teachings of the leaders of Protestant humanism. *Pedagogical Sciences: Theory, History, Innovative Technologies*, 4(128), 277–290.
2. Basenko, R. (2016). Renaissance virtues of the early modern individual in European youth initiatives of the Jesuit order. *Historical and Pedagogical Almanac*, 1, 15–18.
3. Basenko, R. (2022). The concept of research on the development of the idea of holistic education of the individual in European worldview systems of the early modern period. In *Didaskal: Journal: Materials of the International Scientific and Practical Conference "Reforming Higher Education in the Context of Ensuring Sustainable Development of Society,"* November 15–16, 2022 (pp. 38–41). Poltava National Pedagogical University named after V. H. Korolenko.
4. Basenko, R. (2016). The "conquerors of university chairs": Renaissance-humanistic concepts of the culture of pedagogical communication among the order's instructors of the Society of Jesus in the early modern period. In *World History in the Methodological Treasury of Graduate Students of the Faculty of History: Collection of Articles* (pp. 51–64). Poltava National Pedagogical University named after V. H. Korolenko; Hod, B. (Ed.).
5. Eco, U. (Ed.). (2020). *The history of European civilization: The Renaissance era. History. Philosophy. Science and technology* (translated from Italian). Kharkiv: Folio.
6. Hod, B. V. (2004). *Education in the era of the European Renaissance (Mid-14th to early 17th century)*. Poltava: ASMI.
7. Kalakura, Y., Rafalsky, O., & Yuriy, M. (2017). *The mental dimension of Ukrainian civilization*. Kyiv: Geneza.
8. Kotliarov, P. (2020). *Philip Melanchthon: The phoenix of the Reformation*. Kyiv: Duch i Litera.
9. Lacouture, J. (2011). *The Jesuits: In 2 volumes* (Vol. 1: Conquerors; translated from French by I. Dukh). Lviv: Svichado.
10. Mahmoudi, S., Jafari, E., Nasrabadi, H. A., & Liaghatdar, M. J. (2012). Holistic education: An approach for the 21st century. *International Education Studies*, 5(2), 178–186.
11. Yakovenko, N. M. (1997). Latin schooling and "school humanism" in Ukraine from the late 16th to the mid-17th century. *Kyiv Antiquity*, 1-2(315), 11–27.
12. Zema, V. (2021). *The Kyiv metropolis before the challenges of the Renaissance and the Reformation*. Kyiv: Krytyka.

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NEW FUNCTIONAL APPEARANCES OF STABLE EXPRESSIONS IN THE MEDIA TEXTS OF THE RUSSIAN-UKRAINIAN WAR PERIOD

^aMARYNA NAVALNA, ^bNATALIIA KOSTUSIAK,
^cOLEKSANDR MEZHOV, ^dVOLODYMYR OLEKSENKO,
^eTETIANA LEVCHENKO, ^fMARIIA LYCHUK, ^gOLESIA
 SKLIARENKO, ^hIRYNA POLIAK, ⁱYURI DRUZ, ^jGALYNA
 DRUZ

^aNational University of Life and Environmental Sciences of
 Ukraine, 15, Heroiv Oborony Str., 03041, Kyiv, Ukraine

^{b,c}Lesya Ukrainka Volyn National University, 13, Voli Ave,
 43025, Lutsk, Ukraine

^dKherson State University, 27, University Str., 73000, Kherson,
 Ukraine

^{e,g}Hryhorii Skovoroda University in Pereiaslav, 30,
 Sukhomlynsky Str., 08401, Pereiaslav, Ukraine

^fBorys Grinchenko Kyiv University, 18/2, Bulvarno-Kudryavska
 Str., 04053, Kyiv, Ukraine

^hKremenets Taras Shevchenko Regional Academy of Humanities
 and Pedagogy, 1, Litseyna Str., 47003, Kremenets, Ukraine

^{i,j}Kyiv National Economic University named after Vadym
 Hetman, 54/1, Beresteysky prospect, 03057, Kyiv, Ukraine

email: ^amnavalna@gmail.com, ^bkostusyak.nataliia@vnu.edu.ua,
^cmezhov.oleksandr@vnu.edu.ua,

^dvolodymyr.oleksenko@gmail.com,

^etanyalevchenko2010@ukr.net, ^fmlychuk@kubg.edu.ua,

^glesiaskliarenko.82@gmail.com, ^hkovalukjr2@gmail.com,

ⁱy.m.druz@gmail.com, ^jdgm2366@gmail.com

Abstract: In the scientific research, set expressions attested in the texts of modern Ukrainian mass media during the period of the Russian-Ukrainian war (2022-2024) were analyzed. We consider the corpus of collected material to be innovative, as the source base covers modern information platforms of various types and forms of ownership. In accordance with the formulated goal, the article investigates the functional features and reveals the parametric characteristics of set expressions in the language of modern mass media, and their transformational potential and stylistic role are clarified. Achieving the set goal appeared possible due to solution of the following tasks: 1) to characterize set expressions in the context of the modern linguistic paradigm; 2) to outline actual non-speech factors affecting the creation of transformed compounds; 3) to highlight the topics of publications that use stable expressions of different form and meaning; 4) to analyze negative-evaluative and expressive language units, attested in the language of the Ukrainian mass media in 2022–2024. It was found that proverbs, sayings, phraseological units, catchphrases, etc. function in the texts of modern mass media. The most stable expressions are presented in texts about the Russian-Ukrainian war, the leaders of Russia and Belarus. It was found that established phrases are actively used in publications about international relations, various problematic and conflict situations, economic, managerial and business affairs, less analyzed language units are recorded in the topics of sports and recreation, art and science, and in lay news. The dominant is formed by set expressions presented in academic and online dictionaries; new formations and transformed known expressions are quantitatively inferior to them. For the most part, established compounds indicate negative processes and actions, often negatively characterize famous persons. Expressiveness of Ukrainian mass media texts belongs to a number of functional features of the analyzed language units.

Keywords: set expression, phraseology unit, proverb, saying, catchphrase, mass media, media phraseology, extra-linguistic factors, stylistic role, negative evaluation, expression, lexical meaning, transformed phrase, modification, Russian-Ukrainian war.

1 Introduction

The diversity of modern researches of the journalistic text is due to its multifaceted expression, the unusualness of the stylistic presentation of information, and the peculiarities of language resources. The intensive development of the media language serves as a prerequisite for the actualization of a number of issues, among which a prominent place belongs to stylistic certainty, classification of language units, efficiency of presentation and interpretation of new lexemes in dictionaries, the advantages of prescriptive or descriptive norms, the balance of logicalization of the presentation with emotional and expressive coloring, genre differentiation, etc. All this points to the need for multifaceted studies of the language of Ukrainian mass media. In this aspect, the study of set expressions that function in the information space and form a peculiar linguistic phenomenon seems to be relevant.

Researchers consider modern established language units as a multifaceted phenomenon in the semantic and stylistic sense and

from the standpoint of the development of language communication: as a type of language stylistics, phraseology, verbal code, functional resource. New scientific challenges for 21st century phraseology are formed under the influence of the communicative evolution of its main object – phraseology unit (and neo-phraseology unit, if we are talking about modern trends in language development) [18]. Ukrainian linguists analyze fixed expressions in various aspects, in particular in the context of phraseology, stylistics, functional lexicology, etc. The interpretation of stable expressions in the modern communicative space also takes place within the boundaries of new linguistics areas - ecolinguistics, ethno-linguistics, linguistic and cultural studies, political linguistics, etc. Recently, persistent expressions have actively penetrated the mass media, which is a prerequisite for their study in the field of media linguistics. We would like to add that various aspects of this linguistic direction have repeatedly been the object of scientific research [1; 5; 7; 8; 9; 10; 11; 15; 16; 19; 20, etc.], but the phraseological space was either neglected or considered fragmentarily. Determining the qualification parameters of media resources, scientists point to their openness and democracy, on the one hand, and the corresponding unification, codification, stereotyping, and systematicity of language units, on the other. This is associated with the consistent (and natural for developed media cultures) intellectualization of the Ukrainian literary language [14], which in modern times is changing mass media orientations towards total media reality and information consumerism [18].

The specified qualification parameters, as well as a number of other features, were taken into account by the researcher of media phraseology D. Yu. Sizonov, who proposed the concept of a comprehensive study of the functional and stylistic possibilities of media phraseology in the Ukrainian-speaking space, which correlates with the dynamic processes of the development of public communication. What is new in the linguistic paradigm of the scientist is the involvement of the concept of media phraseology in metalanguage - a verbalized representative and objectifier of media meanings, characterized by semantic integrity, precedent and intertextuality, the ability to structural transformations in order to influence the recipient and manipulate his consciousness [18, p. 2]. In the innovative paradigm of modern linguistics, D. Sizonov considered new stable units that arise as a verbal reflection on social changes. The researcher managed to determine the system characteristics of neophraseology, among which there are stable reproducibility in the media, established semantics, mass circulation in the mass media, recognition by the mass recipient, precedent phenomenonality, media invariance, universality for media use, media expressiveness, emotionality, evaluability. D. Sizonov considered new media phraseology in various communicative spheres - political, business, advertising, cross-cultural, which are indicative of the functional capabilities of the studied units [18, p. 5]. A number of unanimous ideas are expressed by M. Navalna and O. Spis. Analyzing the language of modern media in the context of external factors and functional potential, the researchers quite motivatedly emphasize that during the war there is a need for the revival of "old" slogans and phraseological compounds and the emergence of new ones, which, performing voluntary and identification functions, have the ability not only to "to connect, but also to carry powerful spiritual energy" [11, p. 40]. We consider the methodological principles mentioned by scientists to be promising for a comprehensive study of phraseological units attested in newspaper journalism during the active phase of the Russian-Ukrainian war.

The purpose of the article is to investigate the functional and parametric features of stable expressions in the language of modern mass media, to find out their transformational potential and stylistic role. Achieving the set goal involves solving the following tasks: 1) to characterize stable expressions in the context of the modern linguistic paradigm; 2) to outline relevant

non-verbal factors affecting the creation of transformed compounds; 3) to highlight the topics of publications in which stable expressions of different form and meaning are used; 4) to analyze the negative evaluative and expressive formations that function in the language of the Ukrainian mass media in 2022-2024.

2 Materials and Methods

Modern information platforms of various types and forms of ownership during the active phase of the Russian-Ukrainian war served as the source base of the research. The corpus of stable compounds built on their basis covers more than 100 units, represented in about 5000 previously unanalyzed sentence constructions, which, in our opinion, highlights the innovativeness of the article.

It was possible to achieve the set goal and complete the task with the help of the following research methods: descriptive, which made it possible to systematize and classify set expressions selected from mass media texts; the method of complex analysis, which made it possible to study established and modified phrases in the semantic aspect; the method of contextual semantic analysis, which made it possible to characterize the selected statements in terms of contextual environment and semantic specificity; method of component analysis applied to the study of some characteristics of resistant units.

3 Results and Discussion

The topic of the Russian-Ukrainian war remains relevant in modern mass media for a long time. Ukrainian defenders heroically defend their native land, restrain enemy attacks and often win at the cost of their lives. Of course, this news is the first in informational messages. At the same time, some politicians and political parties use military actions for their own PR. In addition, there will always be people for whom war is not a grief, but earnings and privileges. To describe such phenomena in society, journalists use the proverb “*кому війна, а кому мати рідна*” (“*to whom is war, and to whom is native mother*”), which serves as a means of contrasting people who participate in hostilities or actively help their country, and those who are looking for a way to earn money. E.g.: *Геннадій Мазур: Можна сказати, що приказка «Кому війна, а кому мати рідна», яка означає, що завжди знайдуться люди, для яких війна обертається не болем, а благом, як і раніше актуальна (Gennady Mazur: We can say that the saying “To whom is war, and to whom is native mother”, which means that there will always be people for whom war is not a pain, but a blessing, is still relevant today)* (<https://33kanal.com>, April 19, 2023). In the language of modern mass media, the analyzed established expression is quite widely used not only in the all-Ukrainian, but also in the regional mass media: *Кому війна, а кому мати рідна, чи скільки коштують послуги Держспоживслужби для бізнесу під час війни (To whom is the war, and to whom is the native mother, or how much do the services of the State Consumer Service cost for business during the war)* (<https://www.porada.zp.ua>, May 4, 2023). In some places, the authors of the publications use a shortened version of the analyzed expression, which indicates its recognition by native speakers, although at the same time it may cause difficulties in the perception of information for foreign consumers of information. E.g.: *Корупція: кому війна – мати рідна? Що нині з корупцією на Кіровоградщині (Corruption: Whose mother is war? What is the current situation with corruption in Kirovohrad Oblast)* (<https://cbn.com.ua>, October 31, 2022). Focusing attention on the subject of the texts in which the studied proverb is attested, we note that it is found in publications about corruption schemes in the state during the war, about unfair ‘rules of the game’ in business and in other social institutions, e.g.: *Кому війна, кому мати рідна: що відбувається на ринку житла у Києві (headline). Фахівці кажуть, що максимального падіння цін ще не відбулося (To whom is the war, to whom is the mother native: what is happening in the housing market in Kyiv (headline). Experts say that the maximum drop in prices has not yet occurred)*

(<https://apostrophe.ua>, June 19, 2022). In media publications, established expressions play an important communicative and pragmatic role. Emphasizing on their parametric characteristics and functions, V. Kalko quite motivatedly states: “Paremia is a complete speech sign reproduced by the speaker in a finished form, which gives grounds to qualify it as a speech act, that is, a purposeful speech action. A proverb, on the one hand, is an intentional unit, since it is endowed with a corresponding intention, and on the other hand, it is a conventional unit, since it is built according to the rules of speech behavior of the ethnic group. The most frequent among paremias as speech acts are representative ones, because they implement certain situations, represent a ready-made picture of the environment in which a Ukrainian must live, help him orient himself in various life circumstances” [4, p. 41].

In terms of semantics and negative evaluation, the proverb analyzed above is dominated by the fixed expressions “*бізнес із запахом крові, бізнес на крові*” (*business with the smell of blood, business on blood*), cf.: *Бізнес із запахом крові (headline) (“Business with the smell of blood (headline)”)* (<https://business.rayon.in.ua>, July 20, 2022); *Бізнес на крові. Грандіозне весілля сій Амбані: як індійські мільяртери пов’язані з Росією (Business is in the blood. The grand wedding of the Ambani family: how Indian billionaires are connected to Russia)* (<https://finance.24tv.ua>, July 26, 2024).

The lexeme *коаліція* (*coalition*) is “an association, union, agreement of states, parties, etc. to achieve a common goal” [2, IV, p. 200] - most of the phrases include party coalition, deputy coalition, etc. During the Russian-Ukrainian war, we record new expressions structured by this noun, in particular, drone coalition, artillery coalition, e.g.: *«Коаліція дронів»: Канада долучиться до міжнародної допомоги безпілотниками Україні (“Drone coalition”: Canada will join international drone assistance to Ukraine)* (<https://umoloda.kyiv.ua>, March 8, 2024); *«Артилерійська коаліція»: Франція щомісяця постачатиме 50 авіабомб Україні (“Artillery Coalition”: France will supply 50 aerial bombs to Ukraine every month)* (<https://umoloda.kyiv.ua>, January 18, 2024). Selected stable expressions denote informal associations of countries that help the Ukrainian army with weapons, equipment, etc. A synonym for the phrase “drone coalition” is the expression *армія дронів* (*army of drones*), cf.: *«Армія дронів»: на фронт відправлено тисячі підготовлених операторів БПЛА (“Army of drones”: thousands of trained UAV operators have been sent to the front)* (<https://umoloda.kyiv.ua>, September 8, 2023).

In the language of modern Ukrainian mass media, established phrases with the subordinate adjective *воєнний* (*military*) have been added, e.g.: *воєнні рейки, воєнна машина (military rails, military machine)*, etc.: *Україна не СРСР, щоб повністю переводити економіку на «воєнні рейки» – Данілов (Ukraine is not the USSR, in order to completely transfer the economy to “military rails” – Danilov)* (<https://umoloda.kyiv.ua>, November 11, 2023); *Воєнні рейки для української, американської та російської економік (Military rails for the Ukrainian, American and Russian economies)* (<https://tyzhden.ua>, April 22, 2024); *У Болгарії закидають Угорщині та Сербії живлення «воєнної машини» Кремля (In Bulgaria, Hungary and Serbia are feeding the Kremlin’s “war machine”)* (<https://umoloda.kyiv.ua>, October 18, 2023). Usually, the analyzed stable expressions are used in materials on economic subjects, in publications about the priorities of spending funds, in particular, on military needs.

During the period of military operations on the territory of Ukraine, journalists actively use the phraseology *вирушити в останній путь* (*to go on the last journey*) with the meaning “to die” [12, p. 102], e.g.: *В останню путь провели воїна Юрія Глодана, який загинув на фронті у вересні минулого року (https://life.pravda.com.ua, February 23, 2024); У Білгород-Дністровському районі проводять в останню путь захисника України Циброва Олега.* Usually, the analyzed phraseology unit functions in the context of Ukrainian soldiers who died in the war.

In the meaning of “to die”, the authors use the updated stable expression *квитки на концерт Кобзона* (tickets to the Kobzon concert), but addressed to the enemies, cf.: *Доставка квитків на «концерт Кобзона» – чітко за графіком: спецпризначенці до смерті заганяли російську піхоту* (Delivery of tickets to the “Kobzon concert” - clearly on schedule: special forces drove Russian infantry to death) (<https://novynarnia.com>, December 16, 2023); *Втрати РФ в Україні: за тиждень ЗСУ відправили на концерт Кобзона понад 8 тисяч окупантів* (Losses of the Russian Federation in Ukraine: in one week, the Armed Forces of Ukraine sent more than 8,000 occupiers to the Kobzon concert) (<https://www.unian.ua>, June 9, 2024). We trace the persistence of the trend towards the active use of the persistent phrase Kobzon’s concert, which means “the physical destruction of the Russian occupiers, and their symbolic joining to the late Russian singer. It can also be used as a threat or a curse, such as: hurry up to go to Kobzon’s concert” [10, p. 138]. The active use of the analyzed phrase-euphemism can be considered a Ukrainian aphorism, an idiom emphasizing the death of Russian soldiers and other figures. D. Sizonov considers such phraseology as a means of implementing the technique of laconism in the language of the mass media, which “presupposes the use of phraseological units in the media text to save linguistic effort. Several used phraseological units in the text help to compress the informational message and, thereby, place semantic accents. Such construction of the text does not require the involvement of a large number of phraseological units, it is sufficient to use one media phraseological unit in the title and one or two to strengthen the emotional impact - in the lead of the media text” [18, p. 288-289]. We agree that the phrase “tickets to the Kobzon concert” is indeed a laconic and emotionally charged media formation, typical of texts written by Ukrainian journalists.

Expressions with the lexeme *бумеранг* (boomerang) were activated in journalism during the period of the Russian-Ukrainian war. In the dictionary, it is interpreted as “a throwing weapon of Australian tribes, which has the shape of a bent stick, that itself returns to the one who threw it” [2, I, p. 255], and now used with an indication of “the return of anything to the one who caused this or that”, e.g.: *Бумеранги путіна. Як горить і тоне «непереможна Росія»* (Putin’s boomerangs. How “invincible Russia” burns and sinks) (<https://www.pravda.com.ua>, February 28, 2022). In addition to the analyzed expression, in the language of the mass media, the authors use the phrase *ефект бумеранга* (boomerang effect) to denote a backlash, when an attempt to influence leads to the opposite effect than was planned or desired. In the studied contexts, this statement refers to military explosions in the Russian Federation as a response to military actions in Ukraine, e.g.: *Ефект бумеранга спрацював – у Москві вибухи! Ситуація на фронтах* (The boomerang effect has worked - there are explosions in Moscow! The situation on the fronts) (<https://tsn.ua>, March 6, 2023).

In the language of Ukrainian media publications devoted to the topic of war, we come across the phraseology unit *два чоботи пара* (a pair of boots) “similar to each other in some (trans. negative) features, views, position in society, etc.; worth each other” [13, p. 949], e.g.: *Два чоботи пара: Кім повністю підтримує війну РФ в Україні* (<https://umoloda.kyiv.ua>, June 20, 2024). This is how journalists compare countries that support the Russian Federation in the war against Ukraine.

In the body of the selected material, we single out the construction *дати добро*, which means “to approve, to support; to agree, to agree, to agree; allow”. E.g.: *КМУ дав «добро» на закупівлю українських дронів ЧЕРЕЗ PROZORRO* (<https://umoloda.kyiv.ua>, July 4, 2024); *Нідерланди дали «добро» на експорт винищувачів F-16 в Україну* (<https://umoloda.kyiv.ua>, July 2, 2024). We believe that the use of this phrase distorts the language of the Ukrainian mass media, we recommend the authors to use other variants of tokens.

The persistent expression *верхівка айсберга* (the tip of the iceberg) with an indication of “difficulties or problems that are part of a much bigger problem” was activated in the analyzed

period in contexts about Russian spies, various types of violence, etc. E.g.: *«Верхівка айсберга»: зростання активності російських шпигунів турбує європейські столиці* (<https://bintel.org.ua>, March 30, 2022); *Це лише верхівка айсберга. ООН зафіксовано 124 випадки сексуального насильства з початку повномасштабного вторгнення* (<https://espreso.tv>, July 10, 2022); *Новітня Мата Харі російсько-української війни - верхівка айсберга чи безодня шпionageу? (The newest Mata Hari of the Russian-Ukrainian war - the tip of the iceberg or the abyss of espionage?)* (<https://surma.com.ua>, November 8, 2023); *Колишні військові про витік даних до Росії: «Це лише верхівка айсберга»* (<https://www.unian.ua>, March 5, 2024); *Заколот Пригожина був вершиною айсберга: у ГУР розповіли про «бродіння» в армії РФ (Prigozhin’s mutiny was the tip of the iceberg: the GUR told about “roaming” in the Russian army)* (<https://tsn.ua>, July 20, 2023) and others. Let us note that the phrase tip of the iceberg is usually used in relation to negative processes and various problems in the context of the Russian-Ukrainian war.

Among the corpus of persistent phrases, we single out the active use of the expression *брудні гроші* (dirty money), which, according to T.I. Prudnykova’s observations, in the active pre-war period dominated newspaper publications on economic topics [14, p. 151-152]. In the language of modern mass media, the persistent expression *брудні гроші* is used in the context of the Russian-Ukrainian war, illegal actions of the Russian Federation, reimbursement of war expenses, etc., see: *Британські депутати: потік «брудних грошей» з РФ у Британію не сплинея попри війну* (British MPs: the flow of “dirty money” from the Russian Federation to Britain did not stop despite the war) (<https://www.pravda.com.ua>, June 30, 2022); *Передачу Україні брудні гроші росіян: як це планують робити в Європі* (Transfer the Russians’ dirty money to Ukraine: how it is planned to be done in Europe) (<https://www.eurointegration.com>, April 6, 2023); *Російські брудні гроші та пропаганда відзначились і на молдовських місцевих виборах* (Russian dirty money and propaganda were also noted in the Moldovan local elections) (<https://zahidfront.com.ua>, November 7, 2023), and others.

In this vein, D. Sizonov examines common language units in the modern information space, such as *біла – сіра – чорна економіка; чиста – сіра бухгалтерія* (white - gray - black economy; pure - gray bookkeeping), which in the linguist’s concept received the status of media phraseology units. According to the scientist, their use in the media space is a subjective process and is used with accents “necessary” for a journalist [18, p. 144].

In the media texts, the widespread use of the stable phrase *підлити масла у вогонь* (to add fuel to the fire) with the established meaning “to strengthen, inflame, arouse a certain feeling, experience, dispute, etc.” is recorded [3, p. 634]. The main topics of such publications are military actions, negotiation processes regarding the Russian-Ukrainian war, issues of interstate relations, etc.: *Іран, покровитель ХАМАС, лише хоче підлити масла у вогонь хаосу. Росія – покупець зброї в Ірану – уважно за цим спостерігає* (<https://www.pravda.com.ua>, October 20, 2023); *Речник Міністерства закордонних справ Китаю Лін Цзянь порадив НАТО «не підливати масла у вогонь» щодо російсько-української війни* (<https://www.pravda.com.ua>, June 18, 2024); *Не підливати масла у вогонь: як медіа об’єднують громади, розповідаючи про конфліктні теми, зокрема війни* (<https://cje.org.ua>, April 3, 2023); *«Не підливати масла у вогонь»: Китай хоче зберегти відносини і з Україною, і РФ* (“Don’t add fuel to the fire”: China wants to preserve relations with both Ukraine and the Russian Federation) (<https://focus.ua>, May 9, 2023).

Sometimes, in the language of the Ukrainian mass media we come across an option *підливати олію у вогонь*, e.g.: *«Не підливати олії в вогонь»: Китай чекає, що США сприятимуть переговорам РФ і України* (<https://www.pravda.com.ua>, March 27, 2023). Let us note that

the “Phraseological Dictionary of the Ukrainian Language” records both options, in particular, the obsolete forms *підливати оливи в вогонь*, *підливати лою в вогонь* [13, p. 634]. The last options were not recorded among the corpus of the collected material.

Under the influence of non-speech factors, the persistent expression *відкрити скриньку Пандори* (to open Pandora's box) became relevant – “to take an action with irreversible consequences that cannot be undone” [3]. In the context of the Russian-Ukrainian war, the indicated phrase characterizes the head of the Russian Federation, Vladimir Putin, the representative of Hungary, Viktor Orban, etc., cf.: *Путін відкрив «скриньку Пандори», напавши на Україну – президент парламенту Австрії (Putin opened “Pandora's box” by attacking Ukraine - President of the Austrian Parliament)* (<https://www.ukrinform.ua> July 7, 2024); *Путін запуснув у Європі свої «консерви», Орбан ризикував відкрити скриньку Пандори...* (<https://www.obozrevatel.com>, December 15, 2023); *Конфіскація заблокованих у Європі російських активів може «відкрити скриньку Пандори» і призвести до падіння довіри інвесторів (The confiscation of Russian assets blocked in Europe can “open Pandora's box” and lead to a drop in investor confidence)* (<https://glavcom.ua>, May 8, 2024). The use of the established expression *відкрити скриньку Пандори* proves that the Russian-Ukrainian war has caused a number of problems not only for the two participants in the conflict, but also for a number of countries, business structures, etc.

From among the collected language material, we single out examples with a persistent expression *авгієві стайні* (Augian stables) – “an extremely polluted place, a great mess or extremely neglected and confused affairs” [3]. For the most part, it is found in articles about the work of territorial centers for recruiting the military, Russian spies, etc., e.g.: *Авгієві стайні «військокоматів»* (headline) (Augian stables of “military commissariats” (headline)) (<https://weukraine.tv>, August 14m 2023); *У 2022 році вільне життя кремлівських шпигунів у Європі завершилося. Насамперед європейці наважилися почистити авгієві стайні російських посольств. У 2022 році з країн НАТО було видворено 600 чиновників РФ, 400 з них були шпигунами під дипломатичним прикриттям* (<https://news.telegraf.com.ua>, August 11, 2024). Sometimes, we come across the use of the analyzed expression in publications about transport collapses in big cities, cf.: *Авгієві стайні у центрі Львова: не проїти, не проїхати, не припаркуватись* (<https://www.032.ua>, August 9, 2024).

Many Ukrainian proverbs testify to the need to gather together, to make efforts for big, difficult, as well as pleasant things: *добре там живеться, де гуртом сіється й ореється; в гурті робити – як із гори бігти; гуртом можна і море загатити; гуртом і каша краще їється; в гурті і комар сила*, etc. Among such constructions we also include the persistent expression *гуртом і батька легше бити* (it is easier to beat a father in a group), recorded in the language of the mass media both in the context of war and civil affairs, cf.: *Гуртом і батька легше бити. Максим: Не хочуть іти, який інший варіант – капітуляція? Ми не можемо війну наполовину виграти* (<https://umoloda.kyiv.ua>, May 1, 2024); *Гуртом й батька легше бити, або Як в Україні побудувати бібліотечну справу (It is easier to beat a father in a group, or How to build a library business in Ukraine)* (headline) (<https://ukurier.gov.ua>, September 30, 2022), and others.

Under the influence of non-verbal factors, in particular the cessation of grain transportation due to military actions, the adjective *зерновий* (grain) has been actualized in the language of the Ukrainian mass media, which forms a number of stable expressions: *зерновий коридор*, *зернове питання*, *зернова угода* (grain corridor, grain issue, grain agreement), etc., e.g.: *Україна пропонує Туреччині відновити зерновий коридор без РФ (Ukraine offers Turkey to restore the grain corridor without the Russian Federation)* (<https://umoloda.kyiv.ua>, September 7, 2023); *Ти мені – я тобі: ООН пропонує РФ*

продовжити «зернову угоду» в обмін на підключення одного з банків до SWIFT (<https://umoloda.kyiv.ua>, July 13, 2023), and others. The importance of the so-called “grain issue” and the difficulty of solving it are expressed using the expression *зерновий коридор затемнень* (grain corridor of eclipses), e.g.: *Зерновий «коридор затемнень»: чи зможе Україна експортувати збіжжя після виходу Росії з угоди (Grain “corridor of eclipses”: will Ukraine be able to export grain after Russia's withdrawal from the agreement)* (<https://umoloda.kyiv.ua>, July 30, 2023).

With the noun *коридор* (“corridor”), expression *зелений коридор* (green corridor) is fixed, which means “a channel of simplified customs control, intended for Ukrainians who carry goods that are not subject to taxation and declaration and are outside the limits of the prohibition”. In the corpus of the actual material, the expression *green corridor* indicates a partial modification, as it means “permission to import medicines, food products, hygiene items, etc. to the occupied territories”, e.g.: *Що таке зелений коридор та чому Україна про нього просить (What is the green corridor and why is Ukraine asking for it)* (<https://vikna.tv>, March 6, 2022). Thus, it is not about crossing the border between states, but about the possibility of delivering humanitarian aid to Ukrainians and taking people to safe places.

The famous expression *скелет у шафі* (skeleton in the closet) was introduced by the English writer William Thackeray in the novel “The Newcomes” (1853-1855). The expression denotes “spiritual secrets, personal secrets of a person, certain facts carefully hidden from outsiders, events that, if they are made public, can cause significant damage to the reputation” [3]. Ukrainian journalists use the analyzed compound regarding the plans of the Russian Federation in the war with Ukraine, as well as in texts about the national relations of other countries, cf.: *«Скелет у шафі»: ЗС РФ прорвались в Очеретине майже без бою, – DeepState (“Skeleton in the closet”: the Russian Armed Forces broke through to Ocheretin almost without a fight, - DeepState)* (<https://focus.ua>, June 10, 2024); *У Польщі скелет невизнаної колонізації досі у шафі (In Poland, the skeleton of unrecognized colonization is still in the closet)* (<https://espresso.tv>, March 1, 2024), etc.

The expression *точка кипіння* (boiling point) is well-known: “1. The temperature at which a substance begins to change into a gaseous state. 2. The moment when the calm state of things is lost” [3] - in the language of mass media, it is used with the second figurative meaning, e.g.: *Точки кипіння і донні міни: головні воєнні новини (Boiling points and bottom mines: the main military news)* (<https://umoloda.kyiv.ua>, June 25, 2024).

In the topic of military conflicts, journalists use stable expressions *чорний день* (dark day) – “probable period of time when any situation around can be terrible”, *судний день* (doomsday) – “decisive day in this or that case, event, etc.”, etc., cf.: *Чорний день російської авіації: за добу ПКС РФ втратили 4 борти (Black day of Russian Aviation: the Russian Air Force lost 4 aircraft during the day)* (<https://mil.in.ua>, May 13, 2023); *50 років тому Ізраїль виграв війну судного дня проти Єгипту і Сирії. Ця перемога стала поразкою для прем'єрки Голди Меїр і дипломатичним тріумфом для єгиптян (50 years ago, Israel won the doomsday war against Egypt and Syria. This victory was a defeat for Prime Minister Golda Meir and a diplomatic triumph for the Egyptians)* (<https://babel.ua>, October 16, 2023). It is obvious that the analyzed phrases are used with a negative evaluation, they indicate processes and events that are important in the relevant time period.

With the adjective *чорний* (black), we fix the persistent expression *чорний список* (blacklist) – “a list of people (organizations, settlements, etc.) who, for one reason or another, are denied certain privileges, access, service or recognition. To add to the black list means to prohibit someone from working in a specific environment or remove someone from a certain social circle” [3]: *Україну викреслили з корупційного «чорного списку» GRECO (Ukraine was removed from the GRECO*

corruption “black list”) (<https://umoloda.kyiv.ua>, March 24, 2023); «Весна покаже»: Софія Стужук так нічого і не зрозуміла й приєрилася тим, хто вніс її до «чорного списку» (“Spring will show”: Sofia Stuzhuk did not understand anything and threatened those who put her on the “black list”) (<https://news.obozrevatel.com>, March 23, 2022). Among the less productive, there is the compound чорна «Рада» (black “Rada”), used in the context of a TV channel that has a negative reputation, e.g.: **Чорна «Рада»**. Що члени забороненої ОПЗЖ роблять у «Єдиних новинах»? (Black “Rada”. What do the members of the banned OPZH do in “Yediny noviny”?) (<https://www.pravda.com.ua>, September 27, 2022). In the above statement, we trace the allusion to the title of Panteleimon Kulish’s famous novel “The Black Council”. We note that the use of the lexeme чорний (black) in persistent phrases primarily indicates pejorative characteristics of the persons, institutions, and organizations in question.

With the mentioned adjective in the texts of trade and marketing topics, journalists use the well-known expression чорна п’ятниця (Black Friday) – “the day when retail stores have a massive sale of various goods with huge discounts” [3], e.g.: **Чорна п’ятниця-2023: як купувати швидко, екологічно й не витратити зайвого** (Black Friday-2023: how to buy quickly, ecologically and not to spend too much) (<https://www.pravda.com.ua>, November 23, 2023). We also fix the phrase чорний маркетолог (black marketer) – “the one who conducts dishonest policy towards customers”, e.g.: **Чорна п’ятниця чорних маркетологів** (headline). ЕП дослідила, як інтернет-магазини облаштували «чорну п’ятницю», щоб спокушати українців до купівлі товарів (Black Friday of black marketers (headline). The European Parliament investigated how online stores organized “Black Friday” to tempt Ukrainians to buy goods) (<https://www.epravda.com.ua>, November 24, 2023). Journalists especially condemn the behavior of dishonest marketers during the war, cf.: **«Чорна п’ятниця» під час війни: чесний розпродаж чи обман для спустошення гаманців** (“Black Friday” during the war: honest sale or deception to empty wallets) (<https://www.unian.ua>, November 21, 2023).

Antonyms for the adjective чорний (black) include not only the adjective білий (white), but also the adjective чистий, прозорий (clean, transparent), which are part of stable phrases used in the language of the mass media, e.g.: white business – “entrepreneurs, organizations, institutions that comply with current tax legislation”; clean business – “environmental business or obvious profit”; transparent business – “conducting an open policy of the company’s activities”, see: **Нові податкові пастки: як правила гри змінюють майбутнє «білого» та іншого бізнесу** (headline) (<https://fact-news.com.ua>, July 1, 2024); Зелений бізнес відомий як екологічно чистий бізнес або бізнес, який надає пріоритет стійкості та екологічній свідомості (<https://www.doola.com>, April 26, 2023); Франшиза автомобілки самообслуговування: чистий бізнес без ризиків (<https://washercar.ua>, February 16, 2024); Прозорий бізнес та відбудова України: чи є шанси для масштабування під час війни? (headline) (<https://www.tpp.pl.ua>, October 26, 2023).

The authors of publications treat the political leaders Vladimir Putin and Alexander Lukashenko with frank disdain and a negative assessment, calling them політичні трупи (political corpses) – “unpromising political figures” [4], cf.: **Путін тримає біля голови політичного трупа Лукашенка заряджений пістолет – військовий експерт** (Putin holds a loaded gun near the head of Lukashenko’s political corpse - a military expert) (<https://tsn.ua>, July 4, 22); **Путіна перетворили на політичний труп, а для нього це як фізична смерть, – юристка про ордер на арешт президента РФ** (Putin was turned into a political corpse, and for him it is like physical death, – a lawyer on the arrest warrant of the Russian president) (<https://espresso.tv>, March 17, 2023); **Путін перетворив себе на політичний труп, а українці йдуть до перемоги** (Putin turned himself into a political corpse, and Ukrainians are going to victory) (<https://24tv.ua>, February 28, 2022); **Чому найвідоміший «політичний труп» послібно повернувся у владне крісло?** (Why the most famous “political corpse” returned to the office?) (<http://t-weekly.org.ua>, August 21, 2023); **Рішення Міжнародного кримінального суду щодо ордеру на арешт**

Володимира Путіна надзвичайно сміливе – його перетворили на політичний труп (The decision of the International Criminal Court regarding the arrest warrant for Vladimir Putin is extremely bold - he was turned into a political corpse) (<https://patriot.org.ua>, March 17, 2023). D. Yu. Sizonov notes that the attributive unit політичний (political) gives rise to a number of new media phraseology of a pejorative nature, among which політичний труп (political corpse) is “about a politician / party that is losing the rating of public trust...”. The use of such compounds creates a negative impression on the electorate and can be used to form a negative image of a politician [18, p. 209]. According to T. Kovalevska, the role of pejorativeness is played by sensory-defined lexemes, “which correspond to a certain representative system of the speaker in terms of semantic orientation and are, thus, its verbal markers” [6, p. 72]. The authors of Ukrainian media texts unequivocally consider the leaders of the aggressor state and the state that supports the Russian-Ukrainian war to be politicians without a future and condemn their actions.

In journalistic materials on substantive political topics for modeling behavioral stereotypes of the leaders of powers, usually Volodymyr Putin, other persistent expressions are used, in particular, **вийти сухим із води** (to get out of the water dry) – “to avoid punishment” [4], cf: **Держсекретар наголосив, що якщо США дозволять Путіну вийти сухим з води та послабити допомогу Києву, тоді Вашингтон відкриє скриньку Пандори** (<https://www.pravda.com.ua>, January 17, 2024).

More often in the language of the mass media, we record the phrases **натиснути на кнопку, натиснути на червону кнопку** (press the button, press the red button), etc., which mean “to start a nuclear war”, for example: **Ядерний удар РФ: чи може Путін натиснути на «червону кнопку»?** – BILD (Nuclear strike of the Russian Federation: can Putin press the “red button”?) – BILD) (<https://uainfo.org>, April 29, 2024); **Що таке «ядерна валіза» і чи може Путін просто натиснути на кнопку** (What is a “nuclear suitcase” and can Putin simply press a button) (<https://kl.informator.ua>, March 13, 2022). In connection with the beginning of the Russian-Ukrainian war, there was a threat of the use of other types of weapons by the Russian Federation, which caused the use of the specified stable expressions.

Under the influence of non-verbal factors, new compounds with the surnames of famous people have been formed, e.g.: **залізний Байден, група Залужного, вишка Бойка** (Iron Biden, Zaluzhny’s group, Boyko’s tower), etc., cf.: **«Залізний» Байден: президент США не зніматиметься із виборів** – REUTERS (<http://umoloda.kyiv.ua>, July 4, 2024); **«Групу Залужного» штурно звинуватили в усіх гріхах – політична експертиза** (<https://umoloda.kyiv.ua>, July 3, 2024); **«Вишки Бойка» повернуто під контроль України** – ГУР (<https://umoloda.kyiv.ua>, September 11, 2023).

In the corpus of the selected material, a significant part is presented by persistent expressions **пасти задніх** – “to lag behind, to be late, to be behind everyone, the last, to fall behind or to be inferior in something” [3], **тримати язик за зубами** – “keep silent” [3], **дати на горіхи** – “to scold strongly, scold a lot, criticize someone” [3], e.g.: **Не хоч пасти задніх і Еммануель Макрон. «Росію принижувати не можна», – нещодавно знову наголосив він** (<https://www.pravda.com.ua>, July 22, 2022); **Я щиро вірю, що Німеччина має не пасти задніх, а очолювати євроатлантичні заходи для припинення наймасштабнішої війни в Європі...** (<https://tyzhden.ua>, February 8, 2023); **Тімоті Уш: Я щиро вірю, що Німеччина має не пасти задніх, а очолювати євроатлантичні заходи для припинення наймасштабнішої війни в Європі** (<https://www.pravda.com.ua>, February 8, 2023); **Бельгійський прем’єр порадив Орбану «тримати язика за зубами»** (<https://tsn.ua>, December 14, 2023); **ЗМІ: На зустрічі послів ЄС Угорщині дали на горіхи за «мирні вояжі» Орбана** (<https://www.pravda.com.ua>, July 10, 2024). The analyzed phraseological units usually function in the contexts of the

activities of individual political figures or the positions of states regarding the Russian-Ukrainian war. This potential is also revealed by the phraseological unit of *розв'язати руки* (*untying one's hands*) – “to give freedom to actions, to be freed from dependence, limitations in anything” [3], e.g.: *Постачання Росією високоточної зброї КНДР «розв'язе руки» Сеулу в допомозі Україні* (*Russia's supply of high-precision weapons to the DPRK will “untie the hands” of Seoul in helping Ukraine*) (<https://umoloda.kyiv.ua>, July 23, 2024).

The well-known saying *дуже важко шукати чорну кішку у темній кімнаті, особливо, коли її там немає* (*it is very difficult to find a black cat in a dark room, especially when it is not there*), is attributed to the Chinese philosopher Confucius. In the language of the Ukrainian mass media, this expression is fixed in the topic of international relations during the Russian-Ukrainian war, for example: *Не треба шукати чорну кішку у темній кімнаті, особливо якщо її там немає* (headline). *Голова КНР Сі Цзінпін прилетів до Москви й провів першу зустріч з президентом рф володимиром путіним. На ній вони обмінялись компліментами та мимохідь згадали про війну в Україні – швидше за все, це було своєрідним ритуалом, що мав підкреслити миролюбні плани Цзінпїна. Підіб'ємо підсумки першої зустрічі та обговоримо, чого можна чекати далі* (*You should not look for a black cat in a dark room, especially if it is not there* (headline). *The President of the People's Republic of China, Xi Jinping, flew to Moscow and held his first meeting with the President of the Russian Federation, Vladimir Putin. On it, they exchanged compliments and casually mentioned the war in Ukraine - most likely, it was a kind of ritual that was supposed to emphasize the peace-loving plans of Jinping. Let us sum up the results of the first meeting and discuss what to expect next*) (<https://wz.lviv.ua>, March 21, 2023).

Stable phrases are recorded not only in relation to the activities of states and politicians, but also in relation to the Pope, for example: *білий прапор* (*a white flag*) – “a request or demand for the cessation of hostilities, a sign of truce or proposals for negotiations. It is also a symbol of capitulation, i.e. unconditional submission to the mercy of the opposing side” [3], cf.: *Нагадаємо, Папа Римський Франциск, говорячи про війну, сказав, що Україна повинна мати «відвагу білого прапора» і бути готовою вести переговори* (*Let us remind that Pope Francis, speaking about the war, said that Ukraine should have the “courage of a white flag” and be ready to negotiate*) (<https://www.pravda.com.ua>, March 11, 2024).

In the same topic, we find a stable expression *човникова дипломатія* (*shuttle diplomacy*) – “a method of intervention, when the parties to the conflict do not meet and do not directly communicate with each other (they do not want to communicate or interact with each other), communication occurs exclusively through mediation, which promotes the search for understanding, and tries to bring closer (direct) the positions of the parties to the resolution of the conflict” [3], e.g.: *«Човникова дипломатія» Китаю: чого чекати від другої місії спецпосланця Пекіна* (<https://www.ukrinform.ua>, July 19, 2024).

The topic of the Russian-Ukrainian war is quite widely presented in the language of the Ukrainian media. Established compounds characterize various situations and events caused by military actions in Ukraine, e.g.:

- *каламутити воду* (*to muddy the water*) – “to cause disorder, unrest” [4], e.g.: *Що буде з квартирами у Лисичанську? Окупанти намагаються каламутити воду... (What will happen to the apartments in Lysychansk?: The occupiers are trying to muddy the water...)* (<https://vchaspik.ua>, December 3, 2022);

- *нас рятувало небо* (*heaven saved us*) – “God saved us” [3], e.g.: *Нас рятувало Небо»: в Києві жінка з дитиною під час атаки не змогли потрапити до укриття* (“*Heaven saved us*”: *in Kyiv, a woman and a child could not get to the shelter during the attack*) (<https://www.pravda.com.ua>, July 8, 2024);

- *зрати першу скрипку* (*to play the first violin*) – “to be the main one in some matter. To lead forward, to hold primacy” [3], e.g.: *Чому Бахмут став Сталінградом для росіян і вони за будь-яку ціну хочуть його взяти* (headline). *Наші намагалися не поступатися та не давали росіянам подумати, що вона має виключне право зрати першу скрипку в оркестрі* (*Why Bakhmut became Stalingrad for the Russians and they want to take it at any cost* (headline). *Ours tried not to yield and did not let the Russians think that they have the exclusive right to play the first violin in the orchestra*) (<https://www.bbc.com>, November 30, 2022);

- *підняти істерію* (*start hysteria*) - *галасувати* (*make noise*) [3], e.g.: *Пропагандисти рф і гауляйтери підняли істерію навколо «бавовни» в Криму: навіщо?* (<https://umoloda.kyiv.ua>, June 25, 2024);

- *моя хата скраю* (*that's not my headache* (idiom)) - “it doesn't concern me, it is none of my business” [3], e.g.: *У цій війні немає чужої біди. Тут не спрацює принцип «моя хата скраю»...* (<https://pnotg.gov.ua>, May 9, 2022);

- *розбити в пух і прах* (*smash to smithereens*) – “destroying completely” [3], e.g.: *«Розбили в пух і прах» – «ДНРівець» розповідає про важкі бої з українськими захисниками* (<https://armyinform.com.ua>, June 26, 2022);

- *цінувати те, що маємо* (*to appreciate what we have*) – “to be grateful, to appreciate what we have so as not to lose it” (a Christian commandment), e.g.: *Війна показала: треба вчитися цінувати те, що маємо. А маємо ми багато* (*The war showed: we must learn to appreciate what we have. And we have a lot*) (<https://zaxid.net>, March 17, 2023);

- *як білка в колесі* (*like a squirrel in a wheel*) – “to be very concerned” [3], e.g.: *Росіяни як білка в колесі: як тільки зупиняться, то втраять позиції, – офіцер 26 АБр* (*Russians are like a squirrel in a wheel: as soon as they stop, they will lose their positions, - officer of the 26th ABr*) (<https://weukraine.tv>, May 4, 2023);

- *озброєний до зубів* (*armed to the teeth*) – “fully equipped with weapons” [3]; *мати око* (*to have an eye*) – “to be observant, very attentive, vigilant” [3], e.g.: *Джемілев наголосив, що не можна роззброюватися «перед сусідом, який озброєний до зубів та ще й має око на наші території»* (<https://www.ukrinform.ua>, July 10, 2024);

- *зірковий час* (*star time*) – “decisive moments in the life of mankind or a person, when fate is decided and the most favorable conditions for self-realization are created” [3], e.g.: *Зірковий час для військових заводів. Як Україна може виробляти більше зброї? (Star time for military factories. How can Ukraine produce more weapons?)* (<https://www.epravda.com.ua>, July 27, 2023);

- *у хвіст і у гриву* (*with might and main*, idiom) – “to act very strongly” [3], e.g.: *А ви помітили, що у суспільстві та так званих соціальних медіа росте і міцніє такий хриновий тренд – немилосердно товкти військових. Запекло, якби навіть сказали, суїцидально критикувати всіх «у хвіст і у гриву»: генералів у полях, Генштаб та комбатів – за відступ і наступ, і що «людей не бережуть», «ППОшників» – за те, що ракету не збили, промазали, Повітряні сили – бо літаки у Миргороді не вберегли, пресофіцерів – за те, що не погоджують* (<https://glavcom.ua>, July 2, 2024);

- *як грім серед ясного неба* (*like thunder in the clear sky*) – “unexpectedly, suddenly, out of the blue” [3], e.g.: *...війна в 2014 для мене була як грім серед ясного неба. А коли побачив, що відбувається після 24 лютого, зрозумів, що мушу ніти воювати... (the war in 2014 was like thunder in the clear sky for me. And when I saw what was happening after February 24, I realized that I had to go to fight)* (<https://www.pravda.com.ua>, November 9, 2022);

– *тактичні кросівки* (tactical sneakers) – “shoes for the military” [3], e.g.: *Вперше у ЗСУ: Тактичні кросівки на етапі військово-дослідних випробувань* (<https://umoloda.kyiv.ua>, July 30, 2023);

– *п'ята колона* (the fifth column) – “a political expression that refers to citizens who act in the interests of third countries, against the authorities of their own country” [4], e.g.: *Гуманітарна війна: діяльність «п'ятої колони» в Україні* (headline). *Військова агресія РФ активізувала питання визнання демократичним світом Голодомору 1932–1933 рр. злочиним геноциду українців* (Humanitarian war: the activities of the “fifth column” in Ukraine (headline). The military aggression of the Russian Federation intensified the issue of recognition of the Holodomor of 1932–1933 by the democratic world as a crime of genocide against Ukrainians) (<https://umoloda.kyiv.ua>, June 26, 2024);

– *після нас хоч потоп* (after us the deluge, idiom) – “characterizes people who openly consume resources without returning anything in return; they don't think about their successors” [3], e.g.: *Після нас хоч потоп: як росія вневнено вбиває саму себе* (<https://sprotyv.info>, September 25, 2023);

– *залишити свій слід* (to leave one's mark) – “to be remembered by some actions, deeds; to make a significant contribution to some cause” [3], e.g.: *На жаль, війна залишає свій слід, і ми маємо втрати серед цивільного населення внаслідок підриву на мінах...* (<https://www.pravda.com.ua>, February 29, 2024);

– *прикусити язик* (hold tongue) – “to refrain from speaking; to keep silent” [3], e.g.: *Американським генералам варто прикусити язик, а не розповідати про строки контрнаступу ЗСУ, вважає волонтер і політик Сергій Притула* (<https://nv.ua>, April 6, 2023).

In addition to the mentioned stable expressions, a number of phrases relating to scandals, quarrels related to the Russian Federation are used, e.g.: *активи розбрату, ІС розбрату, розгорівся скандал* та ін., напр.: *Російські активи розбрату: Politico пояснило, чому ЄС і США не можуть домовитися* (headline) (<https://www.unian.ua>, May 26, 2024); *«ІС» розбрату. Як російська система автоматизування бізнесу вкоринилась в Україні – розслідування DOU* (headline) (<https://dou.ua>, April 27, 2022); *Розгорівся скандал: у Росії учасникам змагань вручили медалі з українськими написами* (headline) (<https://expert.in.ua>, July 9, 2024). We believe that the stable expressions *активи розбрату, ІС розбрату* are transformed compounds to the expression apple of discord (apple of discord, apple of strife) to indicate the subject of disputes, the cause of hostilities.

Despite the fact that the Russian-Ukrainian war continues, somewhere at many levels politicians talk about peace, and in the language of the Ukrainian mass media we record stable expressions peace plan, peace formula, etc., for example: *Кулеба децю знає про «мирний план» Китаю, але хоче побачити його весь* (Kuleba knows something about the “peace plan” of China, but wants to see it all) (<https://www.pravda.com.ua>, February 21, 2023); *«Формула миру» Зеленського: чи варто Києву розраховувати на глобальний південь* (Zelenskyi's “peace formula”: should Kyiv count on the Global South) (<https://umoloda.kyiv.ua>, May 10, 2024).

In the Ukrainian media, when analyzing the actions of well-known businessmen and politicians who have problems with law enforcement agencies, journalists use the standard expressions *ставити палиці в колеса* (to put sticks in the wheels) with the meaning “to hinder, prevent someone from doing something” [4], *бідні родичі* (poor relatives) – “relatives who have considerable wealth” [3], *на нари, а не на Канари* (on the bunks, not on the Canaries) – “deprivation of freedom” [4], etc., e.g.: *Справи на Коломойського: БЕБ запевняє, що не ставить палиці в колеса НАБУ* (<https://www.pravda.com.ua>, September 19, 2023); *«Бідні» родичі: підозру отримали брати зрадників Медведчука та Козака*

(<https://umoloda.kyiv.ua>, June 10, 2024); *На нари, а не на Канари: цікаві факти про затриману доньку ексмера Полтави Олександра Мамаю* (<https://umoloda.kyiv.ua>, June 26, 2024). The phraseology unit *вставляти палиці в колеса* is also recorded in the topic of Ukraine's international relations, e.g.: *5 країн починають вставляти палиці в колеса: вони незадоволені експортом українського зерна* (<https://glavred.net>, January 16, 2024).

Due to high-profile criminal cases against famous persons, the stable professional expression *домашній арешт* (home arrest) – “deprivation of the accused's freedom in the form of isolation at home” – has been activated in the language of the mass media, e.g.: *Гучна справа отримала продовження. Домашній арешт стосовно Миколи Тищенка діє до 23 серпня 2024 року* (The high-profile case was continued. Mykola Tyshchenko's home arrest is valid until August 23, 2024) (<https://glavcom.ua>, July 1, 2024); *Блогерку Чернецьку залишили під домашнім арештом, але дозволили їй ходити в укріття і до лікаря* (Blogger Chernetska was left under home arrest, but she was allowed to go to the shelter and to the doctor) (<https://mipl.org.ua>, June 26, 2023), etc.

The use of the stable expression *безпечна гавань* (“safe harbor”) – “legislative provisions according to which a certain part of taxpayers are exempted from certain obligations specified in the tax code” is evidenced within the selected linguistic material, cf.: *«Безпечна гавань» у проєкті Директиви Європейського Союзу про належну обачність щодо корпоративної сталості* (“Safe harbor” in projects of the Directive of the European Union on due diligence regarding corporate sustainability) (<https://economiclaw.kiev.ua>, No. 4, 2023).

In their materials, Ukrainian journalists often use well-known catchphrases of both Ukrainian and foreign writers. In particular, we record the use of the famous expression of V. Shakespeare *бути чи не бути* (to be, or not to be) in socio-political topics, e.g.: *Резніков додав, що рішення, бути чи не бути йому міністром оборони, згідно з Конституцією, ухвалює президент* (<https://www.radiosvoboda.org>, February 5, 2023); *Нічний громадський транспорт у Києві: бути чи не бути* (Night public transport in Kyiv: to be or not to be) (<https://www.ukr.net>, August 23, 2023); *Державна регіональна політика 2023: бути чи не бути?* (State regional policy 2023: to be or not to be?) (<https://rpr.org.ua>, January 24, 2023, and others).

A phraseology unit *під ключ* (come-as-it-is) is known in the Ukrainian language in contexts about the sale of an object in which all the necessary repair work has been performed for its operation by the buyer. In modern mass media texts, this stable expression has a wider meaning, denoting various objects, as well as services that can be used in full, cf.: *Привезти автомобіль з Китаю «під ключ» пропонують так звані незалежні дилери* (<https://www.epravda.com.ua>, April 26, 2024); *Ресстрація ФОП під ключ: юридичний супровід підприємців* (<https://visitukraine.today>, March 23, 2024); *«Під ключ» – оплачується єдина сума гонорару за весь процес* (<https://www.pravda1.com>, July 7, 2024).

Within the corpus of selected linguistic material, we record the use of famous expressions of Ukrainian politicians by journalists. In particular, the expression *ці руки нічого не крали* (these hands did not steal (did not take) anything) belongs to the ex-president of Ukraine Viktor Yushchenko, cf.: *«Ці руки нічого не крали»: експрезиденту Юценку – 70 років* (“These hands did not steal anything”: ex-president Yushchenko is 70 years old) (<https://www.stopcor.org>, February 23, 2024); *Ці руки ніколи нічого не брали, окрім ваших сердець* (These hands never took anything but your hearts) (<https://www.instagram.com>, April 24, 2024); the expression *куля в лоб* (a bullet in the forehead) belongs to politician Arseniy Yatsenyuk, cf.: *«Хай президент приймає рішення. Я своє вже прийняв. Куля в лоб так куля в лоб», – твердив політик* (www.ukr.net, July 26, 2023); the expression *Україна не Росія* (Ukraine is not Russia) belongs to ex-president of Ukraine Leonid Kuchma, his book of the same name has the this

title. In the language of the mass media, we come across a transformed compound, cf.: *Медведєв заявив, що Україна – це Росія* (Medvedev declared that Ukraine is Russia) (<https://www.pravda.com.ua>, March 4, 2024).

Modified compounds are presented in media texts such as *Борітеся, поборете, вам Бог допомагає* (Taras Shevchenko), e.g.: *Борітеся – поборете*: у Балаклії українські військові знайшли під російським триколом віри Шевченка (<https://www.pravda.com.ua>, September 11, 2022); *червоне – то любов, а чорне – то журба* (Dmytro Pavlychko), e.g.: *Червоне – то любов*. Чому донорство крові під час війни стало це однією лінією оборони України (<https://shst.sm.gov.ua>, July 16, 2022); *Армія. Мова. Віра* (Army. Language. Faith) is the political slogan of the election campaign of the 5th President of Ukraine Petro Poroshenko, for example: *«Податки. Армія. Перемога»*: Укрпошта випустить нову марку (“*Taxes. Army. Victory*”: Ukrposhta will issue a new stamp) (<https://umoloda.kyiv.ua>, June 26, 2024); *привид ходить по Європі – привид комунізму* (a ghost walks around Europe - the ghost of communism) - this is how Marx and Engels began their famous Manifesto of the Communist Party, e.g.: *Привид оману бродить Україною... Чому в Зе бояться натовських військ?* (<https://umoloda.kyiv.ua>, June 11, 2024); *на городі бузина, а в Києві дядько* (used in contexts about incompatible, meaningless things), e.g.: *У Києві Бузина, в Криму – його «ДЯДЬКА»...* (<https://svitytsia.crimea.ua>, January 16, 2024); *голод не тітка, пиріжків не піднесе* (hunger is not an aunt, pies will not be served) (a hungry person will eat anything), e.g.: *«Осінь не тітка»*: Київ розпочав підключати до тепла житлові будинки (“Autumn is not an aunt”: Kyiv has started connecting residential buildings to heat) (<https://umoloda.kyiv.ua>, 16.10.2023).

Stable phrases on the subject of problematic, conflict situations are widely represented, e.g.:

– *бунт на кораблі* (riot on a ship) – “spontaneous rebellion; manifestations of indignation” [3], e.g.: *Бунт на «кораблі»*: у Ростові ув’язнені «арештували» співробітників СІЗО (Riot on the “ship”: in Rostov, prisoners “arrested” pre-trial detention center employees) (<https://umoloda.kyiv.ua>, June 16, 2024);

– *тримати (брати, хапати) за горло* (to hold (take, grab) by the throat) – “to achieve something obsessively or by force. Quarreling with someone, clinging, picking on someone” [4], e.g.: *Припиніть тримати за горло і трясати власний народ* (Stop holding your own people by the throat and shaking them) (<https://www.zagidkrasnov.com>, 07.07.2024);

– *сізіфова праця* (Sisyphean labor) – “difficult, fruitless and endless work” [3], e.g.: *Українську історію не читають без брону. Це завжди трагедія, а перемоги – сізіфова праця без жодного шансу на успіх у кінцевому результаті* (<https://www.pravda.com.ua>, September 14, 2023);

– *гратися з вогнем* (to play with fire) – “behave carelessly, do something dangerous” [3], e.g.: *Балога до Шкарлета: Доки будемо гратися з вогнем, принижуючи Україну* (<https://mukachevo.net>, January 20, 2023);

– *ведмежа послуга* (a disservice) - “help that ended up causing harm, not benefit” [3], cf.: *«Ведмежа послуга»*: У каналі «Труха» помітили рекламу «Української правди». У виданні зауважили, що не мають до цього допису жодного стосунку (“*Disservice*”: An advertisement for “Ukrainian Pravda” was noticed on the “Trukha” channel. The publication noted that they have nothing to do with this post) (<https://detector.media>, October 23, 2023);

– *як з гуся вода* (like water off a duck’s back) – “someone does not react to something at all; nothing affects, does not affect anyone” [3], e.g.: *Тим більше, що з наших «добросесних» чиновників – як з гуся вода* (<https://www.pravda.com.ua>, March 8, 2023);

– *накивати п’ятами* – “to run away, quickly leave somewhere, leaving the place of residence; to leave a place of work, study, leave something, etc.; to quickly run away” [4], cf.: *Хотіли «накивати п’ятами»: закарпатські поліцейські виявили з півдесятка ймовірних наркоманів* (<https://goloskarpat.info>, June 30, 2023);

– *залишатися за бортом* (to remain on the sidelines) – “to stand aside from something, to be removed from participation in something, to be left out of the team, to lose a job, to be rejected” [3], e.g.: *Тобто лікарі не будуть скорочуватись і точно це не вплине на пацієнтів, що якісь пацієнти «залишатися за бортом»* (<https://www.nikpravda.com.ua>, July 15, 2024);

– *гордіїв вузол* (Gordian knot) – “too complicated and confusing matter, predicament, tricky, almost unsolvable problem” [4], e.g.: *Про можливість розв’язати гордіїв вузол польсько-української суперечки довкола важких сторінок минулого – розмова з професором Рафалом Внук з Люблінського католицького університету* (On the possibility of untying the Gordian knot of the Polish-Ukrainian dispute over difficult pages of the past - a conversation with Professor Rafal Vnuk from the Catholic University of Lublin) (<https://www.polskieradio.pl>, July 11, 2022);

– *переливання з пустаго в порожнє* (plough the sand) – “doing something unnecessary” [3], e.g.: *Переливання з пустаго в порожнє*: іванчівські депутати закликали місцеві парафії УПЦ МП вийти зі складу «московського патріархату» (<https://bug.org.ua>, June 13, 2023); *Оскільки казати про цю конкретне приводів особливо не знайшли, вони були змушені з пустаго в порожнє переливати* (<https://www.pravda.com.ua>, February 23, 2023);

– *жаба в кропі* (the frog in the dill) – “an image of the inability or unwillingness of people to react or realize changes that occur gradually, and not suddenly, and lead to undesirable consequences that are too late to correct” [3], e.g.: *Жаба в окропі*. Чому людство не лякає екологічна катастрофа (<https://www.pravda.com.ua>, October 10, 2023);

– *мильна опера* (soap opera) – “any event, long-term relationship or relationship” [3], eg: *Ірано-Ізраїльська мильна опера*. Чому і на що Корпус вартівих Ісламської революції (КВІР) націлився в Ізраїлі, до чого це призвело... (Iranian-Israeli soap opera. Why and what did the Islamic Revolutionary Guard Corps (IRGC) target in Israel, what did it lead to...) (<https://www.cemaat.media>, April 19, 2024);

– *вивести на чисту воду* (bring to light) - to expose someone’s dishonesty, insidiousness” [3], e.g.: *Розповідаємо, як швидко та просто вивести на чисту воду необоросовісні АЗК законним та доступним способом* (<https://www.klo.ua>, August 26, 2022);

– *пан або пропав* (play an all-or-nothing game) – “a situation that has great risks and a high chance of failure, but if everything works out, the benefit will be huge” [3], e.g.: *Справа Трампа: пан або пропав* (headline). Екс-президенту США Дональду Трампу були офіційно висунуті звинувачення у кримінальних злочинах (<https://www.unian.ua>, April 5, 2023); *Майбутнє військової контррозвідки: пан або пропав* (The future of military counterintelligence: play an all-or-nothing game) (<https://www.pravda.com.ua>, April 26, 2023);

– *кулуарні розмови* (backroom conversations) – “informal contact with partners or participants in negotiations, to get to know them personally in order to exert a beneficial influence on the position of partners, etc.” [4], e.g.: *Зеленський дорогою на саміт НАТО у Вільнюсі відреагував на кулуарні розмови партнерів...* (Zelenskyi reacted to backroom conversations of partners on the way to the NATO summit in Vilnius...) (<https://forbes.ua>, July 11, 2023).

In the topic of life activities of society (economy, management, business, etc.), we record the following stable phrases:

circular models. This support could include financial subsidies or tax incentives for enterprises that implement innovative approaches to resource management, as well as the development of infrastructure to support the circular economy. For instance, creating conditions for processing organic waste or utilizing biomass for energy production can significantly enhance the efficiency of agricultural systems and aid in resource conservation. Therefore, it is essential to develop a functional algorithm to determine the strategy for integrating digital innovations into the business processes of agricultural enterprises (see Fig. 3).

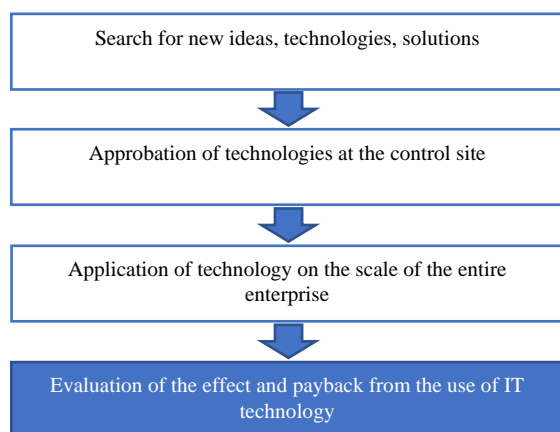


Figure 3. The algorithm for introducing digital technologies to the production strategy of agricultural enterprises
Source: [9]

Therefore, implementing approaches to enhance resource management efficiency in the agro-industrial complex, based on the principles of sustainable development and the circular economy, is essential for ensuring the environmental sustainability and economic stability of rural regions. These approaches help reduce resource losses, optimize production processes, and mitigate the negative impact on the environment. However, their successful implementation requires comprehensive support at all levels—from state policy and regulation to the development of educational programs and international cooperation. Only through this holistic approach can we ensure the long-term growth of agricultural systems that can address modern challenges and preserve natural resources for future generations.

5 Conclusion

Thus, we conclude that the security of sustainable development for the region's agro-industrial complex hinges on integrating digital technologies and circular economy models. Key aspects of ensuring this security include effective resource management, which involves minimizing waste and reusing materials to reduce the environmental burden on the region. The adoption of modern technologies enhances productivity and the agricultural sector's adaptability to climate change. Additionally, the development of the circular economy supports the economic sustainability of agro-industrial enterprises by optimizing the use of natural resources, which is crucial for maintaining environmental and socio-economic stability in the region. Furthermore, to ensure the security of sustainable development in the agricultural industry, it is essential to integrate digital solutions across all stages of the production cycle—from resource monitoring to supply chain management. This integration enables optimization of resource use, thereby reducing costs for agricultural producers. Circular models encourage the efficient use of agricultural waste, converting it into resources such as biogas or fertilizers. This approach lessens dependence on non-renewable resources and promotes the restoration of natural systems. Therefore, to achieve these objectives, the agricultural sector in Ukraine requires support at the state policy level to stimulate innovation and create

conditions for developing a sustainable agricultural economy, addressing contemporary environmental and social challenges.

Literature:

- Dziamulych, M., Antoniuk, N., Tretyak, V., Rudenko, M., Solomnikov, I., Kytaichuk, T., Khomiuk, N., & Shmatkovska, T. (2023). Financial security and economic safety as the basis for sustainable development of the region. *AD ALTA: Journal of interdisciplinary research*, 13(2), XXXVII, 150-154.
- Dziamulych M., Krupka, I., Andruschak, Y., Petyk, M., Paslavka, R., Grudzevych, Y., Martyniuk, R. (2022). Banking liquidity risk management in Ukraine based on the application of digital and information technologies. *AD ALTA: Journal of interdisciplinary research*, 12(2), Special Issue XXIX, 102-107.
- Dziamulych, M., Krupka, I., Petyk, V., Zaplatynskiy, M., Korobchuk, T., Synenko, V., & Avramchuk, L. (2023). Operational efficiency of Ukraine's banking system during the war. *AD ALTA: Journal of interdisciplinary research*, 13(1), XXXII, 164-168.
- Dziamulych, M., Krupka, M., Stashchuk, O., Korobchuk, T., Mostovenko, N., Avramchuk, L., Chyzh, N., & Tur, O. (2024). Dynamics of the monetary sector of Ukraine during the war and its impact on the efficiency of the banking system. *AD ALTA: Journal of interdisciplinary research*, 14(1). Special Issue XL, 230-234.
- Dziamulych, M., Myskovets, I., Zubko, A., Tereshchuk, O., Baidala, V., Voichuk, M. (2022). Formation of the natural resource economics in the system of environmental and economic security. *AD ALTA: Journal of interdisciplinary research*, 12(2), Special Issue XXX, 142-146.
- Dziamulych M., Rogach, S., Shulha, O., Stupen, N., Tendyuk, A., Stryzheus, L., & Bilochenko, A. (2023). Management of production resources of agricultural enterprises in Ukraine: a case study of Volyn region. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, 23(1), 179-188.
- Dziamulych, M., Sarioglo, V., Kotenko, T., Didkivska, O., Korotkova, D., Talakh, T., & Say, V. (2023). Differentiation of income and expenditures of households in the system of formation of the demographic situation in Ukraine. *AD ALTA: Journal of interdisciplinary research*, 13(2), Special Issue XXXV, 111-115.
- Dziamulych, M., Shmatkovska, T., Gordiichuk, A., Kupyra, M., & Korobchuk, T. (2020). Estimating peasant farms income and the standard of living of a rural population based on multi-factorial econometric modeling: a case study of Ukraine. *Scientific Papers: Series "Management, Economic Engineering in Agriculture and rural development"*, 20(1), 199-206.
- Horobets, N. M. (2022). Digital technologies are in the strategic management system of agricultural enterprises. *Agrosvit*, 1, 36-43.
- Koliadenko, S., Dzis, O., & Haidei, V. (2024). Prospective directions of digitalization in agricultural enterprises within the context of economic security. *Economy and Society*, 59.
- Kostiuk, V., Khudolii, A., Korniiiko, Y., Petrenko, O., Dybchuk, L., & Shmatkovska, T. (2024). Logistics infrastructure management in the system of digital transformation of the economy of Ukraine. *AD ALTA: Journal of interdisciplinary research*, 14(2). Special Issue XLIII, 133-137.
- Kulikov, P., Anin, O., Vahonova, O., & Niema, O., (2022). Scientific and applied tools for project management in a turbulent economy with the use of digital technologies. *International Journal of Computer Science and Network Security*, 22(9), 601-606. DOI: 10.22937/IJCSNS.2022.22.9.78
- Mazniev, I., Bielousov, Ya., Luchechko, Yu., Rozbytyskiy, M., Kolosok, A., Shepelenko, S., & Dziamulych, M. (2024). Analysis of modern trends in labour market transformation in Ukraine. *AD ALTA: Journal of interdisciplinary research*, 14(2). Special Issue XLIII, 138-142.
- Rudenko, M., Bereziianko, T., Halytsia, I., Dziamulych, M., Kravchenko, O., & Krivorychko, V. (2023). International experience of capitalization of knowledge in terms of innovation economy. *Financial and Credit Activity Problems of Theory and Practice*, 4(51), 508-518.
- Shmatkovska, T., Kulinich, T., Dziamulych, M., Rogach, S.,

Bilochenko, A., Serdiukova, O. (2022). Analysis of investment efficiency in the agricultural sector of Ukraine on the basis of sustainable development. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, 22(3), 649-657.

16. State Statistics Service of Ukraine. Available at: <https://ukrstat.gov.ua/> (accessed on 15 June 2024).

17. Zahorskyi, V., Bobrovskyi, O., Bondarenko, D., & Karpa, M. (2022). Ensuring information security in the system of public management of sustainable development of the region: EU experience. *International Journal of Computer Science and Network Security*, 22(8), 163-168. DOI: 10.22937/IJCSNS.2022.22.8.21

18. Zghurska, O., Korchynska, O., Rubel, K., Kubiv, S., Tarasiuk, A., & Holovchenko, O. (2022). Digitalization of the national agro-industrial complex: new challenges, realities and prospects. *Financial and Credit Activity Problems of Theory and Practice*, 6(47), 388–399.

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ANALYSIS AND MANAGEMENT OF LOGISTICS CHAINS IN THE CONTEXT OF THE CONVERGENCE OF DIGITAL TECHNOLOGIES IN THE ECONOMIC ARCHITECTURE OF UKRAINE

^aOLHA SHULHA, ^bYULIIA POPOVA, ^cMYKOLA SHVETS,
^dDMYTRO RUDENKO, ^eBOHDAN SAMOILENKO,
^fNATALIIA KHOMIUK, ^gNADIYA BUKALO, ^hRUSLANA
 SODOMA

^a*Borys Grinchenko Kyiv Metropolitan University, 13-b, Levka
 Lukianenka Str., 04212, Kyiv, Ukraine*

^b*State University of Infrastructure and Technologies, 9,
 Kyrylivska Str., 04071, Kyiv, Ukraine*

^{c,d,h}*Lviv State University of Life Safety, 35, Kleparivska Str.,
 79007, Lviv, Ukraine*

^{e,f,g}*Lesya Ukrainka Volyn National University, 28, Vynnychenko
 Str., 43025, Lutsk, Ukraine*

email: ^a*o.shulha@kubg.edu.ua*, ^b*yuli-p@ukr.net*,

^c*kolyashvec1502@gmail.com*, ^d*rudenko.dv@ukr.net*,

^e*samoilenko.bohdan@vnu.edu.ua*, ^f*nataljabilous@gmail.com*,

^g*bukalonadiya@ukr.net*, ^h*sodomaruslana@gmail.com*

Abstract: This article explores the peculiarities of analyzing and managing logistics chains within the context of the active implementation of digital technologies in Ukraine's economy. It examines how the convergence of digital solutions—particularly the Internet of Things, blockchain, and analytics automation—affects the efficiency of logistics processes. The need to integrate modern digital tools into logistics chains to maintain the competitiveness of Ukrainian enterprises in the global market is identified. An analysis of Ukraine's logistics infrastructure reveals critical challenges associated with digital transformation. The article proposes approaches to optimizing logistics processes through the adoption of innovative technologies, which are expected to reduce costs, increase delivery speed, and improve customer service quality. Additionally, the role of state policy and legislative initiatives in supporting the digitalization of logistics chains is discussed.

Keywords: logistics, logistics infrastructure, logistics management, digital transformation, digital technologies, sustainable development.

1 Introduction

The specificity of the current functioning of the Ukrainian national economy includes addressing issues related to the destructive impact of war on logistics supply chain management. Additionally, there is a pressing need to ensure that traditional logistics processes comply with the demands of the modern market, which is undergoing significant transformation due to globalization and the digitalization of economic systems. Consequently, optimizing and enhancing business competitiveness requires the integration of digital technologies—such as blockchain, the Internet of Things, artificial intelligence, and analytics automation—into logistics chains. The convergence of these technologies fosters transparency, speed, accuracy, and adaptability in logistics processes. However, the implementation of digital technologies in logistics in Ukraine remains at an early stage and is hindered by several challenges.

Key obstacles to the digital transformation of logistics chains include the underdevelopment of digital infrastructure, limited financial resources for investing in modern technologies, and the absence of a comprehensive state-level strategy to support logistics digitalization. Furthermore, there is a shortage of qualified personnel with the expertise to apply digital solutions in logistics. This deficit has been exacerbated by wartime conditions, making it even more challenging to integrate innovative technologies and develop effective logistics chains.

It is also important to highlight the need for a unified legal framework to regulate the use of digital technologies in the logistics sector. Currently, various barriers arise from legal uncertainty, cybersecurity concerns, and data protection issues. Additionally, the lack of standardization and uniform protocols for operational procedures complicates interactions among different stakeholders in logistics processes, resulting in inefficiencies and increased costs.

Therefore, it can be concluded that there is an essential need to analyze and develop approaches for effective management of

logistics chains, considering the convergence of digital technologies [31]. This would enable the creation of an innovative and flexible logistics system that meets the modern demands of the digital economy.

2 Literature Review

Modern research in logistics and supply chain management highlights the increasing role of digital technologies in transforming the industry. Scientific literature addresses the digitization of logistics chains through the application of technologies such as the Internet of Things, blockchain, artificial intelligence, automation, and big data analytics. Specifically, studies by I. Arakelova [2], I. Britchenko [4-8], N. Khomiuk [18], M. Rudenko [21], and R. Sodoma [29] underscore the importance of implementing digital solutions to enhance the efficiency and transparency of logistics processes. Notably, the integration of the Internet of Things into logistics management systems facilitates real-time data acquisition and analysis, which contributes to optimizing inventory management, transportation, and customer service.

The issue of logistics digitization is also explored in the research by M. Dziamulych [9-15], V. Kostiuk [19], V. Sarioglo [22], and A. Verzun [32], who examine the challenges and opportunities associated with the digital transformation of logistics chains in Ukraine. These studies emphasize the need to adapt digital technologies to the specific conditions of the Ukrainian economy, which faces infrastructural and legal constraints exacerbated by the ongoing war. The importance of developing a national strategy for logistics digitization, addressing contemporary challenges, and integrating Ukrainian enterprises into global supply chains is also highlighted.

The implementation of digital technologies in logistics is closely tied to the concept of Industry 4.0, as discussed in the works of N. Antoniuk [1], S. Filatov [17], I. Mazniev [20], T. Shmatkovska [23-28], and other researchers. These studies highlight that Industry 4.0 involves the use of interconnected systems and automation to enhance the efficiency of production and logistics processes. This aspect underscores the necessity for an integrated approach to implementing digital solutions, which must encompass not only technological elements but also socio-economic, legal, and organizational factors.

Despite the considerable body of research dedicated to managing logistics chains within the context of digital technology convergence in specialized scientific literature, there remains a need to further develop and refine these studies. A comprehensive analysis of the challenges and opportunities associated with integrating digital technologies into logistics chains in Ukraine is essential, considering both the national characteristics of its economic framework and global best practices.

3 Materials and Methods

A comprehensive approach employing various general and specialized scientific methods was used to address the research objectives. The primary methods included comparison, analysis, synthesis, as well as abstract reasoning and logical generalization. This methodology enabled a thorough examination of the challenges associated with managing logistics chains amidst the convergence of digital technologies and facilitated the formulation of practical recommendations for optimizing logistics processes.

Specifically, the comparison method was employed to evaluate the level of digitization of logistics chains in Ukraine relative to other countries. This method revealed significant differences in the approaches to implementing digital technologies and

identified which strategies could be effectively adapted to the Ukrainian context.

Methods of analysis and synthesis were employed to examine the key aspects of implementing digital technologies in logistics chains. The analysis facilitated a review of the components of logistics processes in the context of their digital transformation. This included an examination of existing challenges in the digitalization of logistics in Ukraine, such as infrastructural, financial, and regulatory barriers. The synthesis method was then used to integrate the findings and develop a comprehensive strategy for managing logistics chains through digital technologies. This approach enabled the formulation of a holistic perspective on how the integration of digital solutions can enhance the efficiency and flexibility of logistics processes.

The abstract method was applied to develop a theoretical model for the digitization of logistics chains. This method highlighted the critical elements of digital transformation and created conceptual diagrams to illustrate the relationships between various components of logistics and digital technologies. The use of the abstract method helped avoid excessive detail and focus on the fundamental principles and laws underpinning the digital transformation of logistics. These principles formed the basis for developing recommendations for managing logistics chains in the context of digitalization.

At the final stage of the research, the method of logical generalization was employed to summarize the results and draw conclusions. This method enabled the integration of findings from the analysis and synthesis stages, highlighting key trends and patterns in the digitalization of logistics chains. Consequently, recommendations were developed for advancing Ukraine's logistics infrastructure and implementing digital technologies in logistics processes, with consideration of national characteristics.

Thus, the application of a defined set of research methods facilitated a comprehensive and in-depth analysis of logistics chain management within the context of Ukraine's economic digital transformation.

4 Results and Discussion

The analysis and management of logistics chains within the context of the active integration of digital technologies in Ukraine's economy present unique challenges. These challenges include the need to adapt logistics systems to the dynamic changes in the digital environment. Integrating modern technologies at every stage of the logistics chain is essential to enhance transparency, accuracy, and speed in business processes. Concurrently, the analysis of logistics data becomes increasingly complex, requiring big data and analytics for demand forecasting, route optimization, and inventory management. Ukrainian companies face additional hurdles, such as limitations in digital infrastructure, insufficient investment, and a shortage of qualified personnel, largely due to the destructive impact of the war on the national economy. Addressing these issues necessitates a new approach to managing logistics chains, focused on flexibility and innovation. Thus, effective management requires a comprehensive strategy that accounts for the features of the digital economy and enhances overall enterprise competitiveness [3].

The convergence of digital solutions significantly transforms the management of logistics processes, making them more efficient, transparent, and adaptable. This transformation impacts various aspects of logistics, from monitoring and control to strategic planning and resource optimization. Crucially, these technologies do not merely complement existing business processes but fundamentally alter them, offering new opportunities to boost productivity, reduce costs, and improve service quality. A key mechanism of this transformation is the increased transparency of logistics chains. Technologies such as the Internet of Things and blockchain enable real-time tracking of goods, providing a complete view of the condition and location of each cargo unit throughout its journey. This shift

from disparate data sources and accounting systems to a unified information platform ensures that logistics operators, manufacturers, suppliers, and customers have access to current and reliable information. Such transparency helps prevent discrepancies and facilitates the quick resolution of supply chain issues. The effectiveness of digital solutions is further evidenced by the dynamics of investments in Ukraine's logistics infrastructure (Figure 1).

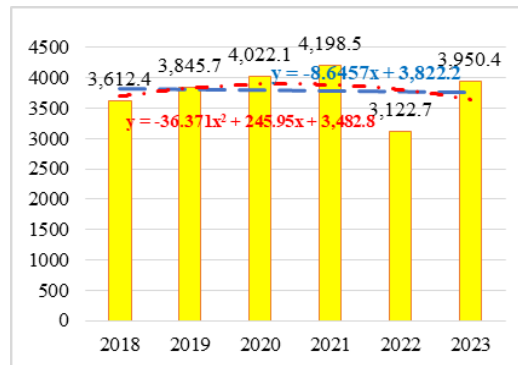


Figure 1. Correlative assessment of the dynamics of investments in logistics infrastructure in Ukraine for 2018-2021, UAH million.

Source: calculated by the author based on [30]

The figure illustrates that the calculated parameters of the linear trend indicate a decrease in the volumes of Ukraine's logistics infrastructure during the analyzed period. This decline is attributed to the adverse impact of Russian aggression on the national economy. Specifically, the absolute decrease in this indicator amounted to UAH 8.6457 million. Conversely, the analysis of the polynomial trend reveals that the actual annual change in financing volume is UAH 245.95 million, with an initial reduction of UAH 36.371 million.

Additionally, the consistency of information provided by blockchain technology is crucial for enhancing the overall efficiency of logistics systems. Traditional systems often encounter issues with data disparity and the complexity of data exchange between different supply chain participants. Each party typically operates its own accounting system, which can result in discrepancies and errors due to the varied functionalities of the software. In contrast, blockchain offers a single, immutable, and secure record of all transactions and events within the supply chain. This ensures that all participants have access to the same information, fostering trust and collaboration. Such data integration helps to reduce reconciliation times, expedite order processing, and improve overall efficiency.

Automation of analytics processes plays a crucial role in enhancing the efficiency of logistics operations. By automating data collection and analysis, logistics companies can swiftly respond to shifts in demand, market conditions, or risk realization. Specifically, automated systems can process vast amounts of data from diverse sources—such as IoT sensors, warehouse management systems, and transportation systems—providing actionable insights for making optimal decisions under varying conditions. This capability increases the speed and accuracy of decision-making, thereby reducing enterprise costs and boosting operational productivity.

Another key aspect of this process is resource and process optimization. The convergence of digital solutions enables more effective planning and utilization of resources, including transportation, warehouse space, and labor. For instance, data gathered via IoT sensors can be used to optimize delivery routes, minimize downtime, and ensure efficient vehicle loading. Additionally, automated analytics can forecast demand, determine optimal inventory levels, and guide timely stock replenishment decisions. This approach helps prevent overstocking, which ties up capital, and avoids market shortages.

Furthermore, the integration of digital solutions enhances the flexibility and adaptability of logistics chains. The modern market is characterized by high dynamism and unpredictability, necessitating rapid adaptation by companies. IoT technologies and automated analytics enable logistics operators to adjust plans and routes promptly in response to real-time conditions, such as traffic congestion, customs delays, or fluctuations in demand. This results in minimized operational delays, optimized costs, and timely delivery of goods.

An essential aspect of the impact of the convergence of digital solutions is the improvement of interaction between participants in the logistics chain. It is known that traditional logistics chains are often characterized by a complex structure with many parties involved, including manufacturers, suppliers, transport companies, warehouses, distributors, etc. Each has its processes, systems, and requirements, which can complicate the exchange of information and the coordination of actions in moving goods and services. However, digital technologies provide a single platform for data exchange and commercial interaction between parties, which facilitates better coordination. As a result, all supply chain participants get the opportunity to achieve more effective management of logistics processes.

It is important to note that the convergence of digital solutions also contributes to reducing enterprises' operating costs. Automation and digitization of business processes can minimize manual labor and errors while accelerating order processing. For instance, automated warehouse management systems can optimize inventory placement, decreasing the time required to locate and prepare goods for shipment. This efficiency reduces logistics operation costs and enhances personnel productivity. Additionally, digital solutions facilitate the reduction of paper document handling and associated expenses, leading to more efficient and environmentally responsible logistics management.

Another benefit of digital convergence is the enhancement of customer service. In the current market, customers expect timely and reliable delivery from logistics providers, along with real-time order tracking. IoT technology enables customers to receive up-to-date information about delivery status, boosting their trust and satisfaction. Furthermore, automated analytics systems can forecast delivery times with greater accuracy by considering various factors. This capability allows for more realistic delivery time estimates and improves overall service quality. However, it is noteworthy that following the onset of Russian aggression in 2022, the volume of investments by Ukrainian companies in logistics digitalization decreased (Figure 2).

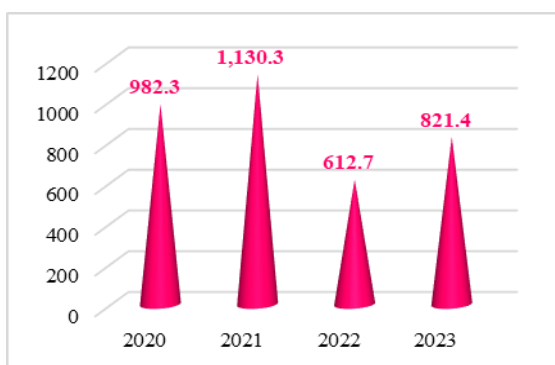


Figure 2. Volumes of investments in digital software solutions by logistics companies of Ukraine for 2020-2023, in million UAH.

Source: [30]

As shown, in 2022, the volume of investments by Ukrainian logistics operators in digital technologies nearly halved, decreasing from UAH 1,130.3 million to UAH 612.7 million. However, with the stabilization of the market situation in 2023, expenditures on digitalization increased to UAH 821.4 million. Although this figure has not yet reached pre-war investment levels, it indicates that the need to enhance the efficiency of

supply chains through digital solutions remains highly relevant for Ukrainian operators.

Ultimately, the convergence of digital solutions enhances the resilience of logistics chains against external challenges and risks. Modern supply chains are subject to numerous threats, but companies can anticipate potential risks and implement preventive measures thanks to big data analytics and automated monitoring systems. As demonstrated in practice, these systems can suggest alternative delivery routes in the event of obstacles, ensuring supply continuity and mitigating the negative impact on business. Based on this convergence, methods for minimizing risks associated with the integration of digital technologies into supply chains can be determined (see Table 1).

Table 1: Methods of minimizing the risks of digital logistics

The main risks in logistics	Risk minimization measures in digital logistics
Spoilage of cargo, total or partial loss of consumer properties or product type	Marking of cargo with special sensors that determine temperature, humidity and other transportation parameters online
Loss of cargo, theft, shortage, mistaken shipment to third parties, late delivery	Digital coding, which makes it possible to enter all the necessary information into the marking of the cargo and track it anywhere in the traffic
Improper preparation of accompanying documents, inability to clear cargo	Electronic customs, preventing documents from entering the database and detecting errors even before the cargo has left
Disclosure of trade secrets or confidential information	Coding of information in digital transmission channels
Environmental risks due to violations of the rules of transportation and storage of goods	Equipping vehicles with "cloud" technology programs makes it possible to minimize or eliminate empty mileage. Ecology
The risk of civil liability for causing damage to third parties, traffic accidents	The use of RIO-type programs enables drivers to use the most convenient, safe vehicle control parameters, taking into account road conditions. Unmanned control. Delivery of goods by drones
Reputational risks, freedom from corruption, careful selection of partners	Transparency of contracts, verification of documentation

Source: [17]

Thus, the convergence of digital solutions directly enhances the efficiency of logistics processes through several key mechanisms. It increases the transparency and reliability of data, improves interactions among supply chain participants, optimizes resource utilization, and reduces operational costs for businesses. Consequently, these advancements contribute to the development of more flexible, adaptive, and sustainable logistics systems, capable of effectively addressing modern market challenges and maintaining high levels of business competitiveness.

5 Conclusion

Thus, we conclude that the convergence of digital technologies is a critical factor in enhancing the efficiency of logistics chains in Ukraine. Integrating solutions based on the Internet of Things, blockchain, and automation improves transparency, optimizes inventory management, and ensures flexibility in responding to market changes. This is essential for Ukrainian logistics companies aiming to boost their competitiveness amid the ongoing conflict and the broader digital transformation of the economy.

However, the successful implementation of digitalization in logistics requires robust support from the government. The role of state policy is pivotal in this context. The government should provide a supportive regulatory environment, promote the development of digital infrastructure, and encourage innovation within the logistics sector [33]. This includes developing regulations that govern the adoption of digital technologies and creating incentives for businesses to invest in these solutions. Additionally, government support for the education and development of digital skills is crucial for training qualified personnel capable of effectively utilizing new technologies.

A comprehensive approach is necessary to optimize logistics processes, which includes implementing advanced supply chain management systems that leverage big data and analytics for

demand forecasting and route optimization. The development of integrated platforms for data exchange among logistics chain participants will enhance coordination and reduce operational costs. The active use of blockchain technologies is also recommended to ensure transparency and security in supply chain operations. Therefore, the successful digitization of logistics chains in Ukraine can only be achieved through coordinated efforts between businesses and the government. Integrating modern digital technologies into logistics will enable optimized processes, reduced costs, and sustained national economic development amidst digital transformation.

Literature:

- Antoniuk, N., Melnykova, K., Kholodna, Y., Britchenko, I., Khomiuk, N., Rogach, S., & Shmatkovska, T. (2023). Financial support of logistics: security aspects and sustainable development (in Ukrainian context). *AD ALTA: Journal of interdisciplinary research*, 13(2), Special Issue XXXVIII, 135-140.
- Arakelova, I., Shulpina, N., Tokareva, V., Nahorna, O., Shulha, O., Khomiuk, N., Sodoma, R., Shmatkovska, T. (2024). Research and management of the price policy in the field of marketing services of the enterprise using modern information technologies in the conditions of sustainable development. *AD ALTA: Journal of interdisciplinary research*, 14(1), Special Issue XL, 240-244.
- Bondar, O., Petrenko, G., Khalilov, A., & Vahonova, O. (2022). Construction project management based on the circular economy. *International journal of computer science and network security*, 22 (9), 630-635. DOI: 10.22937/IJCSNS.2022.22.9.82
- Britchenko, I. (2023). Innovative approaches to business management in conditions of economic instability. *Studies of the industrial geography commission of the Polish geographical society*, 37(4), 41-49.
- Britchenko, I., Bohomolova, N., Pinchuk, S., & Kravchenko, O. (2018). Assessment of the determinants of the financial security of railways in Ukraine. *Financial and credit activity: Problems of Theory and Practice*, 4 (27), 270-281.
- Britchenko, I., & Cherniavska, T. (2017). Transport security as a factor of transport and communication system of Ukraine self-sustaining development. *Scientific Bulletin of Polissia*, 1 (9), 16-24.
- Britchenko, I., Drotárová, J., Antonov, M.; Kholodna, J.; Polonska, O.; & Popova, Y. Environmental and economic security in the conditions of digitalization of the Ukraine's economy. *AD ALTA: Journal of interdisciplinary research*, 12 (2), Special Issue XXIX, 118-122.
- Britchenko, I., Drotárová, J., Yudenko, O., Holovina, L., Shmatkovska, T. (2022). Factors and conditions of the environmental and economic security formation in Ukraine. *AD ALTA: Journal of interdisciplinary research*, 12 (2), Special Issue XXIX, 108-112.
- Dziamulych, M., Antoniuk, N., Tretyak, V., Rudenko, M., Solomnikov, I., Kytaichuk, T., Khomiuk, N., & Shmatkovska, T. (2023). Financial security and economic safety as the basis for sustainable development of the region. *AD ALTA: Journal of interdisciplinary research*, 13 (2), XXXVII, 150-154.
- Dziamulych M., Krupka, I., Andruschak, Y., Petyk, M., Paslavaska, R., Grudzevych, Y., Martyniuk, R. (2022). Banking liquidity risk management in Ukraine based on the application of digital and information technologies. *AD ALTA: Journal of interdisciplinary research*, 12(2), Special Issue XXIX, 102-107.
- Dziamulych, M., Krupka, I., Petyk, V., Zaplatynskyi, M., Korobchuk, T., Synenko, V., & Avramchuk, L. (2023). Operational efficiency of Ukraine's banking system during the war. *AD ALTA: Journal of interdisciplinary research*, 13 (1), XXXII, 164-168.
- Dziamulych, M., Krupka, M., Stashchuk, O., Korobchuk, T., Mostovenko, N., Avramchuk, L., Chyzh, N., & Tur, O. (2024). Dynamics of the monetary sector of Ukraine during the war and its impact on the efficiency of the banking system. *AD ALTA: Journal of interdisciplinary research*, 14(1). Special Issue XL, 230-234.
- Dziamulych, M., Myskovets, I., Zubko, A., Tereshchuk, O., Baidala, V., Voichuk, M. (2022). Formation of the natural resource economics in the system of environmental and economic security. *AD ALTA: Journal of interdisciplinary research*, 12(2), Special Issue XXX, 142-146.
- Dziamulych M., Rogach, S., Shulha, O., Stupen, N., Tendyuk, A., Stryzheus, L., & Bilochenko, A. (2023). Management of production resources of agricultural enterprises in Ukraine: a case study of Volyn region. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, 23(1), 179-188.
- Dziamulych, M., Sadovska, I., Shmatkovska, T., Nahirska, K., Nuzhna, O. & Gavryliuk, O. (2020). The study of the relationship between rural population spending on peasant households with the main socioeconomic indicators: a case study of Volyn region, Ukraine. *Scientific Papers: Series "Management, Economic Engineering in Agriculture and rural development"*. 20(2), 217-222.
- Dziamulych, M., Sarioglo, V., Kotenko, T., Didkivska, O., Korotkova, D., Talakh, T., & Say, V. (2023). Differentiation of income and expenditures of households in the system of formation of the demographic situation in Ukraine. *AD ALTA: Journal of interdisciplinary research*, 13(2), Special Issue XXXV, 111-115.
- Filatov, S. A., & Golovchenko, L. M. (2018). The influence of digital technologies on the efficiency and development of agro-logistics in Ukraine. *Scientific notes of the University "KROK"*, 49, 151-161.
- Khomiuk, N., Bochko, O., Pavliukha, N., Demchuk, A., Stashchuk, O., Shmatkovska, T., & Naumenko, N. (2020). Economic modeling of sustainable rural development under the conditions of decentralization: a case study of Ukraine. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and Rural Development"*, 20(3), 317-332.
- Kostiuk, V., Khudolii, A., Korniiiko, Y., Petrenko, O., Dybchuk, L., & Shmatkovska, T. (2024). Logistics infrastructure management in the system of digital transformation of the economy of Ukraine. *AD ALTA: Journal of interdisciplinary research*, 14(2). Special Issue XLIII, 133-137.
- Mazniev, I., Bielousov, Ya., Luchechko, Yu., Rozbytskyi, M., Kolosok, A., Shepelenko, S., & Dziamulych, M. (2024). Analysis of modern trends in labour market transformation in Ukraine. *AD ALTA: Journal of interdisciplinary research*, 14(2). Special Issue XLIII, 138-142.
- Rudenko, M., Bereziianko, T., Halysia, I., Dziamulych, M., Kravchenko, O., & Krivorychko, V. (2023). International experience of capitalization of knowledge in terms of innovation economy. *Financial and Credit Activity Problems of Theory and Practice*, 4(51), 508-518.
- Sarioglo, V., Levkovska, L., Kotenko, T., Horemykina, Y., Didkivska, O., Rozbytskyi, M., Shmatkovska, T. (2024). Dynamics of formation of the labour market and employment of the rural population of Ukraine: a case study of Vinnytsia region. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, 24(1), 857-866.
- Shmatkovska, T., Agres, O., Luchechko, Y., Korobchuk, L., Naumenko, N., Voichuk, M., Dziamulych, M. (2023). Realities and prospects of managing the development of agricultural business in Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, 23(4), 777-783.
- Shmatkovska, T., Derevianko, S., Rogach, S., Shulha, O., Chudovets, V., Artemchuk, L., Begun, S., Khomiuk, N. (2023). Financial, accounting-analytical support and management of economic security in the system of sustainable development. *AD ALTA: Journal of interdisciplinary research*, 13(2), Special Issue XXXVII, 155-159.
- Shmatkovska, T., Krupka, I., Synenko, V., Sydorenko, R., Mostovenko, N., Talakh, T., Danchevska, I., & Melnyk, N. (2023). Accounting and analytical tools for the formation of subordinated debt of commercial banks in Ukraine. *AD ALTA: Journal of interdisciplinary research*, 13(1), Special Issue XXXIV, 52-55.
- Shmatkovska, T., Kulinich, T., Dziamulych, M., Rogach, S., Bilochenko, A., Serdiukova, O. (2022). Analysis of investment efficiency in the agricultural sector of Ukraine on the basis of sustainable development. *Scientific Papers Series*

"Management, Economic Engineering in Agriculture and Rural Development", 22(3), 649-657.

27. Shmatkovska, T., Shubalyi, O., Rogach, S., Kupyra, M., Dobryanskyi, O., Shved, A., & Voichuk, M. (2023). Simulation of socio-economic security of rural areas in the conditions of sustainable development: a case study of Ukraine. *Scientific Papers Series "Management, Economic Engineering in Agriculture and Rural Development"*, 23(1), 709-718.

28. Shmatkovska, T., Volynets, L., Dielini, M., Magopets, O., Kopchukova, I., Kytaichuk, T., Popova, Yu. (2022). Strategic management of the enterprise using the system of strategic management accounting in conditions of sustainable development. *AD ALTA: Journal of interdisciplinary research*, 12(2), Special Issue XXIX, 123-128.

29. Sodoma, R., Lesyk L., Hryshchuk, A., Dubynetska, P., & Shmatkovska, T. (2022). Innovative development of rural territories and agriculture in Ukraine. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, 22(4), 685-696.

30. State Statistics Service of Ukraine. Available at: <https://ukrstat.gov.ua/> (accessed on 15 June 2024).

31. Sukhova, K., Borodin, Y., Tarasenko, T., Komarova, K., Akimova, L., & Akimov, O. (2022). Organizational mechanism of state management of social services in territorial communities. *Ad Alta: Journal of interdisciplinary research*, 12(1), XXVII, 188-192.

32. Verzun, A., Voynycha, L., Fedyk, O., Shulha, O., Lipych, L., Shmatkovska, T., & Herylo, V. (2023). Export potential of agricultural-industrial complex of Ukraine: logistics and development prospects. *Scientific Papers Series Management, Economic Engineering in Agriculture & Rural Development*, 23(4), 915-926.

33. Zahorskyi, V., Lipentsev, A., Mazii, N., & Bashtannyk, V. (2020). Strategic directions of state assistance to enterprises development in Ukraine: managerial and financial aspects. *Financial and Credit Activity: Problems of Theory and Practice*, 2(33), 452-462.g DOI: 10.18371/fcapt.v2i33.207230.

Primary Paper Section: A

Secondary Paper Section: AE, AH

THE APPLICATION OF THE “ROMAN FORMULA” METHOD IN CRIMINAL OFFENCE INVESTIGATIONS: PAST AND PRESENT

^aANATOLII STARUSHKEVYCH, ^bANDRII ZHUKOV,
^cANNA HREBENYUK, ^dIVAN BANDURA,
^eOLEKSANDR HOLOVKO, ^fPETRO HLAMAZDA

^{a,b}University of Modern Knowledge, 57/3, Velyka Vasylkivska Str., 03150, Kyiv, Ukraine

^{c,e}National Academy of the Security Service of Ukraine, 22, Maksymovycha Str., 03022, Kyiv, Ukraine

^dJudge of the Svyatoshyn District Court, 27a, Yakub Kolasa Str., 03148, Kyiv, Ukraine

^fLesya Ukrainka Volyn National University, 28, Vynnychenko Str., 43025, Lutsk, Ukraine

email: ^astargdoc@gmail.com, ^bpatriot2411@gmail.com,
^calefinaandrievskaya@gmail.com, ^dinbox@sv.ki.court.gov.ua,
^esashaalinayana@gmail.com, ^fglamazda.petro@vnu.edu.ua

Abstract: This paper explores the “Roman formula” method as an effective cognitive tool for detecting, disclosing, and investigating criminal offenses. The method serves two primary functions: first, to elucidate the circumstances surrounding a specific event during the detection, disclosure, and investigation of a criminal offense; and second, to act as an educational tool that aids investigators in self-education and professional development. The “Roman formula” method comprises a system of rules or recommendations that investigators can employ to develop intuitive procedures for solving tactical problems while analyzing past events. The key advantage of this method is that, at the initial stage of a criminal investigation, tactical tasks may not have a definitive answer and may present multiple solutions. This expands the investigator’s “ignorance” and facilitates the formulation of various investigative hypotheses. The method underscores the importance of impartiality, advocating against a solely accusatory approach in investigations. The main functions of the “Roman formula” method include: 1) guiding investigators to the correct resolution of tactical tasks, 2) reducing options when selecting solutions for tactical problems, and 3) addressing “open questions.” The use of the “Roman formula” method allows investigators to transition from reproductive knowledge (theoretical and practical) to productive knowledge (constructing forensic models of past events). Its versatility is evident as it can be applied individually in “internal dialogue” or collaboratively within a group (e.g., investigative-operational groups or investigative teams), enhancing its effectiveness.

Keywords: criminal offense investigation methods, Roman formula method, seven-term Roman formula, crime investigation methods, crime investigation tactics, cognitive methods in criminology.

1 Introduction

The use of forensic algorithms and programs to detect, disclose, and investigate criminal offenses can somewhat confine the investigator to specific cognitive frameworks. At the initial stage of a criminal investigation, particularly during the examination of the crime scene, an investigator may require a more comprehensive approach to gathering information within a particular subject area. To address this need, criminology advocates the application of cognitive methods developed within the general methodology of science, especially heuristic methods. V. V. Tishchenko and A. A. Bartsytska assert that “the heuristic method is a distinct form of cognition and is not confined to a traditionally defined set of logical methods. In forensics, the heuristic method addresses atypical investigative tasks, engaging the full spectrum of mental and intuitive potential. Its application fosters the emergence of intuitive insights and beliefs, significantly facilitating the search and cognitive process” [10]. Other researchers highlight that heuristic techniques, which activate creativity and non-standard thinking, are employed when conventional methods, based on experience and current conditions, fail to achieve the desired outcome. Heuristic methods are categorized as methods of undirected search, including techniques such as “brainstorming,” expert evaluations, “collective notebooks,” “control questions,” “associations and analogies,” business games and simulations, “cybernetic meetings,” and others [9]. Therefore, the dual purpose of heuristic methods is to serve as educational tools and to facilitate the acquisition of new knowledge while exploring specific research subjects.

The term “heuristics” refers to the branch of knowledge concerning creative activity and the search for methods to discover new insights in judgments, ideas, and approaches. The

concept of “heuristics” originated in ancient Greece as a method of effective learning employed by Socrates. Over time, this branch of knowledge, which studies creative activity, came to be known as heuristics. Its primary purpose is to develop models for discovering new solutions to problems. Today, heuristics is a multifaceted field that encompasses aspects of philosophy, psychology, cybernetics, linguistics, information theory, and the organization of scientific work. The central focus is on the psychology of creative thinking, which explores the mechanisms behind solving various problem situations. Heuristic techniques become relevant when existing conditions do not provide a clear solution and when experience lacks a ready-made scheme applicable to the situation. These techniques generate new strategies for overcoming problem situations. The importance of heuristics has grown with the rapid advancement of science and technology, which has broadened the range of complex problems needing resolution [8].

In philosophy, the development and adoption of heuristic methods are attributed to Socrates and Quintilian. For example, “Socratic conversations” are viewed as a dialogic method for discussing the relevant “object of knowledge” and the “search for truth”. Socratic dialogues are considered “dialectics in action,” a philosophical “art of reflection,” resulting in knowledge generated during the conversation as “fruits” by the participants. Notably, the cognitive value of the “Socratic conversation” is aimed at uncovering the mental essence of the studied phenomena rather than merely describing their sensory images and external connections.

Even today, certain Socratic “methodical principles” form the basis of specific forensic recommendations and remain effective during the detection, disclosure, and investigation of criminal offenses. These principles include: 1) a dialogic form for discussing the “subject of research” and “search for truth” (utilized during the development of forensic hypotheses, interrogation tactics, and meetings of investigative and operational groups); 2) leading questions that help determine the boundaries of “knowledge” and “ignorance” of dialogue participants (standard in interviewing witnesses); 3) the inductive method of “ascent to the general” (forming the basis for profiling the criminal and understanding the criminal activity mechanism); 4) dialogic discussion of the strengths and shortcomings of investigative practices (common in meetings, when analyzing investigative mistakes, and reviewing best practices in investigative work).

In the 1990s, nearly 400 years after Socrates, Marcus Fabius Quintilian (Quintilian, 1834)—who is renowned not only as a Roman educator and rhetorician but also as a theoretician and author of a well-known textbook on oratory—offered his interpretation of heuristic methods. Quintilian formulated and defined a sequence of seven questions designed to provide the most complete information possible about a particular event, phenomenon, process, or task. This set of questions is known as the “Roman formula,” which, according to him, should be answered in the following sequence: 1) Quis? - Who? (subject); 2) Quid? - What? (object); 3) Ubi? - Where? (place); 4) Quibus auxiliis? - With what? (means); 5) Cur? - Why? (purpose); 6) Quomodo? - How? (method); 7) Quando? - When? (time). Quintilian extensively utilized the heuristic questions of the “Roman formula” in his scholarly and practical work, advising his students to gather as much information as possible about a specific event and to address these questions logically.

Quintilian believed that productive knowledge could be acquired through the “question-and-answer method.” To this end, he proposed an original approach involving the use of the “Roman formula” questions for the audience. Quintilian was convinced of the benefits of this learning method and highlighted its distinct advantage for self-education, where students, through “internal

dialogue,” could ask questions to themselves and thereby gain new insights into specific events.

Elucidating the circumstances of past events is a fundamental task in the detection, disclosure, and investigation of criminal offenses. The methods that enable success in solving this tactical problem remain a critical issue in the field of criminology.

2 Literature Review

The development of jurisprudence as a science dates back to the time of ancient Roman statehood. It is widely accepted that Roman law, formulated by the lawyers and jurists of that era, laid the foundation for the legal systems of European states. Many direct Latin borrowings have been preserved in European languages and are used even without alterations to their orthographic structure.

In the realm of criminal process investigation, Roman jurists of the classical period (1st-3rd centuries) developed a scheme consisting of seven key elements to be clarified during an investigation of an offense or event: “Quis, quid, ubi, quando, cur, quomodo, quibus auxiliis”. These are translated as follows: “who committed”, “what exactly” (the offense), “where” (the place of commission), “when” (the time of commission), “for what purpose”, “how” (the method), and “with whose help”. These “schemes” were sometimes referred to as “formulas,” which served as guidelines for judges in resolving specific cases.

For instance, in the mid-2nd century, the Roman lawyer Claudius Saturninus proposed a method to determine the degree of danger of a specific crime and the appropriate type and amount of punishment. His scheme included seven points: “causa, persona, locus, tempus, qualitas, quantitas, eventus”, which translate to “cause” (the crime), “person” (the criminal and victim), “place” (sacred or secular), “time” (day or night), “quality” (open or covert crime), “quantity” (amount stolen), and “consequence” (completed crime or attempt). By the 6th century, Claudius Saturninus’s recommendations were incorporated into the extensive and systematized collection of excerpts from the works of authoritative Roman jurists known as the Digests of Justinian (Digesti Justinian, 2005), which held the force of law.

At the beginning of the 20th century, Austrian criminologist Hans Gross recommended that future forensic investigators utilize the guidelines now commonly known as the “Roman formula” to uncover the circumstances of a crime. In his “Manual for Forensic Investigators as a System of Criminology,” published in translation in 1908, Gross advised future forensic investigators on the questioning of individuals, stating: “In the initial interrogations, experience is crucial—the ability to strike a balance, avoiding the waste of time on trivial matters while maintaining focus on the important aspects. For those without such experience, it is beneficial to remember the old, valuable advice of lawyers: ‘Quis (who), quid (what), ubi (where), quibus auxiliis (by what means or with which tools), cur (for what purpose), quo modo (how, under what circumstances), quando (when).’ On my desk, where many young lawyers prepared to become forensic investigators, there was always a board displaying this simple, all-encompassing wisdom. I frequently heard from these young professionals, who later embarked on independent practice, that they avoided significant errors by keeping this board in view” [3].

Between 1910 and 1918, the “Roman formula” was established as the foundation of the “modus operandi system” by L. Etcherley, Chief of the Yorkshire Police (England, 1910), and A. Vollmer, Chief of the California Police (USA, 1918). This system focused on criminal activities aimed at theft.

The Latin term “modus operandi,” which literally translates to “conditions (mode) of action,” later became widely used in criminology to describe “the way a person commits crimes.” The “modus operandi system” is a specialized method for recording, accumulating, storing, and processing information about the modus operandi of both known and unknown criminals. Each criminal’s modus operandi in resolved or unresolved cases is

recorded on a specific card, which is then added to an array of cards, creating a comprehensive information and search system. In Western European criminology, this system became widely known as the “modus operandi system,” while in post-Soviet countries, it is referred to as “accounting according to the method of committing crimes.” This system was later endorsed by prominent Western European criminologists V. Shtiber and R. Reis [7]. In this system, modes were categorized and numbered from 1 to 10 as follows: 1) the object targeted; 2) method of entry; 3) tools used; 4) nature of the stolen property; 5) time of the crime; 6) methods (tricks) used to gain access; 7) the story (legend) used by the criminal to explain their presence at the crime scene; 8) information about accomplices; 9) vehicles employed by the criminal; 10) characteristics of the criminal’s actions indicating specific professional skills.

In the 1950s, M. Fitzgerald, in his book *Manual of Criminal Investigation*, recommended entering information, modified in a specific way and based on the analyzed “Roman formula,” into the robbery record card. This information includes: 1) the crime scene; 2) a description of the entry point to the premises; 3) the method of entry; 4) the time of day; 5) a description of the stolen items; 6) accomplices; 7) the type of transport used; 8) unusual or peculiar facts; 9) the criminal’s surname or nickname; 10) the victim [1].

Today, forensic accounting based on the “Roman formula” continues to serve practical purposes, including the investigation of specific criminal offenses, the search for perpetrators, the prevention of crimes, and the development of tactical techniques, forensic tools, and investigative recommendations.

In the 1940s, the “Roman formula” was still recommended for clarifying the circumstances of a crime. According to Soviet criminologist S. M. Potapov, a crime is proven when the relevant facts are collected and analyzed, clarifying the essence of the event (what happened), its location (where), time (when), and method (how). The identity of the perpetrator is proven when facts are gathered that accurately identify the individual (who), with or without accomplices (with whose help), and the motive for their actions or inactions (for what purpose). Therefore, S. M. Potapov believed that one of the main tenets of forensic science is that all these issues should be addressed both during the investigation and when evaluating the collected evidence for completeness [12].

In the 1948 textbook *Criminal Procedure*, the renowned proceduralist M. O. Cheltsov links the “Roman formula” to the investigation plan. Cheltsov writes, “It can be considered that the general plan—a scheme that establishes the main milestones of the investigation—has not lost its significance. This scheme was even recommended by ancient Roman lawyers.” V. Hromov, a Soviet proceduralist with extensive investigative experience, cites this formula in his book *Investigation and Preliminary Investigation as a practical guide for investigators*: “Quis, quid, ubi, quando, cur, quomodo, quibus auxiliis?” (That is: “Who (committed the crime)? What exactly (was done)? Where (did it occur)? When (did it happen)? For what purpose? In what way? And by what means?”) However, Hromov correctly emphasizes that the order of actions according to this scheme is determined by the specifics of each case. In his work, the creative element plays a crucial role for the investigator.

In the graphical representation of the scheme (with questions from the “Roman formula”) presented in Cheltsov’s textbook, an attempt is made to illustrate the content of each element (question) and its possible connection to the identified subject of the crime (or a wanted criminal). The investigator is advised to address the questions of the Roman formula as follows: What? (the composition of the crime, its object); Where? (issues of alibi, jurisdiction); When? (issues of alibi, timing); Why? (purpose, motive, composition of the crime, aggravating or mitigating circumstances); How? (method of action and circumstances aggravating the crime); By what means? (instrument of the crime, questions of complicity); Who? (the subject of the crime).

In the textbook mentioned above, M. O. Cheltsov graphically demonstrated the interrelationship of issues in crime investigation, explaining it as follows: while the object of the crime (i.e., the victim) often provides clues about the motive and sometimes about the perpetrator, there are cases where the investigator must deduce the composition of the crime from the motive, method of action, and identity of the criminal.

Cheltsov also notes that accurately determining the place and time of the crime often provides a "key" to establishing the criminal's identity and can sometimes reveal the falseness of an alibi. The significance of these factors also affects the determination of jurisdiction and the statute of limitations. A collaborative examination of the motive and method of action can occasionally assist in addressing questions about the mental state of the accused (M. A. Cheltsov, 1948).

During this period, the questions of the "Roman formula" were adapted to investigate specific types of crimes. For instance, in the methodology for investigating motor vehicle accidents, the following questions were proposed: a) What are the causes of the motor vehicle accident? b) Does the incident constitute an "accident" or a "crash"? c) What is the time of the motor vehicle incident? d) Where did the accident occur, and what positions did the vehicles and the victim occupy relative to each other? e) From where could the incident have been seen or heard? f) What objects remained at the scene, and what traces were left as a result of the accident? g) Who is the perpetrator of the accident and who is the victim? h) What was the direction of the vehicle's movement if it disappeared? [4].

At the beginning of the 2000s, opinions among scholars regarding the use of the "Roman formula" in crime investigations became polarized. For instance, M. V. Saltevsikii, when developing a murder investigation plan and evaluating the sufficiency of collected evidence for proving each element, recommended employing the "Roman formula" questions, specifically: "Who was killed? By whom? When? By what means and in what way? With what purpose?" [5]. On the other hand, I. A. Vozgrin argued that the "Roman formula" could not be considered universal due to its brevity and lack of specificity, which do not account for the nuances involved in investigating different types of crimes. Efforts to expand the range of investigative questions to twelve did not fully address these limitations. In light of this, most contemporary forensic frameworks for analyzing crimes include systematic lists of circumstances to be established, categorized according to the core elements of the crime: a) the object of the crime (the target of the crime, the reason for the damage, the extent of the damage, etc.); b) the objective aspect of the crime (where, when, how, whether committed by one or multiple individuals, each person's role, the circumstances, the consequences, the damage inflicted, the causal relationship between the act and the consequence, contributing factors, etc.); c) the subject of the crime (the perpetrator, details characterizing the perpetrator, and if applicable, the identities of accomplices); d) the subjective aspect of the crime (the nature of the perpetrator's guilt, its form, motive, and intent). This approach effectively conveys the specifics of all relevant circumstances in various types of crime investigations while maintaining the practical simplicity of applying scientific data. However, it is important to note that excessive detail in outlining the circumstances to be clarified during crime investigations is inadvisable, as it may lead to a criminal-legal analysis of the crime's composition, potentially undermining the forensic character of methodological recommendations (I. A. Vozgrin, 2001).

Finally, the issue of employing the "Roman formula" method in the investigation of criminal offenses was addressed approximately twenty years ago. The purpose of this article is to conduct a scientific analysis of the "Roman formula" method, focusing on: 1) its role in the development of cognitive methods in criminology, and 2) the potential for adapting this method to contemporary conditions for the detection, disclosure, and investigation of criminal offenses.

3 Materials and Methods

To achieve this goal, the methods of scientific inquiry are employed, including observation, comparison, abstraction, analysis, synthesis, and modeling.

4 Results and Discussion

In the context of the modern application of the "Roman formula" as a heuristic method for understanding events, the following provisions are particularly significant: 1) new knowledge about an event can be effectively gained using the "Roman formula" questions in conjunction with the contemporary informational framework of criminology; 2) the question-and-answer approach of the "Roman formula" relies on a system of key (heuristic) questions; 3) employing the "Roman formula" questions during the "internal dialogue" that an investigator conducts with themselves is advisable, as it can foster self-education and professional development.

At the core of heuristic methods in general, and the "Roman formula" method in particular, is the question. A question is a statement that identifies the unknown elements of a specific problematic situation that need to be clarified or a problem that requires resolution. In natural language, questions are expressed through interrogative sentences or phrases. Each question contains two components: what is known (assertoric side) and what requires clarification (problematic side). The assertoric side characterizes the subject of the question, highlights the presence of what is assumed by the question but not yet fully understood, and defines the range of possible meanings for the unknown [12].

Questions formulated by investigators during the detection, disclosure, and investigation of criminal offences, based on the components of the "Roman formula," represent inquiries that address gaps in forensically significant information about a specific object. These questions have a unique structure and require a response or explanation. They function as prompts that encourage the investigator to provide additional information to reduce or eliminate cognitive uncertainty about a past event. The forensically significant information available to the investigator, which may be explicitly or implicitly contained in the constructed question and expressed as a judgment or a system of judgments, is referred to as the question's premise. These premises enable the questions to convey essential information.

A question formulated by the investigator using the "Roman formula" components represents an unknown element that must be resolved. This question expresses the absence of forensically significant information about a specific object, is structured with a particular form and intonation, and requires an answer or explanation. Verbally, such a question is presented as an interrogative sentence.

The formulation of questions by investigators based on the components of the "Roman formula" is integral to detecting, disclosing, and investigating criminal offences, as this process is both purposeful and substantive. A question arises when an investigator's knowledge about a particular subject is insufficient to achieve the set goal, thereby highlighting the need for additional information. Consequently, studying the context in which the investigator has a question allows for an assessment of the existing knowledge's relevance and identifies specific gaps. Only after recognizing these gaps can investigators formulate an adequate question. In this context, a question formulated using the components of the "Roman formula" aims to clarify the situation by addressing and filling the identified knowledge gap. This function of the "Roman formula" questions is to determine the goal of acquiring knowledge. Similarly, the investigator mentally anticipates the outcome of this knowledge acquisition. The question effectively reflects the situation when the anticipated result of the inquiry helps bridge the knowledge gap specific to that situation.

The investigator's question, formulated based on the components of the "Roman formula" and appropriate to the situation, reflects the dialectical contradiction between "knowledge" and "ignorance." As such, it serves as a critical tool for developing knowledge about the past event under investigation. Typically, the investigator's question identifies a knowledge gap and requests its resolution. Therefore, the question simultaneously expresses a lack of knowledge and a demand to resolve this deficiency. Each question the investigator poses is rooted in what is already known but points toward the unknown, signaling the need to search for the unknown based on its relationship to the known. This process precedes the investigator's search, which can be described as the journey from the "known" to the "unknown" and as the transition from "imperfect" to "perfect" knowledge.

The directions embedded within the questions formulated based on the components of the "Roman formula" indicate the investigative area in which the investigator will gather information about the past event. These questions function as guides, providing focus for the investigator's inquiry, much like landmarks. The questions are always linked to a potential answer, which forms the subject of the inquiry. The scope of a question represents the range of possible answers concerning a known subject. The investigator's progression from established judgments to new, more precise, and content-rich insights follows a sequence of steps: posing a question, searching for new forensically significant information, constructing an answer, and then formulating the next question based on the new information revealed in the previous answer. The questions formulated based on the "Roman formula" gradually disappear as the contradictions in the investigator's knowledge are resolved through the learning process. A correct understanding of these questions, their specifics, and their role in gaining knowledge about the past event can be achieved by recognizing the contradictions that emerge and are resolved through the investigator's interaction with the object of inquiry.

As a means of expression and syntactic structure, the question primarily functions as an interrogative sentence in the detection, disclosure, and investigation of criminal offenses. It can be expressed as a word or phrase and may take either an expanded or a highly abbreviated form. However, a question is not a judgment, as a judgment involves asserting or denying something, whereas a question does neither. As a result, questions are not subject to the concepts of truth or falsity. Instead, questions can be meaningful or nonsensical, correct or incorrect, appropriate or inappropriate.

When a question arises based on some initial knowledge, it indicates a gap or uncertainty that must be resolved. This incompleteness or uncertainty is highlighted by the interrogative words of the "Roman formula," such as: "Who?", "What?", "When?", "Why?", etc.

As mentioned earlier, questions play a crucial role in understanding past events investigated by the investigator. It is through questions that the problems and tasks are framed, and by solving these, the investigator gains new knowledge. The role of questions formulated based on the components of the "Roman formula" is equally important in the training of investigators. In uncovering past events, the investigator seeks answers to questions that are not yet known within the context of the criminal investigation. Investigators in training must engage with such questions, the answers to which may have already been found but are still unknown to them. The process of searching for answers, obtaining missing information, mirrors the cognitive process of scientific research and investigative inquiry. This approach fosters the development of logical thinking, enhances intelligence, and encourages flexibility in mental processes, including creative thinking, observation, prediction, intuition, and focused attention.

To effectively apply the "Roman formula" method, the investigator must learn how to ask and answer questions correctly, particularly when conducting an "internal dialogue"

mentally. The following specific rules should be followed when formulating such questions:

- 1) The question must be meaningful and accurate (to verify the accuracy of the question, it is necessary to ensure the premises are valid).
- 2) The question should be formulated as briefly and clearly as possible (long, complex, or unclear questions make it difficult to understand and answer them).
- 3) It is advisable to break down complex questions into simpler components (for example, the question "Could Mr. Petrov and Mr. Sidorov have committed theft from the apartment because surveillance cameras recorded their car entering the building?" should be divided into two simpler questions since the answers will differ: Petrov could have committed theft because he was a repeat offender previously prosecuted for similar offenses, while Sidorov, a driver providing private taxi services, had no criminal record, was positively regarded in his community, and had been officially hired by Petrov to provide transportation).
- 4) In complex multiple-choice questions, all possible alternatives should be presented (for example, "Did the criminal enter the apartment on the fifth floor through the door or the window?").

Only a correctly formulated question, using the components of the "Roman formula," can fulfill its functions in the detection, disclosure, and investigation of a criminal offense, as well as in the training and professional development of investigators.

When formulating questions with the components of the "Roman formula," the investigator must differentiate between "logically correct" and "logically incorrect" questions. A question is considered "logically correct" if the investigator can provide a "true" answer that reduces cognitive uncertainty during the investigation of the event. Such an answer cannot be given to "logically incorrect" questions. For instance, questions are deemed incorrect when their wording contains expressions or terms whose meanings are unclear; when all expressions in the question have specific meanings, but there is no agreement between them; when the basis for the question is a false assumption (these questions cannot yield a "true" answer and are therefore called provocative); or when the question does not reduce cognitive uncertainty because it is based on a non-existent issue (such questions are referred to as tautological).

Based on the degree of uncertainty the investigator must address, questions are categorized as "difficult" or "easy." Difficult questions occur when there is no fixed number of answers. "Open" and "closed" questions require a specific number of responses. Among the "real" answers, there is a distinction between "correct" and "incorrect." "Correct" answers entirely or partially resolve the investigator's cognitive uncertainty.

The answer that eliminates the investigator's cognitive uncertainty is called "strong," as opposed to entirely "weak." Out of two "weak" responses, one may be "stronger" than the other.

The following peculiarities can be identified regarding the answer to a question formulated by the investigator using the components of the "Roman formula": asking the question is inseparable from the search for its answer; the correct formulation of the question is essential for finding the appropriate answer; and the proper formulation of the question is the result of the investigator's complex mental activity, derived from analyzing the forensically significant information available to them.

From a psychological perspective, human activity involves both external and internal components: external actions are mediated by internal processes, while internal processes manifest through external actions. A person's external and internal activities are interconnected and similarly structured. One can engage in internal thought (an inner plan), working with images, concepts, schemes, and auditory representations. At the same time, words

(concepts) that reflect the essential properties of objects and phenomena are crucial. The use of concepts and symbols regulates human activity and behavior, grounded in experience and social practice, enabling the transmission and retention of such knowledge.

Internal activity realizes a theoretical approach to the world, reproducing it as an image, concept, model, or scheme. It is carried out through cognitive processes—such as sensation, perception, memory, thinking, and imagination—and its results are summarized through language.

In a specific performance situation, internal activity prepares external activity, optimizes human effort, creates opportunities to choose the necessary action, and helps avoid errors in both activity and behavior [6].

An investigator's communication with others during the detection, disclosure, and investigation of a criminal offense can never fully satisfy the need for forensically significant information about a past event. The investigator always relies on their own thinking; thus, "internal dialogue" is a crucial component of productive thinking. The role of "internal dialogue" in the investigator's mental process vividly demonstrates its cognitive function. In certain cases, when solving tactical problems collaboratively, the investigator's "internal dialogue" can substitute for "external dialogue."

The investigator's mental actions involve manipulating objects reflected in images, ideas, and concepts, which are processed "in thought" through language. In this process, the investigator does not interact directly with the objects but rather engages with them mentally, without altering their physical structure or position [11].

"Internal dialogue" is a term from general psychology that describes the investigator's continuous internal communication with themselves while investigating a past event. This "internal dialogue" and the cognitive actions performed by the investigator during the investigation are two essential and relatively independent components of the mental process. "Internal dialogue" is a crucial part of the investigator's thinking when solving complex tactical problems, particularly when using the "Roman formula" method.

At the same time, the high productivity of the investigator's mental process, which continues through "internal dialogue," is only possible when there is coherence and coordination between the dialogue and the intellectual actions undertaken by the investigator. A key aspect of this mental process is the investigator's ability to formulate questions and independently search for answers. The investigator's mental actions should not be involuntary or random. They must approach the problem openly, analyze it, understand the connection between the conditions of the problem and what needs to be determined, and grasp the essence of the issue. Insight and the ability to formulate productive questions are often significant outcomes of the investigator's effective "internal dialogue."

Unfortunately, the investigator's "internal" thinking activity is not always highly organized or productive. Often, finding a solution or addressing a problem directly is impossible. The reasons for this may include:

- 1) Inappropriate or inaccurate perception of the situation: The investigator may lack the necessary vision to understand the key prerequisites for achieving the desired result. At first glance, they may seem to comprehend the entire situation, but this perception often turns out to be inappropriate, inaccurate, too general, or excessively focused on details.
- 2) The temptation to quickly and unproductively combine aspects of the problem: Vaguely understood problematic issues can negatively affect the investigator's ability to see the whole picture, imposing a narrow, sometimes erroneous view of the problem and leading to unproductive focus.

- 3) Subjective difficulties and personal problems: Intense emotions, especially negative ones, can severely impair the investigator's ability to think calmly, causing objects and their properties to be perceived in a distorted or biased manner. On the other hand, mild positive emotions can significantly improve cognitive performance.
- 4) Dominance of the investigator's "I" and an uncontrolled desire to always be right (closed cognitive position): Such an investigator is not guided by the current cognitive situation or the laws of logic because their sense of self-importance (the "I") takes precedence [6].

The investigator's mastery of organized and productive mental methods is a prerequisite for effectively solving tactical problems using the "Roman formula" method. The method of obtaining new knowledge based on the "Roman formula" has developed in an interesting way. For instance, H. I. Bush created a "sevenfold search strategy" based on the "Roman formula" [1] and introduced it for use in invention training at Latvian national universities of technical creativity.

This strategy involves the systematic and repeated application of various 7x7 matrices, tables, and other techniques. The strategy assumes that an individual can adequately consider, compare, and study up to seven subjects, elements, concepts, or ideas at one time. Bush originally conceived the number "7" as a technique to facilitate data analysis by enabling the simultaneous consideration of information. It turned out that in many cases, this approach—simultaneously considering ideas, concepts, relationships, and characteristics—promotes the generation of new inventive ideas. Using tables with just two or three columns, either horizontally or vertically, rarely stimulates creative thinking, while bulky tables with excessive information stifle creativity, turning a person into a mechanical operator. The multifaceted nature of the 7x7 tables, on the other hand, helps to activate and engage thinking.

The "sevenfold search strategy" is denoted by the conventional symbol "seven squared." In addition to tables, other graphic tools for visualization can also be used in the strategy, such as graphs, diagrams, and schemes.

The proposed strategy suggests conditionally dividing the creative process into seven stages: 1) analysis of the problem situation; 2) analysis of analogs and prototype functions; 3) formulation of the problem; 4) generation of inventive ideas; 5) concretization of ideas; 6) evaluation of alternatives and selection of rational decision options, choosing the optimal solution; 7) simplification, development, and implementation of the solution [1].

The foundation of this method lies in obtaining information about the subject, object, location, means, goal, methods, and time by asking successive questions based on the "Roman formula" in the sequence proposed by Quintilian. According to H. I. Bush, these questions are particularly useful when setting an inventive task, especially under conditions of limited information, as they allow for a multi-faceted consideration of the available data to maximize benefits.

It has been observed that combining questions can yield more information than answering the seven individual questions of the "Roman formula" directly. To facilitate the systematic posing of combined questions, a table illustrating the interaction of key questions is constructed, with each rhombus representing a combination of two questions (for example, rhombus 1-4 contains the question "Who – What?", rhombus 2-3 "What – Where?", rhombus 6-7 "How – When?", etc.) [1].

In the course of detecting, disclosing, and investigating criminal offenses, the use of combinations of "Roman formula" questions allows the investigator to formulate inquiries such as: "Who (specifically) among the members of the criminal group performed what actions?", "Who (specifically) among the participants of the criminal group was in a certain location?", "Who (specifically) among the group members used certain

means to commit the crime?”, “What goal did a (specific) member of the criminal group pursue?”, “What actions did a particular group member perform?”, etc. The investigator can also use these questions to predict future actions of offenders, such as: “Who and what means will be used to commit a criminal offense in the future?”, “What property and where should criminals target in the future?”, “How was this crime committed, and when might a similar crime occur in the future?”, etc. Additionally, the investigator records the answers to these questions on a separate sheet for presentation and discussion at meetings of investigative or investigative-operational groups, when formulating forensic versions, and so on.

In several cases, especially within complex problem situations, asking 21 combined questions in a general form may not be sufficient. For a more precise study of the problem situation, it is recommended to construct a “detailed” table illustrating the interaction of “elements” (i.e., “Roman formula” questions). To enhance clarity, it is advisable to indicate rational combinations of these questions by shading the corresponding diamonds, and to record the answers on a separate sheet.

The investigator can use the answers to these “difficult” questions to address specific local tactical problems and throughout the investigation of a criminal offense. Therefore, it is recommended to maintain and continually update the list of answers to these combinations of questions at least until the main body of additional forensically significant information is obtained.

5 Conclusion

Therefore, the heuristic method of the “Roman formula” can serve two main functions for the investigator: first, to uncover the circumstances surrounding a specific event during the detection, disclosure, and investigation of a criminal offense; and second, as an educational tool that aids investigators in acquiring new knowledge through self-education and professional development. This method provides a system of rules and recommendations that investigators can effectively use to develop intuitive procedures for solving tactical problems and understanding past events.

A significant advantage of using the “Roman formula” method is that, at the initial stage of a criminal investigation, tactical tasks often lack precise, unequivocal answers and involve multiple potential solutions. This approach expands the range of the investigator’s “ignorance” and allows for the development of several investigative hypotheses in a particular direction. By adhering to the principle of impartiality, investigators are encouraged to avoid exclusively accusatory approaches and to explore various investigative paths.

Therefore, the main functions of the investigator’s use of the “Roman formula” method during the detection, disclosure, and investigation of criminal offenses are as follows: 1) guiding the investigator toward the correct solution of a tactical task; 2) reducing options when selecting possible solutions to a tactical problem; and 3) fostering the function of “open questions.” The latter is evident in the way the more uncertain, general, and non-traditional questions posed by the “Roman formula” stimulate diverse and heuristic approaches, thereby enhancing the potential for finding varied solutions.

The general principles outlined for using the “Roman formula” questions to clarify past events can serve as a foundation for refining modern investigative methods. Specific, enduring heuristic procedures embedded in this method are well-suited for acquiring forensically significant information in contemporary contexts of criminal investigation.

By employing the “Roman formula” method, investigators progress from reproductive knowledge (previously acquired theoretical and practical insights) to productive knowledge (constructing a forensic model of past events). This method is highly versatile, as it can be used independently in the process of

“internal dialogue” or collectively within a group (such as an investigative-operational group or investigative team). It can also be effectively applied in both individual and group settings, significantly enhancing its effectiveness.

Furthermore, the “Roman formula” method can be employed both symptomatically—such as during a specific inspection at the crime scene to address a particular tactical issue—and longitudinally—throughout the process of developing a comprehensive model of the past event. It supports continuous clarification and acquisition of new knowledge about the event, facilitating a transition from “ignorance” to “knowledge.”

Literature:

1. Bush, H. I. (1974). *Methodological foundations of scientific management of innovation*. Riga: LIESMA Publishing House. 166 p.
2. Fitzgerald, M. J. (1952). *Handbook of Criminal investigation*. New York: Arco Publishing Company. 238 p.
3. Gross, H. (1908). *Guide for forensic investigators as a system of criminalistics*. St. Petersburg: M. Markushev Printing House. 1040 p.
4. Kravtsov, M. A. (1948). Inspection and recording of pictures of motor vehicle accidents. *Collection of works of the Odesa Research Institute of Forensic Expertise*, 1, 5-10.
5. Saltevskiy, M. V. (2001). *Criminalistics*. Kharkiv: Consum. Part 2. 528 p.
6. Savchyn, M. (2024). *General psychology*. Kyiv: Akademiya. 352 p.
7. Shepitko, V. & Shepitko, M. (2021). Criminal law, criminology and judicial sciences: an encyclopedia. Kharkiv: Pravo. 508 p.
8. Shynkaruk, V. I. (2002). *Philosophical encyclopedic dictionary*. Kyiv: Abrys. 742 p.
9. Skalozub, L. N., Vasylynchuk V. I., Nykyforchuk, D. Y., & Busol O. Yu. (2009). *Conducting an analysis of the criminogenic situation and operational information in the field of combating economic crime: educational and practical guide*. Lviv: Literary Agency "PYRAMIDA". 59 p.
10. Tishchenko, V. V., Bartsytska, A. A. (2012). *Theoretical foundations of the formation of a technological approach in criminalistics*. Odesa: Phoenix. 198 p.
11. Trofimov, Yu. L., Rybalka, V. V., & Honcharuk, P. A. (2005). *Psychology*. Kyiv: Lybid. 560 p.
12. Tsymbal, M. L., Symakova-Efremyan, E. B., & Shepytko, V. Y. (2002). *S. M. Potapov is the founder of the theory of forensic identification*. Kharkiv: Pravo. 41 p.

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THE ROLE OF DIGITIZATION OF THE EDUCATIONAL PROCESS IN THE CREATION AND FUNCTIONING OF ARTIFICIAL INTELLIGENCE

^aIRINA MOSIAKOVA, ^bVALENTYN ROGOZA, ^cYAROSLAV SMOLYN, ^dVIKTORIA BAIKAL, ^eIHOR HAVRYLOV, ^fOLGA KAZANSKA

^{a,b,f}*Institute of Pedagogy of the National Academy of Educational Sciences of Ukraine, Kyiv, Ukraine*

^c*Educational and Research Institute of Law, Psychology and Innovative Education, Lviv Polytechnic National University, Lviv, Ukraine*

^d*Institute of International Education at V. N. Karazin Kharkiv National University, Kharkiv, Ukraine*

^e*Grigory Skovoroda University in Pereyaslav, Pereyaslav, Ukraine*

email: ^a*mosyakova@ukr.net*, ^b*rogoza.v.v@gmail.com*,

^c*yaroslav.v.smolyn@lpnu.ua*, ^d*vikuskabai@gmail.com*,

^f*197019901gor@gmail.com*, ^f*olgakazanskaya70@gmail.com*

Abstract: The authors assert that by improving instruction methods and reinventing learning experiences, artificial intelligence is already changing the educational environment for both instructors and students. It has been demonstrated that artificial intelligence disrupts conventional teaching and learning strategies, having a significant influence on contemporary education. Moreover, it is mentioned that gaining an understanding of AI-powered technologies' potential will make it easier to integrate them into the teaching process, improve instructional strategies, and automate administrative duties.

Keywords: digitization, artificial intelligence, technology, education, learning, ecosystem.

1 Introduction

The education system has to be updated and adapted in light of the global trends of the current day, including the digital economy and society. The primary goal of education is to educate students for professional and personal life in the VUCA and BANI worlds. Digital technologies have completely changed the way that education is delivered in academic settings, providing students with new ways to access, interact with, and apply information. The bounds of conventional education have been changed by technology, which includes interactive multimedia content, virtual classrooms, online learning platforms, and adaptive learning algorithms. In addition to improving learning's adaptability and accessibility, this digital revolution has made it possible for customized learning experiences that are catered to each learner's requirements and preferences [5-8; 13; 14; 16; 17; 35; 36; 44; 46].

The needs of the post-Covid-19 epidemic have been met by the smoothly connected school systems backed by technology across the world. The educational communities are also quickly acquainting themselves with the rapid advancements of digital technologies that are supported by artificial intelligence (AI) [24]. The smooth integration of digital technology tools into conventional learning environments characterizes the contemporary era's digital landscape, which has transformed education [19; 22]. This paradigm shift substantially alters students' ideas of individualized learning in the digital age and transforms how they engage with educational environments. Their ability to smoothly combine emerging personal learning environments with existing educational institutions, bolstered by AI-powered digital instructional technologies, is at the core of this change [45].

The integration of customized and adaptive learning experiences with conventional teaching-learning models is heralded by the introduction of AI technology in education. The conventional educational systems were teacher-focused and followed a set methodology for disseminating information in classroom settings [19; 23]. By offering a broad range of intelligent tutoring systems to adaptable learning platforms, artificial intelligence technologies catered to the specific demands and learning preferences of individual students [1]. This signals a change in strategy from a general to individualized instruction. Without

diminishing the advantages of the conventional social learning systems, it reshapes the educational landscape by establishing a setting where students advance at their own speed and receive tailored feedback, resulting in a more efficient and interesting learning experience [18].

Digitalization has been a major driver of innovation in classroom education during the past 10 years [43]. The next wave of innovation will be focused on artificial intelligence (AI) or integrating AI with other technologies; the majority of innovation to date has been focused on increasing the use of computers and the internet in the classroom. Since at least the 1980s, "AI in education" has been a coherent field of academic research, as evidenced by the founding of the International AI in Education Society (IAIED) in 1993 and the publication of the International Journal of Artificial Intelligence in Education in 1989. An artificial intelligence system is defined as a machine-based system that can make predictions, recommendations, or judgments influencing real or virtual environments for a given set of human-defined goals by the AI Group of Experts at the OECD in 2019. AI systems are designed to be autonomous to varying degrees. Artificial intelligence in society (2019) states that an AI system goes through the following phases throughout its lifetime: 1) planning and design, data collection and analysis, model creation and interpretation; 2) validation and verification; 3) deployment; and 4) operation and monitoring. One of the most promising AI strategies is machine learning (ML), which is characterized as a group of techniques that allow computers to learn automatically via patterns and inferences as opposed to by explicit instructions from a human [38].

All things considered, artificial intelligence is interwoven into a number of educational technology developments that offer learning analytics, recommendations, and diagnostic tools in a number of formats and for a number of purposes. AI applications are frequently still in their early stages of development and are not widely deployed at the system level; instead, they are implemented locally or in experimental settings. Nonetheless, there are a number of possible applications that hint to how artificial intelligence (AI) can alter education in the next decades and target a variety of stakeholders, including parents, educators, administrators, and students. Both in the classroom and at the systemic levels are instances of this. AI may be particularly useful in accomplishing SDG 4, which aims to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" [33].

Inclusive education is one of the global goals included in SDG Goal 4, with the explicit objective of granting everyone, including those with disabilities, fair access to all educational levels. Artificial intelligence (AI) systems have demonstrated their effectiveness in helping people with disabilities - such as vision, hearing, or social skills (language and communication) deficits - complete their education. By enabling them to read books and recognize individuals, wearables with AI capabilities, for example, may help visually impaired students study and interact with others in their community. There are now systems designed expressly to support children with a range of disabilities. Students with physical and mental health limitations benefit from robotics, augmented and virtual reality (AR/VR), and other AI-powered technologies that facilitate their participation in class and study. Some of the difficulties can be overcome with the help of certain technologies, including text-to-speech or speech-to-text applications, while other approaches are supported by research and yield positive results. For example, kids with autism may explore and improve social skills in a school setting by interacting and cooperating with virtual characters and digital objects [33].

With the emergence of AI-powered digital learning technologies, education might undergo a radical transformation in the classroom as learning becomes more personalized, adaptable, and participatory. They enable students to get specialized

instruction, participate in collaborative learning with distant peers and teachers, and have access to a wealth of resources. These technologies are upending the status quo in education and facilitating more accessibility to lifelong learning than in the past by developing and growing.

The fusion of artificial intelligence and education heralds in a new era of learning. In response, Education 4.0 and digital education require an environment where artificial intelligence and digital skills converge [31]. This phenomena warrants in-depth investigation as it is causing a true paradigm change in education at all levels.

2 Materials and Methods

The methodological basis of the study was formed by the theory and methods of digitalization of education, the personal-activity approach to the analysis and evaluation of pedagogical phenomena, the personality-oriented approach to learning, as well as the development and use of intelligent systems. The methodology of the study is based on the use of the method of analysis and synthesis. The work also uses the systemic and dialectical approaches. In addition, the axiological approach directs the attention to the study of values as the meaning-forming foundations of the modernization of education.

3 Results and Discussion

Humanity is evolving from an information-based civilization to an intelligent society driven by artificial intelligence. Artificial intelligence (AI) has been the vanguard of human investigation into machine intelligence due to the rapid advancements in computer and information technologies in recent years [42; 47]. John McCarthy coined the phrase “Artificial Intelligence” in 1955, and since then, computational technology has advanced over the course of five decades, potentially leading to the creation of reliable computer-assisted learning systems [10]. The advent of Computer-Assisted Learning (CAL), which uses technology to personalize learning experiences, was a huge shift for educational systems [9]. Computer-assisted learning is now a vibrant, multidisciplinary subject with a wide range of issues and research possibilities because to the advancement of educational technology, digital devices, and machine learning applications [47]. CAL was more than just an instructional aid; it was a driving force behind the development of a generation that was engaged, adaptive, and digitally savvy, actively influencing the course of education in the future. With the introduction of AI technologies with deep learning to the CAL, learning content may be tailored to the specific needs of each student, resulting in improved comprehension and engagement through the use of interactive activities and multimedia that accommodate a variety of learning preferences. CAL uses internet channels to overcome geographical limitations during the Covid-19 epidemic, providing universal access to education worldwide [9].

The mandate of UNESCO mandates an approach to AI that is human-centered by nature. In addition to making sure AI doesn't further technical gaps inside and across nations, it seeks to change the debate to address present disparities in access to information, research, and the diversity of cultural expressions. “AI for all” must guarantee that everyone will be able to benefit from the ongoing technological transformation and enjoy its rewards, most notably in terms of knowledge and innovation.

Additionally, UNESCO created a book as part of the Beijing Consensus framework to help education policymakers become more artificial intelligence-ready. Practitioners and professionals in the policy-making and education communities might particularly benefit from reading UNESCO's paper “Artificial Intelligence and Education: Guidance for Policy-makers”. It attempts to create a common understanding of the advantages and disadvantages AI presents for education, as well as how it affects the fundamental skills required in the AI era.

In the upcoming years, there's a good chance that the fast development of artificial intelligence technologies will significantly alter the content of education and give rise to

entirely new digital learning resources and tools [12, 20-21, 26-29, 35-36]. The special potential of educational analytics based on intellectual data analysis should be taken into consideration when planning the use of AI in education. This technique can help to improve the quality of the educational process by predicting and identifying problems in the process of knowledge transfer and assimilation [40]. In certain nations, artificial intelligence (AI) and other digital advances have already shown to be beneficial in generating a whole new digital learning environment [11].

When discussing the relationship between the use of AI technologies in education and digital transformation, it is useful to discuss Rojas and Chiappe's research [37]. Digital ecosystems, according to the experts, are made up of a number of interrelated components that work together to provide a smooth and integrated digital experience. Artificial intelligence (AI) offers a lot of promise to enhance teaching and learning in the field of education. But in order to live up to the expectations around the use of AI in education, sufficient digital ecosystems must be created to support its efficient use. For this reason, it is crucial to have a deeper grasp of these ecosystems and the components that are essential to their implementation. A complex and dynamic environment made up of several linked parts working together to provide digitized educational experiences by exploiting AI capabilities is referred to as an AI-enabled digital educational ecosystem. In order to promote social interaction, collaboration, and communication among students, teachers, and learning communities, According to Giró-Gracia and Sancho-Gil [15], this calls for the efficient articulation of a number of technologies, including learning management systems, data, intelligent devices, apps, content, infrastructure, and users. These are the primary technologies of the fourth industrial revolution.

Okai-Ugbaje et al. [34] suggest a conceptual vision of new paradigm of digital (including AI-based) education, which they call m-learning (see Figure 1).

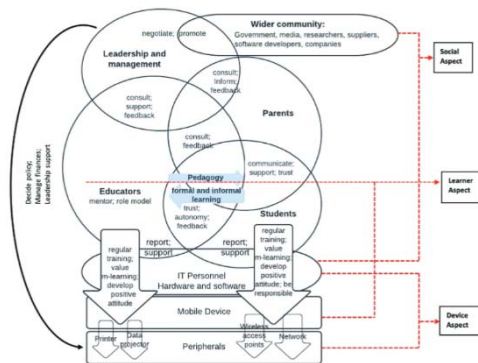


Figure 1. M-learning conceptual framework [34]

The assessment domain presents the most significant opportunity for transformative shifts in education using artificial intelligence. However, this is not appraisal in the conventional sense. AI-enabled exams use completely new tools and techniques than standard evaluations. Artificial Intelligence may lead to the replacement of traditional tests, which would need adjustments to educational practices. Unique and unusual artifacts employed in traditional assessments for summative, retrospective sampling include supply and choose response tests. On the other hand, artificial intelligence can assist recursive feedback networks, which are crucial to learning. Rather of employing sampling, the dataset may contain all recordable actions that occur during the learning process, such as using computer-mediated content resources, communicating with peers and instructors, and generating student work as knowledge representations [10]. Advanced AI models may create personalized, individualized learning paths by utilizing information about a learner's past, interests, and performance. AI can choose the best learning resources for each student based on their specific learning

preferences, increasing engagement and improving the educational experience.

Ruiz-Rojas et al. [39] claim that AI facilitates adaptive material distribution, active learning, and attendance tracking, all of which make virtual classrooms more user-friendly. AI improves instructional strategies, makes the most of instructional resources, and uses data analytics to enable data-driven decision-making. Furthermore, AI-powered learning management systems (LMS) are designed to streamline administrative tasks, customize learning paths, or offer real-time feedback [12]. By using AI-powered platforms, students may get timely feedback on their work in real-time that is contextually relevant. This helps them identify areas for improvement and makes rapid corrections. Rather than waiting for teacher input, this method shortens the time between learning and improvement cycles.

Although AI can directly help students create more efficient learning plans, the technology can also improve teachers' abilities. AI will benefit instructors and students alike by offering assistance across the educational system. Generative AI models have shown to be especially helpful for content creation and ideation. Interactive language models have the potential to expedite the development of preliminary lesson plans, practice worksheets, and homework assignments from an educational standpoint. The teacher can then modify and enhance AI's recommendations to provide a more customized and effective outcome.

Interactive technologies powered by AI are already showing their value in the classroom. More interactive games, adaptive simulations, and virtual laboratories are being developed to get students more involved in their schoolwork. These resources give educators effective new ways to educate, and elite universities now consider them standard equipment. A staggering 75% of respondents to a study by market research firm HolonIQ stated that the main justification for using AI is that it improves learner outcomes [4]. AI has the ability to greatly assist educators by enabling them to build solid curriculum foundations and customize instruction to meet the requirements of each unique learner.

AI-driven learning systems use data analytics to predict future learning patterns, guide the creation of curricula, and maximize the use of available educational resources. Educational institutions can improve overall educational performance, modify teaching approaches, and discover areas for growth by utilizing big data analytics [25].

Particularly in poor nations where traditional infrastructures may be weak, artificial intelligence has emerged as a transformational force in widening access to education. According to a number of case studies, AI-powered efforts have been crucial in democratizing education by offering creative ways to close the accessibility gap between students and high-quality learning materials.

For example, companies have deployed AI-driven systems in rural Asia and Africa to provide customized learning experiences based on the requirements of each individual student [33]. These platforms can adjust learning materials and procedures to maximize understanding and retention by evaluating massive quantities of data on student performance and behavior. This allows them to accommodate a variety of learning styles and abilities. These programs, which go out to remote communities with limited access to conventional educational institutions, have proven successful in giving students the tools and resources they need to pursue academic achievement regardless of geographic limits [32].

According to Lakshmi et al. [30], the United Arab Emirates (UAE) has taken the lead in the world in using AI and online education in recent years. Military universities have adopted this new technology, even though they still follow the conventional educational framework. Lakshmi's study examined the current acceptance rate, challenges, and solutions for putting in place an AI-powered online learning platform. The findings show that,

when supported by the institution, digital technology has a noticeable effect on every aspect of higher education. The findings also show that the organization is essential to the integration of digital technology into instruction and learning, and that understanding the possible impacts of new digital technology requires a critical analysis of the materiality that already exists within the Collaborative Technical Education (CTE) organization.

Artificial Intelligence is deliberately integrated into the educational system of Australia. The Australian Framework for Generative AI in Schools, in particular, aims to provide guidelines for the ethical and responsible application of generative AI technologies in ways that are advantageous to society, schools, and students. All parties involved in school education - teachers, administrators, support staff, service providers, parents, guardians, students, and policy makers - are supported by the Framework. The Minister for Education has endorsed a framework created by the national AI schools task group, which is why the decision to use AI in Australian schools was made. In an effort to reduce teacher workloads in Western Australia (WA), the Australian and Western Australian governments are working together on a co-funded pilot initiative that will include artificial intelligence into the education sector. The main objective of this AU\$ 4.7 million project is to decrease the amount of time teachers spend on lesson preparation and administrative duties by using AI technologies in eight chosen schools around Western Australia. By making these procedures more efficient, teachers will have more time to oversee lessons in the classroom, which will improve the students' overall educational experience. By automating different parts of lesson preparation and activity ideas, the AI technology used in this pilot program is designed to support instructors and make sure that these components are in line with the national curriculum. By using technology to handle most of the administrative work, this technology-driven approach hopes to free up instructors to concentrate more on teaching responsibilities and student interaction. The Workload Reduction Fund of the Commonwealth provides cash for the pilot program, and the Cook Government matches this amount. In addition, Western Australia's non-governmental education sector is funding the effort with AU\$300,000. The joint effort between various government levels and the education sector to alleviate teacher workloads through creative technological solutions is highlighted by this financial assistance [41].

The size of the global AI in education market is anticipated to increase from USD 3.6 billion in 2023 to about USD 73.7 billion by 2033, with a compound annual growth rate (CAGR) of 35.10% between 2024 and 2033 [2]. Figure 2 displays the market's statistical data.

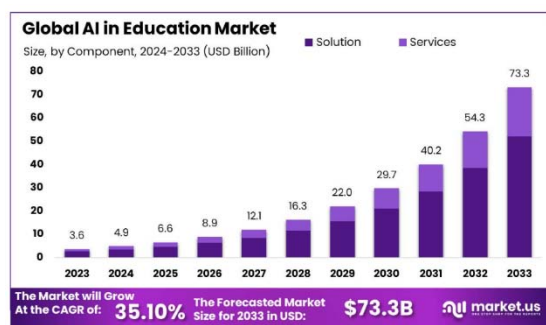


Figure 2. Global market of AI in education [2]

The industry is defined by the advancement of AI-powered products including virtual facilitators, intelligent tutoring systems, and intelligent content production tools. Strong digital infrastructure and encouraging government regulations are credited with the rapid adoption of AI technology in education in North America and the Asia-Pacific region. But obstacles like the digital divide, expensive implementation costs, and worries over data privacy might hinder industry expansion.

According to analysts, the market for AI in education has demonstrated promise and development that is encouraging. The successful fund-raising efforts of Chinese EdTech firm Squirrel AI Learning, which received \$150 million in 2022 at a value of \$2 billion, are among the noteworthy advances in the business. This sizeable investment shows that investors have a lot of faith in systems that use AI to drive adaptive coaching [2]. Studies suggest that AI-powered tutoring systems may boost student performance and engagement by as much as 30%. This is a remarkable effect of these systems. This beneficial result confirms even more the usefulness of AI in improving learning environments [2].

AI has the capacity to enhance understanding and help educators promote morality, judgment, and human dignity. One can explore new educational possibilities by integrating cutting-edge technology with timeless ideals. Furthermore, the creation of an "Ethics of Care" framework for AI in education depends heavily on cooperation between many stakeholders. Public education, policy recommendations, and targeted research are essential for guiding AI systems toward moral and ethical goals. The many viewpoints on AI in education highlight the importance of planning, common sense, and teamwork.

Work at the interface between technology and pedagogy centers around four key axes that together define the future of education. The sphere of educational revolution is covered by these axes, which include mobility, interaction, artificial intelligence, and technology learning aids like games and augmented reality [3]. The combination of these components demands the creation of a mobile-interactive paradigm that appropriately takes into account the learner's maximum convenience and temporal availability. At the moment, technology is already incorporated into the field of education. Its varied expressions in different settings, however, highlight how urgently these aspects must be combined and integrated into instructional frameworks that place a premium on students' knowledge. The understanding of the importance of intelligent tutoring systems, which democratize tutoring access, is fundamental to this paradigm. Learners may benefit from individualized and adaptable support, regardless of their location or socioeconomic background, by endowing these systems with sophisticated AI capabilities. It is also impossible to overstate the importance of technological experimentation since it opens up new avenues for research and enables for the application of discoveries to "teaching-learning models". These models make use of a wide variety of interaction patterns in order to improve learning. Educational frameworks may better meet the changing requirements of students by including these transformational aspects, and continual technology innovation and intelligent tutoring systems are key components in enhancing the educational process.

Literature:

1. Aggarwal, D. (2023). Integration of innovative technological developments and AI with education for an adaptive learning pedagogy. *China Petroleum Processing and Petrochemical Technology*, 23(2). <https://zgysjgysyhjgs.cn/ind ex.php/eric/article/pdf/02-709.pdf>
2. AI in Education Market (2024, February). *Market.us*. <https://market.us/report/ai-in-education-market/>
3. Alam, A., & Mohanty, A. (2023). Educational technology: Exploring the convergence of technology and pedagogy through mobility, interactivity, AI, and learning tools. *Cogent Engineering*, 10(2). <https://doi.org/10.1080/23311916.2023.2283282>
4. Artificial Intelligence in Education. Survey Insights (2023, February 27). *HolonIQ*. <https://www.holoniq.com/notes/artificial-intelligence-in-education-2023-survey-insights>
5. Bezena, I., Hoi, N., Kryshchanovych, S., Kaminska, O., Partyko, N. (2021). Modelling the assessment of influence of institutional factors on the learning process of future business managers. *Management Theory and Studies for Rural Business and Infrastructure Development*, 43(3), 363-372. <https://doi.org/10.15544/mts.2021.33>
6. Bilostotska, O., Ulianova, V., Kryshchanovych, S., Tkachova, N., Tkachov, A. (2020). Experience in the application of cognitive techniques in the field of physical education and sports. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 11(2), 147-159. <https://doi.org/10.18662/brain/11.2/79>
7. Balukh, M., Buchkivska, G., Kryshchanovych, S., Chubinska, N., & Ilina, D. (2021). The application of health pedagogy in the context of the formation of physical education among schoolchildren. *Annals of Applied Sport Science*, 9(4). <https://doi.org/10.52547/aassjournal.1001>
8. Chorna-Klymovets, I., Semeriak, I., Kryshchanovych, S., Mordous, I., Zainchivska, I. (2022). Modern technologies for the development of distance education. *IJCSNS. International Journal of Computer Science and Network Security*, 22(9), 103-108. <https://doi.org/10.22937/IJCSNS.2022.22.9.16>
9. Chen, X., Zou, D., Xie, H. R., Su, F. (2021). Twenty-five years of computer-assisted language learning: A topic modeling analysis. <http://hdl.handle.net/10125/73454>
10. Cope, B., Kalantzis, M., & Searns, D. (2021). Artificial intelligence for education: Knowledge and its assessment in AI-enabled learning ecologies. *Educational Philosophy and Theory*, 53(12), 1229-1245.
11. Fadel, Ch., Holmes, W., & Bialik, M. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. GRIN Verlag.
12. Firat, M. (2023). Integrating AI Applications into learning management systems to enhance e-learning. *Instructional Technology and Lifelong Learning*, 4(1), 1-14.
13. Gavrysh I., Yaroshenko A., Khltochina O., Kuzemko N., Semenenko A., Gontar Z. (2024). Transformation of higher education in Ukraine in the context of globalization. *AD ALTA Journal of Interdisciplinary Research*, 14(1), Special Issue XLI, 146-151. <https://doi.org/10.33543/j.140141.146151>
14. Gavrysh, I., Kryshchanovych, S., Chubinska, N., Khltochina, O., Shevchenko, Z. (2021). Philosophical and psychological approach to self-development of scientific and pedagogical workers. *WISDOM*, 20(4), 139-147. <https://doi.org/10.24234/wisdom.v20i4.560>
15. Giró-Gracia, X., & Sancho-Gil, J. M. (2022). La Inteligencia Artificial en la educación: Big data, cajas negras y solacionismo tecnológico. *Revista Latinoamericana De Tecnología Educativa - RELATEC*, 21(1), 129-145.
16. Golub, V., Kryshchanovych, M., Kozakov V., Pakhomova, T., Polovtsev, O. (2021). Socio-ecological effect of public management of green development in the context of the philosophy of modern ecology. *WISDOM*, 19(3), 114-126. <https://doi.org/10.24234/wisdom.v19i3.493>
17. Gorban, I., Kornat, L., Kryshchanovych, M., Dykyi, A., Marushko N. (2022). Investment support for the digitalization of socio-economic systems in the context of ensuring security. *IJCSNS. International Journal of Computer Science and Network Security*, 22(6), 733-738. <https://doi.org/10.22937/IJCSNS.2022.22.6.92>
18. Grindal, M., Admire, A., Carlin, D. M., & Nieri, T. (2023). Gender and substance use among Latinx college students: An application of social structure social learning theory. *Journal of Ethnicity in Substance Abuse*, 1-25. <http://dx.doi.org/10.1080/15332640.2023.2271873>
19. Guppy, N., Verpoorten, D., Boud, D., Lin, L., Tai, J., & Bartolic, S. (2022). The COVID-19 future of digital learning in higher education: Views from educators, students, and other professionals in six countries. *British Journal of Educational Technology*, 53(6), 1750-1765. <http://dx.doi.org/10.1111/bjet.13212>
20. Helesh, A., Eremenko, O., & Kryshchanovych, M. (2021). Monitoring the quality of the work of experts when they conduct accreditation examinations of educational programs. *Revista Tempos E Espaços Em Educação*, 14(33), e16535. <https://periodicos.ufs.br/revtee/article/view/16535>
21. Horoshko, V., Pasko, O., Prudka, L., Kryshchanovych, S., & Grynyk, I. (2021). Distance work with the preparation of future managers of physical culture in the conditions of a post-pandemic society. *Postmodern Openings*, 12(4), 305-315. <https://doi.org/10.18662/po/12.4/377>

22. Joseph, G. V., & Thomas, K. A. (2021). Integration of Technology Initiatives with Educational Neuroscience and its Impact on Technology Readiness to Technology Adoption by HSS Teachers, Kerala. In: Thomas, K.A., Kureethara, J.V., Bhattacharyya, S. (eds) *Neuro-Systemic Applications in Learning*. Springer, Cham. pp. 423-444. https://doi.org/10.1007/978-3-030-72400-9_21
23. Joseph, G. V., & Thomas, M. A. (2022, August). The Mediation Effect of Technology Anxiety and Barriers on Technology Exposure to Teachers' Technology Adoption. In 2022 Third International Conference on Intelligent Computing Instrumentation and Control Technologies (ICICICT) (pp. 1737-1741). IEEE. <http://dx.doi.org/10.1109/icicict54557.2022.9918006>
24. Joseph, G., Thomas, A., Jose, D., Roy, T., Prasad, M. (2024). Impact of Digital Literacy, Use of AI tools and Peer Collaboration on AI Assisted Learning: Perceptions of the University students. *Digital Education Review*, 45, 43-49.
25. Knox, J., Wang, Y., & Gallagher, M. (2019). *Artificial intelligence and inclusive education: Speculative futures and emerging practices*. Springer.
26. Kryshtanovych, M., Gavrysh, I., Kholobina, O., Melnychuk, I., Salnikova, N. (2020). Prospects, problems and ways to improve distance learning of students of higher educational institutions. *Revista Romaneasca pentru Educatie Multidimensionala*, 12(2), 348-364. <https://doi.org/10.18662/rrem/12.2/282>
27. Kryshtanovych, M., Kryshtanovych, S., Stechkevych, O., Ivanytska, O., Huzii, I. (2020). Prospects for the development of inclusive education using scientific and mentoring methods under the conditions of post-pandemic society. *Postmodern Openings*, 11(2), 73-88. <https://doi.org/10.18662/po/11.2/160>
28. Kryshtanovych, M., Kotyk, T., Tiurina, T., Kovrei, D., Dzhanda, H. (2020). Pedagogical and psychological aspects of the implementation of model of the value attitude to health. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 11(2Sup1), 127-138. <https://doi.org/10.18662/brain/11.2Sup1/99>
29. Kryshtanovych, S., Zahura, F., Dulibskyy, A., Ilkiv, O., Odnovorchenko, I., Chyzh, V. (2024). Innovative technologies in the work of a teacher of physical culture and sports. *AD ALTA Journal of Interdisciplinary Research*, 14(1), Special Issue XL, 220-225. <https://doi.org/10.33543/j.140140.220225>
30. Lakshmi, A., Kumar, A., Patel, S., Naik, S., Ramesh, J. (2023). Artificial intelligence in steering the digital transformation of collaborative technical education. *The Journal of High Technology Management Research*, 34(2), 100467.
31. Marzal, M.-A., & Vivarelli, M. (2024). The convergence of artificial intelligence and digital skills: A necessary space for digital education and Education 4.0". *JLIS.It*, 15(1), 1-15.
32. Miller, M. (2023). *AI for educators: Learning strategies, teacher efficiencies, and a vision for an artificial intelligence future*. Ditch That Textbook.
33. OECD Education Working Papers (2024). https://www.oecd-ilibrary.org/education/oecd-education-working-papers_19939019.
34. Okai-Ugbaje, S., Ardzejewska, K., & Imran, A. (2022). A mobile learning framework for higher education in resource constrained environments. *Education and Information Technologies*, 27(8), 11947-11969.
35. Olenych, I., Gontar, Z., & Borutska, Y. (2021). The system of managing the pedagogical process of training students-specialists in the tourism sector in the conditions of COVID-19. *Revista Tempos E Espaços Em Educação*, 14(33), e16569. <https://doi.org/10.20952/revtee.v14i33.16569>
36. Romanova, A., Koval, I., Kryshtanovych, M., Lesko, N., Lukashyvska, U. (2021). Research of problems and prospects of state development in the pedagogical process. *Revista Tempos E Espaços Em Educação*, 14(33), e16534. <https://doi.org/10.20952/revtee.v14i33.16534>
37. Rojas, M.P., & Chiappe, A. (2024). Artificial Intelligence and Digital Ecosystems in Education: A Review. *Technology, Knowledge and Learning*. <https://doi.org/10.1007/s10758-024-09732-7>
38. Rosak-Szyrocka, J. (2024). The role of artificial intelligence in digital education. *Scientific Papers of Silesian University of Technology Organization and Management Series*, 195, 477-499.
39. Ruiz-Rojas, L.I., Acosta-Vargas, P., De-Moreta-Llovet, J., Gonzalez-Rodriguez, M. (2023). Empowering Education with Generative Artificial Intelligence Tools: Approach with an Instructional Design Matrix. *Sustainability*, 15, 11524.
40. Shah, P. (2023). *AI and the future of education: Teaching in the age of artificial intelligence*. Jossey-Bass.
41. Sharon, A. (2024, August 20). Western Australia: AI Pilot to Reduce Teacher Workload. *OpenGov*. <https://opengov.asia.com/2024/08/20/western-australia-ai-pilot-looks-to-reduce-teacher-workload/>
42. Tzirides, A. O. O., Zapata, G., Kastania, N. P., Saini, A. K., Castro, V., Ismael, S. A. R., ... & Kalantzis, M. (2024). Combining Human and Artificial Intelligence for Enhanced AI Literacy in Higher Education. *Computers and Education Open*, 100184. <https://doi.org/10.1016/j.caeo.2024.100184>
43. Vincent-Lancrin, S., González-Sancho, C., Bouckaert, M., Luca, F. de, Fernández-Barrerra, M., Jacotin, G., Urgel, J., Vidal, Q. (2019). Creativity and critical thinking in everyday teaching and learning. OECD. https://www.oecdilibrary.org/education/fostering-students-creativity-and-critical-thinking_10f841e0-en.
44. Yaroshenko A., Gontar Z., Grybyk I., Zinkevych V., Serheieva K. (2022). The system for assessing the quality of education in the context of the development of public administration. *International Journal of Computer Science and Network Security*, 22(9), 497-502. <https://doi.org/10.22937/IJCSNS.2022.22.9.64>
45. Zancajo, A., Verger, A., & Bolea, P. (2022). Digitalization and beyond: the effects of Covid-19 on post-pandemic educational policy and delivery in Europe. *Policy and Society*, 41(1), 111-128.
46. Zdanevych, L., Chagovets, A., Gontar, Z., Onyschuk, I., Lanetska, Y. (2022). The role of didactic games and exercises in the sensory development of preschoolers. *International Journal of Computer Science and Network Security*, 22(5), 61-66. <https://doi.org/10.22937/IJCSNS.2022.22.5.10>
47. Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., ... & Li, Y. (2021). A Review of Artificial Intelligence (AI) in Education from 2010 to 2020. *Complexity*, 2021, 1-18.
48. Zhu, S., Yu, T., Xu, T., Chen, H., Dustdar, S., Gigan, S., ... & Pan, Y. (2023). Intelligent computing: the latest advances, challenges, and future. *Intelligent Computing*, 2, 0006. <http://dx.doi.org/10.34133/icomputing.0006>

Primary Paper Section: A**Secondary Paper Section: AM**

F MEDICAL SCIENCES

FA	CARDIOVASCULAR DISEASES INCLUDING CARDIO-SURGERY
FB	ENDOCRINOLOGY, DIABETOLOGY, METABOLISM, NUTRITION
FC	PNEUMOLOGY
FD	ONCOLOGY AND HAEMATOLOGY
FE	OTHER FIELDS OF INTERNAL MEDICINE
FF	ENT (IE. EAR, NOSE, THROAT), OPHTHALMOLOGY, DENTISTRY
FG	PAEDIATRICS
FH	NEUROLOGY, NEURO-SURGERY, NUERO-SCIENCES
FI	TRAUMATOLOGY AND ORTHOPAEDICS
FJ	SURGERY INCLUDING TRANSPLANTOLOGY
FK	GYNAECOLOGY AND OBSTETRICS
FL	PSYCHIATRY, SEXOLOGY
FM	HYGIENE
FN	EPIDEMIOLOGY, INFECTION DISEASES AND CLINICAL IMMUNOLOGY
FO	DERMATOLOGY AND VENEREOLOGY
FP	OTHER MEDICAL FIELDS
FQ	PUBLIC HEALTH SYSTEM, SOCIAL MEDICINE
FR	PHARMACOLOGY AND APOTHECARY CHEMISTRY
FS	MEDICAL FACILITIES, APPARATUS AND EQUIPMENT

DEVELOPMENT OF ADAPTIVE CHANGE MANAGEMENT PRINCIPLES IN THE PHARMACEUTICAL INDUSTRY UNDER THE INFLUENCE OF THE PANDEMIC

[#]TETIANA DZIUBA

^aNational University "Chernihiv Polytechnic", 95, Shevchenko Str., 14035, Chernihiv, Ukraine
e-mail: [#]tatianadzuba@gmail.com

Abstract: The COVID-19 pandemic significantly impacted the global economy, healthcare, and the pharmaceutical sector. In response to new challenges, international organizations and governments implemented unprecedented measures aimed at mitigating the effects of the pandemic, particularly in the areas of healthcare and pharmaceutical security. This article analyzes the pandemic's impact on patient care, pharmaceutical safety, and the actions taken to minimize these effects. It examines organizational and logistical challenges in drug supply, the development of telemedicine and remote communications, and Ukraine's experience in developing COVID-19 treatment protocols. The article concludes with a discussion on the need for further study of both the short- and long-term consequences of the pandemic for the pharmaceutical industry.

Keywords: COVID-19, pandemic, pharmaceutical safety, treatment protocols, healthcare, telemedicine, drug shortages, economic impact.

1 Introduction

The coronavirus has become the most serious challenge to the global economy since the financial crisis of 2008. The measures taken by international organizations and leading world nations are unprecedented. A unique feature of this crisis is its natural origin, along with a shift in the global trajectory from globalization to a stronger focus on localized production and increased independence of national economic from the global market.

Transport and logistics chains were disrupted, and air travel was nearly halted, which had a profound impact on the modern globalized world where the manufacturing operations of leading companies are often outsourced to optimize costs. Border closures for several months brought normal trade exchanges to a standstill, resulting in significant losses for many corporations. The service, transportation, and tourism sectors were hit hardest, with unemployment rates doubling in some countries and nearly tripling in others. Companies began transitioning their employees to remote work, prompting people to purchase gadgets and computer equipment to enable them to work from home.

The World Health Organization's (WHO) declaration of the COVID-19 pandemic and the associated quarantine restrictions significantly impacted Ukraine's economy. According to data from the State Statistics Service of Ukraine (SSSU), the country's economy experienced a year-long decline: GDP dropped by 1.3% in Q1, by 11.4% in Q2, by 3% in Q3, and a 3% in Q4. The pandemic and quarantine restrictions affected nearly every sector, resulting in a rise in unemployment rates [52].

The objective of presented study is to analyze how the pandemic affected patient care and the pharmaceutical safety of the population. Additionally, the research aims to identify and describe the interventions implemented in healthcare management and pharmaceutical services during the COVID-19 pandemic.

2 Materials and Methods

A review of the literature was conducted, along with an analysis of data from IQVIA and PharmaProxima Research, searches in PubMed, Embase, and the Virtual Health Library, and information gathered from pharmaceutical industry experts during specialized conferences and webinars. The data were analyzed to identify the interventions and practices adopted for managing pharmaceutical care during the COVID-19 pandemic.

3 Results and Discussion

The pandemic required government bodies and the healthcare sector to implement new measures aimed at preventing the

spread of infection, saving lives, and minimizing the overall impact of the disease. Healthcare systems across the globe were overwhelmed and had to reorganize processes to improve service efficiency. These factors also influenced the development of pharmaceutical market. Table 1 outlines the sequence of actions taken by the World Health Organization leading up to the designation of COVID-19 as a pandemic.

Table 1: COVID-19: WHO Action Timeline [56]

31.12.2019	The Wuhan Municipal Health Commission in China reported a cluster of pneumonia cases in Wuhan, Hubei Province. It was later determined that the cause of the illness was a novel coronavirus.
01.01.2020	The WHO established an Incident Management Support Team across its three levels (headquarters, regional offices, and countries) and shifts into the Organization's emergency response mode for the outbreak.
04.01.2020	The WHO announces on social media the emergence of a cluster of pneumonia cases in Wuhan, Hubei Province, noting that all patients are alive.
05.01.2020	The WHO publishes the first issue of disease outbreak news focused on the new virus. This marks the organization's initial technical publication on the subject, aimed at the scientific community, health authorities, and global media. The issue includes a risk assessment, recommendations, and information received from China regarding the status of patients and the health measures implemented in response to the emergence of pneumonia cases in Wuhan.
10.01.2020	The WHO publishes a comprehensive set of technical recommendations online for all countries regarding the detection, diagnosis, and management of potential cases of illness, based on the data available at that time about the virus. To protect healthcare workers and drawing on experiences from combating SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome), as well as known transmission models for viral respiratory pathogens, guidelines were issued for infection prevention and control. These guidelines emphasized the need for medical personnel to adhere to precautions against airborne and contact infections while providing care to patients, as well as measures to protect against aerosol transmission during procedures that generate aerosols.
11.12.01.2020	China released the genetic sequencing data for COVID-19.
13.01.2020	The first officially confirmed case of COVID-19 outside of China was reported in Thailand.
14.01.2020	At a press briefing, the head of the Technical Response Division stated that limited human-to-human transmission of the coronavirus infection cannot be ruled out, particularly among a group of 41 patients, mainly between relatives. He also noted the risk of potential expansion of the outbreak. Furthermore, he indicated that confirming the possibility of human-to-human transmission would not be surprising, given the experience with MERS, SARS, and other respiratory pathogens.
20.21.01.2020	WHO experts based in its office in China and the Regional Office for the Western Pacific undertook a brief trip to the outbreak area in Wuhan.
22.01.2020	The WHO mission in China issued a statement confirming evidence of human-to-human transmission of the virus in Wuhan; however, further research was needed to fully understand the extent of this transmission.
22.23.01.2020	The WHO Director-General, in accordance with the International Health Regulations (IHR 2005), convened a meeting of the Emergency Committee to determine whether this outbreak constitutes a Public Health Emergency of International Concern. At that time, the available data did not allow independent members of the Committee from various countries to reach a consensus on the issue. They request that a follow-up meeting be scheduled in 10 days when additional information will be available.

28.01.2020	To study China's response measures to the outbreak and assess the possibilities for providing technical assistance, a high-level WHO delegation led by the Director-General was sent to Beijing for discussions with Chinese leadership. In Beijing, Dr. Tedros negotiated with the Chinese government to send an international group of leading scientists to the country to gain a more comprehensive understanding of the situation, the response measures taken, and to facilitate the exchange of information and experiences.
30.01.2020	The Director-General of WHO reconvened the Emergency Committee (EC). This occurred earlier than the initially planned 10-day period and just two days after the first reports of isolated instances of human-to-human transmission outside of China. This time, the EC reached a consensus and recommended that the Director-General declare the outbreak a Public Health Emergency of International Concern (PHEIC) [13-16]. The Director-General agreed with the recommendation and declared a PHEIC due to the outbreak of the novel coronavirus infection (2019-nCoV). This marked the sixth declaration of a PHEIC since the International Health Regulations (2005) came into effect. In the WHO situation report on January 30, there were 7,818 confirmed cases of infection worldwide, the majority of which were reported in China, with 82 cases in other countries [18]. WHO assessed the risk of further virus spread in China as very high, while at the international level, it was considered high.
03.02.2020	WHO presented the Strategic Preparedness and Response Plan, developed by the international community to assist countries with weak health systems in safeguarding public health.
11-12.02.2020	WHO convened the COVID-19 Science and Innovation Forum, featuring over 400 experts from various countries. The forum includes presentations by Dr. George Gao, Director-General of the Chinese Center for Disease Control and Prevention, and Dr. Zhong Nanshan, Chief Epidemiologist at the Chinese Center for Disease Control and Prevention.
16-24.02.2020	A joint mission of WHO and China, featuring experts from Canada, Germany, Japan, Nigeria, the Republic of Korea, Russia, Singapore, and the United States, was working in China and visiting Wuhan as well as two other cities. The mission held meetings with representatives from health authorities, scientists, and medical staff at healthcare facilities, all while maintaining physical distancing. The report of the joint mission can be found at https://www.who.int/docs/default-source/coronavirus/who-china-joint-mission-on-covid-19-final-report.pdf
11.03.2020	WHO concluded that the COVID-19 outbreak can be characterized as a pandemic.

In the following months, COVID-19 spread rapidly across the globe, infecting approximately 2.5 million individuals by April 23, 2020 (according to WHO). The COVID-19 pandemic became a source of significant panic, concern, and a sense of uncertainty.

According to social research by Gradus, there was an increase in anxiety, uncertainty, disappointment, and hopelessness regarding a swift end to the pandemic and a return to normal life in Ukraine (see Figure 1) [17].

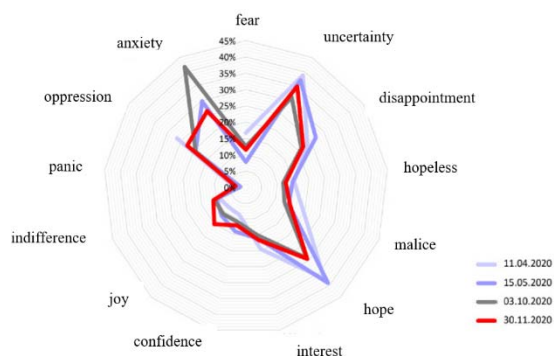


Figure 1. Dynamics of the emotional state of the urban population of Ukraine

The pandemic had a significant impact on healthcare and the pharmaceutical sector, leading to substantial consequences that emerged in the short term and may continue in the long term [2]. These effects require identification and appropriate planning to mitigate their socio-economic impact.

Data collected (Table 2) indicate that the pandemic's influence on the pharmaceutical sector and consumer sentiments in the Middle East, Europe, and the United States exhibited similar trends [54]. In the initial weeks, people were overwhelmed by fear and uncertainty, resulting in a panic demand for various medications: an increase in self-medication through over-the-counter drugs (or stockpiling) and a rise in prescriptions for chronic conditions [21-23]. Countries faced logistical challenges due to quarantine restrictions, leading to shortages of certain medications or active pharmaceutical ingredients.

Globally, investments in new clinical research and the development of vaccines against SARS-CoV-2 increased. Conversely, the launch of new drugs was delayed, and existing studies slowed down or were halted due to their secondary nature [24-29]. Telemedicine and remote communications experienced significant momentum and a growing trend, with WhatsApp calls becoming the most popular digital channel for patient consultations and communication among colleagues.

Table 2: Impact of the Pandemic on the Pharmaceutical Sector and Consumer Changes in the Middle East, Europe, and the United States

Impact	Middle East [53]	EU5 countries [53]	The USA [2]
Drug shortage due to induced demand	Increase of 10.8% in the over-the-counter category (vitamin and mineral supplements)	Increase of 10.8% in the over-the-counter categories (cold remedies)	Research treatment methods doubled
	Increase of 62% in personal hygiene products	Increase of 403% in personal hygiene products	Consumption of medications used in hospitals for the treatment of COVID-19 increased from 100% to 700% since early January.
	Increase of 67% in the hospital sector.		
Overall (panic demand)	Increase of 23%, hypolipidemics	Increase of 7%, the largest volume growth in the ATC Class N, RX category in Spain	7, 6, 5, 4, and 2 million excess prescriptions for hypertension, mental health, respiratory diseases, diabetes, and anxiety
	Increase of 40%, antidiabetics		
	Increase of 29.1%, antihypertensives		
Supply shortage	Medications for chronic diseases face a high risk of shortages or supply chain issues.		A deficit of both active pharmaceutical ingredients (APIs) and finished products, with approximately

				by 40% of APIs for the U.S. generic drug market sourced from India.
				Shortage of treatments for complications related to COVID-19.
R&D Changes		156 clinical trials initiated for COVID-19	140 clinical trials initiated for COVID-19	
Shifts Toward Telemedicine and Remote Communication	WhatsApp calls have become the most popular digital channel for both patient consultations and communication among colleagues.	There has been a 320% increase in remote interactions in Spain compared to the previous year, with a corresponding growth of 471% in Italy.		
	The digital channel is becoming widely adopted (over 75% of doctors), yet physicians still prefer traditional face-to-face communication.	There has been a 51% decrease in specialist consultations and a 25% decline in visits to general practitioners.	Telemedicine interactions have increased, accounting for 23% of all engagements.	
Delays in the confirmation of clinical trials and registrations (products unrelated to COVID-19).		Pharmaceutical companies report delays in the initiation of new trials.		
	New trials are delayed by 16%, and the registration of existing patients is delayed by 32%.	Launches of new medications are being postponed. COVID-19 disrupts these processes or negatively impacts their rollout.		

On March 11, 2020, the WHO declared a pandemic for the new disease [56]. Humanity faced the challenge of a lack of vaccines and treatment experience. However, it was crucial to treat patients with varying degrees of severity and to ensure the non-spread of the infection. On March 30, 2020, the Verkhovna Rada of Ukraine adopted Law No. 539-IX "On Amendments to Certain Laws of Ukraine Regarding the Provision of Treatment for Coronavirus Disease (COVID-19)" [50] This law mandated the development of a local protocol for "Providing Medical Care for the Treatment of Coronavirus Disease (COVID-19)" [50].

From the moment of implementation of quarantine measures until March 2022, the COVID-19 treatment protocol underwent 12 revisions. The first and latest protocols exhibit significant differences, reflecting the accumulation of experience and adjustments in treatment regimens [30-34; 36]. During its development, certain medications were added to or removed from the list [10-11]. The protocol included hydroxychloroquine (chloroquine), favipiravir, remdesivir, ibuprofen, acetaminophen, antibiotics, tocilizumab, glucocorticosteroids (hydrocortisone, prednisone, methylprednisolone), low molecular weight heparins (enoxaparin), immunoglobulin preparations, convalescent

plasma, direct-acting antiviral medications, and monoclonal antibodies.

Simultaneously, experiences and treatment practices from other countries were disseminated [43-48]. The most popular protocol came from the United States, where the prevention list recommended, among other things, vitamins D, C, and zinc, as well as nasal interferons.

All these trends were reflected in the changes in consumer demand dynamics, with an increase in the aforementioned categories during the virus spread (See Figure 2).



Figure 2. Ranking of the Top 20 ATC classes at level 2 by retail sales volume, YTD 07_2020 [39]

According to IQVIA, one of the largest contract research organizations in the world [19], the consumption of personal hygiene products increased by 62% and 403% in the Middle East and Europe, respectively (Figure 2). As shown in Figure 3, Ukrainians purchased 13,000% more masks than before the pandemic began.

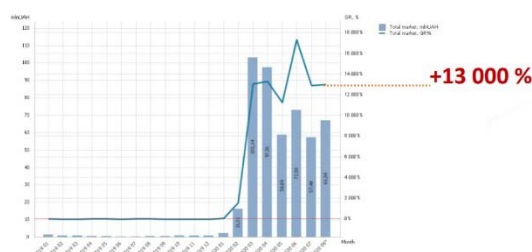


Figure 3. Distortion of mask consumption due to quarantine restrictions [39]

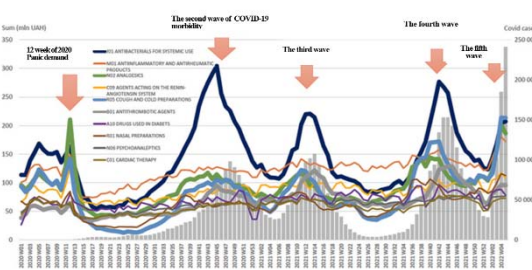


Figure 4. Dynamics of demand for various classes of pharmaceuticals since the start of the pandemic

Quarantine restrictions significantly modified the growth rates of certain ATC groups [53]. The graph (Figure 4) illustrates that the panic demand in week 12 of 2020 prompted the public to purchase all medications in anticipation of the uncertain future of the situation. During the second wave, the COVID-19 treatment protocol already included the necessity of using antibiotics at certain levels of disease severity, followed by the addition of analgesics (ibuprofen, paracetamol) and antithrombotic agents

(enoxaparin) [58-61]. The virus mutated, strains changed, and various symptoms began to manifest alongside the illness. As a result, the consumption of traditional cold and cough medication groups increased.

Let us examine the distortion of demand using the example of low molecular weight heparins (Figure 5), which were in high demand for hospitalized patients with moderate to severe disease. At that time, both domestic and foreign-produced enoxaparin were available in Ukraine [51; 55]. As previously mentioned, this category of medications was essential worldwide due to its evidence base and inclusion in most treatment protocols. Foreign manufacturers primarily addressed the needs of their domestic markets, treating their own citizens first [3-4]. As shown in the graph, a shortage of foreign-produced enoxaparin arose in Ukraine in 2020. During this period, patients had the option to be treated with domestic alternatives [1; 39]. Therefore, the presence of local players in the market directly impacted the pharmaceutical safety of citizens.

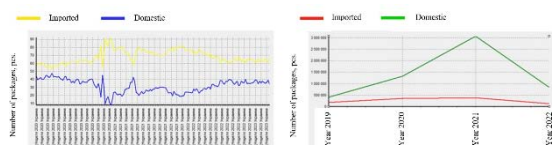


Figure 5. Fluctuations in retail sales of imported and domestic enoxaparin (MS% and Quantity)

Since vaccines are not produced in Ukraine, the domestic market was completely reliant on vaccine supply. It is important to note that the prioritization was determined by manufacturers and suppliers [20]. The chart below (Fig. 6, 7) illustrates the distribution of vaccine doses among countries and manufacturers.

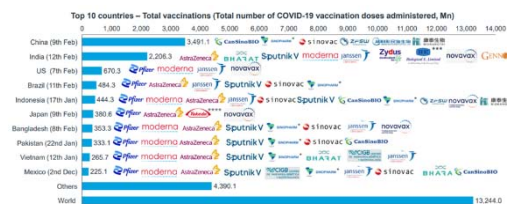


Figure 6. Top 10 countries by total number of vaccine doses administered as of February 2023.

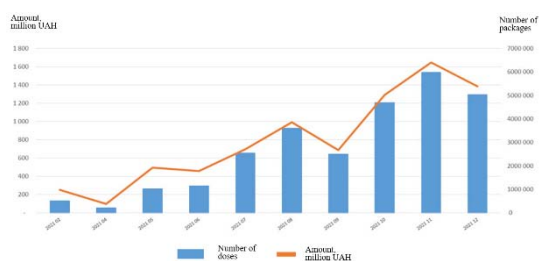


Figure 7. Dynamics of COVID-19 vaccine supplies to Ukraine [35]

In 2020, as part of anti-epidemic measures, a series of regulatory changes were adopted, among which the following should be noted:

- Exemption from VAT for a list of anti-epidemic goods: to improve public access to anti-epidemic goods, the Government exempted the import of medicines, medical devices, and disinfectants necessary for preventing, localizing, and eliminating outbreaks, epidemics, and pandemics of COVID-19 from import duties and VAT [42]. The relevant Resolution No. 224 was adopted on March 20, 2020 (this Resolution was valid until the end of quarantine) [37].

- Simplification of procurement procedures: in accordance with Law No. 530 [39], the Government adopted Resolution No. 225 on March 20, 2020 [38], which approved the procedure for procuring goods, works, and services necessary for preventing, localizing, and eliminating outbreaks, epidemics, and pandemics of acute respiratory disease COVID-19 caused by the SARS-CoV-2 coronavirus within Ukraine [40]. This Resolution also approved a list of such goods, works, and services. This was necessary as Law No. 530 exempted the procurement of these goods, works, and services from the Law of Ukraine on Public Procurement. (This Resolution was valid until the end of quarantine).
- Introduction of distance selling of medicines: in the spring, the Government adopted Resolution No. 220 on March 23, 2020 [41], which temporarily allowed pharmacies to conduct remote sales of medicines and related goods and organize their delivery directly to consumers while adhering to the storage conditions specified by the manufacturer during transportation, including engaging postal operators on a contractual basis.

At the same time, restrictions were established on conducting such types of trade for:

- Prescription medications, except for those included in the “Affordable Medicines” program.
- Controlled substances: This includes medicines whose circulation requires a license for the cultivation of plants listed in Schedule I of the narcotic substances list, as well as psychotropic substances and precursors [6-9]. This pertains to the development, production, manufacturing, storage, transportation, acquisition, sale, importation into Ukraine, exportation from Ukraine, usage, and destruction of narcotic substances, psychotropic substances, and precursors included in this list.
- Potent and toxic medications: Any medications classified as having strong effects or that are toxic.
- Medications requiring special storage conditions: These are medicines that must be kept under specific conditions to ensure their efficacy and safety.

4 Conclusion

The COVID-19 pandemic has sparked an important epidemiological discussion regarding the rise in the frequency and proportion of new infectious diseases capable of becoming pandemics in this century [5]. There are several indicators pointing to this shift: the emergence of new infectious agents or mutations of existing viruses that may be more contagious; the development of resistance to antimicrobial drugs; an increased incidence of infectious diseases due to globalization, international movement of people and goods, climate change, weakened public health measures, and the introduction of infectious diseases into isolated areas [57]. In this context, the experience gained during the COVID-19 pandemic, particularly in defining strategies developed across various scenarios, becomes a vital resource for formulating emergency action plans and training for potential new diseases.

The COVID-19 pandemic has reshaped the priorities of the healthcare system, revealing its vulnerabilities. The experience demonstrated that patients in Ukraine lacked access to certain medications, and the pharmaceutical safety of the population was compromised. The pharmaceutical sector faced industry shortages due to distorted demand and a lack of local production for specific groups of medicines. The COVID-19 pandemic introduced new challenges and lessons for health services. This situation prompts an exploration of development pathways and innovations in public policy concerning pharmaceutical safety in light of changing market structures.

Literature:

1. According to: *PharmaProxima Research*.
2. Aitken, M., & Kleinrock, M. (2020). Shifts in Healthcare Demand, Delivery, and Care During the COVID-19 Era: Tracking the Impact in the United States. *IQVIA Institute for Human Data Science: Parsippany, NJ, USA*.
3. Avedyan, L., Gavkalova, N., & Belyavtseva, V. (2023). The effectiveness of the development of territories in the state regional system politicians. *Financial and Credit Activity Problems of Theory and Practice*, 4(51), 333–344. DOI: 10.55643/fcaptp.4.51.2023.4116
4. Baltgailis, J., & Simakhova, A. (2022). The Technological Innovations of Fintech Companies to Ensure the Stability of the Financial System in Pandemic Times. *Marketing and Management of Innovations*, 13(2), 55-65.
5. Bamba, C. (2022). Pandemic inequalities: Emerging infectious diseases and health equity. *International Journal for Equity in Health*, 21, 1-4. <https://doi.org/10.1186/s12939-021-01611-2>
6. Bashtannyk, A., Kveliashvili, I., Yevdokymov, V., Kotviakovskiy, Y., & Akimov, O. (2021). Legal bases and features of public administration in the budget sphere in Ukraine and foreign countries. *Ad Alta: Journal of interdisciplinary research*, 1(1), XVIII, 63-68.
7. Bobrovska, O.Y. & Kravchenko, T.A. (2021). The current state of investment security in Ukraine in the context of covid-19 and its impact on the financial and economic situation of the state. *Financial and Credit Activity-Problems of Theory and Practice*, 1(36), 233-242. DOI: 10.18371/FCAPTP.V1I36.22 7770
8. Bondar, O., & Vahonova, O. (2022) Construction Project Management Based on the Circular Economy. *IJCSNS. International Journal of Computer Science and Network Security*, 22(9), 630-635. DOI: 10.22937/IJCSNS.2022.22.9.82
9. Borodin, Y., Sorokina, N., & Akimov, O. (2023). Social Policy Development In The Conditions Of Digital Transformation Of Society. *Ad Alta: Journal of interdisciplinary research*, 13(01), XXXIV, 40-46. DOI: 10.33543/1301344046
10. Borysenko, O., & Karpa, M. (2022). Features of the Implementation of Public Authority in the Context of Modern International Security Challenges: Information Component. *IJCSNS. International Journal of Computer Science and Network Security*, 22 (8), 123-128. DOI: 10.22937/IJCS NS.2022.22.8.16
11. Cebula, J., Chygryn, O., Chayen, S. V., & Pimonenko, T. (2018). Biogas as an alternative energy source in Ukraine and Israel: Current issues and benefits. *International Journal of Environmental Technology and Management*, 21(5-6), 421-438.
12. Dulski, Paweł., Ilnicki, Aleksander., Kurnicki, Leszek., & Słomki, Wojciech. (2022) The Personal and Common good in the theory of state solodarium. *Ad Alta: Journal of interdisciplinary research*, 12(2), XXIX, 79-85.
13. Dzwigol, H. (2021). Meta-analysis in management and quality sciences. *Marketing and management of innovations*, (1), 324-335.
14. Ferdman, H. Filippova V., & Kozak I. (2024). Innovation Defense Clusters - An Effective Driver Of Defense And National Security Of Ukraine. *Ad Alta: Journal of interdisciplinary research*, 14(01), XLI, 201-206. DOI: 10.33543/j.140141. 201206
15. Gaievska, L., Karlova, V., Bobrovska, O., Kulynych, M. & Akimov, O. (2023). Public-Private Partnership As A Tool For Implementing State Policy. *Ad Alta: Journal of interdisciplinary research*, 13(01), XXXIV, 21-30. DOI: 10.33543/1301342130
16. Gavkalova, N. & Akimov, O. (2023). Anti-crisis Management Mechanism in the Digital Age. *Marketing and Management of Innovations*, 14(4), 188–199. DOI: 10.21272/ mmi.2023.4-14
17. Gradus Research Report: Study on the Emotional State of Citizens of Ukraine. <https://gradus.app/ru/open-reports/>
18. Halushka, Z. Bobrovskyi, O. & Kharechko D. (2024). State Policy Of Wellbeing In The Face Of Global Challenges: Problems Of Socialization, Socio-Economic Transformation Against The Background Of The Introduction Of Digitalization And Artificial Intelligence Technologies. *Ad Alta: Journal of interdisciplinary research*, 14(01), XLI. 195-200. DOI: 10.3354 3/j.140141.195200
19. In Wikipedia. <https://en.wikipedia.org/wiki/IQVIA>
20. IQVIA (2023, February 25). European thought leadership.
21. Karpa, M., Serohina, N., Oleshko, O., & Lipovska, N. (2021). Public administration as a systemic phenomenon in society. *Ad Alta: Journal of interdisciplinary research*, 11(1), XV, 56-62.
22. Kitsak, T., Karpa, M., Domsha, O., & Zhuk, O. (2023) Artificial Intelligence As A Tool Of Public Management Of Socio-Economic Development: Economic Systems, Smart Infrastructure, Digital Systems Of Business Analytics And Transfers. *Ad Alta: Journal of interdisciplinary research*, 13(01), XXXIV, 13-20. DOI: 10.33543/1301341320
23. Koibichuk, V., Ostrovska, N., Kashiyyeva, F., & Kwilinski, A. (2021). Innovation technology and cyber frauds risks of neobanks: gravity model analysis. *Marketing and management of innovations*, (1), 253-265.
24. Koshova, S. & Kaliuzhna, S. (2022). Regulatory and Legal Aspects of Information Support for the Provision of Administrative Services in the Field of Public Administration as a Communicative Culture of a Public Servant. *IJCSNS. International Journal of Computer Science and Network Security*, 22(9), 595-600. DOI: 10.22937/IJCSNS.2022.22.9.77
25. Kryshchanovych, M. & Shulga, A. (2022) Modern Technologies for Ensuring Economic Security in the Context of Achieving High Efficiency of Public Administration. *IJCSNS. International Journal of Computer Science and Network Security*, 22(2), 362-368. DOI: 10.22937/IJCSNS.2022.22.2.42
26. Kulikov, P., Vahonova, O., & Niema, O., (2022). Scientific and Applied Tools for Project Management in a Turbulent Economy with the Use of Digital Technologies. *IJCSNS. International Journal of Computer Science and Network Security*, 22(9), 601-606. DOI: 10.22937/IJCSNS.2022.22.9.78
27. Kwilinski, A., Lyulyov, O., Dzwigol, H., Vakulenko, I., & Pimonenko, T. (2022). *Integrative smart grids' assessment system. Energies*, 15(2), 545.
28. Lappo, V.V., & Soichuk, R.L. (2022) Digital technologies of support the spiritual development of students. *Information Technologies and Learning Tools*, 2022, Vol 88, No2. 103- 114. DOI: 10.33407/itlt.v88i2.3403
29. Laptev, S., & Gaman, N. (2021). Influence of corporate governance ratings on assessment of non-financial threats to economic security of joint stock companies. *Financial and Credit Activity: Problems of Theory and Practice*, 6(41), 223– 237. DOI: 10.18371/fcaptp.v6i41.251442
30. Levytska, S., & Pavlov, C. (2019). The role of accounting in providing sustainable development and national safety of Ukraine. *Financial and credit activity: problems of theory and practice*, 30(3), 64-70. DOI: 10.18371/FCAPTP.V3I30.179501
31. Liubkina, O., & Murovana, T. (2019). Financial instruments of stimulating innovative activities of enterprises and its improvements. *Marketing and Management of Innovations*, 4, 336-352. DOI: 10.21272/MMI.2019.4-26
32. Lukashev, S. & Avedyan, L. (2022). Functioning Of United Territorial Communities And Identification Of Main Problems Of Organizational Support Of Local Budget Management. *Financial and Credit Activity Problems of Theory and Practice*, 2(43), 107–117. DOI: 10.55643/fcap tp.2.43.2022.3708
33. Marchenko, A., Akimova, L., & Akimov, O. (2021) The current state of ensuring the effectiveness of coordination of anticorruption reform. *Ad Alta: Journal of interdisciplinary research*, 11(2), XX, 78-83
34. Mihus, I., & Dmitrenko, V. (2020). Improvement of the methodological approach to assessing the impact of public governance on ensuring the economic security of the state. *Financial and Credit Activity-Problems of Theory and Practice*, 4(35), 180-190. DOI: 10.18371/fcaptp.v4i35.221969
35. Ministry of Health of Ukraine. (n.d.). Distribution of COVID-19 vaccines. <https://moz.gov.ua/rozpodil-vakcin-proti-kovid>
36. Novak, A., Tkachenko, I., Terska, S., & Akimov, O. (2022) Anti-corruption as a component of state policy. *Ad Alta: Journal of interdisciplinary research*, 12(1), XXV, 79-87.

37. Official web portal of the Parliament of Ukraine. (n.d.-c). Resolution No. 224. <https://zakon.rada.gov.ua/laws/show/224-2020-%D0%BF#Text>
38. Official web portal of the Parliament of Ukraine. (n.d.-d). Resolution No. 225. <https://zakon.rada.gov.ua/laws/show/225-2020-%D0%BF#Text>
39. Official web portal of the Parliament of Ukraine. (n.d.-e). Law of Ukraine No. 530-IX. On amendments to certain legislative acts of Ukraine aimed at preventing the emergence and spread of coronavirus disease (COVID-19). <https://zakon.rada.gov.ua/laws/show/530-20#Text>
40. Official web portal of the Parliament of Ukraine. (n.d.-a). Order on the approval of the protocol "Providing medical assistance for the treatment of coronavirus disease (COVID-19)". <https://zakon.rada.gov.ua/rada/show/v0762282-20#n5480>
41. Official web portal of the Parliament of Ukraine. (n.d.-b). Resolution No. 220. <https://zakon.rada.gov.ua/laws/show/220-2020-%D0%BF#Text>
42. Pharmaceutical Market of Ukraine 2020-2021: External Influencing Factors. <https://ukrcomexpo.com/pharmavision-2021/>
43. Razumei, M., Kveliashvili, I., & Kazantsev, S. (2024). Directions And Prospects Of The Application Of Artificial Intelligence In Customs Affairs In The Context Of International Relations. *Ad Alta: Journal of interdisciplinary research*, 14(01), XL, 179-186. DOI: 10.33543/j.140140.179186
44. Rosłoń, D., Lukianchenko, D., & Zlenko, S. (2023). European Standards Of The Rights Of The Parties To The Case In The Application Of Civil Action Enforcement Measures And Their Implementation In Ukraine. *Ad Alta: Journal of interdisciplinary research*, 13(02), XXXVII, 12-21. DOI: 10.33543/j.130237.1221
45. Romyk, I., & Karpa, M. (2021) Financial support and forecasting of food production using economic description modeling methods. *Financial and Credit Activity: Problems of Theory and Practice*, 5(40), 248–262. DOI: 10.18371/fcaptop.v4i35.245098
46. Serohina, T., Pliushch, R., Pobirchenko, N., & Shulga, N. (2022) Pedagogical Innovations In Public Administration And Legal Aspects: The Eu Experience. *AD ALTA: Journal of interdisciplinary research*, 12(1), XXV. 7-13.
47. Shestakovska, S., Bondar, N., Kravchenko, I., & Akimov, O. (2022). Comparative Characteristics Of Social Leave: International And Foreign Experience. *AD ALTA: Journal of interdisciplinary research*, 12(1), XXV, 27-32.
48. Smyrnova, I., Krasivskyy, O., Shykerynets, V., & Babych, A. (2021). Analysis of The Application of Information and Innovation Experience in The Training of Public Administration Specialists. *IJCSNS International Journal of Computer Science and Network Security*, 21, 3, March 2021, 120-126.
49. Staniewski, Marcin W.; Slomski, Wojciech; Ryzinski, Remigiusz (2015) Are ethics in entrepreneurship possible at all? *Filosofija-Sociologija*, 26(3), 193-200.
50. State Expert Center of the Ministry of Health of Ukraine. Sectoral Standards and Medical Protocols / Coronavirus Disease 2019 (COVID-19). <https://www.dec.gov.ua/mtd/koronavirusna-hvoroba-2019-covid-19/>
51. Sukhova, K., Borodin, Y., Tarasenko, T., Komarova, K., & Akimov, O. (2022). Organizational mechanism of state management of social services in territorial communities. *Ad Alta: Journal of interdisciplinary research*, 12(1), XXVII, 188-192.
52. The Apteka Newspaper (2021, January 25). Pharmacy sales results for 2020. *The Apteka Newspaper*, 3, 1274. <https://www.apteka.ua/article/581310>
53. The impact of COVID-19 on Middle-East healthcare: Current and future. (n.d.). *IQVIA Webinar*. <https://www.iqvia.com/events/2020/04/navigating-the-immediate-impact-of-covid-19>
54. Title of subordinate document. In: Monitoring the Impact of COVID-19 on the Pharmaceutical Market – EU5. IQVIA. <https://www.iqvia.com/library/white-papers/monitoring-the-impact-of-covid-19-on-the-pharmaceutical-market-eu5>
55. Vasylevska, T., Shevchenko, S., & Akimov, O. (2022). Development Of Professional Competence Of Public Servants In The Conditions Of Decentralization Of Public Authority. *Ad Alta: Journal of interdisciplinary research*, 12(2), XXIX. 61-66.
56. WHO (2020). Archived: WHO timeline - COVID-19. <https://www.who.int/ru/news/item/27-04-2020-who-timeline---covid-19>
57. WHO (2021). International Health Regulations and Emergency Committees. <https://www.who.int/news-room/questions-and-answers/item/emergencies-international-health-regulations-and-emergency-committees>
58. Zahorskyi, V., & Karpa, M. (2022). Ensuring Information Security in the System of Public Management of Sustainable Development of the Region: EU Experience. *IJCSNS. International Journal of Computer Science and Network Security*, 22(8), 163-168. DOI: 10.22937/IJCSNS.2022.22.8.21
59. Zaiachkivska, O.V., & Gupta, S.K. (2020). Modern analytical instruments for controlling the enterprise financial performance. *Financial and Credit Activity-Problems of Theory and Practice*, 2(33), 314-323. DOI: 10.18371/fcaptop.v2.133.206967
60. Ziabina, Y., & Navickas, V. (2022). Innovations in energy efficiency management: role of public governance. *Marketing and management of innovations*, (4), 218-227.
61. Zilinska, A.S. & Kyrychenko, Y.V. (2022). Efficiency In The Context Of Ensuring Sustainable Territorial Development. *Financial and Credit Activity Problems of Theory and Practice*, 4(45). 234–243. DOI: 10.55643/fcaptop.4.45.2022.3830

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