

relevant results and theoretical developments
of science and research

14

2024

issue 2, special XLIV.

AD ALTA

Journal of Interdisciplinary Research

AD ALTA: Journal of Interdisciplinary Research

Double-Blind Peer-Reviewed

Volume 14, Issue 2, Special Issue XLIV., 2024

Number of regular issues per year: 2

© The Authors (September, 2024)

MAGNANIMITAS Assn.

AD ALTA: JOURNAL OF INTERDISCIPLINARY RESEARCH

© THE AUTHORS (SEPTEMBER, 2024), BY MAGNANIMITAS, ATTN. AND/OR ITS LICENSORS AND AFFILIATES (COLLECTIVELY, "MAGNANIMITAS"). ALL RIGHTS RESERVED.

SPECIAL ISSUE NO.: 14/02/XLIV. (VOLUME 14, ISSUE 2, SPECIAL ISSUE XLIV.)

ADDRESS: CESKOSLOVENSKE ARMADY 300, 500 03, HRADEC KRALOVE, THE CZECH REPUBLIC, TEL.: 498 651 292, EMAIL: INFO@MAGNANIMITAS.CZ

ISSN 1804-7890, ISSN 2464-6733 (ONLINE)

AD ALTA IS A PEER-REVIEWED JOURNAL OF INTERNATIONAL SCOPE.

2 ISSUES PER VOLUME AND SPECIAL ISSUES.

AD ALTA: JOURNAL OF INTERDISCIPLINARY RESEARCH USES THE RIV BRANCH GROUPS AND BRANCHES, BUT THE JOURNAL IS NOT A PART OF RIV. THE RIV IS ONE OF PARTS OF THE R&D INFORMATION SYSTEM. THE RIV HAS COLLECTED AN INFORMATION ABOUT RESULTS OF R&D LONG-TERM INTENTIONS AND R&D PROJECTS SUPPORTED BY DIFFERENT STATE AND OTHER PUBLIC BUDGETS, ACCORDING TO THE R&D ACT [CODE NUMBER 130/2002], THE CZECH REPUBLIC.

A	SOCIAL SCIENCES
B	PHYSICS AND MATHEMATICS
C	CHEMISTRY
D	EARTH SCIENCE
E	BIOLOGICAL SCIENCES
F	MEDICAL SCIENCES
G	AGRICULTURE
I	INFORMATICS
J	INDUSTRY
K	MILITARISM

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MAGNANIMITAS'S PRIOR WRITTEN CONSENT. ALL INFORMATION CONTAINED HEREIN IS OBTAINED BY MAGNANIMITAS FROM SOURCES BELIEVED BY IT TO BE ACCURATE AND RELIABLE. BECAUSE OF THE POSSIBILITY OF HUMAN OR MECHANICAL ERROR AS WELL AS OTHER FACTORS, HOWEVER, ALL INFORMATION CONTAINED HEREIN IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. UNDER NO CIRCUMSTANCES SHALL MAGNANIMITAS HAVE ANY LIABILITY TO ANY PERSON OR ENTITY FOR (A) ANY LOSS OR DAMAGE IN WHOLE OR IN PART CAUSED BY, RESULTING FROM, OR RELATING TO, ANY ERROR (NEGLIGENT OR OTHERWISE) OR OTHER CIRCUMSTANCE OR CONTINGENCY WITHIN OR OUTSIDE THE CONTROL OF MAGNANIMITAS OR ANY OF ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS IN CONNECTION WITH THE PROCUREMENT, COLLECTION, COMPILATION, ANALYSIS, INTERPRETATION, COMMUNICATION, PUBLICATION OR DELIVERY OF ANY SUCH INFORMATION, OR (B) ANY DIRECT, INDIRECT, SPECIAL, CONSEQUENTIAL, COMPENSATORY OR INCIDENTAL DAMAGES WHATSOEVER (INCLUDING WITHOUT LIMITATION, LOST PROFITS), EVEN IF MAGNANIMITAS IS ADVISED IN ADVANCE OF THE POSSIBILITY OF SUCH DAMAGES, RESULTING FROM THE USE OF OR INABILITY TO USE, ANY SUCH INFORMATION.

PAPERS PUBLISHED IN THE JOURNAL EXPRESS THE VIEWPOINTS OF INDEPENDENT AUTHORS.

TABLE OF CONTENTS (BY BRANCH GROUPS)

A SOCIAL SCIENCES

THE POTENTIAL AND PROSPECTS OF ARTIFICIAL INTELLIGENCE USE IN STRATEGIC PLANNING: ISSUES OF SECURITY AND DEFENSE OLHA RUDENKO, IHOR RAFALSKYI, OLEKSANDR YERMAK, VLADYSLAV VARYNSKYI, YAROSLAV KONOPLIA	6
STYLES AND DIRECTIONS OF CONTEMPORARY UKRAINIAN FINE ARTS IN THE CONTEXT OF WORLD TRENDS TETIANA PROKOPOVYCH, OLEKSANDRA PANFILOVA, HALYNA VAKHRAMIEIEVA, IVAN TARASIUK, OLGA KALENIUK	13
METHODOLOGICAL PRINCIPLES OF PSYCHOLOGICAL AND PEDAGOGICAL SUPPORT OF FUTURE SPECIALISTS PROFESSIONAL TRAINING IN HIGHER EDUCATION INSTITUTIONS OLEKSANDRA KHALLO, NADIIA KICHUK, VALENTYNA VERTUHINA, VOLODYMYR FEDORAK, LILIANA KHMICHUK, OLEKSANDR VOROBETS	19
SOME INDICATORS OF STUDENTS' MENTAL HEALTH IN THE CONDITIONS OF WAR (ON THE EXAMPLE OF THE KHARKIV STUDENTS DURING THE FULL-SCALE MILITARY INVASION OF RUSSIA INTO UKRAINE) IRYNA NECHITAILO, OKSANA BORIUSHKINA, YANA PONOMARENKO, IULIIA TVERDOKHVALOVA, TETIANA YELCHANINOVA, DALIA KOBELIEVA	25
PARTICIPATION OF THE STATE IN INTERNATIONAL COMMERCIAL TRANSACTIONS (INTERNATIONAL COMMERCIAL ACTIVITY): IMMUNITY ISSUES YEVGEN POPKO, VADYM POPKO, VIKTOR KALAKURA	36
THE ESSENCE AND SCOPE OF UKRAINE'S VICTORY IN THE CONTEXT OF RUSSIA'S TOTAL WAR AGAINST THE UKRAINIAN STATE ANATOLII RACHYNSKYI, OLEKSANDR ZIUZIA	41
HOLISTIC EDUCATION IN THE EUROPEAN SOCIO-CULTURAL SPACE IN THE EARLY MODERN PERIOD MARYNA GRYNKOVA, RUSLAN BASENKO, VASYL FAZAN, DMYTRO LOBODA, MARYNA ZUYENKO	45
NEW FUNCTIONAL APPEARANCES OF STABLE EXPRESSIONS IN THE MEDIA TEXTS OF THE RUSSIAN-UKRAINIAN WAR PERIOD MARYNA NAVALNA, NATALIIA KOSTUSIAK, OLEKSANDR MEZHOV, VOLODYMYR OLESENKO, TETIANA LEVCHENKO, MARIIA LYCHUK, OLESIA SKLIARENKO, IRYNA POLIAK, YURII DRUZ, GALYNA DRUZ	49
GRAPHO-BARBARISMS IN THE HEADLINES OF UKRAINIAN MEDIA TEXTS MARYNA NAVALNA, NATALIIA KOSTUSIAK, OLEKSANDR MEZHOV, LIUDMYLA MARCHUK, OKSANA BUHAIOVA, SVITLANA NOVOSELETSKA, NATALIIA SHAPRAN, TETIANA KHOMYCH, TETIANA MUSICHUK, VADYM BOBKOV	59
MUSICAL AND INSTRUMENTAL FORM CREATION AS A STRUCTURAL AND PROGRESSIVE PHENOMENON: GUIDING PRINCIPLES YULIIA IVANOVA, LI JUAN, WEN WEN, XU NIANJIA, LIU LU	67
THE VOCAL HERITAGE OF JOHANNES BRAHMS WITHIN THE CONTEXT OF THE RELIGIOUS AND ETHICAL PRINCIPLES OF 19TH-CENTURY GERMAN CULTURE OLHA MURAVSKA, LARISA GORELIK, LARYSA LOBODA, HALYNA SHPAK, YAOLISHA FANG	71
TRANSLATION TRAINING OF FUTURE PHILOLOGISTS USING MODERN INFORMATION TECHNOLOGIES VIKTORIA IHNATENKO, IRYNA VAKULYK, IRYNA VORONIUK, MYKOLA PROKHOROV, HALYNA MELEKH	75
INCLUSIVE PEDAGOGY IN SOCIETY 5.0: SOCIAL ASPECT LARYSA SUSHCHENKO, ROMAN SUSHCHENKO, TETIANA MARTYNIUK, IRYNA PUSHCHYNA, ALONA SADYKINA, GNAT STRYZHAK	80
PHYSICAL CULTURE AND A HEALTHY LIFESTYLE IN THE LANDSCAPE OF SUSTAINABLE DEVELOPMENT YURIY YAKIMETS, IVAN ILYNYSKYI, NATALIIA KORZH, OLGA SOKOLOVA, INNA PAVLENKO	85
CYBERSECURITY AS A COMPONENT OF INTERNATIONAL SECURITY OLEKSANDR HOMANIUK	90
SOME GENRES AND FORMS OF EARLY MUSIC IN MODERN DOMESTIC PRACTICE OLHA SHADRINA-LYCHAK, NATALIYA FOMENKO, IRYNA DRUZHHA, HANNA IVANIUSHENKO, OLENA ZHUKOVA	94
THE IMPACT OF LIABILITIES ON A COMPANY'S FINANCIAL STABILITY NORA ŠTANGOVA, AGNEŠA VIGHOVA	99
SECURITY OF SUSTAINABLE DEVELOPMENT OF THE AGRICULTURAL SECTOR OF THE REGION BASED ON DIGITALIZATION AND CIRCULAR ECONOMY: A CASE STUDY OF UKRAINE MARYNA DIELINI, OLGA KORNELIUK, TETIANA SHMATKOVSKA, NATALIIA NAUMENKO, LILIIA VIRUN, NATALIIA KHOMIUK, ROSTYSLAV MARTYNIUK	104
ANALYSIS AND MANAGEMENT OF LOGISTICS CHAINS IN THE CONTEXT OF THE CONVERGENCE OF DIGITAL TECHNOLOGIES IN THE ECONOMIC ARCHITECTURE OF UKRAINE OLHA SHULHA, YULIIA POPOVA, MYKOLA SHVETS, DMYTRO RUDENKO, BOHDAN SAMOILENKO, NATALIIA KHOMIUK, NADIIA BUKALO, RUSLANA SODOMA	109
THE APPLICATION OF THE "ROMAN FORMULA" METHOD IN CRIMINAL OFFENCE INVESTIGATIONS: PAST AND PRESENT ANATOLII STARUSHKEVYCH, ANDRII ZHUKOV, ANNA HREBENYUK, IVAN BANDURA, OLEKSANDR HOLOVKO, PETRO HLAMAZDA	114

THE ROLE OF DIGITIZATION OF THE EDUCATIONAL PROCESS IN THE CREATION AND FUNCTIONING OF ARTIFICIAL INTELLIGENCE
IRINA MOSIAKOVA, VALENTYN ROGOZA, YAROSLAV SMOLYN, VIKTORIIA BAIDALA, IHOR HAVRYLOV, OLGA KAZANSKA

120

F MEDICAL SCIENCES

DEVELOPMENT OF ADAPTIVE CHANGE MANAGEMENT PRINCIPLES IN THE PHARMACETICAL INDUSTRY UNDER THE INFLUENCE OF THE PANDEMIC
TETIANA DZIUBA

126

A SOCIAL SCIENCES

AA	PHILOSOPHY AND RELIGION
AB	HISTORY
AC	ARCHAEOLOGY, ANTHROPOLOGY, ETHNOLOGY
AD	POLITICAL SCIENCES
AE	MANAGEMENT, ADMINISTRATION AND CLERICAL WORK
AF	DOCUMENTATION, LIBRARIANSHIP, WORK WITH INFORMATION
AG	LEGAL SCIENCES
AH	ECONOMICS
AI	LINGUISTICS
AJ	LITERATURE, MASS MEDIA, AUDIO-VISUAL ACTIVITIES
AK	SPORT AND LEISURE TIME ACTIVITIES
AL	ART, ARCHITECTURE, CULTURAL HERITAGE
AM	PEDAGOGY AND EDUCATION
AN	PSYCHOLOGY
AO	SOCIOLOGY, DEMOGRAPHY
AP	MUNICIPAL, REGIONAL AND TRANSPORTATION PLANNING
AQ	SAFETY AND HEALTH PROTECTION, SAFETY IN OPERATING MACHINERY

THE POTENTIAL AND PROSPECTS OF ARTIFICIAL INTELLIGENCE USE IN STRATEGIC PLANNING: ISSUES OF SECURITY AND DEFENSE

^aOLHA RUDENKO, ^bIHOR RAFALSKYI, ^cOLEKSANDR YERMAK, ^dVLADYSLAV VARYNSKYI, ^eYAROSLAV KONOLIA

^aNational University "Chernihiv Polytechnic", 95, Shevchenko Str., 14035, Chernihiv, Ukraine

^bZhytomyr Polytechnic State University, 103, Chudnivska Str., 10005, Zhytomyr, Ukraine

^cNational University «Yuri Kondratyuk Poltava Polytechnic», 24, Pershotravneva Str., 36011, Poltava, Ukraine

^dNational University "Odesa Maritime Academy", 8, Didrikhson Str., 65052, Odesa, Ukraine

^eIvan Franko National University of Lviv, 1, Universytetska Str., 79000, Lviv, Ukraine

e-mail: ^aolham.rudenko@gmail.com, ^bkmypmi_rio@ztu.edu.ua,

^cermak.oleksandr89@gmail.com, ^dvlad_varinskiy@gmail.com,

^eyarik27kon@ukr.net

Abstract: The subject of the study is the most promising technological solutions using artificial intelligence and global trends in their use by the armed forces of technologically advanced countries of the world. The main areas of AI technologies application by a number of countries (USA, China, and Israel) are identified. The article is an attempt to conduct a comprehensive analysis of the current world situation in the field of determining the prospects and dangers of using AI technologies in the field of defense and in the area of ensuring national security of modern states.

Keywords: artificial intelligence, strategizing, strategic planning, security, warfare, defense sphere, public sphere, national security.

1 Introduction

The field of military and national security is still being shaped by artificial intelligence, which presents both new and exciting potential as well as a host of challenges. The predictive powers of AI are a great help for developing national security plans and strategies. Artificial intelligence (AI) models are able to predict possible security issues, geopolitical changes, and new threats by evaluating past data and present patterns.

Crisis management and national security are changing as a result of artificial intelligence and machine learning. But significant issues come up. These worries may be seen, for instance, in the historical record when considering the topic of how crisis decision-making would be impacted by the integration of AI/ML throughout a state's national security environment. At machine speed, for instance, how could the Cuban Missile Crisis appear?

The integration of artificial intelligence into military plans is a paradigm shift that is revolutionizing the tactical environment and strategic requirements of defense. Using AI strategically has the potential to totally change the nature of battle in the digital age, in addition to increasing the precision and efficiency of military operations [53]. Moreover, the incorporation of artificial intelligence (AI) into security policy offers a fresh perspective, emphasizing the necessity of autonomous systems and algorithmic decision-making for maintaining global stability and national security [24].

On the other hand, as we move toward these bright futures, society will also need to face the myriad issues raised by this ground-breaking technology. Gaining a thorough grasp of these possible obstacles is just as important as seizing the chance to guarantee the safe, ethical, and well-rounded use of AI in defensive systems [22].

The growing use of artificial intelligence for military purposes raises questions of deep concern for humanity. The armed forces are investing heavily in AI systems. There are already examples of their use on the battlefield to provide information support for military operations or as part of various weapons systems.

The technologies can help handle and comprehend the massive amounts of data created in modern combat using intelligent

systems for command and control. By giving commanders a thorough, almost instantaneous image of the battlefield, this can support their strategic planning and decision-making.

AI technologies are the most promising direction for re-equipping the armed forces of the leading military powers of the modern world. Developments are being carried out in various areas, ranging from unmanned vehicles to lethal autonomous weapons. Experts note both the pronounced positive prospects for using AI in the field of national security and the possible negative consequences of its use [44].

Autonomous weapons pose an especially dangerous risk. Despite almost ten years of diplomatic attempts at the UN, nations around the world are unable to come to a consensus on a ban on lethal autonomous weapons. Military must discriminate between troops and civilians in accordance with international humanitarian law, and the Pentagon has long maintained that human decision-making must be included when deciding whether to use force [16]. However, there are other circumstances (like guarding against approaching missiles) in which human assistance is just not feasible.

There is a dangerous regulatory vacuum when it comes to military artificial intelligence (AI) since there is no comprehensive global governance structure in place. Due to this vacuum, a potent technological category remains uncontrolled, increasing the threats to global peace and security, accelerating the spread of weapons, and undermining international law. Globally, governments are vying for the top spot in the emerging and disruptive technologies (EDTs) space while also attempting to comprehend the deep and revolutionary effects of artificial intelligence. Corporate tech companies are competing for venture capital investment in foundation models by entering a trillion-dollar generative AI arms race. The stakes are enormous and the global balance of power is unstable in the struggle for dominance in the economy and morality. The issue of replacing humans with artificial intelligence in the military field should be as acute as possible and resolved with the utmost caution.

2 Materials and Methods

The scientific and methodological basis of the work was a complex of various methods of cognition, research, description, and explanation of the thematic horizon under study. The methodological basis of the study was the systemic, activity-based approaches, the hermeneutic method of research and the principle of historicism. The study also uses traditional general scientific methods (analysis, synthesis, deduction, induction, etc.).

3 Results and Discussion

We are seeing an unparalleled escalation in recent history due to the growing tensions between countries, ranging from the Middle East to the Pacific, and the spread of ongoing conflicts throughout the world, like the war between Russia and Ukraine. The consequences of these conflicts extend beyond borders and, given the speed at which technology has advanced recently, even into the realms of internet and space. Lately, artificial intelligence (AI) has emerged as a key component in shaping both the military industry and combat in the future. For instance, the French Navy said that it will use artificial intelligence (AI) to analyze signals in underwater acoustics warfare [47]. In a similar vein, the Italian defense behemoth Leonardo forecast that by 2028, its space, cybersecurity, and artificial intelligence efforts will increase fourfold at a presentation to analysts a few weeks ago. This demonstrates unequivocally a trend in which artificial intelligence (AI) is becoming fundamental to the idea of war and the military industry at large. This implies that determining the future of the military industry and combat will need a knowledge of AI. The increasing widespread integration of AI into numerous processes has extended well beyond cyberspace, as

addressed in recent findings [17]. Understanding AI's integration and influence beyond what is now known is essential. AI is facilitating the gradual mixing of security factors in this setting.

The main competitors in the fight for leadership in the field of artificial intelligence today are the People's Republic of China and the United States, which define strategic steps to ensure superiority in a number of conceptual documents.

In particular, in July 2017, the State Council of the People's Republic of China, the top administrative body in China, released the country's strategy for the development of artificial intelligence, called "The new generation Artificial Intelligence Development Plan" (AIDP) [23]. The strategy outlines goals and steps to ensure the country's global leadership in AI by 2030, to make AI a trillion-yuan (about \$150 billion) industry, and to define ethical norms and standards for AI.

The new generation Artificial Intelligence Development Plan acts as a single document outlining China's AI policy goals. In 2018, Chinese media called it "the first year of China's AI development strategy" The overall policy goal articulated by the AIDP is to make China a global hub for AI innovation by 2030, with intelligence serving as the main driver of the country's modernization and driving military and economic transformation. The AIDP also calls for standards and ethics for the use of AI. Overall, the Plan represents a comprehensive AI strategy and challenges other leading countries in many key areas.

The desire to overtake the United States is reflected in statements by China's political and military leadership.

For example, President Xi Jinping stated back in 2017 that "in an increasingly fierce international military competition, only innovators win" [42]. This view was shared by Lieutenant General Liu Guozhi, a member of the 19th National Congress and director of the Science and Technology Committee of the Central Military Commission, who stated in a public interview that AI represents a rare opportunity to shorten the path to innovation and outperform competitors [42]. In parallel, military scientists in China's People's Liberation Army (PLA) emphasize that AI will be used to predict battlefield situations and determine optimal approaches to "win before the war" [20]. Some PLA members go further, expecting a battlefield "singularity" in which AI outpaces human decision-making. These statements highlight the widespread belief in Chinese military circles on the importance of using new technologies, including AI, to achieve a competitive military advantage.

It is known that cyberspace has been a new theater of military operations in NATO for over ten years. Since the development of AI technologies, theorists and practitioners have been working on the issue of their implementation in the combat sphere [6-10]. This is reflected not only in numerous studies and the creation of samples of the latest weapons, but also in doctrinal documents of NATO, the United States, Great Britain, and other leading countries of the world.

Thus, on October 21, 2021, NATO defense ministers agreed the first-ever NATO strategy on artificial intelligence. NATO Secretary General Jens Stoltenberg said that the new strategy was formed in response to the race of authoritarian regimes in the field of new technologies development. The document covers data analysis, imagery, and cyber defense. To this end, the alliance plans to create a \$1 billion fund for "future defense." The strategy notes that AI is changing the global defense and security environment and provides an unprecedented opportunity to strengthen technological advantage. "This foundational technology is likely to affect the full range of activities carried out by the North Atlantic Alliance in support of its three core tasks: collective defense, crisis management, and cooperative security" [16].

The National Security Commission on Artificial Intelligence (NSCAI) released its final report on March 1, 2021, which presents an unprecedented strategy for the nation to win in the

era of artificial intelligence [15]. According to the Commission members, AI warfare will no longer depend on the emergence of a single effective new weapon, promising military technology, or operational-tactical technique. Rather, success will be determined by the integration of AI technologies into all aspects of combat operations [1-3]. AI will change the way war is waged in all areas: on land, at sea, in the air, in space, in cyberspace, and in all ranges of the electromagnetic spectrum. AI will change all attributes of war: the level of control over the theater of military operations (battlefield); the quality of reaction to events; the level of influence on the enemy, taking into account political, social, and religious factors; the accuracy of hitting a target; the reliability of building a defense; the speed and scale of the use of force; the relationship between personnel and equipment (man and machine), etc.

The 16-chapter strategy outlines steps the United States should take to responsibly use of AI for national security and defense, defend against threats, and advance innovation. The report makes dozens of recommendations to U.S. President Joe Biden, Congress, companies, and institutions. The 15-member committee, chaired by former Google CEO Eric Schmidt, advocates for expanding and democratizing AI research with an annual investment of \$40 billion. The commission plans to create a multi-tiered ecosystem that will ensure the widespread development and adoption of AI technologies at all levels, from the C-suite to the tactical level.

The U.S. military is also integrating AI systems into warfighting through a lead initiative called Project Maven, which uses AI algorithms to identify insurgent targets in Iraq and Syria. The goal of Project Maven, according to Air Force Lt. Gen. John N. T. Jack Shanahan, director of defense intelligence for the warfighter, "is to turn the vast amount of data available to the DoD into actionable intelligence and insight" [56]. AI is expected to be particularly useful in intelligence activities due to the large amounts of data available for analysis. For example, the first phase of Project Maven involves automating intelligence processing in support of the counter-ISIS campaign. Specifically, the Project Maven team is using computer vision and machine learning algorithms in intelligence collection cells that will analyze footage from unmanned aerial vehicles and automatically identify hostile activity for targeted investigation. In this way, artificial intelligence (AI) aims to replace human analysts' labor, which now requires hours of 'sifting through video' in order to extract pertinent data [12-14]. The theory behind this is that analysts who could be freed up would be able to use the data they get to make faster and more informed judgments.

In April 2022, NATO foreign ministers endorsed the Defence Innovation Accelerator for the North Atlantic (DIANA) Charter, which commits national AI test centers to supporting NATO's ambitious AI projects. DIANA brings together defense personnel, promising start-ups from NATO countries, academic researchers, and technology companies to address key security challenges.

This program focuses on deep technologies - those emerging and disruptive technologies that NATO has identified as a priority, including Big Data, Artificial Intelligence, Autonomy, Quantum Technologies, Biotechnology, Energy and Propulsion, New Materials and Advanced Manufacturing, Hypersonics and Space, particularly where they are dual-use (commercial and defense) and deep-tech and where they can be used to address complex defense and security challenges [54]. The first DIANA regional office was opened on 30 March 2023 at the Imperial College London Innovation Centre (in partnership with Estonia).

Figure 1 below presents comparison of military spending and share of GDP across selected countries.

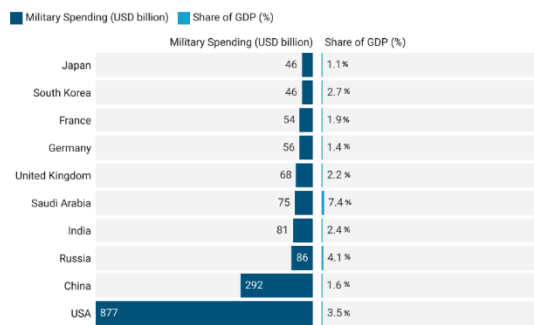


Figure 1. Spending in USD billion and share in percentage [43]

In 2023, the worldwide artificial intelligence market for the military generated \$8.9 billion in sales. The software, hardware, and services sectors are predicted to generate USD 10.52 billion, USD 8.00 billion, and USD 6.18 billion in revenue, respectively, by 2032, when the market is predicted to grow to USD 24.7 billion (see Figure 2).

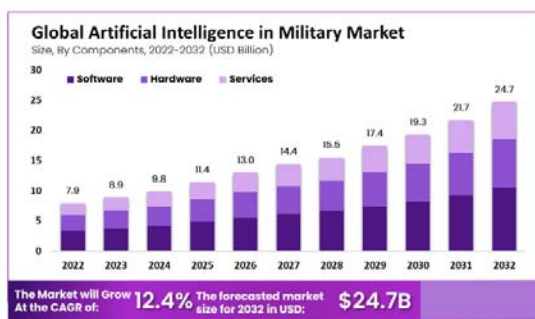


Figure 2. Global AI in military market, with forecast up to 2032 [49]

Another competitor in the defense/security AI market is Israel. Although Israel is only 70 years old, it has one of the most modern armed forces in the world. Despite Israel's small size and budget (compared to the world's major superpowers), about 4.5% of its GDP is spent on defense research and development, almost double the OECD average [11].

Military applications of AI at Israel's top 4 defense contractors cover the following four areas:

- Elbit - autonomous loitering drone
- IAI - autonomous perimeter patrol drone
- Rafael Advanced Defense Systems - missile guidance
- IMI Systems - autonomous vehicles

Elbit - Israel's top defense contractor - offers Sky-Striker, an autonomous loitering munition technology that is claimed to help the military conduct stealthy and precise airstrikes on targets using an AI-powered autonomous device.

Artificial Intelligence is becoming more and more prevalent in all areas of combat, including cyberspace, space, air, sea, and land. It is increasingly a factor that needs to be taken into account when making strategic decisions, not just in relation to cyberwarfare but also, for instance, by ground troops [44-45]. Because of its growing impact, artificial intelligence must be better understood and incorporated into different military plans and actions. For instance, commanders may need to come up with new strategies for unit deployment and concealment as a result of AI being integrated into weapon and recognition systems. Furthermore, by incorporating AI into their operations, military structures and procedures might be redesigned to increase operational efficiency, necessitating a new use of labor [18]. This macroscopic viewpoint allows us to see AI's transversal and progressively more widespread reach. With AI acting as their common denominator, this trend indicates that the

many sectors of combat are becoming more intertwined than before.

Rethinking and updating the idea of the domains of warfare is imperative, with the human/policy domain being included as an essential transversal element that AI has brought to bear on the concept of defense policy. This shift suggests that new weaknesses will also surface, along with new interactions between an organization and AI. AI that manages automated military procedures, for instance, may be used to afflict military institutions and people that rely on it, decreasing effectiveness or producing disability [24-28]. By taking advantage of the U.S. military's reliance on policies, this might result in a rise in unpredictability. On the other hand, AI may take advantage of the individual-centric strategy in the majority of European armies by controlling people's emotions and leading them to make poor or self-destructive choices.

The increasing interplay between AI and humans is the source of these serious vulnerabilities, which have the potential to make AI the most deadly insider threat. When thinking about the future of defense strategy and the core of a military organization, this vulnerability needs to be taken into account [29-31]. It is crucial to proactively reinterpret what defense means in addition to responding to these potential future events. We may better prepare for the integration of AI in defense by recognizing and resolving these challenges and ensuring that technology and human aspects are harmoniously balanced for the best results.

Additionally, the use of AI to military operations modifies the process of formulating and carrying out strategic choices. Since AI systems by their very nature rely on preprogrammed algorithms and data inputs, any data tampering or corruption might result in serious mistakes in the formulation and implementation of strategic plans [33-36]. This may have a domino effect, causing errors in the scheduling of crucial activities, supply chain management, and military movements. These weaknesses emphasize the necessity of strong cybersecurity defenses and the creation of AI systems resistant to both internal and external mistakes [33].

This specific circumstance would enable Iran to conduct strikes that are far more extensive than what is currently thought to be feasible while momentarily eluding Western military capabilities. In addition, it may enable Iran's proxies - despite their smaller size and inferior equipment - to develop their capabilities, interfere with or disrupt air supplies to US military installations in the Gulf, modify drone routes, and carry out strikes [38-40]. This is a serious strategic risk that military leadership must address with a new understanding of strategic dynamics and a revised strategy for cybersecurity and military operations.

Furthermore, using AI in military operations has geopolitical ramifications that go beyond simple tactical issues. Depending on their own military capabilities and use of military assets, nations may perceive AI-enhanced capabilities as a danger or an opportunity [47; 58]. This means that the integration of AI into defense policies might have an impact on international relations. The competitive character of AI development in the military sector may cause security dynamics to escalate as local and national players constantly compete to surpass one another in AI capabilities, thus complicating the dynamics of global security [20]. This emphasizes even more how crucial it is for nations to work together and have open communication in order to control the risks posed by AI in military settings and to set standards and laws that can stop tensions from rising and encourage stability.

AI's influence on military tactics and national security has already been demonstrated by Russia's continuing conflict in Ukraine. The battle has seen civilian tech companies explore with AI technologies and play crucial roles in military operations. Dubbed by Time's Vera Bergengruen [4] an "AI war lab," the conflict has led to civilian tech firms experiment with AI tools and play critical roles in military operations. Due to their provision of data analytics for drone strikes and monitoring, private enterprises like as Palantir and ClearviewAI have

emerged as crucial players in the war [49-51]. These initiatives give rise to questions concerning the growing militarization of AI and the moral and legal obligations of the commercial tech industry in times of war. Israel has demonstrated the ethical, legal, and strategic challenges associated with military AI through its algorithmic warfare and its employment of AI targeting systems in Gaza with minimal human control.

The capacity of artificial intelligence (AI) to swiftly and effectively handle and analyze enormous volumes of data is one of its most important benefits for national security [53; 55]. Massive amounts of data are produced by intelligence services from a variety of sources, such as open-source intelligence, satellite photography, and communications intercepts. These data may be sorted through by AI-powered systems, which can spot trends, abnormalities, and possible risks that human analysts would overlook.

Machine learning algorithms, for instance, are capable of analyzing satellite photos to find anomalous troop movements or changes in military sites. Millions of social media postings may be scanned by natural language processing (NLP) models to find new security concerns or monitor the propagation of misinformation campaigns. Security services are able to react to possible threats faster and with greater informed decision-making because to this improved analytical capabilities [38].

Planning and strategy formulation for national security can benefit greatly from AI's predictive powers. Artificial intelligence (AI) models are able to predict possible security issues, geopolitical changes, and new threats by evaluating past data and present patterns. This makes it feasible for security organizations to prepare scenarios more intricately, foreseeing potential assaults or crises and becoming ready with the right answers [5]. AI systems may, for example, simulate how different variables, such political upheaval, economic volatility, and climatic change, would affect regional security. This would assist decision-makers in creating longer-term security plans that are more successful.

AI can quickly analyze changing circumstances during a crisis or battle, assisting political and military leaders in making deft judgments under duress. Real-time data from several sources may be processed by machine learning algorithms to provide a complete image of the battlefield or crisis area [57-59]. This may result in less casualties and more strategic decisions being made.

However, all these advantages have 'mirror' risks, and this should be understood by world political and military establishment.

Powerful nations like the US and China are engaged in a fierce race for superior military technologies. China's 2019 white document on national defense promoted the idea of "intelligentized warfare", according to which the PLO's modernization goals depend on utilizing AI. In the meanwhile, out of concern that Beijing might strengthen its cutting-edge military AI capabilities, the United States has concentrated on limiting China's access to sophisticated semiconductors that are essential for AI models. However, it is unclear if these initiatives advance global peace, U.S. national security goals, or both. One thing is for sure: efforts to regulate AI by limiting exports of advanced chips have been compared to nuclear nonproliferation tactics.

However, it is not easy to adapt models from the Cold War era to the digital era. Global leader in AI research OpenAI has advocated for an AI monitoring organization akin to the International Atomic Energy Agency, which keeps an eye on nuclear activity. UN Secretary General António Guterres has endorsed this idea. Theoretically, there is validity in a worldwide multilateral convention like to the Nuclear Nonproliferation convention that would stigmatize states seeking strategic gains from risky military AI technologies [60-61]. However, AI technologies are much more flexible than nuclear weapons, which begs serious concerns about the idea of an AI safety research and development program modeled after the Manhattan

Project, which was launched during World War II to create the first nuclear weapons. The capacity of nuclear nonproliferation regimes in general to adapt is called into doubt by the fast growing nature of AI. Furthermore, it is significantly more difficult to regulate AI for military and civilian purposes than it is for controlling tangible goods like nuclear weapons since AI is a general-purpose technological category.

In overall, "ratio" of key advantages, disadvantages/risks, and challenges in implementing AI in national security is presented in Figure 3 below.

Advantages of AI in National Security	Disadvantages and Risks	Challenges in Implementing AI for National Security
<ul style="list-style-type: none"> Enhanced Intelligence Gathering and Analysis Predictive Analytics and Threat Assessment Cybersecurity and Network Defense Autonomous and Semi-Autonomous Systems Decision Support in Crisis Situations 	<ul style="list-style-type: none"> Vulnerability to Adversarial Attacks Potential for Autonomous Weapons Systems Over-reliance on AI and Erosion of Human Expertise Data Privacy and Civil Liberties Concerns Potential for Escalation and Misunderstanding 	<ul style="list-style-type: none"> Ethical and Legal Frameworks Data Quality and Bias Interoperability and Standardization Workforce Development and Adaptation Adversarial AI and the AI Arms Race Explainability and Transparency

Figure 3. Key advantages, disadvantages/risks, and challenges in implementing AI in national security [18]

Thus, modern military and the defense industry are unleashing a Pandora's box with the increasing adoption of AI. This new technology is unexpected because of its quick development, adaptability, and incomplete knowledge of the consequences of its use. The factors that will dictate the kind and degree of impact it will have on wartime dynamics and the agencies implementing it, however, are gradually coming into focus. Furthermore, it is clear that this significant shift will need for updated perspectives on cybersecurity, military strategy, and geopolitical dynamics in order to properly account for the advances brought about by artificial intelligence.

Moreover, the incorporation of AI systems signifies a fundamental shift in military strategy and doctrine, not merely a technological or operational adjustment. To effectively use the potential of AI, extensive training programs for staff members and major modifications to command-and-control structures will be necessary [62]. Furthermore, as the application of AI in combat scenarios raises concerns about decision-making, accountability, and the possibility of unexpected effects due to AI pollution, ethical considerations will become more and more important.

Finally, as it is seen with the hypothetical scenario of an attack on the U.S. military capabilities in the GCC [48], the integration of AI systems will bring about a change in the balance of power between nations and militaries, which will redefine the various regional security complexes and the concept of security in the near future [63]. This change will probably result in new alliances and rivalries as various entities try to use or undermine AI capabilities. Keeping a strategic advantage in this shifting environment will be crucial, requiring constant innovation and adjustment to the quickly advancing technical development of artificial intelligence.

In conclusion, artificial intelligence (AI) has a great deal of promise to improve military capabilities, but it also brings new risks and weaknesses that need to be properly considered. In addition to concentrating on successfully incorporating AI into their operations, military leadership needs to design all-encompassing plans to reduce the hazards that come with it. This entails making investments in cybersecurity, encouraging staff to be more watchful and less dependent on predetermined procedures, and participating in global initiatives to control and oversee the application of AI in military settings. The only way to fully profit from AI while lowering the possibility of a military escalation is to take a diverse strategy.

It is vital that the international community takes a truly human-centered approach to the development and application of AI in conflict-affected areas. It is necessary to start by taking into account the obligations and responsibilities placed on the individual and the necessary measures to ensure the compatibility of the use of these technologies with international law, as well as social and moral values.

The following are some significant worries about the use of AI in defense:

1. The process of ensuring that the goals and actions of an AI system correspond with human intent is referred to as "alignment". The intricacy of AI, its ability to learn on its own, and the potential lack of transparency in its decision-making process all contribute to alignment issues. Misaligned AI may have unintended repercussions that cause harm to humans while achieving its intended purpose. The repercussions might range from significant disruptions in defense supply chains to collateral damage during combat operations. Transparency in decision-making, the explicit programming of human values, and the implementation of feedback mechanisms to adjust the AI's behavior are necessary to counteract this.
2. The worry of "enfeeblement" stems from an over-reliance on AI, which may eventually lead to a loss of essential human abilities and talents. As AI assumes more duties, military personnel may become less proficient in some areas, which might impact their readiness for operations. This needs a well-balanced approach that uses AI to enhance human skills rather than to replace them. Regular training and skill refreshment are necessary for human effectiveness in AI-assisted military missions.
3. The possible degeneration of knowledge systems brought on by an over-reliance on AI is referred to as "eroded epistemics", or the erosion of our knowledge systems. Poor strategic and national security judgments may result if the defense industry adopts AI system outputs without thoroughly examining or comprehending how those outputs were produced.

Defense personnel need more AI knowledge and training in order to counteract this. This entails teaching students about the fundamental decision-making processes of AI systems in addition to how to use them. In addition, it is vital to cultivate an environment where people are prepared to question AI results, respect critical thinking, and see human intuition and machine intelligence as complementary forces. Additionally, creating more transparent systems that offer intelligible justifications for their choices might guarantee greater inspection and comprehension, assisting in preventing the notion of AI as a "black box."

Literature:

1. 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. <https://doi.org/10.55643/fcaptop.4.51.2023.4116>
2. 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.
3. Bashannyk, 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.
4. Bergengruen, V. (2024, February 8). How Tech Giants Turned Ukraine Into an AI War Lab. *Time*. <https://time.com/6691662/ai-ukraine-war-palantir/>
5. Biltgen, P. (2024). *AI for defense and intelligence*. Tallaios.
6. Bobrovska, O., Lysachok, A., & Kravchenko, T. (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/FCAP TP.V1136.227770

7. Bondar, O., Petrenko, G., Khalilov, A., & 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
8. Borodin, Y., Sorokina, N., Tarasenko, T., Volkova, N., Akimova, L., & 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
9. Borysenko, O., Kitsak, T., Pasichnyi, R., & 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/IJCSNS.2022.22.8.16
10. 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.
11. Dolinko, I., & Antebi, L. (2024). Embracing the Organized Mess: Defense AI in Israel. In: Borchert, H., Schütz, T., Verbovszky, J. (eds) *The Very Long Game. Contributions to security and defence studies*. Springer, Cham. https://doi.org/10.1007/978-3-031-58649-1_18
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. - PP. 201-206. - DOI: <https://doi.org/10.33543/j.140141.201206>
15. Gaievska, L., Karlova, V., Bobrovska, O., Kulynych, M., Akimova, L., & 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. Garcia, D. (2024). *The AI military race: Common good governance in the age of artificial intelligence*. Oxford University Press.
17. Gavkalova, N., Akimova, L., & 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
18. Greene, J. (2023). *National security and artificial intelligence*. Nova Science Publishers.
19. Halushka, Z. Bobrovskiy, 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: 10.33543/j.140141.195200
20. Hull, A. D., Liew, J. K.-S., Palaoro, K. T., Grzegorzewski, M., Klipstein, M., Breuer, P., & Spencer, M. (2022). Why the United States must win the Artificial Intelligence (AI) Race. *The Cyber Defense Review*, 7(4), 143-158.
21. Hynek, N. (2022). *Militarizing artificial intelligence*. Routledge.
22. Iqbal, Sh., Rizvi, W., Haider, M., Raza, S. (2023). Artificial Intelligence in Security and Defense: Explore the integration of AI in military strategies, security policies, and its implications for global power dynamics. *International Journal of Human and Society*, 3(4), 341-353.
23. Jones, H. (2022). *When AI rules the world: China, the U.S., and the race to control a smart planet*. Bombardier Books.

24. Jones, C. (2019). Artificial Intelligence, international competition, and the balance of power. *International Security*, 44(3), 162-200.
25. Karpa, M., Akimova, L., 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.
26. Kitsak, T., Karpa, M., Domsha, O., Zhuk, O., & Akimov, 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
27. Koibichuk, V., Ostrovska, N., Kashiyeva, F., & Kwilinski, A. (2021). Innovation technology and cyber frauds risks of neobanks: gravity model analysis. *Marketing and management of innovations*, (1), 253-265.
28. Koshova, S., Lytvynova, L., & 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
29. Kryshchanovych, M., Gavkalova, N., & 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
30. 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. *IJCSNS. International Journal of Computer Science and Network Security*, 22(9), 601-606. DOI: 10.22937/IJCSNS.2022.22.9.78
31. Kwilinski, A., Lyulyov, O., Dzwigol, H., Vakulenko, I., & Pimonenko, T. (2022). *Integrative smart grids' assessment system. Energies*, 15(2), 545.
32. Lappo, V.V., & Soichuk, R.L. (2022) Digital technologies of support the spiritual development of students. *Information Technologies and Learning Tools*, 88(2), 103-114. DOI: 10.33407/itlt.v88i2.3403
33. Lax, E. (2024, August 4). The strategic implications of AI in defense: Redefining the future of global security. *Trends Research & Advisory*. <https://trendsresearch.org/insight/the-strategic-implications-of-ai-in-defense-redefining-the-future-of-global-security/>
34. Levytska, S., Pavlov, C., Kupchak, V., & Karpa, M. (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
35. Liubkina, O., Murovana, T., Magomedova, A., Siskos, E., & Akimova, L. (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
36. Lukashev, S., Avedyan, L., & Akimov, O. (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. <https://doi.org/10.55643/fcaptop.2.43.2022.3708>
37. 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
38. Masakowski, Y. (2020). Artificial intelligence and the future global security environment. In: Masakowski, Y.R. (Ed.) *Artificial Intelligence and Global Security*, Emerald Publishing Limited, Leeds, pp. 1-34.
39. Mihus, I., Koval, Y., & 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/fcaptop.v4i35.221969
40. Mihus, I., 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/fcaptop.v6i41.251442
41. Novak, A., Bashtannyk, V., Tkachenko, I., Terska, S., Akimova, L., & Akimov, O. (2022) Anti-corruption as a component of state policy. *Ad Alta: Journal of interdisciplinary research*, 12(1), XXV, 79-87.
42. Ozdemir, G. (2024). *Artificial intelligence arms dynamics: The case of the U.S. and China rivalry*. Seta Yayınları.
43. Pangarkar, T. (2024, April 15). Artificial intelligence in military statistics 2024 by efficiency, tech, simulations. *SCOOP Market*. <https://scoop.market.us/artificial-intelligence-in-military-statistics/>
44. Pavic, A., & Berisa, H. (2024). Artificial intelligence and national security strategy development – challenges and perspectives. *Natzionalny Interes*, XX(48), 53-75.
45. Razumei, M., Kveliashvili, I., Kazantsev, S., Hranik, Y., Akimov, O., & Akimova, L. (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
46. Rosloň, D., Lukianchenko, D., Zlenko, S., Kulibaba, O., Akimov, O., & Akimova, L. (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
47. Ruitenber, R. (2024, may 17). France Turns to AI for Signals Analysis in Underwater Acoustics War. *Defense News*. <https://www.defensenews.com/global/europe/2024/05/17/france-turns-to-ai-for-signals-analysis-in-underwater-acoustics-war/>
48. Romyk, I., Laptev, S., Sehed, S., & 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
49. Schraagen, J. (2024). *Responsible use of AI in military systems*. Chapman and Hall/CRC.
50. Serohina, T., Plushch, R., Pobirchenko, N., Shulga, N., Akimova, L., Akimov, O. (2022) Pedagogical Innovations In Public Administration And Legal Aspects: The Eu Experience. *AD ALTA: Journal of interdisciplinary research*, 12(1), XXV, 7-13.
51. Shavarskyi, I., Falshtynskyi, V., Dychkovskyi, R., Akimov, O., Sala, D., Buketov, V. (2022). Management of the longwall face advance on the stress-strain state of rock mass. *Mining of Mineral Deposits*, 16(3), 78-85. DOI: 10.33271/mining16.03.078
52. Shestakovska, S., Bondar, N., Kravchenko, I., Kuznetcova, M., Akimova, L., & Akimov, O. (2022). Comparative Characteristics Of Social Leave: International And Foreign Experience. *AD ALTA: Journal of interdisciplinary research*. 12(1), XXV. 27-32.
53. Smith, M. M., Jenks, J. D., & Mathews, J. A. (2021). Artificial intelligence and the security dilemma. *Texas National Security Review*, 4(2), 66-84.
54. Smyrnova, I., Krasivskyy, O., & 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.
55. Staniewski, Marcin W.; Slomski, Wojciech; Ryzinski, Remigiusz (2015) Are ethics in entrepreneurship possible at all? *Filosofija-Sociologija*, 26(3), 193-200.
56. Strokes, J., & Sullivan, A. (2023). *U.S.-China competition and military AI*. CNAS.
57. 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.

-
58. Takach, G. (2024). *Cold War 2.0: Artificial intelligence in the new battle between China, Russia, and America*. Pegasus Books.
59. Vasylevska, T., Shevchenko, S., Sydorenko, N., Gradvysky, V., Akimova, L., & 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.
60. 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. *IJCSNS. International Journal of Computer Science and Network Security*, 2(8), 163-168. DOI: 10.22937/IJCSNS.2022.22.8.21
61. Zaiachkivska, O.V., Levytska, S.O., Karpa, M.I., & 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/FCAPTP.V2I33.206967
62. Ziabina, Y., & Navickas, V. (2022). Innovations in energy efficiency management: role of public governance. *Marketing and management of innovations*, (4), 218-227.
63. Zilinska, A.S. Gavkalova, N.L. Avedyan, L.Y., & 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/fcaptp.4.45.2022.3830

Primary Paper Section: A

Secondary Paper Section: AD, AE

STYLES AND DIRECTIONS OF CONTEMPORARY UKRAINIAN FINE ARTS IN THE CONTEXT OF WORLD TRENDS

^aTETIANA PROKOPOVYCH, ^bOLEKSANDRA PANFILOVA,
^cHALYNA VAKHRAMIEIEVA, ^dIVAN TARASIUK, ^eOLGA
KALENIUK

^{a-c}Lesya Ukrainka Volyn National University, 15, Kovelska Str.,
43025, Lutsk, Ukraine

email: ^aprokopovych.tetiana@gmail.com,

^bPanfilova.Oleksandra@vnu.edu.ua, ^chalyna.v.18@gmail.com,

^dTarasjuk@vnu.edu.ua, ^ekonlyair@gmail.com

Abstract: The article represents an attempt to comprehend specific features of contemporary Ukrainian arts and its development within the landscape of the trends in world fine arts in the 21st century – in particular, transformation of approaches, concepts, techniques and materials used, as well as the phenomenon of globalization in arts. A description and analysis of the works of several Ukrainian painters and sculptors is presented. Transformation and prospects of Ukrainian fine arts during the current wartime are considered.

Keywords: fine arts, contemporary art, Ukrainian art, arts trends, transformation.

1 Introduction

Art is the best medium for expressing the essence of a certain period. The creative world is made up of manifestations such as painting, sculpture, architecture, and more; these are the live reflections of society and its forces. In an environment that is fragile, nervous, non-linear, and unintelligible, it is imperative to adopt an inventive attitude [6], and this completely applies to the fine arts.

Author and anthropologist Jamais Cascio claims that humanity has reached a new era. He created the acronym “BANI”, which stands for brittle, anxious, nonlinear, and incomprehensible, to represent how many of us view the world. The following is a synopsis of BANI world [14]:

- **Brittle:** Though they seem strong and adaptable, society’s mechanisms are actually fragile. When under pressure, they break.
- **Anxious:** The sense of approaching catastrophe. It originates from a perception that the systems we depend on are not trustworthy. Humans are burdened with this existential menace.
- **Non-Linear:** Things happen in an erratic and disproportionate way. It is difficult or impossible to determine cause and effect. One such example is Covid. A virus that started in a Chinese bazaar eventually spread over the entire world. Global events also have exaggerated highs and lows.
- **Incomprehensible:** People look for solutions to issues that they do not fully comprehend. Our solutions fall short and do not address the problem. This makes people feel more hopeless and anxious.

Instability and unpredictability of the environment find their manifestation in fine art.

“Color over neutrals” is one of the defining themes in fine art today [13]. Artists will employ color more deliberately and expressively in order to arouse viewers’ energizing feelings and give places a stunning burst of brightness. Geometric patterns and forms in art are another fascinating trend. These forms can be seen in textiles and ceramics in addition to paintings and sculptures. A good example that combines both of these tendencies in one image is the one below (see Figure 1).



Figure 1. “Phygital Cities” by SurR.Ai is available as NFT on Rarible marketplace & as a fine art print on demand

The art sector is still evolving as we go into 2024, driven by changes in customer tastes, market factors, and technology breakthroughs. Convergence of digital and physical art is one of the biggest trends. With more and more artists and collectors seeing digital art as a valid and valued medium, the distinction between these two domains becomes increasingly hazy. The emergence of NFTs (Non-Fungible Tokens), which have completely changed the market for and ownership of art, is what is driving this change. As digital art platforms grow, artists have more ways to connect with people across the world, and collectors gain from blockchain technology’s security and transparency [15]. The art of 2024 promises to be a remarkable journey into uncharted territories of human imagination in a world where every stride toward advancement opens up new creative opportunities.

Artists are increasingly incorporating elements of their native cultures and customs into their works in this age of globalization and uniformity. They investigate their past and origins, drawing inspiration from them and utilizing them to convey their own character [5].

Moreover, intriguingly, the art industry is also becoming green in 2024, favoring more ecologically friendly creations [12]. A growing number of artists are incorporating ethical principles into their work, reflecting a societal commitment to using the arts to address urgent environmental issues. The comeback of natural materials and colors in art is another important factor. Natural dyes and materials are seeing a renaissance, much like vinyl has in recent years. This is an illustration of the “green” revolution taking place in the art world, where every brushstroke is a powerful link to the planet and a reminder of our interdependence with it. Ecological art encourages people to reconsider their relationship with the environment and increases public awareness of environmental challenges through these creative manifestations. It inspires us to think about the potential worth and beauty found in sustainable practices and the protection of the environment. It will become routine for them to include recycled materials and natural materials like wood and fabrics into their works, giving us artwork that is kind to the environment as well as our eyes. In particular, some African artists that are leading the way in environmentally conscious art include El Anatsui, Ifeoma Anyaeji, Chibuikwe Ifedilichukwu, Yusuf Grillo, Ghada Amer, Ibrahim Afegbua and Romuald Hazoumè.

The creation of new art forms and the emergence of new trends in the visual arts have been greatly aided by the past few decades. Our lives have been profoundly altered by the technology revolution, and this is clearly shown in the way we see and interpret art. Art is no longer limited to the confines of canvas and paper thanks to the enormous expansion of the visual structures associated with the term. Additionally, artists are experimenting and pushing the boundaries of their creativity. Artists in India and elsewhere are experimenting with new media such as computer paintings, graphics, installation, video

installation, land art, body art, street paints, mask creation, digital photography, mixed media, and installation art. To produce fresh and intriguing pieces of art, artists are experimenting with various waste materials. Nearly all modern painters, particularly the younger generation of artists, are investigating novel approaches to the portrayal of art.

According to O. Kashshay [8], a Ukrainian researcher, there are natural questions that arise when considering the obvious processes of Ukraine's integration into the global cultural and artistic space. These processes were significantly accelerated in response to the need to defend one's own national identity and demonstrate one's own accomplishments. What makes modern Ukrainian art unique, and what is its contextual model? What impact do geopolitical changes throughout the world have on the style and substance of Ukrainian artists' visual practices? And the furthest question to be researched and examined is: What impact did Russia's war against Ukraine have on these processes?

2 Materials and Methods

The specificity of this study involves the use of a methodology whose principles and methods belong to the research apparatus of the humanities. In the work, the authors used general scientific methods of synthesis and analysis, modeling and reconstruction, the interpretive method, the system method in the study of the phenomena of art and culture. The following methods were used as special methods of research: cultural-philosophical, comparative, cultural-historical, cross-cultural.

3 Results and Discussion

The development of art production techniques and technologies under the influence of scientific discoveries and globalization processes stimulated the formation of new layers of representation in the visual arts: traditional art represented reality, postmodernism represented ready-made representations of reality, and contemporary art represents postmodernism, reflecting a synthesis of art and innovative media technologies that shift interest from the work of art itself to the technique of its production. The dominance of the virtual temporal-topological mode of presentation of contemporary art is presented as a result of the dynamic interrelation of socio-cultural and technological processes, in which each new formula representing reality quickly loses its relevance, which leads to the intensification of the process of artifacts production [1]. The global art space is decentralized: the dominance of Western trends in art is giving way to global cultural values, in which the search for new publicly accessible visual means and a new expressive language of art is of great importance [5].

A new age of art has begun in the twenty-first century. The popularity of postmodernism, modernism, and all other forms of art has increased. Globalization and cultural changes like the digital revolution have spurred the development of this new medium, and there are now more avenues than ever for ideas to be expressed through visual art.

A new style of painting has gained prominence in the twenty-first century. A greater emphasis on realism has replaced pop art, abstract art, and other dominant genres from the past. In actuality, a lot of modern painters have started fusing still life themes into their pieces. Although this new style is contemporary, its forms and colors frequently harken back to the Renaissance and ancient master paintings. For many years, abstract painters have been experimenting with novel ways to convey their thoughts, and the present is no different. Themes of mankind and our relationship to environment are frequently explored in these paintings. While some painters add more abstract aspects, others use the human form as a key motif in their work. To create a collection that flows, these contemporary pieces are frequently combined with more conventional ones. This collection of artworks includes both realistic landscapes and abstract compositions, as well as everything in between [4].

Over the last century, modern art has expanded dramatically, but it has also profited from the contributions of artists from many various countries. While contemporary artists are not limited to any one origin or race, many draw inspiration from their own ancestry. Indigenous artists' contemporary works frequently address the problems that many of them encounter, such as marginalization, poverty, and oppression. The relationship that indigenous people have to their culture and land is frequently the subject of these modern works by indigenous artists. Numerous of these quirky pieces honor the natural world's splendor and the relationship between humans and animals [4].

Contemporary artists from many different cultures have incorporated elements from African art into their work. These works often highlight the beauty of the African continent and its rich traditions. Contemporary artists have taken inspiration from the art of the Bush, which flourished in the areas that are now part of Zimbabwe and South Africa. Contemporary artists have also incorporated rock art into their work, which dates back thousands of years to many different cultures [10]. These paintings often explore themes of nature and humanity, often using the African landscape as a central motif. Some of these works are abstract while others are more figurative. They may also be realistic in style, showing the beauty of the African landscape while incorporating symbolic elements.

Asian art is frequently associated with shamanic traditions and is distinguished by its use of natural materials such as wood, stone, and clay. Incorporating both digital and natural materials into their paintings, contemporary painters have also taken inspiration from Asian art. While digital Asian art sometimes has a more global vibe, traditional Asian art is frequently influenced by Buddhism, Hinduism, and other religions. Asian religious iconography is frequently included into these modern Asian artists' creations. While some of these pieces are more abstract, others are more representational. Other Asian modern works concentrate on social and cultural subjects including politics, feminism, and immigration.

Latin American art has been infused into the works of contemporary artists from a wide range of cultural backgrounds. These pieces frequently draw attention to how beautiful the scenery is in this region of the world, which is frequently defined by thriving towns, beaches, and lush rain forests. Incorporating both digital and natural materials into their paintings, contemporary painters have also taken inspiration from Latin American art. These modern pieces by Latin American artists frequently examine identity and how immigration shapes it. Some of these pieces are more abstract, while others could be more representational. A few of these pieces deal with societal topics including feminism and immigration [10].

There are several variants in the European art heritage, all of which are rooted in distinct regional traditions. These components have been used by contemporary artists in their works, frequently to examine the contrast between light and dark. These pieces frequently have a Gothic vibe to them and use light and shadow to uncanny effect. These modern pieces by European painters frequently examine symbolism, including that found in Egyptian hieroglyphs and Slavic runes. While some of these pieces are more abstract, many of them are representational.

Within the context of European art heritage and innovation, Ukrainian fine art represents a quite unusual phenomena. The historical foundation of the Ukrainian national painting school was academism and realism. It was established in the twentieth century. Artists who studied at professional art academies or other institutions during the turn of the 19th and early 20th centuries - many of them European - actively participated in international art exhibitions, and integrated their experiences into the establishment of Ukrainian art schools were responsible for the country's high standard of art education. However, the country's cultural space was greatly impacted by the swift social and political change that occurred in the 1990s as a result of Ukraine's independence. A significant boost to the development of Ukrainian fine art came at the beginning of the twentieth

century, in the early nineties. Artists have unrestricted access to travel, study modern art, and reach their full potential abroad. Ideological precepts and a burdensome system of state regulation of culture vanished together with the collapse of the Iron Curtain. A new generation of masters emerged in these circumstances, one that was approachable in their artistic endeavors and open to the outside world. Their works may be found in private collections and auctions, and their names are well-known even outside of Ukraine.

Ivan Marchuk is one of the names of contemporary Ukrainian painters. Marchuk opposed the aesthetic principles of socialist realism, therefore even though he was actively exhibiting his work until the late 1980s, the Community of Artists of the Ukrainian SSR did not acknowledge his work. He left his home country of Australia in 1989 and resided in Canada, the United States, and Australia. It was not until 2001 that the artist made his way back to Ukraine that he began painting and actively participated in the public life of the nation. Samples of Marchuk's painting are presented in Figure 2.



Figure 2. "Cornflowers" and "Winter", Ivan Marchuk

The maestro himself claims that his creative journey may be split into twelve distinct phases, each distinguished by a unique painting style and technique. The artist himself is unable to pinpoint the exact number of paintings he created or the course of each one's development. Marchuk's distinctive painting technique was dubbed "plontanism" because of his love of "collecting" pictures on canvases using strips and threads. The master's creations are highly valued globally and may be found on display in renowned museums in the United States, the European Union, Turkey, Thailand, Jordan, Tunisia, and other nations. Regretfully, the maestro still lacks a museum in Ukraine, despite his enormous contribution to the history of fine arts in both the country and beyond the world. It could take a few decades before we can truly recognize the scope of Marchuk's creative talent.

Another Ukrainian artist who should be mentioned in relation to the subject at hand is Oleksandr Roitburd. Beginning his career in the 1970s, this brilliant painter from Ukraine embodies the postmodernist tendency in his work. In 1983, Roitburd's artwork was first displayed to the public at the Union of Artists, and two years later, he held his first solo exhibition. The artist believes that postmodernism is a worldview and cannot be "found," nevertheless he is regarded as one of the pioneers of Ukrainian postmodernism. The master's work is permeated with the ideas of free play with meanings and the dismantling of conventional value systems. Different from the postmodernist perspective,

Roitburd's paintings display a typical blend of imagery from many cultures and eras [3]. Samples of Roitburd's paintings are presented in Figure 3.



Figure 3. "Rousseau in primitive bliss", and "Skovoroda in the garden of divine songs", Oleksandr Roitburd

The paintings of Roitburd are highly regarded overseas and may be found in museums both in the US and other nations. "Farewell, Caravaggio!" is the artist's most well-known work. (It sold for \$97.2 thousand in 2009). Roitburd had the chance to actively impact Ukraine's cultural life in addition to painting. He has been in prominent roles at the Odesa Art Museum, the Soros Center for Contemporary Art in Odesa, the Helman Gallery in Kyiv, and the association "New Art" from 1993 [3].

The representative of the Lviv School of Painting, another Ukrainian artist named Yuriy Kokh, claimed that upon entering the studio and inhaling the scent of oil paints, he made the decision to dedicate his life to the arts. He was a part of the "Way" movement from 1988 to 1992, which looked for fresh conceptual, ideological, and artistic-stylistic approaches. The course of this association's activities greatly influenced the artistic endeavors of contemporary Lviv artists. Koch has taken part in hundreds of exhibits in the USA, the EU, and the Ukraine since 1984. Koch describes the artist's approach as a "metaphysical mannerism", yet it is more akin to magical realism. The creative tale frequently takes place on Lviv's streets. Below are two images of Kokh (refer to Figure 4).

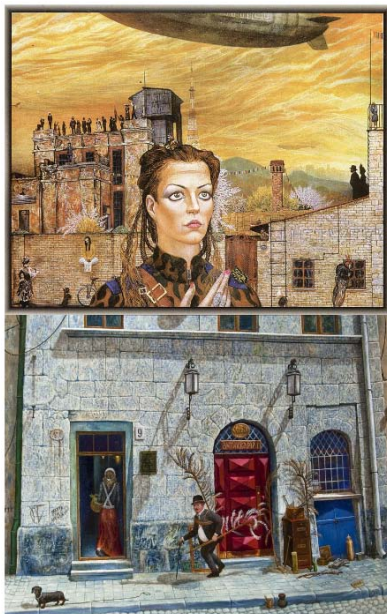


Figure 4. "Olga Litunka", and "Antiques", Yuriy Kokh

One of the world's most famous representatives of modern Ukrainian art is Anatoly Kryvolap. The artist produces beautiful paintings in the non-figurative genre; the observer is drawn to the color rather than the form. The maestro claims that in an attempt to give the landscape more emotional expressiveness, Kryvolap concentrated on color during a creative endeavor that resulted in the creation of his unique style. Inciting in the spectator "a state against which you feel immersed in the mystical dream of nature" is the author's stated internal purpose [9]. According to Forbes magazine, Kryvolap is one of the most famous and most expensive artists of Ukrainian contemporary art, whose works can be found in the best museum and private collections. His works samples are presented in Figure 5.



Figure 5. "March" and "Cloud", Anatolii Kryvolap

Speaking about the Ukrainian art of sculpture of the beginning of the 21st century, it is appropriate to note, in particular, the collective exhibition "Sculpture" in the National Museum in Lviv named after A. Sheptytsky (February 4-March 8, 2016), which is a particularly representative section of modern Ukrainian sculpture. Such a number of recognized artists-

sculptors from different regions of Ukraine are rarely united: Petro Antip (Horlivka, Donetsk region), Vasyl Yarych (Lviv), Oleksandr Dyachenko (Kyiv), Volodymyr Kochmar (Kharkiv), Valery Pirogov (Kyiv), Oleg Kapustyak (Lviv). This is the generation of sculptors born in the 1950s-1970s [11]. The stone sculpture of Petro Antip (Figure 6) is monumental in character and design. The theme of Ukrainian antiquity and archaism can be clearly read in the sculptor's works. The artist manifests himself with an eclectic creative philosophy, which includes figurative symbolism, realism and exclusively individual expressive abstractionism. Using the fundamental geometric forms of a pyramid, a circle, a cube, and others, P. Antip seems to enter the realm of cosmic eternity inherent in the monumentalism of Ancient Egypt.



Figure 6. A fragment of the exposition hall of the works of Petro Antip

Oleksandr Dyachenko is one of the few Ukrainian sculptors whose works are distinguished by the special profundity of images that tend towards generalizations, universalism, and monumentality. The artist's creativity is based primarily on the form and character of the material in which he works. Among the works of O. Dyachenko, figurative and portrait sculptures made of stone, fireclay and bronze are the most common. The architecture of large building forms, with which fireclay sculptures are endowed, has not only a visual-optical, but also a constructive-physical character: to prevent subsidence during firing, hollow sculptures have a structure of stiffening ribs inside - arches, buttresses.

O. Kapustyak's sculptures are no less strong in terms of their internal architecture. The sculptor's wide range of search for ideological and plastic form ranges from naturalistic figurative to abstraction. The monumental qualities of sculpture for O. Kapustyak are manifested in the emphasis on the most basic and in the absence of non-essential details and literary narration. In a number of works, Kapustiak does not avoid entering into the temporal and historical drag, creating lyrical and poetic images of archaic heroes. Laconicism and simplicity of forms are close for the artist [2].

The representatives of the Odessa sculptural school proved themselves as unsurpassed masters of lyrical fantasies, carnival laughter and Mediterranean pagan looseness. The mischievous-romantic images of the sculptor E. Lelechenko seem to balance on the border of "heavenly" ("The Fourth Horseman") and "messy", according to the apt expression of the local art critic L. Saulenko ("Fish-fish, or Sit on a fish and eat a fish"; "Lolita" as a variant of erotic sculpture; "Waiting for the triennial, or Game of beads").

The sculptural animalism of L. Subangulova is imbued with the idea of humanity, a world of friendly contact creatures ("Bird", "Beast", "Pelican", "Rhino", "Griffon", testifying to the limitless expressive possibilities of fireclay (fire-resistant clay), decorative in shape and mythopoetic by creative design [7].

Digital art from Ukraine is equally intriguing, particularly because of its distinct inventiveness. Oleksii Sai is particularly well-known for creating Excel-art, an original work of art. The artist has been utilizing Microsoft Excel tools to create visual

graphics since 2007. This application appears to be the least conducive to creative expression; instead, it works best for quickly creating lists and graphs and budgeting. Sai critiques the global corporate culture in this way, and his creations uphold the mechanization and continuity of production, even in the arts. A piece of his art is seen in Figure 7. When examining Sai's paintings closely, one finds that although they appear to be a cohesive landscape from a distance, they really break down into lines, numbers, columns, and other graph and chart features up close. Similar to this, our lives in the modern world "disintegrate" into bank accounts, receipts, and other remnants of civilization.



Figure 7. *Brave, 2019 (from Sai's website)*

Crisis situations always give birth to a burst of creativity in Ukraine, and the current full-scale war is no exception. The newest Ukrainian written and visual culture is developing intensively even in such conditions. Nonetheless, the influence of the conflict on Ukrainian fine art was clear. One of the striking illustrations of art produced during the Russia-Ukraine War is the installation "To Plant a Stick" by Anna Zvyagintseva. Lines from Dmytro Pavlychko's poetry, "Like a leafless tree, My soul stands in the fields", are one of its components. The artist discovered the poem in her grandfather's collection following his death in 2016. Stanislav Turina's "Thank you" art series illustrates the intersubjective realm of assistance and caring. In order to proclaim the future, Tamara Turliu embroidered the phrases "this is the beginning of trees, this is how a pile of stems looks" on light-colored, white linens using black threads. One windowless, roofless chamber eventually included the famous poet's lyric from the 1960s, the common phrase "thank you" inscribed on a frail napkin, and the poetic observation of a young artist (see Figure 8). The apartment display "Everyone is Afraid of the Baker, but I am Grateful", organized by Kateryna Iakovlenko and held at the end of August 2022 in her own house - which had been devastated by an enemy shell - featured the works of Zvyagintseva, Turina, and Turliu.



Figure 8. Stanislav Turina, "Thank You," drawing, 2022

The landmark performance is "Freedom Is Not Free" by ASAKI - an artist of Kazakh origin. She has been living in Ukraine since she was three years old and considers herself Ukrainian, speaks Ukrainian and has Ukrainian citizenship. ASAKI worked with

"emotionally charged material" - soil that was collected from all territories of Ukraine where active hostilities were taking place (except for Luhansk region and Crimea, as team of the artist could not get there). The soil was collected from the bottom of the Kakhovsky and Pechenez reservoirs, destroyed by the Russians, from Chornobayivka and other places, coal from Donbas. ASAKI made an installation in an aquarium, which she filled layer by layer with Ukrainian soil. The land from the frontline and occupied territories became the material for reflection on the topic of freedom (see Figure 9). According to the artist, Ukrainian freedom is a free land soaked in tears and blood.



Figure 9. ASAKI's work on the theme of war and freedom

Thirteen contemporary Ukrainian artists from the front lines of art were featured in the 2024 Mason Exhibitions in Arlington show "A Closer Look: Conflicted Art from Ukraine", which offered artistic reactions to violence. Through media such as painting, sculpture, film, photography, and installations, these artists investigate important topics along the lines of conflict. Their creations encourage and exemplify perseverance in the face of hardship by starting a conversation between viewers and the terrible truths of war.

Simple pen drawings by Kristina Otchich-Cherniak highlight urgent problems such as the needless death of animals, the brave defiance of women against torture and rape, the terrible massacre of civilians, and the tenacity of survivors in the face of bombs and air attacks. Old chess boards, which represent a strategic battlefield where opposing forces fight for victory and frequently find themselves stuck in situations from which there is no way out, serve as an inspiration to Natalia Shynkarenko. In her White Town series, Elena Alyabyeva portrays a path from hopelessness, loss, and desperation to stability, rebirth, and a renewed sense of purpose. Alyabyeva portrays the recollections of her surroundings by using black paper to represent the gloom of the conflict in Ukraine in contrast to the hopeful images of a white town. Natalia Amirova's watercolor portrait paintings, which appear to be of ordinary people, really disclose buried psychological anguish that splits groups and cultures. Her storylines are derived from background in journalism and Ukrainian needlework (see Figure 10).

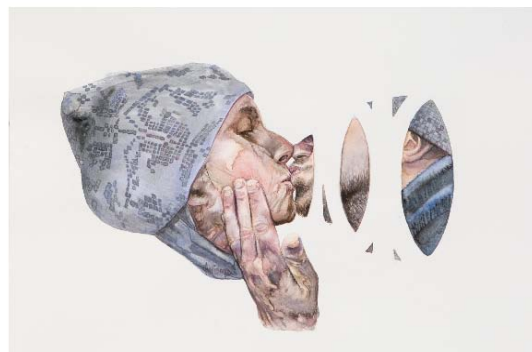


Figure 10. Natalia Amirova, *Kiss Before the Evacuation, 2022 watercolor on paper, 12x16 in*

In overall, Ukrainian fine art during years of war predominantly acquired a touch of tragic worldview, surrealist motives, theme of blood, death, aggression and revenge. At the same time, addressing to folk motives, 'working' with topics of revival, peace, and nature are traced. Probably, during the coming years, including after war, a convergence of these two conceptual directions will be observed, but the influence of surrounding environment is inevitable – thus, in today BANI world exact forecasts are unlikely possible.

Literature:

1. Abazine, L. (2017). Glocalization: An Analytical Path Towards More Inclusive Contemporary Art? *Journal of Extreme Anthropology* 1(2), 5-12.
2. Biedarieva, S. (2021). *Contemporary Ukrainian and Baltic Art: Political and Social Perspectives, 1991–2021 (Ukrainian Voices)*. Ibidem Press.
3. Bondar, L. (2023). *Ukraine Rising: Contemporary Creative Culture from Ukraine*. Gestalten.
4. Brown, K. Cummins, A., & González R. (Eds.) (2024). *Communities and Museums in the 21st Century: Shared Histories and Climate Action*. Routledge.
5. Eric, Z. (2007). Glocalisation, Art Exhibitions and the Balkans. *Third Text*, 21, 207-210.
6. Hartle, S., & White, D. (2022). *Visual Activism in the 21st Century: Art, Protest and Resistance in an Uncertain World*. Bloomsbury Visual Arts.
7. Hotsaliuk, A. (2019). Development of the art of sculpture in Ukraine (late 20th - early 21st century). *Ukrainian Studies*, 1(70), 67-75.
8. Kashshay, O. (2024). The Ukrainian art of the 20th – early 21st centuries: An attempt to identify the national context. *National Academy of Fine Arts and Architecture*, 35, 76-84.
9. Lozhkina, A. (2024). *The art of Ukraine*. Thames & Hudson.
10. Morato, A., & Santana-Acuna, A. (2022). *Sociology of the Arts in Action: New Perspectives on Creation, Production, and Reception*. Palgrave Macmillan.
11. Odrekhivskiy, V. (2017). Ukrainian sculpture of the 21st century: the problem of intermediality and genre-species synthesis. *Bulletin of the Lviv National Academy of Arts*, 31, 97-107.
12. Ryal, Sh. (2024). *Environmental Art and Sustainability in the Art World*. University of Wolverhampton. https://www.researchgate.net/publication/380165136_Environmental_Art_and_Sustainability_in_the_Art_World
13. Schavemaker, M., Vesters, Ch., Commandeur, I., Bouwhuis, J., Frieling, G. (2010). *Now is the Time: Art & Theory in the 21st Century*. nai010 publishers.
14. Togan, A. (2023, April 13). VUCA vs BANI – Which Will Come Out on Top? *The Agile Company*. <https://theagilecompany.org/vuca-bani/>
15. Wang, Z., & Liu, B. (2022). Research on the Integrated Development of Local Art Design and Art Design Education in the New Media Environment. *Journal of Environmental and Public Health*, 4, 1-10.

Primary Paper Section: A

Secondary Paper Section: AL

METHODOLOGICAL PRINCIPLES OF PSYCHOLOGICAL AND PEDAGOGICAL SUPPORT OF FUTURE SPECIALISTS PROFESSIONAL TRAINING IN HIGHER EDUCATION INSTITUTIONS

^aOLEKSANDRA KHALLO, ^bNADIYA KICHUK,
^cVALENTYNA VERTUHINA, ^dVOLODYMYR FEDORAK,
^eLILIANA KHIMCHUK, ^fOLEKSANDR VOROBETS

^a*Ivano-Frankivsk National Medical University, 2, Galyska Str., 76018, Ivano-Frankivsk, Ukraine*

^b*Izmail State University of Humanities, 12, Repin Str., 68600, Izmail, Ukraine*

^c*Borys Grinchenko Kyiv Metropolitan University, 18/2, Boulevard-Kudryavskaya Str., 04053, Kyiv, Ukraine*

^{d-f}*Vasyl Stefanyk Precarpathian National University, 57, Shevchenko Str., 76018, Ivano-Frankivsk, Ukraine*

email: ^aluka.if@gmail.com, ^btonya82kichuk@gmail.com,

^cv.vertuhina@kubg.edu.ua, ^dvolodymyr.fedorak@pnu.edu.ua,

^eliliana.khimchuk@pnu.edu.ua,

^foleksandrvoorobec36@gmail.com

Abstract: Psychological and pedagogical support is considered as a type of activity in which psychological and pedagogical conditions are created for the successful learning and development of each student, as a complex, multi-faceted process of interaction between students and teachers. This study introduces new paths for research into the appropriate profile of mentors to effectively accompany university students. Comparative evidence-based research indicates that students who ask for assistance from institutional resources are more likely to be satisfied and perform better; however, when an integrative approach is used to combine institutional support and internal team environments for students' academic engagement and psychological well-being, the best outcomes are obtained.

Keywords: mental health, well-being, support services, higher education, academic achievements.

1 Introduction

Institutions of higher education are part of a system intended to foster the creation and growth of the individual as a communication and knowledge subject. The role of higher education institutions' psychological and pedagogical services has grown in this regard, offering the conditions necessary for the development of each person's subjective potential and a better understanding by a young person of the paths leading to his or her professional and personal development during their time in college. This helps the student feel more stable psychologically and be able to overcome a variety of obstacles. A university's support system entails establishing unique educational and psychological settings for each student's effective individual growth, including the self-development of juniors above all. It is generally the case that first-year students have the most difficulty breaking through the barrier of adaption [13].

Furthermore, one of the main concerns facing higher education globally is the mental health of its students. Prevalence studies, which show that the severity of mental health issues is rising across student populations and that a significant percentage of students - higher than the general community - are dealing with moderate-to-severe levels of stress, anxiety, and depression, are at least partly responsible for this increased attention [1].

Over the past fifteen years, studies have consistently shown that mental health issues, including depression, anxiety, stress, suicidal thoughts, and self-harm, are very common among college students worldwide, including in the US, China, Malaysia, Turkey, Brazil, Belgium, and France [20]. Australia is likewise witnessing a similar trend. For instance, 83.9% of 6479 undergraduate and graduate students from two institutions who participated in the study showed increased psychological distress levels. One university's coursework study of 4258 undergraduate and master's students revealed that one in four of them had significant levels of stress, anxiety, or depressive symptoms. A more recent study using 14,880 students from the same university found that 5% had tried suicide or self-harmed, 80% were worried about their mental or emotional health, and 1 in 5

were presently dealing with a mental health issue [20]. These kinds of findings have prompted some academics to conclude that there is a "mental health crisis" at Australian universities [16].

Psychological discomfort in students can have a deleterious effect on their motivation, attention span, cognitive abilities, and success. It can also raise their risk of attrition and suicidal thoughts and actions [5]. Because of this, it is essential that academic institutions use evidence-based practices and techniques to address the mental health and wellness of their students.

The Australian government's independent research and advisory body, the Productivity Commission, released the Mental Health Inquiry Report in 2020 and suggested that the government adopt a more cross-portfolio and strategic approach to mental health promotion (Productivity Commission, 2020). A recommendation made was to update the Higher Education Standards Framework 2015 (ACT) to mandate that all postsecondary educational establishments create a plan for the mental health and wellness of their students. It also suggested that guidelines on how to effectively assist students' mental health and wellness be provided by the government to tertiary education providers, either directly or through commissioning. A 2017 report by Orygen, Australia's leading youth mental health organization, underscored the urgent need for higher education institutions to develop their own strategies and policies to support students' mental health and wellbeing [15]. This was several years before the Productivity Commission's (2020) report. The absence of precise guidelines on the role of universities in assisting students' mental health and welfare was highlighted in this paper, "Under the radar: the mental health of Australian university students". The Australian Department of Health then gave Orygen funding in 2018 so that it could create a mental health framework for colleges. Six guiding concepts comprise this approach [18]:

1. Approaches to mental health and welfare that take into account students' needs, viewpoints, and actual experiences improve the educational experience for them.
2. A learning environment that supports students' mental health and wellness is something that all members of the university community contribute to.
3. University communities that are mentally healthy enable involvement, create a varied and inclusive atmosphere, build connections, and encourage both personal and academic success.
4. Coordination and coordinated efforts increase the response to mental health and wellness.
5. Students can get timely, relevant, and effective services and assistance to address their needs related to mental health and wellness.
6. Evidence-based innovation and continuous improvement contribute to our understanding of what promotes the mental health and wellbeing of students.

The importance of universities in creating supportive, health-promoting environments and creating policies for the overall welfare of the institution is also becoming more widely acknowledged [23]. Universities should prioritize assisting students' mental health and wellness in addition to their moral need to safeguard everyone's safety, as psychological discomfort has been shown to negatively impact students' academic motivation, retention, and accomplishment.

From a substantive perspective, psychological and pedagogical support for a student's professional training within the framework of a multi-level organization of educational activities can be described as a process that helps a future specialist develop a variety of personal attributes, including [14]:

- Capacity and preparedness for autonomous, knowledgeable, free, and responsible decision-making
- A desire for self-improvement, autonomous professional growth, and professional training upon graduation
- Psychological preparedness for a career in line with the obtained professional certification.

The primary objective of pedagogical and psychological support is to empower the teacher to assist each student in achieving success. The instructor needs to take charge of the situation, decide how each student will be interacted with, and assess his or her own development possibilities. The following is a definition of the tasks associated with psychological and pedagogical support: fostering a climate of safety and trust within the teacher-student relationship; and offering psychological and pedagogical support in the effective professional training of university students in changing social situations.

A series of activities conducted by experts in the fields of psychophysiology and professional selection for psychological diagnostics and psychological and pedagogical training of senior schoolchildren and students can be summed up as the essence of professional and psychological support in the learning process. These activities involve identifying and thoroughly examining the unique psychological characteristics of individuals who are having difficulty learning and adapting, as well as addressing their functional state and performance.

The goals of psychological and pedagogical support are to improve the overall quality of specialized training, the creation and development of personally and professionally significant traits, and the adaptive capacity and efficacy of educational activities. The following are the primary tasks of educational and psychological assistance [22]:

- Assessment of the structure of intelligence and type of intellectual activity
- Determination of the professional orientation of senior schoolchildren and designing of differentiated psychological recommendations for choosing a future profession
- Forecasting the success of learning and socio-psychological adaptation in an educational institution
- Formation and maintenance of motivation for learning and professional activity
- Identification of persons requiring psychological assistance in the process of preparation for admission and at the initial stage of study at a university
- Conducting psychological trainings and psychological and pedagogical classes;
- Conducting psychophysiological correction activities with persons experiencing adaptation difficulties.

The main objective of psychophysiological support activities is to achieve functional comfort, in which there is a correspondence between the means and conditions of educational activity and the functional capabilities of the body; learning in this case is accompanied by a positive attitude towards it with adequate mobilization of physiological and mental functions, which ensures the preservation of health, high performance, and professional longevity.

Higher education has changed in a number of ways within the past ten years. The necessity to maintain it updated throughout the COVID-19 epidemic, be able to teach remotely, and have as minimal of an influence on academic life as possible may have been the most recent and significant one. The introduction of personal attention, accompanying, or mentorship programs - which have taken on a life of their own and are now a common theme in many universities - is another noteworthy development [11]. Researching and evaluating these programs and their results represent pertinent scientific tasks in the current stage of higher education transformation and increasingly unstable environment. Universities across the globe are offering an increasing number of accompaniment and mentoring programs.

2 Materials and Methods

The theoretical basis of the study was the theory of professional development and formation, the theory of pedagogical assistance and support, the theory of pedagogical support for students, subject-activity theory, and a personality-oriented approach to education. The methods of analysis and generalization of advanced pedagogical experience were used.

3 Results and Discussion

The long-standing problem of psychological well-being affects university students all across the world. A university education represents a major life shift, requiring students to adapt to a number of new academic, social, and cultural expectations. Student well-being may be impacted by a number of elements, such as the change in pedagogy, learning resources, and environment, as well as relationship support. This is particularly true for management education, where students must acquire a wide range of professional and personal abilities through in-class and extracurricular activities in a condensed amount of time due to the demanding and intense course structure [6]. Students can also have to spend a lot of time away from home. They could be enrolled in residential programs in large numbers. These elements can all negatively impact their well-being. Research on graduate students has shown that 40% of them exhibit signs of mental illness [10], and 51% of them report experiencing psychological discomfort [17]. Formal and informal assistance from many sources is one of the key elements that might improve the well-being of students.

Chaudhry et al.'s analysis [6] of data from 309 management students at Indian universities using structural equation modeling and hierarchical regression demonstrates a positive relationship between students' psychological well-being and supportive institutional and familial environments as well as a positive internal team environment. The relationship between a supportive home environment and psychological well-being as well as a favorable internal team environment and psychological well-being is partially mediated by academic involvement. Furthermore, the relationship between institutional support and psychological well-being is totally mediated by academic involvement. The study emphasizes how important it is for students' academic engagement and psychological well-being to have a supportive internal team environment and institutional support, as well as how academic engagement affects psychological well-being. The significance of an internal team environment is supported by U.S. statistics. While the number of disclosures has increased significantly in tandem with students seeking mental health support at universities, it is concerning to note that, according to the graph below (see Fig. 1), only about 30% of students feel comfortable discussing problems with their academic advisers, and even fewer feel comfortable disclosing to university support teams.

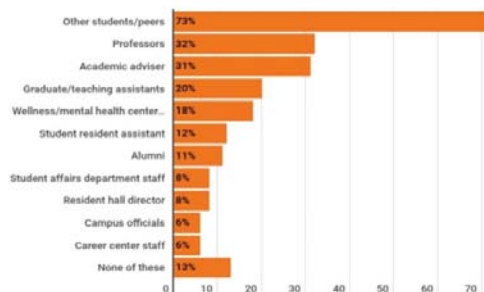


Figure 1. Individuals and groups on campus that students feel most comfortable sharing perspective with about issues of importance [3]

Psychological and pedagogical support for the professional development of future specialists is defined in the literature as a system of tools and methods created by a teacher to develop students' ability to make optimal decisions in various professional or life situations that contribute to their

development as an individual and as a future specialist [22]. At the same time, the process of support in higher education is considered as a multi-level interaction of the educational process subjects [19]. The essence of the idea of pedagogical support is a comprehensive approach to solving development problems.

Student support services are crucial to enhancing the educational process and promoting student success. These services encompass a broad spectrum of programs and resources designed to support students' academic, emotional, social, and financial needs. The following are some salient features that underscore the significance of student support services:

1. **Academic Support:** Programs like study skills seminars, writing centers, and tutoring assist students in understanding the subject, developing better study habits, and achieving academic success. These programs can have a big impact on a student's retention and academic success by giving them access to extra learning materials.
2. **Counseling and Mental Health Services:** Students' achievement and general well-being are directly correlated with their mental health. Whether they have to do with stress, anxiety, depression, or other mental health concerns, counseling services provide a secure environment for students to talk about their worries and difficulties. These programs are essential in raising awareness of mental health issues and provide the assistance required to deal with both academic and emotional obstacles.
3. **Career Services:** By assisting students in developing necessary skills, exploring career choices, and making connections with possible employers, career counseling, resume workshops, internship opportunities, and job fairs help students become ready for the workforce. These programs are crucial in supporting students as they move from school to the workforce.
4. **Disability Services:** Ensuring equitable access to education for individuals with disabilities is made possible via student support in higher education. Fairness and the ability for every student to engage completely in their education depend on accommodations including longer exam times, note-taking services, and adaptive technology.
5. **Social and Cultural Integration:** A key component of integration is the value of student support services. It can be difficult for many students to integrate into the campus community, particularly those who come from marginalized groups or have overseas origins. In addition to enhancing campus culture, initiatives that support diversity, inclusiveness, and cultural interaction also make students feel included and appreciated.

It is impossible to overstate the significance of student support programs. Support services are essential in creating a welcoming and inclusive learning environment because they attend to the whole requirements of the students. They support not just academic achievement but also the growth of well-rounded people who are equipped to meet obstacles in life and make valuable contributions to society.

According to Díaz-López [8], mentoring is a fortunate chance to help students in negotiating the back-and-forth between their experiences and their perception of their present situation and surroundings. The mentee makes a place for introspection when their mentor is around, thinking back on their experiences, the decisions they have made, and how these things have caused them to reevaluate their beliefs and make decisions that will affect their day-to-day lives when they go back to their experiences.

Consequently, it is clear that mentoring cannot be reduced to a simple relationship in which the accompanying individual's advancement is the primary goal. According to Díaz-López [8], mentoring is a relationship based on trust between the mentor and the mentee in a setting where there is consistency, trust, and the mentor's capacity to offer advice based on personal experiences. For the mentee, who takes on the role of the protagonist, freedom, quiet times, freedom from others, and confidentiality are all important. On the other hand, the mentor

takes on a helping position and promotes an environment of acceptance and respect.

A trainer with a focus on formative accompaniment should serve as the mentor during the educational accompaniment process in higher education, rather than just being a highly experienced professional of a higher rank. As a result, a mentor has to be highly technically prepared, have a strong theoretical foundation, be genuinely committed to their mentee, have consistent internal motivation, and be steadfast in their objective while also being flexible enough to adjust to changing conditions. Being a mentor demands having real people who can be real life instructors, real witnesses, and real life guides for their mentees, helping them on their own path to satisfaction and personal progress. This is a never-ending process that has been replete with both accomplishments and problems.

Universities have a significant role in the lives of both instructors and students as centers of culture, its production, and transmission. These are multidisciplinary communities that work to guarantee that every entity receives the reasonably priced, high-quality, continuous care that they occasionally sorely require. Inequalities in access to education and academic assistance may be eliminated and prevented with the use of comprehensive, culturally relevant university services, which can also lessen the barriers to accessing psychological and other services and integrate them into the educational system. Maintaining the availability of mental health services is essential to successfully addressing the diverse needs of students. When comprehensive mental health services are provided using systemic practices - a multilayered, multidimensional system of the other two structures, as seen in the Intervention Response Model (RTI), Positive Behavior Interventions and Supports (PBIS) programs, and other models - they are most successful [7].

In their study, Garcia-Cardo et al. [11] analyzed the various curricula offered by sixty Spanish institutions. The pertinent data gathered for this study pertains to the presence of an accompanying program, the mentor function it fulfills, and the program's duration. Additional data gathered from the search pertains to the nature of mentorship programs, including whether they are official, governed, or associated with certain courses. In the event that an evaluation is used, the assessment processes are also provided at the end. Following the analysis produced during the research, the Francisco de Vitoria University mentor-mentee program is described in depth, emphasizing how it differs from other programs and how it helps students. Out of 60 institutions, the preliminary findings indicated that 42 were public, 18 were private, and only 17 did not have any kind of student mentorship program. Twelve of these institutions were state-run, and five were private. There were over 54 mentoring programs, the majority of which were exclusive to each of the 43 colleges that had a mentoring program, plan, or initiative (see Figure 1). Three private universities, the Universidad San Pablo CEU, the Francisco de Vitoria University (UFV), and the University of Navarra, have two, five, and four programs, respectively, while only three public universities, the University of Granada, the University of Seville, and Carlos III University, offer two programs each.

Of the 54 Accompanying Programs, 29 had a mentor who is a degree-seeking five-year student. The majority of the programs (from 15 institutions) included mentoring as an integral part of their teaching duties, with a teacher in charge of supervising the process. Alumni oversee the programs at four universities: CEU San Pablo University and the Pontifical University of Comillas, both in the Comunidad de Madrid; two are private, one is public (Universidad Carlos III and Universidad Politécnica de Cartagena). Additionally, UFV has a special program in Spain that employs 264 mentors, 83 of whom were employed specifically to perform mentoring duties. Only three other private colleges throughout the remainder of Spain provide their students any kind of accompanying. Out all the universities that get funding from the accompanying programs, only eleven provide programs that are open to all students. all these, five are

located in Madrid and eight are private. Interestingly, all of these colleges depend on instructors, professionals, and even trained staff to accompany students. Only one of the other three public colleges provides accompaniment, which is given by seniors. There are just seven universities with professional development programs, three of which are public.

Although Garcia-Cardo et al. [11] et al. assert that virtually every institution uses the same model and methodology, young Spanish university students in Galicia and Murcia are not that different from one another. They all have to answer the same questions on their psychological makeup, experience levels, and historical background, including "Have I picked the right degree?" or "After I graduate, will I be able to obtain employment?" In light of this situation, it is critical to decide how to support these students and give them surroundings and learning opportunities that will enable them to achieve their academic, professional, and personal objectives.

It should be mentioned that, generally speaking, students in Spain have a number of rights regarding their academic education under the present Organic Law of the University System (LOSU in Spanish). These rights include assistance for mental and emotional health care, psycho-pedagogical counsel, and access to a tutorial and advising system. Students also have the right to knowledge about events that impact them, guidance, and access to a guidance service that helps them plan their course in school and makes it easier for them to integrate socially and professionally. In addition, students can get academic credit for their participation in service-learning projects, student representation, solidarity events, mentorship programs at their universities, and more.

Interestingly, empirical research indicates that in several nations, private universities' accompaniment procedures typically last longer than those of public universities. These universities also provide a greater variety of programs for both incoming and outgoing students, as well as those with particular needs, like international students [1].

Person-centered thinking (PCT) tools, according to Zatkova et al. [28], are systematic approaches to guarantee that education is fulfilling the requirements of every young learner, acknowledging that every student has a different manner of communicating, learning, forming connections, and making decisions. Person-centered planning (PCP) and PCT integrate the principles of positive psychology, humanism, and solution-focused methodologies. It seeks to highlight personal qualities rather than flaws and promotes jointly developed, practical solutions as opposed to ones that are dictated by the needs of the service.

A PCT tool called the One-Page Profile (OPP) requires students to describe all of their positive traits, skills, and abilities by learning what other people find admirable, appealing, and valuable about them. With an emphasis on psychosocial support and assisting others in the institution or community, OPP provides professors with information on how they may assist students in utilizing their abilities in overcoming everyday obstacles [21]. One-Page Profiles provide a synopsis of the following: (i) what others find admirable and like about the student (using the 'Appreciation' tool); (ii) what the student values (using several tools); and (iii) the best ways to assist the student (using multiple tools). [21]. According to Sanderson et al., OPP are a way to begin using a person-centered approach by gathering particular information on an individual's personality.

There are various benefits of employing a One-Page Profile in higher education, such as assisting professors to comprehend the student's distinctive personality, enabling a rapid comprehension as to what is significant to the individual in the profile. It is feasible to guarantee that decisions are made with the student's interests, safety, and learning possibilities in mind, all while promoting their well-being. OnePage Profiles are particularly useful for students with special education needs since they enable lecturers to identify any adjustments that can assist the student have a "better day". Additionally, they give students the

precise assistance they need in the correct circumstances to enable them to progress as much as possible. Students also gain from being heard when activities and support plans for positive change, such career goals, are created [27].

Each student has the chance to express themselves verbally and visually through OPPs. While their sole objective is to answer three particular questions, students have the option to express themselves through color, sketching, and the use of other materials. It is a fun and enjoyable manner of presenting knowledge informally. Students can use a variety of innovative handwriting methods or computer applications to complete the OPP [9].

In order to get a better understanding of how students use campus resources, Johnson et al.'s study [12] examines the help-seeking behavior of Foundation Program and Undergraduate students at Qatar University (QU) via their usage of these resources. The study looks at the relationship between students' achievement and perseverance in two consecutive semesters - Spring 2019 and Fall 2019 - and their help-seeking behavior as demonstrated by services. The results show a strong correlation between student services and perseverance and achievement. There was a noteworthy distinction seen between the majors of at-risk students and those in STEM and non-STEM fields. The authors stress that a supportive learning environment that helps students recognize their issues and access on-campus resources increases their want to learn and advances their academic achievement. Students who used the support services, both at-risk and general, had a higher chance of succeeding and continuing their education by registering for the next semester [12].

Likewise, Johnson's study found no distinctions between country and gender with regard to help-seeking behavior throughout the course of the two semesters. Students who are sufficiently aware of available resources can act in a help-seeking manner at any moment. From this angle, given their knowledge of the student support programs, it may be said that students exhibited help-seeking behavior.

Students can choose from a wide range of services. For instance, the following student services are offered by Qatar University. Academic support services include peer tutoring, study skills workshops, writing and language assistance, career counseling and exploration (counseling and professional development to prepare students to compete for the best career opportunities), student counseling (helping students overcome psychological, behavioral, social, and emotional disorders and difficulties that may affect their performance), and inclusion and accessibility services [24].

Because university programs consistently mentor students who confront difficulties and adopt help-seeking behavior from institutional sources, these students often exhibit greater performance over time [2]. Less awareness of academic courses, university projects, personal problems, and having poorer mental health to study modules are among the potential concerns [4]. A university's successful student support services program can address these issues. As a result, it may be said that seeking assistance through services.

An academic support therapist assesses the challenges they have, decides what resources are needed, and then offers a range of customized methods to assist and encourage the growth of their learning [1]. The first step in the job of an educational support therapist is "understanding", which entails figuring out and comprehending the fundamental reasons behind the challenges that students encounter. This basic knowledge is essential because it makes it possible to precisely create the processes and tactics that will successfully deal with these challenges. Brief reports and assessments are utilized to obtain a comprehensive grasp of the students, offering a more comprehensive picture of the students' educational needs [26].

This all-encompassing strategy is essential to their expert execution because it enables the support therapist to create

customized therapies that deal with both the underlying reasons and the outward symptoms. Planning strategies then starts, taking into account the student's academic program. These techniques are usually used in challenging subjects when the learner does not have the resources to manage well. To address the identified requirements, the support therapist offers tools that are specifically designed for this purpose.

Cognitive psychology serves as the foundation for psychopedagogical assistance, which at first concentrated on learning challenges, particularly those involving executive function regulation. But since the COVID-19 outbreak, support requirements have considerably increased.

Following the duration of confinement, there has been a decline in cognitive functions such as working memory, inhibition, and planning. New challenges to adjusting to school have also surfaced: anxiety has grown to be a major trigger in the educational environment for adolescents and even younger students. Due to the anxiety brought on by confinement, this symptomatology affected these processes, especially working memory, which had a direct influence on reading and writing performance because these tasks are essential for processing information.

Consequently, it is important to remember that psychopedagogical assistance nowadays encompasses more than only cognitive processes. It is critical to comprehend how the growth of a student is influenced by emotional and cognitive elements. When they use their talents, these variables continually interact and have a direct impact on how well they do. An obvious illustration is the typical scenario of having a challenging exam and having what is commonly referred to as a "blank mind". These feelings of paralysis, loss of control, and uncertainty are simply anxiety states brought on by emotional symptoms; this illustrates how emotional management may either make it easier or harder to apply our knowledge and talents [25].

Globally, student support services at universities help students succeed, perform better, and have a higher probability of earning a degree. The success of student support services programs is reliant on the help-seeking behavior of students.

The laws that are now in effect for higher education govern support and counseling services, but each university customizes its offerings based on its own internal personnel, financial, and other unique circumstances. As a result, it is critical to tailor the faculty's support and counseling services to the needs of university students in real life as well as their preferred modes of help, while also learning about their backgrounds, viewpoints, and attitudes. The student is viewed as a master of their life and of organizing the care they want while using the customization method in psychosocial support, which is a strengths-based model of practice.

Moreover, teachers may foster healthy team norms and actively interact with students to make sure that each student team has a common goal, that members support one another emotionally and psychologically, and that members feel safe speaking out when necessary.

Students have the power to influence their own favorable results. If given the opportunity, people can create teams around common goals and the ability to speak opinions and get support from one another. In the event that students initiate team formation, it is probable that they will select peers with whom they feel at ease, increasing the likelihood of a positive team dynamic within the group.

Literature:

1. Barden, N., & Caleb, R. (2019). *Student mental health and wellbeing in higher education: A practical guide*. SAGE Publications.
2. Beisler, M., & Medoille, A. (2016). How do students get help with research assignments? Using drawings to understand

students' help seeking behavior. *The Journal of Academic Librarianship*, 42(4), 390-400.

3. Boaden, Ch. (2022). 10 years of wellbeing data reveals the extent of the mental health crisis in UK higher education. *Tribal*. <https://www.tribalgroup.com/blog/10-years-of-wellbeing-data-reveals-the-extent-of-the-mental-health-crisis-in-uk-higher-education>
4. Brown, D., Barry, J.A., & Todd, B.K. (2020). Barriers to academic help-seeking: the relationship with gender-typed attitudes. *Journal of Further and Higher Education*, 45(3), 1-16.
5. Brownson, C., Drum, D. J., Swanbrow Becker, M. A., Saathoff, A., Hentschel, E. (2016). Distress and suicidality in higher education: Implications for population-oriented prevention paradigms. *Journal of College Student Psychotherapy*, 30(2), 98-113.
6. Chaudhry, S., Tandon, A., Shinde, S., Bhattacharya, A. (2024). Student psychological well-being in higher education: The role of internal team environment, institutional, friends and family support and academic engagement. *PLoS One*, 19(1), e0297508.
7. Compagnucci, L., & Spigarelli, F. (2020). The Third Mission of the university: A systematic literature review on potentials and constraints. *Technological Forecasting and Social Change*, 161, 120284.
8. Díaz-López, M. (2022). Doctoral thesis "La acción formativa integrada e integradora como elemento básico de un programa universitario de formación personalizada en competencias transversales. Análisis de los efectos". [Integrated an integrating formative action as a basic element of a university program of personalized training in cross-cutting competencies. Analysis of effects.]. Madrid: Complutense University of Madrid.
9. Erwin, L., & Sanderson, H. (2016). One-page profiles with children and young people. <https://creativeoptionsregina.ca/wp-content/uploads/2016/11/2015-04-23-One-Page-Profiles-in-Schools.pdf>
10. Evans, T., Bira, L. Gastelum Jazmin Beltran, L., Vanderford, N. (2018). Evidence for a mental health crisis in graduate education. *Nature Biotechnology*, 36(3), 282-284.
11. García-Cardo, S., Queiruga-Dios, M., & Queiruga-Dios, A. (2023). Comparative study of accompaniment programs for undergraduate degree students in Spanish universities. *Frontiers in Psychology*, 14, 1165232
12. Johnson, Ch. et al. (2022). Student support in higher education: campus service utilization, impact, and challenges. *Heliyon*, 8(12), e12559,
13. Julal, F. S. (2013). Use of student support services among university students: Associations with problem-focused coping, experience of personal difficulty and psychological distress. *British Journal of Guidance & Counselling*, 41(4), 414-425.
14. Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2011). *Student success in college: Creating conditions that matter*. John Wiley & Sons.
15. Lappo, V.V., & Soichuk, R.L. (2022) Digital technologies of support the spiritual development of students. *Information Technologies and Learning Tools*, 2022, 88(2), 103-114. DOI: 10.33407/itlt.v88i2.3403.
16. Lau, R. W. K., & Pretorius, L. (2019). Intrapersonal wellbeing and the academic mental health crisis. In L. Pretorius, L. Macaulay, & B. Cahusac de Caux (Eds.), *Wellbeing in doctoral education: Insights and guidance from the student experience* (pp. 37-45). Springer.
17. Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J., & Gisle, L. (2017). Work organization and mental health problems in PhD students. *Research Policy*, 46(4), 868-879.
18. Orygen, The National Centre of Excellence in Youth Mental Health (2020). Australian university mental health framework report. Orygen, The National Centre of Excellence in Youth Mental Health.
19. Pryal, K. (2024). *A light in the tower: A new reckoning with mental health in higher education*. University Press of Kansas.
20. Ryan, T., Marangell, S., Baik, C. (2023). Examining Mental Health and Wellbeing Policies in Australian Universities. In: Coleman, K., Uzhegova, D., Blaher, B., Arkoudis, S. (eds) The

Educational Turn. Rethinking Higher Education. Springer, Singapore.

21. Sanderson, H., Goodwin, G., Kinsella, E., Smith, T., Jones, V., Higgins, C., Ralphs, J., Byatt, L. (2018). A guide to using person-centred practices in schools. Personalising Education. East Riding of Yorkshire Council. <http://helensandersonassociates.co.uk/wp-content/uploads/2018/05/A-guide-tousing-person-centred-practices-in-school.pdf>

22. Stones, S., & Glazzard, J. (2019). *Supporting student mental health in higher education*. Critical Publishing.

23. Serohina, T., Pliushch, R., Pobirchenko, N., Shulga, N., Akimova, L., & Akimov, O. (2022) Pedagogical innovations in public administration and legal aspects: the EU experience. *Ad Alta: Journal of interdisciplinary research*, 12(1), XXV, 7-13.

24. Vaniushyna, O., Gaivoronska, T., Dunayeva, L., Lanska, S., Kuzmina, M., Varnava, U. (2024) Social and psychological prevention of professional burnout of social sphere employees under the conditions of the martial law. *Ad Alta: Journal of interdisciplinary research*, 14(1), XL, 78-81. <https://www.webofscience.com/wos/woscc/full-record/WOS:001222983700007>

25. Ward, A. & Wegner, D. (2013). Mind-blanking: when the mind goes away. *Frontiers in Psychology*, 4, 650.

26. Wulf-Andersen, T., Larsen, L., Jensen, A., Krogh, L. (2024). *Students' experiences of psychosocial problems in higher education*. Routledge.

27. Zatkova, T., Tokovska, M., & Solcova, J. (2024). What Psychosocial Support Do First Year University Students Need? A Mixed Creative Methods Study. *International Journal of Emotional Education*, 16(1), 140-153.

Primary Paper Section: A

Secondary Paper Section: AM

SOME INDICATORS OF STUDENTS' MENTAL HEALTH IN THE CONDITIONS OF WAR (ON THE EXAMPLE OF THE KHARKIV STUDENTS DURING THE FULL-SCALE MILITARY INVASION OF RUSSIA INTO UKRAINE)

^aIRYNA NECHITAILO, ^bOKSANA BORIUSHKINA, ^cYANA PONOMARENKO, ^dTULIIA TVERDOKHVALOVA, ^eTETIANA YELCHANINOVA, ^fDALIA KOBELIEVA

^{a,c,d}*Kharkiv National University of Internal Affairs, 27, Lev Landau Ave., 61000, Kharkiv, Ukraine*

^{b,f}*State Biotechnological University, 44, Alchevskih Str., 61002, Kharkiv, Ukraine*

^e*H. S. Skovoroda Kharkiv National Pedagogical University, 29, Alchevskih Str., Kharkiv, Ukraine*

email: ^anechit@ukr.net, ^bpsuh@ukr.net,

^cposokhova1992@gmail.com, ^dposokhova1992@gmail.com,

^et.m.elchaninova@gmail.com, ^fdaliakobelieva@gmail.com

Abstract. The article is dedicated to the issue of the impact of war on the mental health of the civilian population, particularly focusing on students. Thus, the aim of this article is to provide a comprehensive analysis of the mental health of students during wartime (using the example of students in Kharkiv during the full-scale military invasion of Russia into Ukraine). The theoretical part of the article analyzes scientific concepts regarding the phenomenon of mental health, the impact of war-related stress on the mental health of the population, and reviews research findings on the mental health of the civilian population in general and students in particular. The empirical part of the article presents the results of a study on the mental health of Kharkiv students, conducted by the authors. The study involved secondary data analysis of research on the mental health and subjective well-being of the civilian population of Kharkiv and the Kharkiv region (November 2023, n = 730), conducted by a research group from the Department of Sociology and Psychology at the Kharkiv National University of Internal Affairs, which included some of the authors of this article. The results of the study revealed that overall, the indicators of students' subjective (psychological) well-being and mental tension tend toward normal levels. No significant signs of post-traumatic stress were identified. The biggest problem highlighted was loneliness, associated with the forced social isolation of students due to distance learning and the unfavorable security situation in Kharkiv and the Kharkiv region. In light of this issue, the authors provide a set of recommendations for addressing it.

Keywords: mental health, subjective (psychological) well-being, stress, post-traumatic stress disorder, student, higher education institution, university, full-scale military invasion of Russia into Ukraine, wartime conditions.

1 Introduction

War and military conflicts bring significant psychological and emotional disturbances that directly impact the mental health and psychological well-being of people. It is evident that not only military personnel suffer from war but also the civilian population. War leads to the development of post-traumatic stress disorder, significant mental and emotional strain, depression, anxiety disorders, and other mental illnesses. Understanding the stress factor of war and its impact on the mental health of civilians is crucial for developing effective strategies for the support and rehabilitation of those affected. Knowledge of how different population groups respond to stressful situations allows for the creation of targeted psychological support and intervention programs to help reduce the negative effects of war on mental health.

Students represent a social group that accumulates the potential for the country's future development, including post-war recovery. It is obvious that studying during wartime is significantly different from studying during peaceful times, as it is accompanied by constant stress related to military actions. This primarily concerns students who live and study in areas located in close proximity to military activities, as well as near the border with the aggressor country, making these areas easy targets for constant enemy bombings (for example, the city of Kharkiv and the Kharkiv region).

Before the war, Kharkiv was considered a "student city" as, according to the Main Department of Statistics, the higher education network in the Kharkiv region included 74 higher education institutions [42]. If we consider this number on a national scale, it constitutes nearly a quarter of all higher education institutions in Ukraine. With the onset of the full-scale invasion, all higher education institutions located in Kharkiv and the Kharkiv region switched to fully remote learning — the only

relatively safe form of education. Later, some of them, particularly those classified as universities "with specific learning conditions," were forced to temporarily relocate to other cities in the country where in-person learning is possible, as this format of education is mandatory in such institutions (primarily referring to institutions that train police officers, military personnel, etc.).

According to the Regional Department of Science and Education, 22 higher education institutions in Kharkiv sustained significant damage due to Russian bombings and shelling [25]. Despite the extremely challenging conditions in which the educational system of Kharkiv region operates, and despite the damage to numerous university buildings in Kharkiv, as of June 2024, the Kharkiv region ranks second in the country in terms of the number of students enrolled in higher education institutions. This information was confirmed by the Ministry of Education and Science of Ukraine [16].

Students attending universities in Kharkiv and residing in the city or other localities within the Kharkiv region face high levels of stress due to constant threats to their lives, the loss of loved ones, destruction of homes, and the disruption of their usual way of life. Investigating the mental health status of these students is essential for understanding the potential for both current and post-war development of the region, as the state of their mental health influences their ability, as a key social group, to fully realize their potential.

In light of the above, the aim of this article is to conduct a comprehensive analysis of the mental health status of students in wartime conditions (using the example of students from Kharkiv during the full-scale military invasion of Russia into Ukraine).

2 Method

Theoretical and methodological foundations of the study were composed of:

- 1) Scientific concepts of the phenomenon of mental health by A. Maslow, C. Rogers, V. Frankl, V. Ananiev, B. Bratus, F. Vasiliuk, I. Dubrovina, V. Pakhalyan, O. Shuvalov, and others; research on the state of mental health during wartime conducted by foreign researchers such as S. Galea, K. Wortman, D. Koren, D. Norman, A. Cohen, et al.;
- 2) Studies on the mental health of students conducted by both Ukrainian and international scholars, including Yu. Borets, I. Shlimakova, I. Vlasenko, O. Reva, N. Grankina-Sazonova, H. K. Altinyelken, L. Hoek, L. Jiang, E. Sokolowska, L. Zabłocka-Żytka, S. Kluczyńska, J. Wojda-Kornacka, and others;
- 3) Research by Ukrainian scholars on the mental health of students in wartime, specifically researchers such as K. Chmeliuk, L. Tampilina, Ya. Inatenko, O. Gogol, M. Tsymbaliuk, N. Zhyhailo, M. Kichula, V. Zavorotna, L. Trushchenkova, A. Vyshnevskiy, K. Levchenko, N. Kharitonova, H. Chuiko, T. Koltunovych, N. Yeremenko, N. Kovaliova, and V. Uzhvenko.

Empirical Methods: Surveys (online questionnaires for the population of the Kharkiv region to assess indicators of mental health and well-being, as well as the factors influencing them); psychodiagnostic methods—use of standardized tests and scales to measure stress, anxiety, depression, and other indicators of psychological well-being, specifically: 1) the modified BBC Subjective Well-being Scale (BBC-swb) (P. Pontin, M. Schwannauer, S. Tai, & M. Kinderman; adapted by L. M. Karamushka, K. V. Tereshchenko, O. V. Kredentser) [14]; 2) the Neuropsychic Stress Questionnaire (T. A. Nemchin) [22]; 3) the Traumatic Stress Questionnaire (I. O. Kotieniev) [33].

Methods of mathematical-statistical data analysis: correlation analysis, cluster analysis.

3 Results and Discussion

The analysis of scientific sources devoted to the theoretical conceptualization of the stress-inducing conditions of war and the study of stress states during wartime indicates the prevalence of psychopathology among those who have experienced war. This applies not only to military personnel but also to civilians [5; 24; 34]. Galea S. and Wortman K., in their article, convincingly summarize the relevant evidence, demonstrating that individuals who are socially or economically vulnerable (low-income, children, the elderly), and in many cases, women, are more prone to experiencing distress during war. The impact of war on their mental health tends to be significantly more negative [8].

Furthermore, researchers have shown that displacement (either internal or abroad) and war-related losses (human, material, etc.) can prolong the course of psychopathology and delay recovery, even if the individual has been in a safe environment for an extended period. This indicates both a temporal and spatial "potential prolongation" of war conditions, meaning that they continue to exert their stress-inducing effects even after the war has officially ended.

Karam E. and Ghosn M. highlight that war is always accompanied not only by a surge in mental disorders but also by significant mortality and physical illness. It is important to take into account the strong interconnection between physical and psychological illnesses: individuals who have suffered physical injuries are more likely to experience prolonged psychopathology, and conversely, mental illnesses or traumas increase the likelihood of deteriorating physical health [12]. This conclusion is particularly relevant for further modeling of the tools used in our empirical research.

Koren D., Norman D., Cohen A., and others point out that "war is a demonstration of force aimed at subjecting one group to the will of another" [13; 18]. The researchers suggest that one of the primary goals of war is to inflict harm (both physical and psychological) "as a means of coercing capitulation and stopping actions undesirable to the aggressor" [18]. Ukrainians, at the cost of their own lives, have confirmed this hypothesis, especially those living in close proximity to the aggressor nation. For instance, when Kharkiv became an unattainable target for Russia, despite being a highly desired military "trophy," the aggressor intensified bombings of civilian infrastructure, residential areas, and the homes of ordinary citizens in an effort to subjugate the city's inhabitants, intimidate them, and cause suffering.

One of the modern myths about war (which prevailed in the civilized world until the full-scale Russian invasion of Ukraine) was the belief that wars could be conducted in a deliberate, "smart" way, focusing military actions exclusively on soldiers, military targets, etc., without causing harm to civilians. However, current events in Ukraine demonstrate that it is practically impossible to wage war in such a manner that only those who can resist, or those responsible for political and military decisions, are targeted. The consequences of war inevitably include the deterioration of existing social structures, exposing the population to stress and trauma, limiting access to preventive and therapeutic resources and healthcare institutions, and leading to increased levels of psychopathology and physical illness among individuals who may not be direct targets of military attacks [8].

Poor public health is an inevitable consequence of war. The achievement of personal goals by individuals and, broadly, societal objectives depends on the health of the population—both physical and mental. Due to the significant harm to public health, war effectively hinders the attainment of strategic development goals for communities, regions, and society as a whole, which were set before its onset. This is an argument in favor of recognizing the fact that the impact of war on society

persists long after the war itself has ended. The experience of all wars that took place in the 19th century shows that the consequences of war-related stress, as well as various mental and physical pathologies that arose and developed during the war, continue to affect people for many years after the conflict is over.

Galea S. and Wortman K. assert that "war rarely 'ends' within the lifespan of any generation." Given that the negative health consequences of war persist long after its conclusion, this leads to social and economic effects that shape the entire future experience of the generation that lived through the war [8]. Even more concerning are research findings indicating that the psychological trauma caused by war-related stress is transmitted from generation to generation [18].

The stress, depression, and anxiety that accompany war-related traumatic events can profoundly impact the physical health of society as a whole, its internal relationships, and daily life. As previously noted, war significantly contributes to the onset and severity of stress and mental disorders observed among the civilian population. The most common conditions include post-traumatic stress disorder (PTSD), depression, and anxiety. Moreover, the exacerbation of pre-existing mental disorders is seen not only among individuals living directly in conflict zones but also among internally displaced persons and refugees [19].

Most existing studies focus on examining the psycho-emotional state and mental health of affected communities during the post-war period. Despite the prevalence of active military conflicts in various parts of the world, the understanding of war's impact on the mental health of civilian populations, particularly regarding stress and anxiety, remains quite vague. Although this issue is of great importance, few studies have specifically explored the relationship between active military operations and the levels of stress and anxiety [11; 31]. For this reason, the situation in Ukraine, where on February 24, 2022, a full-scale Russian military invasion began, is of heightened research interest, particularly in regard to those territories where the civilian population suffers from ongoing terror.

Stress and anxiety are expected consequences of living in wartime conditions, significantly affecting the quality and safety of human life. War creates a fertile ground for the development of anxiety disorders, as it involves a high degree of trauma, both mental and physical [6]. Existing research literature demonstrates that war has a profoundly negative impact on the civilian population involved, leading to stress disorders [15], anxiety [6; 12], depression [7], and post-traumatic stress disorder (PTSD) [9]. Researchers place particular emphasis on the mental health of refugees who are forced to leave their homes due to military conflict in their country or region. For instance, Kashdan et al. [15] confirm that refugees represent a vulnerable group, more susceptible to anxiety disorders, PTSD, and depression. The authors explain the causes of these conditions as being due to sudden changes in lifestyle, forced relocations, and the need to separate from family and loved ones.

Alongside this, it is important to note that the study of the relationship between war and stress, as well as anxiety disorders among the civilian population of Ukraine, remains under-researched. However, some explorations have been undertaken by Ukrainian scholars. For example, Kurapov A. et al. report a deterioration in the psycho-emotional state of Ukrainian students; specifically, the majority of respondents exhibited signs of depression and nervousness, reporting increased feelings of loneliness and anger. There was also a rise in cases of alcohol, tobacco, and sedative abuse among them [20]. Pavlenko V. et al. focused on the mental health of women working in education, including students and teachers. Their study revealed that the respondents experienced elevated levels of fear and reduced resilience to stressful situations [29].

Researchers Kurapov A., Danyliuk I., Loboda A., Kalaitzaki A., Kovach T., Klimash T., and Predko V., based on the results of their study (respondents – adult representatives of the civilian population of Ukraine, sample – random, non-representative;

online survey, field stage – July to October 2022), found that, on average, Ukrainians exhibit low levels of anxiety and depression that do not meet the diagnostic criteria for disorders. However, a significant portion of the population still shows signs of these disorders. The situation is different with stress: 70% of Ukrainians report acute stress symptoms [20]. Referring to Hinz A. and Schwarz R., the authors suggest that the prevalence of depression is generally age-related and should not exceed 15% in a normal population. This indicates that Ukrainians demonstrate significantly elevated levels of anxiety and depression due to the war.

Kurapov A. and his colleagues note that, although the high level of stress among Ukrainians seems evident, the results of their study differ considerably and even contradict the findings of studies conducted during the first month after the Russian invasion, which reported a significant deterioration in the mental health of Ukrainians [29; 31]. That is, the results of Kurapov A. and his colleagues are considerably more favorable, especially regarding stress. However, as the authors themselves note, it is important to understand that the mental health of people who have experienced the stress of war may worsen over time. The researchers also hypothesize that the strengthening of national unity, which has consistently accompanied each crisis throughout Ukraine's independence, may have contributed to the development of effective coping strategies for overcoming stress, anxiety, and depression among Ukrainians, which have worked relatively well during the war. For example, Ukrainians typically employ support-seeking and providing strategies rather than distancing or emotional venting strategies [26].

Kurapov A. and colleagues also found that individuals who remained at their permanent place of residence experienced lower levels of stress and anxiety compared to internally displaced persons and refugees. These findings align with previous research that reported the psychological effects of displacement [6; 7; 9; 12; 13; 11; 15]. This may suggest that Ukrainians perceive direct military threats as less traumatic than fleeing their homes and country. In other words, Ukrainians' resilience to the reality of war and constant threats can be explained by their strong family values and attachment to home. However, it is important to note that mental disorders may manifest in the short or long term with a high likelihood in individuals who have experienced displacement or other traumatic events. Participants who reported direct trauma experiences (armed attacks, sexual violence, severe human suffering, physical violence, military actions, and other war-related stressful events) exhibit higher levels of distress, anxiety, and depression. This is particularly evident in victims of sexual and physical violence, who report symptoms of anxiety and depressive disorders if they have experienced such trauma.

Direct experience of a war-related stressful event (occupation, violence, loss of loved ones, home, or property) significantly increases symptoms of anxiety and depressive disorders, as well as perceived stress [19; 20]. Interestingly, it is refugees who report direct experiences of severe human suffering, not participants who remained in Ukraine, and this is associated with a significantly elevated level of anxiety-depressive disorders. The situation is quite different for participants who stayed in Ukraine, as they report only a slight increase in depression, and even then, only as a result of experiencing severe human suffering.

When considering war-related stress factors specifically affecting social groups such as students, it is important to note that by the third year of the full-scale war, Ukrainian students faced reduced governmental support instead of improvements in social protection [2].

The economic aspect of student issues is primarily reflected in the fact that a large portion of students is forced to combine studies with work, often working full-time. This issue is certainly not new, but in the context of war and the accompanying economic crisis, the situation has worsened. This prevents individuals from fully engaging in the educational process, limits opportunities for personal development, and leads

to both physical and psychological fatigue. Many respondents reported burnout in their workplaces due to excessive workloads [2].

The necessity to work while studying may impact their future professional lives, particularly their ability to find suitable employment in their field of study. The fragmented knowledge they acquire often makes it difficult to enter the relevant labor market. According to the 2022 Employment Monitoring Report of Graduates of Higher and Specialized Secondary Education Institutions, the employment rate for bachelor's degree graduates was only 36.3% [10].

Working students are more likely than others to face labor rights violations and uncertainty regarding their status in the labor market. Lacking experience, they often take short-term jobs, frequently in informal employment. In some cases, their employment relationships are disguised as "self-employment," with employers requiring them to register as individual entrepreneurs. This strips students, particularly female students, of proper social protection and complicates the formal defense of their labor rights when necessary. The new legislation allowing for zero-hour contracts—employment agreements without guaranteed working hours—could further worsen the position of young people in the labor market [10].

Russian military aggression has altered the lives of all students, but especially those living in frontline and occupied territories. Even if a university offers students the option of distance learning, there are often issues that can only be resolved by being physically present at the educational institution, which becomes an additional stress factor. Reaching the university's location is dangerous, and in some cases, completely impossible [10].

After the onset of the full-scale war, many students were forced to take academic leave because they became refugees, had to work more, or joined the front lines. It is important to emphasize that taking academic leave for many students (except for those who joined the Ukrainian Armed Forces) means losing the opportunity to continue their education funded by the state. Returning from academic leave is possible only if the student continues their studies on a paid, contractual basis [10].

Following the COVID-19 pandemic, the war has caused prolonged periods of distance learning at many educational institutions. This complicates, and sometimes makes it impossible to complete practical training, occasionally leading to a loss of interest in acquiring knowledge. In-person education during wartime is also problematic, especially when university and dormitory shelters are in poor condition, with issues related to capacity and safety. Students from occupied, de-occupied, and frontline areas report increased nervous reactions to air raid sirens, loud noises, and issues with sleep and self-control [3; 40]. This clearly indicates mental health issues that have arisen specifically as a result of the war.

It is important to emphasize that the stress factors negatively affecting students' mental health are not limited to the educational process itself. Many students have lost their homes, property, family members, friends, and much more due to the war. Despite these losses, they are forced to move forward, continue their studies, work, conduct research, write qualification papers, take exams, and more.

Once again, it should be noted that studying the mental health of students is crucial for understanding and assessing the human potential of our country, particularly in the context of post-war recovery. From a sociological and socio-psychological perspective, the student body represents a significant social group within society.

The term "student" (from Latin *studens*, genitive *studentis* – one who diligently works, studies) refers to a person pursuing higher education. In ancient Rome and the Middle Ages, the term "student" applied to anyone engaged in the process of learning. With the establishment of universities in the 12th century, the

term "student" began to refer specifically to those who study and work within these institutions. After academic titles were introduced for teachers (such as professor), "student" was used exclusively to refer to those engaged in studying [3].

The term "student body" refers to students as a socio-demographic group, characterized by a specific size, gender-age structure, territorial distribution, and so on. It denotes a certain social status and corresponding roles, as well as a distinct phase or stage of socialization (the student years) that the youngest people go through. This stage is marked by specific socio-psychological characteristics [3].

With the increasing social significance of higher education, the role of students in society is growing, and their numbers are increasing. Students are not only a source of replenishment for qualified personnel and intellectuals but also constitute a substantial and significant social group in their own right. The process of massification of higher education in Ukraine reduces its elitism on one hand, while on the other hand, it makes higher education more democratic and accessible to people from various social strata. There are also changes in gender structure, with an increasing number of women participating. Despite differences in social background and material resources, students share a common type of activity and form a specific socio-professional group that is potentially important for the existence and development of various professional fields and industries [28].

According to the classic definition prevalent in social and behavioral sciences, a social group is a collection of individuals united by a common purpose, idea, or work [21]. In contrast to, for example, a socio-demographic community, a social group contains significant activity potential, meaning the potential for social engagement, which leads to noticeable social changes and shifts. Therefore, in the context of considering students as an important social group, given the difficult conditions they face during the war, it is crucial to assess their mental health. This is directly related to their ability to realize their activity potential.

The mental health of students is also analyzed by foreign scholars such as Altinyelken H. K., Hoek L., Jiang L., Sokolowska E., Zabłocka-Żytka L., Kluczyńska S., and Wojda-Kornacka J. However, the scientific works of these international authors mainly address general aspects of students' mental health, without specifically considering the conditions of war [1; 36].

Regarding scientific publications on the mental health of students specifically under wartime conditions, the authors are Ukrainian researchers. It should be noted that the theoretical and methodological foundations for studying student mental health in a state of war have been thoroughly defined and analyzed by Ukrainian scholars such as Kichula M. Y., Zavorotna V. M., Trushchenkova L. V., and Vyshniovsky A. V. [17]. Issues faced by Ukrainian students during the war have been the focus of specific scientific and practical conferences. For example, the Khmelnytsky Cooperative Trade and Economic Institute organized and held a nationwide scientific and practical conference titled "Ukrainian Students in the Context of War with Russia" [41].

At the empirical level, the mental health of students has been researched by several scholars. In November 2023, Ukrainian researchers Tamilyna L., Inatenko Y., and Hohol O. conducted a survey titled "What Allows Young People to Feel Happy During the War? A Study of Life Satisfaction Among Students of Higher Educational Institutions in Ukraine." The research focused on examining the subjective well-being of Ukraine's young population, with particular attention given to the life satisfaction of students at Kyiv universities. The survey included 184 students aged 18 to 25 years (average age 18.6 years). The study found that "the war significantly impacts the life satisfaction of young people in Ukraine. Students show increased sensitivity to social isolation, which is felt directly or indirectly through the transition to online learning. The perception of positive changes in personal life or surroundings

greatly contributes to an increased overall level of subjective well-being. Universities can further enhance this level by offering psychological counseling services on campus." Despite the war, respondents demonstrated a relatively high level of life satisfaction, averaging 7 on a 10-point scale (where 1 is the lowest level of satisfaction and 10 is the highest) [37].

Research conducted by M. Tsybaliuk and N. Zhyhailo among students of Ivan Franko National University of Lviv and other higher educational institutions revealed that prior to the full-scale invasion, students were relatively stress-resistant. For instance, 46.7% of students did not experience stress. However, the war has negatively affected students' psychological resilience. The severity and frequency of stress have increased, and stress resistance has decreased [38].

Levchenko K. and Kharitonova N. tracked the mental health and the impact of traumatic situations among students of the State University "Zhytomyr Polytechnic" during the first year of Russia's full-scale invasion of Ukraine. The researchers noted that six months after the invasion began, the overall psycho-emotional state had worsened for 40.7% of respondents, remained unchanged for 36.4%, and improved for 22.9%. One year after the invasion started, the trend had shifted: 58.1% of respondents reported an improved overall state, 27.1% remained unchanged, and 14.8% experienced a deterioration. These results indicate a high capacity among students to cope with stress and psychological pressure and to combat distress. The authors interpret this trend as indicative of post-traumatic growth [23].

Chuiko G. V. and Koltunovich T. A. investigated mental health by analyzing indicators of psychological well-being, reactive anxiety, and trait anxiety among first-year psychology students ($n = 45$) at Yuriy Fedkovych Chernivtsi National University. They found that, on average, all components of psychological well-being and its overall indicator were at a moderate level in the sample; the same applied to the indicator of reactive/situational anxiety. However, the average level of trait anxiety in the sample was high, suggesting a likelihood of experiencing prolonged stress/distress among the respondents [4].

Yeremenko N. P., Kovaliova N. V., and Uzhvenko V. A. conducted a survey on mental health among first-year students of the National University of Physical Education (Kyiv). The results led to the conclusion that student youth require mental health support and assistance from relatives, friends, and the government [43].

It is important to note that each higher education institution conducts annual surveys of its students to identify existing issues, such as the quality of teaching, adequacy of material and technical support, and availability of social, psychological, and other types of support. Since the onset of the full-scale invasion, some educational institutions have introduced special surveys, such as "Students in Wartime" (National University "Lviv Polytechnic") and similar initiatives [27].

The reviewed literature highlights a connection between war, stress states, and anxiety disorders among the civilian population. However, there is no comprehensive understanding of the mental health and well-being of communities that experience daily enemy attacks while continuing to work, study, rebuild, and achieve their goals. The aforementioned research results on war stress and the impact of wartime conditions on the mental health of the civilian population in general, and students in particular, indicate the need for further studies. These studies have shown that the war has indeed harmed the mental health of Ukrainians, though not as severely as might be expected given the scale, brutality, and ferocity of the Russian aggressor's military actions. It is important to note that previous wars worldwide suggest that the situation regarding mental health may worsen over time, and thus it needs to be continuously monitored. This will provide insight not only into the current state but also into the prospects for Ukraine's post-war development and the development of its regions, which will be based on this state.

Overall, a review of the specialized scientific literature dedicated to empirical studies of students' mental health in wartime conditions reveals the following:

- limited scope of research (small sample sizes);
- focus on specific educational institutions (samples consisting of students from a single university);
- variability, ambiguity, and sometimes contradictory conclusions, which prevent the formation of a more or less coherent picture of students' mental state;
- lack of empirical data characterizing the mental health of students living and studying in areas close to active combat zones or under occupation (stressfulness of conditions and intensity of stress experience are significantly higher in these cases compared to students living in central and western regions of Ukraine).

These findings prompted authors to conduct own study on the mental health of students studying at universities in Kharkiv and residing in Kharkiv city or other settlements in the Kharkiv region. The results of this research are presented below.

But before presenting the data from authors' empirical research, it is necessary to define key concepts and terms.

The concept of mental health is relatively new but one of the most significant and relevant in contemporary psychology. The phenomenon of mental health has been explored by scholars such as A. Maslow, C. Rogers, V. Frankl, V. Ananyev, B. Bratus, F. Vasilyuk, I. Dubrovina, V. Pakhaliyan, O. Shuvallov, and others. According to the World Health Organization's definition, mental health is understood as a state of well-being in which an individual realizes their own abilities, can cope with the usual stresses of life, and can work productively and fruitfully to contribute to their community. The World Health Organization's protocols define the role of mental health in individual and social functioning. It is noted that mental health is a fundamental basis for both collective and individual capacities to think, experience emotions, interact with others, and enjoy life emotionally. Consequently, mental health is considered a foundation for adequate and healthy functioning in both personal and social environments [32].

For analyzing the phenomenon of mental health, its structural characteristics and criteria are crucial. When defining the structure of mental health, a hierarchical model of personality is often used, with its components determining the components of mental health. Health at the biological level involves a dynamic balance of the functions of all internal organs and their adequate response to external environmental influences. It makes sense to understand psycho-emotional health as "specific" in relation to the "general," which is psychological health. If psycho-emotional health is understood as a subjective construct, then the orientation of emotions towards satisfying certain personal needs becomes more significant. Health is linked to the personal context in which an individual is viewed as a psychological whole at the psychological level.

On one hand, mental health is influenced (both positively and negatively) by the social environment. On the other hand, the mental health of individuals affects society as a whole. It is important to emphasize that only those with strong mental health feel like active participants in society. In its definition of mental health, the World Health Organization identifies seven components: 1) awareness of the stability and identity of one's physical and psychological "self"; 2) consistency and uniformity of experiences in similar situations; 3) critical self-reflection and assessment of one's activities; 4) adequacy of mental reactions to environmental influences; 5) ability to manage behavior according to established norms; 6) planning and carrying out one's life activities; 7) ability to adapt behavior according to changing life circumstances [32].

Various criteria are used to assess an individual's level of mental health. According to most authors, the most informative criteria are: the alignment of subjective images with real objects of reality and the nature of reactions to external stimuli; age-

appropriate and maturity level-specific aspects, particularly in the emotional-volitional and cognitive domains; adaptability in micro-social relationships, the ability to consciously plan life goals, and maintain activity in achieving them.

Thus, mental health is well-being in the psychological, emotional, social, and somatic spheres, which enables effective functioning in the environment, the development of personal goals, and their achievement [30]. It is also important to consider that mental health and mental disorder are not opposing concepts. The absence of a recognized mental illness does not necessarily equate to mental health.

War is the most pronounced negative factor affecting an individual's psyche, as it involves a direct threat to human life and various forms of violence that are antagonistic to the aforementioned well-being. The persistent stress, which is a daily reality in the modern context, pushes a person beyond their window of tolerance. As a result of this displacement, the homeostasis of the nervous system is disrupted, leading to uncontrollable behavioral responses. These responses occur at the level of the reptilian and limbic systems, both of which are instinctive and not subject to conscious regulation. Therefore, stress reactions at these levels are uncontrolled and manifest on physiological, cognitive (narrative), linguistic, and behavioral levels, with specific manifestations and negative consequences for the individual and their surroundings during an emergency situation. In cases of excessive stress, the psychological defense mechanisms may fail, leading to an acute stress reaction. According to research diagnostics, an acute stress reaction is a temporary disorder that develops in response to unusual physical or psychological stress without other manifestations of mental disorders and usually subsides within a few hours or days [39]. The duration and intensity of this reaction depend on the severity of the circumstances and the individual's ability to cope with stress, based on past skills and experience. With prior experience, the recovery period may be shorter; otherwise, there is a potential tendency to develop distress, which can result in post-traumatic stress disorder, generalized anxiety disorder, chronic fatigue syndrome, and depression. Overall, prolonged distress leads to biochemical and physiological changes in the central nervous system, particularly the brain [39].

When presenting data on the mental health status of students in Kharkiv amidst the full-scale invasion of Russia into Ukraine, it is important to note that authors conducted a secondary analysis of the data. In other words, the analyzed empirical data were originally collected for a different purpose, intended for another study. Specifically, this study was focused on examining the mental health and subjective well-being of the civilian population of Kharkiv and the Kharkiv region (data collection: November 2023; n = 730; random, non-representative sample). The research was conducted by the research group of the Department of Sociology and Psychology at the Kharkiv National University of Internal Affairs. Some authors of this article were members of the research group. The results of this study are fully presented in a collective monograph [44]. The study was conducted using an online survey. The collected data were then coded, imported into SPSS, and subjected to mathematical and statistical analysis. The sample consisted of adult civilians from Kharkiv and the Kharkiv region who were residing in these areas at the time of the survey. A significant portion of the sample (130 respondents) were students attending universities in Kharkiv. During the data analysis, it was observed that the responses of students significantly differed from those of representatives of other groups (particularly age and professional groups). This prompted a secondary analysis of the data, focusing specifically on students and their mental health.

Therefore, using SPSS functions, it was filtered the data to include only students (n1 = 130), and all subsequent mathematical and statistical processing and analysis were conducted with this (student) sub-sample. Initially, it is necessary to outline some important specific characteristics of this sub-sample.

Among the surveyed students, there were nearly twice as many male respondents: 68.5% male and 31.5% female. Considering that men are generally less anxious, research by the Penn State University College of Medicine, using magnetic resonance imaging (MRI) of the brains of 96 volunteers, demonstrated significant differences in the nervous system's response to psychological stress between men and women. The study revealed that different parts of the brain are activated in men and women under stress, explaining why statistics show that women have a higher prevalence of mental disorders, depression, and heightened anxiety compared to men [35]. Thus, authors hypothesized that the gender factor might influence the overall results of our analysis, potentially skewing them towards more normalized indicators of mental health. To confirm or refute this hypothesis, authors conducted a correlational analysis. The results indicated that gender has almost no impact on the mental health indicators of students. For example, gender did not affect any indicators of subjective (psychological) well-being. Regarding indicators of neuropsychic tension, a weak statistically significant correlation was found only for four of the 30 characteristics predicted by the respective questionnaire: the presence of physical discomfort ($T = 0.21$; $Tcs = 0.25$; $r = 0.16$); frequency of tension ($T = 0.22$; $Tcs = 0.26$; $r = 0.23$); overall degree of tension ($T = 0.21$; $Tcs = 0.25$; $r = 0.25$). Analysis of the two-dimensional distribution tables shows that among female students, a significantly higher proportion experiences mental discomfort at a moderate level (24.4% versus 6.7% among male students). Additionally, female students are twice as likely to experience tension when there are objective reasons and circumstances causing it (48.9% versus 24.7% among male students). In contrast, male students significantly outnumber those who rarely experience tension (70.8% versus 43.9% among female students). Furthermore, among female students, there is a noticeable number who report that when tension occurs, it is often moderate (31.7% versus 13.5% among male students). Conversely, among male students, those who report a complete absence of tension are more prevalent (85.4% versus 63.4% among female students).

According to the post-traumatic stress questionnaire, which included 110 items, statistically significant weak correlations were found in only 8 cases: loss of interest in many usual activities ($T = 0.21$; $Tcs = 0.30$) and, at the same time, deriving pleasure from minor things ($T = 0.19$; $Tcs = 0.28$; $r = -0.18$); emotional self-control ($T = 0.20$; $Tcs = 0.28$; $r = -0.24$) and emotional balance ($T = 0.21$; $Tcs = 0.28$); effort required to work ($T = 0.21$; $Tcs = 0.31$); unpleasant (difficult) memories of recent events ($T = 0.24$; $Tcs = 0.35$); tendency to take medication even when not acutely necessary ($T = 0.22$; $Tcs = 0.31$; $r = -0.28$); and gratitude towards fate ($T = 0.23$; $Tcs = 0.32$).

Analysis of the two-dimensional distribution tables indicates that among female students, there is a slightly higher proportion who report losing interest in many usual things, and at the same time, a noticeably higher number who tend to derive pleasure from small things. For instance, nearly 66% of female students report being strongly or very strongly inclined towards this, whereas among male students, this figure is significantly lower at 37.1%.

It is expected that female students are more emotional compared to their male counterparts and feel they need to better control their emotions. More than a quarter of male students (25.8%) believe they have no problems with emotional control, whereas only 9.8% of female students feel the same. Logically, male students are more likely to consider themselves emotionally balanced, with only 3.4% perceiving themselves as imbalanced, compared to 11.6% among female students.

Interestingly, male students are forced to exert more effort to work, while female students more frequently recall unpleasant and difficult events. Female students are also noticeably more likely to take medication without a clear reason (36.6% versus 13.5% among male students).

Female students are more "grateful" for their own fate (70.75% compared to 47.2% among male students).

A moderate statistically significant correlation is observed between gender and memory problems ($T = 0.32$; $Tcs = 0.46$; $r = -0.24$). Female students report greater issues in this area. Among them, 48.8% often or very often forget things, whereas only 17.7% of male students experience the same. Additionally, nearly three times as many male students do not consider forgetting things to be characteristic of them (20.2% versus 7.3% among female students). This finding is supported by another indicator that also suggests memory issues. A statistically significant correlation was found between the student's gender and forgetting what they intended to say ($T = 0.22$; $Tcs = 0.31$; $r = -0.26$). Female students notably experience this issue more frequently (51.2% compared to 22.5% among male students).

Thus, while gender has a weak effect, it does influence some aspects of mental health. Female students are somewhat more emotional, more stressed, and anxious, and they have more pronounced memory problems. However, it is important to note that these differences do not significantly impact the overall results. Therefore, the conclusions drawn at the end of the analysis should be considered as equally relevant to all student respondents and not skewed due to any gender imbalance in the sample.

Authors find it necessary to emphasize that the correlation analysis for the group of respondents who are not students revealed a large number of statistically significant relationships (including notable and moderate) between gender and indicators of subjective well-being, neuropsychological stress, and post-traumatic stress. A detailed examination of these gender differences is covered in another scientific publication [44]. Comparing this data with the aforementioned data related to students, a significant difference is observed: the gender of students has almost no effect on mental health indicators, whereas the gender of non-student respondents noticeably affects their mental health indicators. This discrepancy is likely related to the age characteristics of the two mentioned samples. The student group consists of respondents whose age does not exceed 28 years, with a significant majority being in the traditional (for Ukraine) student age range of 18-22 years. In contrast, the non-student respondents are predominantly in the mature age range of 36-45 years. Authors do not attempt to analyze and explain this difference within the scope of this article, as it merits a separate scientific inquiry and publication.

The vast majority of surveyed students lived in Kharkiv at the time of the survey (73.85%), while a significant portion resided in the Kharkiv region (26.15%).

Students predominantly assess their level of material well-being as one where money is spent only on the essentials (39.2%) or where money is generally sufficient (33.1%). Approximately 7% are on the brink of poverty, meaning they lack enough money even for the essentials.

Regarding marital status, the vast majority of students who participated in the study are unmarried and have never been married (92.3%), and do not have and have never had children (95.4%).

Respondents were asked about the losses they experienced during the full-scale invasion. Among students, the most common losses were the loss of peace (26.9%) and friends (24.6%). The research instrument did not specify how these losses occurred. However, concerning friends, we can assume that it does not necessarily mean loss due to death or casualty; it is quite likely that it refers to losing friends due to relocation to another country or city within Ukraine. Inability to communicate directly and without obstruction might be perceived by respondents as a break in friendships and a loss of friends. In 13.1% of cases, students reported losing relatives, and there are also relatively high percentages indicating that students lost their homes or property (10.7% each).

When comparing the data from the student subset with the results from the entire dataset, similar trends are evident, with one notable difference: among non-student respondents, losses

related to physical health are significantly more pronounced. Only 9.2% of students reported losing physical health due to the war, whereas among non-student respondents, this figure is substantially higher at 24.25%. This difference can be explained by the younger age of students. As noted earlier, the age of the majority of students ranges from 18 to 22 years. At this age, health reserves and resources are significantly greater compared to those of middle-aged or elderly individuals. Therefore, students, being relatively young, may not perceive the impact of war stress on their physical health. It is possible that due to their younger age and corresponding lesser experience with illness, they are less sensitive to their own physiology and body.

Before moving on to the indicators of mental health, it is important to note that the research instrument included a total of 175 indicators (questions), of which 164 pertained to three psychodiagnostic methodologies (described in the second section of this article), while the rest concerned various general socio-demographic characteristics of the sample (age, gender, level of material well-being, etc.) and traumatic experiences of respondents (losses due to war, experiences in occupation, etc.). Consequently, the dataset is vast, and it is impossible to present it in full within a single article. Therefore, in presenting the results here, authors focus on key, most indicative indicators of mental health among the student community, including those that highlight the specific characteristics of this group compared to other civilian populations.

First, let's present the data regarding the subjective well-being of students. The vast majority are moderately or highly satisfied with their physical health (45.4% and 36.15%, respectively). A comparative analysis was conducted to strengthen these results. Using SPSS operations, authors created another dataset (n2 = 130) that randomly included respondents who are not students. Among the total dataset (n = 730), there were 600 such individuals. However, to enable a comparative analysis, authors also randomly selected 130 respondents from the 600, thus equating the sizes of both subsets (n1 – "Students" and n2 – "Non-Students"), which facilitated the comparative analysis.

Comparing the data from n1 – "Students" with the data from n2 – "Non-Students," it is evident that "Non-Students" rate their physical health worse. Among them, there are noticeably more individuals who are either dissatisfied with their health overall or only slightly satisfied (6.1% among students versus 19.3% among "Non-Students").

Approximately half of the students are moderately or highly satisfied with the quality of their sleep. These results significantly differ from those obtained for the subset of respondents who are not students. The comparison of results for both subsets is visualized in Figure 1.

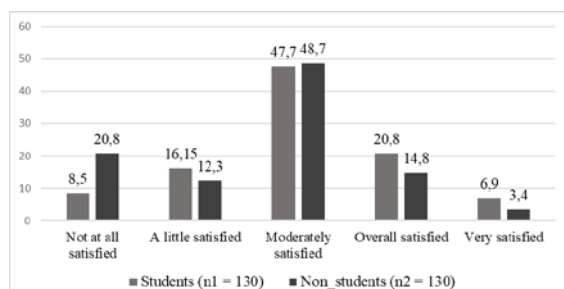


Figure 1. Degree of Satisfaction with Sleep Quality Among Members of the Student Community and Respondents Who Are Not Students (Percentage for Each Group)

Despite the dire conditions of the war, the vast majority of students experience a moderate or strong ability to enjoy life (42.3% and 33.85%, respectively). These figures also exceed the results obtained from the other sub-group—non-students (Figure 2).

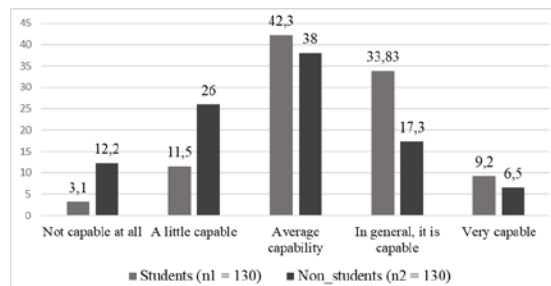


Figure 2. Ability to Enjoy Life Among Students and Non-Students (in % for Each Group)

It should also be noted that students are significantly more optimistic about the future compared to non-student respondents (see Figure 3).

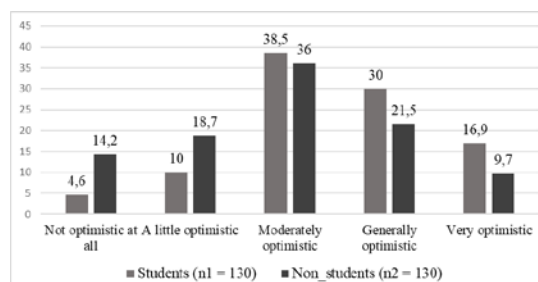


Figure 3. Degree of optimism about the future among students and non-student respondents (in % for each group)

Since the article length requirements do not allow to present the data in full, it notes that according to the methodology measuring subjective well-being, students generally report high levels of well-being (indicating greater well-being) and exceed similar measures from the non-student respondents' sub-sample in almost every scale. For instance, the majority of student respondents believe they can control their lives, rating this ability at an average level or higher (80%). Specifically, 34.6% rate this ability as high, and 12.3% as very high. About 55% of students are very or extremely satisfied with themselves as individuals, with no respondents expressing dissatisfaction. Additionally, 88% of students are at least moderately satisfied with their appearance. Just over 80% believe they can live their lives as they wish, and approximately 94% feel they have the opportunity to grow and develop (with 44.6% and 19.23% feeling this strongly and very strongly, respectively).

Although authors did not calculate the level of each respondent's subjective (psychological) well-being, the generalized analysis of the data from the student sub-sample, compared with the non-student sub-sample, indicates that the overall level of subjective well-being among students from Kharkiv can be characterized as aiming towards high levels.

Now, let's examine some of the most significant data obtained from the questionnaire on neuro-psychic stress. These results align with those presented earlier. For example, more than a third of students (35.4%) report not experiencing any physical discomfort, which is twice as many as among non-student respondents. The vast majority of students (56.9%) experience only slight physical discomfort. Among students, only 7.7% experience a significant amount of physical discomfort (Figure 4).

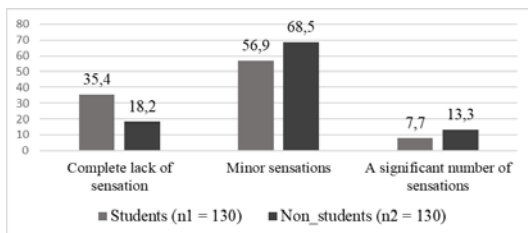


Figure 4. Perception of Physical Discomfort Among Student Respondents and Non-Student Respondents (in % for each group)

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).

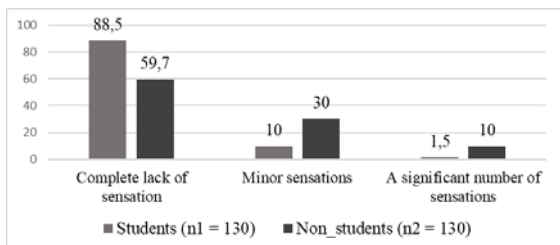


Figure 5. Sensitivity to External Stimuli Among Members of the Student Community and Non-Students (in % for each group)

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).

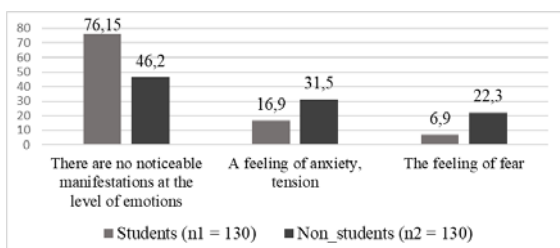


Figure 6. Emotional Responses Among Students and Non-Students (as % within each group)

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).

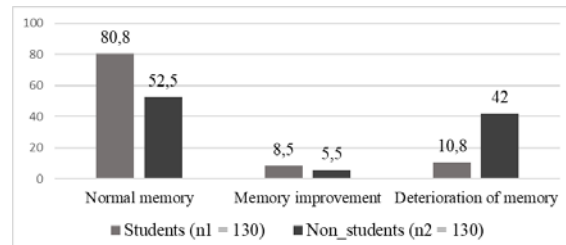


Figure 7. Memory Characteristics Among Student Respondents and Non-Student Respondents (in % for each group)

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).

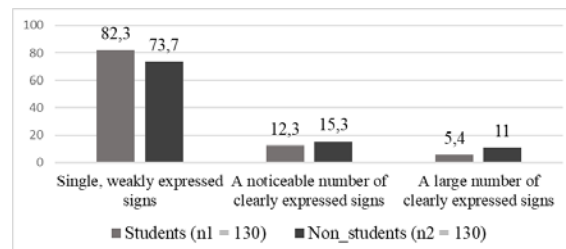


Figure 8. Prevalence (Generality) of Stress Among Student Representatives and Non-Students (in % for each group)

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).

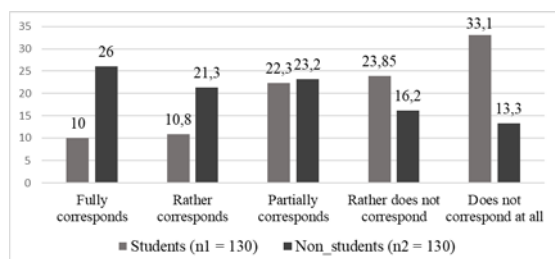


Figure 9. Responses of student community members and non-student respondents to the question "To what extent do you experience startle reactions to sudden noise?" (in % for each group)

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.

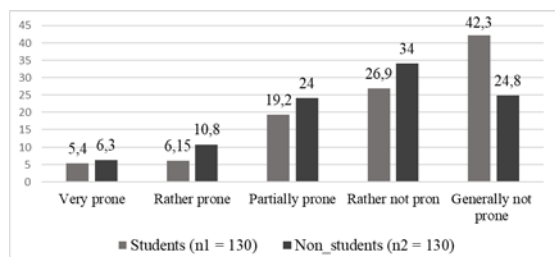


Figure 10. Responses of students and non-student respondents to the question "To what extent are you prone to displaying uncontrolled anger without any reason?" (as a % for each group)

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).

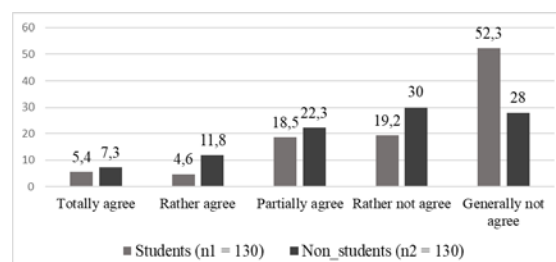


Figure 11. Responses of student and non-student respondents to the question "To what extent do you agree that you recently had to face a very dangerous situation?" (in % for each group)

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 ushkodzhennid 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. Merezhko 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*).

The well-known English judge, Lord A.T. Denning, explains the shift away from the theory of absolute sovereignty in interstate practice as follows: "The last 50 years have seen a complete transformation of the functions of the sovereign state. Almost every country is now engaged in commercial activities. Countries have governmental agencies or establish their own legal entities that participate in global markets. They charter ships, they purchase goods, they issue letters of credit. This transformation has altered the rules of international law regarding sovereign immunity. Many states have now abandoned the rule of absolute sovereignty. So many states have abandoned it that it can no longer be considered a rule of international law. The theory of absolute sovereignty has been replaced by the doctrine of limited sovereignty. This doctrine grants immunity to governmental actions, described in Latin as *jure imperii*, but does not grant immunity to commercial actions, *jure gestionis*" [17].

The spread of the concept of limited immunity worldwide is driven by the development of economic relations between countries and the increasing involvement of states in these activities. States enter into various foreign trade agreements on their own behalf, engage in investment activities, obtain loans from foreign banks, and use maritime transport for trade purposes. Through these actions, they effectively position themselves as merchants, traders, or as private individuals and legal entities, which allows courts to treat them as ordinary participants in the commercial process. According to the Law of Ukraine "On International Commercial Arbitration" of 1994 [22], commercial activities can occur across various sectors of economic life, not limited solely to traditional commercial relations. These activities may include agreements for the supply or exchange of goods and services, distribution agreements, trade representation, factoring transactions, leasing, engineering, construction of industrial facilities, investment, financing, provision of advisory services, purchase and sale of licenses, banking services, insurance, operating or concession agreements, joint ventures, and other forms of industrial or business cooperation, as well as the transportation of goods and passengers by air, sea, rail, or road. Today, states cannot avoid engaging in commercial activities; moreover, they actively seek to participate in them. Therefore, states that aim to expand their involvement in international private law relations must be prepared to limit their immunity. The global community is developing various mechanisms to define the boundaries and scope of state immunity, among which the conclusion of relevant international treaties is particularly effective.

The European Convention on State Immunity of May 16, 1972 [9] is of particular significance for the development of the doctrine of state immunity, as it is based on the concept of limited immunity and delineates exceptions to state immunity, with commercial activities being especially prominent. The European Convention of 1972, along with other international documents, draft international instruments, and national laws, adopts the approach of listing specific types of actions that are commercial in nature, for which a foreign state cannot claim immunity. This approach, as described by L. Boucher, is known as a "negative list" [4].

The European Convention on State Immunity of 1972 does not provide a definition of commercial activity or commercial transaction. The document merely states that "a State may not invoke immunity in a court of another State if it has in the territory where the proceedings are taking place a bureau, agency or other establishment through which it carries on industrial, commercial or financial activities in the same manner as a private person, and if the proceedings relate to those activities of the bureau, agency or establishment" (Article 7, paragraph 1) [9].

National laws on state immunity in countries such as the United Kingdom, the United States, Canada, Australia, Singapore, and South Africa were adopted in the 1970s, based on the provisions of the European Convention on State Immunity of 1972. These laws also reflect the principle of limited state immunity and

provide for exceptions to this principle. The structure of these national laws closely mirrors that of the Convention, often replicating its categories of norms in terms of content and the subject matter of legal regulation. In countries that have not adopted specific laws on state immunity, the issue of granting immunity to a foreign state falls within the jurisdiction of the courts. Most European countries, including Austria, Belgium, Denmark, Finland, Greece, Italy, the Netherlands, Germany, Norway, Switzerland, and the United Kingdom, are among those that do not have special legislation governing the immunity of foreign states.

The UN Convention on Jurisdictional Immunities of States and Their Property, dated December 2, 2004 [24], holds significant importance due to its potential universality, although it has not yet entered into force because the required ratification conditions have not been met (Article 30). Like the European Convention of 1972, the UN Convention of 2004 establishes exceptions to the general rule of state immunity in the context of their commercial activities (Article 10 "Commercial Transactions"). According to this article: "1. If a State enters into a commercial transaction with a foreign natural or legal person and, by virtue of applicable rules of private international law, a dispute concerning that commercial transaction is subject to the jurisdiction of a court of another State, that State may not invoke immunity from jurisdiction in the consideration of a case arising out of that commercial transaction. 2. Paragraph 1 shall not apply: (a) in the case of a commercial transaction between States; or (b) if the parties to the commercial transaction expressly agree otherwise."

The primary exception to the principle of state immunity is outlined in Article 10 of the UN Convention, which states that "if a State enters into a commercial transaction with a foreign natural or legal person and, by virtue of applicable rules of private international law, a dispute concerning that commercial transaction is subject to the jurisdiction of a court of another State, the State may not invoke immunity from jurisdiction in the consideration of a case arising out of that commercial transaction" (Article 10(1)) [24]. It should be noted that the application of this Article 10 of the 2004 UN Convention depends on the classification of the dispute as involving a "commercial" or "non-commercial" transaction, as defined in subparagraph "c" of paragraph 1 of Article 2 of the Convention.

General exceptions to state immunity, as established by international legal instruments, include commercial transactions, employment contracts, personal injury or damage to property, intellectual property, and industrial property, among others. The most significant exception is a state's commercial activities. The definitions of "commercial activity" and "commercial transaction" of a foreign state, as provided in international agreements and modern codifications, are crucial for determining the application of functional (limited) state immunity in private international law. Even if a court recognizes a party to a dispute as a "foreign state," it will deny immunity if the foreign state is engaged in commercial activities as a subject of private international law.

According to the Legal Encyclopedia, the term "commercial activity" derives from the Latin *commercium*, meaning trade. In a broad sense, it refers to activities in the field of trade and commerce, which, with the development of economic relations, have increasingly encompassed a wider range of parties and types of economic activity [15]. In modern foreign legislation, the concept of commercial activity is employed in both a narrow (trade) and broad sense. This approach is reflected in the practice of most countries, where the broadest interpretation of commercial (trading) activity is commonly used. This concept includes any activity of an economic nature, such as agreements arising from the production activities of industrial, agricultural, construction, publishing, entertainment, and other enterprises; agreements of commercial, banking, and other enterprises related to the circulation of goods and money; agreements of transport, insurance, and forwarding enterprises involving transportation, storage, insurance, and other operations related

to the circulation of goods; and agreements related to ancillary industrial and commercial activities, such as leasing for a trading enterprise, advertising of goods, and similar activities.

According to the Principles of International Commercial Contracts adopted by the International Institute for the Unification of Private Law (Unidroit), the concept of international *commercial contracts* extends not only to contracts related to the exchange of goods, but also to service contracts, as well as investment, concession agreements, and more. The only exceptions are consumer agreements [25].

The US Foreign Sovereign Immunities Act of 1976 also outlines circumstances under which a foreign state engaged in commercial activities and establishing a jurisdictional connection with the United States will not be entitled to immunity. The Act states that "foreign sovereigns are immune from the jurisdiction of the courts of the United States except in limited specified circumstances" (§ 1604). To bring a lawsuit against a foreign sovereign, the case must fall under one of the exceptions listed in the Act (§ 1605-1607). Similar provisions are found in the laws of the United Kingdom, Canada, Australia, and other countries. Like the US law, these laws specify that a foreign state is not granted immunity from enforcement actions concerning property used for commercial (trade) purposes.

The 1976 US law identifies several scenarios in which a foreign state engaged in commercial activities and establishing a jurisdictional connection with the United States will not be entitled to immunity. First, there is the waiver of immunity by a foreign state, either explicitly or implicitly. In other words, a foreign state does not enjoy immunity from the jurisdiction of US federal and state courts if it has waived its immunity or has taken actions indicating this, such as participating in a lawsuit or filing a counterclaim. Secondly, immunity is not granted when a foreign state conducts commercial activities within the United States or engages in activities outside the United States that have a direct impact within the country. Thirdly, the Act applies when a foreign state performs "an act outside the territory of the United States in connection with commercial activity and that act has a direct effect in the United States." Thus, when a foreign state engages in commercial activity anywhere, and that activity has a "direct effect" in the United States, the foreign state may be held liable under the Act. For example, a foreign state's commercial activities abroad, such as price fixing, that result in price effects within the United States, may lead to the foreign state being held liable under the Act.

The 2004 UN Convention offers a generalized definition of a commercial transaction: "A commercial transaction means: (a) any commercial contract or agreement for the sale of goods or the provision of services; (b) any loan or other financial transaction, including any obligation to guarantee or indemnify such a loan or transaction; (c) any other contract or agreement of a commercial, industrial, trade, or professional nature, except for employment contracts" (Article 2, paragraph 1, subparagraph (c)).

The subsequent part of this article specifies the criteria for classifying commercial agreements: "In determining whether a contract or agreement qualifies as a 'commercial transaction' under Article 2(1)(c), the nature of the contract or agreement shall be the primary consideration. However, the purpose of the contract or agreement should also be considered if the parties have so agreed or if, according to court practice, that purpose is relevant to determining the non-commercial nature of the contract or agreement" (Article 1(2)).

The debate over the criteria for classifying commercial agreements—whether to consider only the nature of the contract or also its purpose—was contentious within the International Law Commission during the Convention's drafting. As Yevgenii Kornichuk notes, "The inclusion of the purpose clause was strongly supported by developing countries but opposed by Western countries[12]. The main argument against considering the purpose is that government actions ultimately serve

sovereign purposes, which could lead to a return to absolute immunity, especially concerning politically sensitive issues like investment disputes." [14]

Determining the commercial nature of an agreement or contract involving a state as a party can be challenging. The traditional approach to distinguishing between *jure imperii* (sovereign acts) and *jure gestionis* (commercial acts) involves assessing the nature of the state's activities or actions and, in some cases, the purpose of the transaction. Modern codifications emphasize the principle of the transaction's nature. The European Convention on State Immunity of 1972 adheres to the doctrine of functional immunity but does not provide criteria for differentiating between *jure imperii* and *jure gestionis* activities, only listing instances where the state does not enjoy immunity.

National laws enacted after the 1972 Convention generally reflect similar principles. The 2004 UN Convention on Jurisdictional Immunities of States and Their Property also specifies in Article 2(2) that determining whether a contract is commercial should primarily consider its nature. However, the purpose of the contract should also be considered if the parties have agreed to it or if applicable law regards the purpose as relevant to determining the contract's commercial character. Most national courts prefer to focus on the nature of state agreements rather than their purpose. Foreign scholars argue that a clear distinction between *jure imperii* and *jure gestionis* actions, as well as the criteria for defining commercial versus non-commercial state activities, requires further justification. [11]

Discussions during the work of the UN International Law Commission and subsequent negotiations on the 2004 draft Convention highlight varying approaches to defining this concept across different legal systems [21]. For example, the US Foreign Sovereign Immunities Act of 1976 [26] stipulates that immunity will not be granted "when the cause of action arises out of commercial activities conducted by a foreign state within the United States or from an act performed outside the United States in connection with the commercial activities of a foreign state outside the United States, provided the act has direct consequences for the United States" (§ 1605(a)(2)). Furthermore, property of a foreign state located in the United States and used for commercial activities there is not immune from measures to secure claims or foreclosure based on a court decision. The Act defines commercial activity to include either ongoing activities or specific transactions or actions. Here, the key criterion for determining the nature of a foreign state's action is its nature rather than its purpose [10]. In the case of the Federal Bank of Nigeria, the US Court of Appeals ruled: "If the activity is one that a private person could engage in, it does not give rise to immunity" [5]. Thus, when assessing the commercial nature of an act by a foreign state, US courts determine whether it could be conducted by a private person [8]. This stance is evident in the US Supreme Court's decision in *Republic of Argentina v. Weltover*, where it concluded that the purpose behind a foreign state's activities is irrelevant for determining their commercial nature. Instead, the decisive factor is whether a private person could undertake similar activities [19].

To determine the nature and content of a transaction involving the state, it is important to assess whether the transaction could be conducted by a private individual or if it necessitates the exercise of the state's sovereign power. As Professor O. Merezhko notes, "Contracts for the international sale of goods involving a state as one of the parties should be classified as *acta jure gestionis*, meaning they are of a commercial nature. Similarly, transportation transactions where the state is a contracting party should be regarded as purely commercial and may be governed by international trade law. This is because transportation agreements involving state entities such as postal or railway organizations are commercial in nature and do not require the state to act in its sovereign capacity" [16].

Despite the existence of the 1978 *Act on State Immunity* [23],

UK law lacks a general concept for categorizing which foreign state actions are commercial. The law follows the structure of the European Convention on State Immunity and enumerates acts to which state immunity does not apply [10]. It defines a commercial action by describing its nature and listing relevant types of contracts. The Act states: "The State does not enjoy immunity in legal proceedings relating to (a) a commercial transaction entered into by the State, or (b) a duty of the State which, by virtue of a contract (commercial or non-commercial), is to be performed wholly or partly in the territory of the United Kingdom" (Part I, Section 3, clause 1). The term "commercial transaction" is defined as follows: (a) any contract for the supply of goods or services; (b) any loan or other transaction involving financing, or any guarantee or indemnity related to such a transaction or other financial obligation; (c) any other transaction or activity (commercial, industrial, financial, professional, or similar) that a State enters into or engages in outside its sovereign authority (Part I, Section 3, clause 3) [23]. Thus, determining the commercial nature of state contracts requires considering their nature, and in some cases, their purpose.

Australian law defines a commercial transaction as "a commercial, trade, business, professional, industrial, or similar transaction, including contracts for the supply of goods or services, loans, other financial arrangements, and financial guarantees" [20].

The criterion of the "nature of the acts" is also reflected in the European Convention on State Immunity (1972), although some of its provisions (Articles 1-3, 12) approach the concept of limited immunity. They establish conditions and forms for waiving immunity by the state. A similar "mixed" approach is found in the Draft Articles on Jurisdictional Immunities of States and Their Property, developed by the UN International Law Commission (UN International Law Commission Draft Articles on State Immunity [27]). While the predominant influence of the "nature of actions" criterion is evident, the purpose of the state's commercial contract may also be considered in certain cases. For instance, Article 2(2) of the Draft Articles refers to the practice of the state party to the contract, indicating that such purpose may suggest the non-commercial nature of the contract or transaction.

Therefore, to distinguish between commercial and non-commercial actions of the state, international regulations, national legislation, and judicial practice apply two main criteria: *the nature and character of the specific action, and the purpose of the action*. To determine the commercial nature of the state's actions, both court practice and international law doctrine consider whether such activities could be performed by a private person.

As noted above, state immunity does not cover commercial actions, making it crucial to identify what constitutes commercial actions of a state and how they differ from sovereign actions. In private international law, a state's commercial activity involves its economic engagements as a participant in international economic relations to achieve market goals, ensure profitability, and interact with other market participants through commercial contracts. Such activity is characterized by private law principles and aims to generate profit through property use, sale of goods, provision of services, or performance of work for foreign individuals or entities.

To mitigate or prevent potential property losses, the state, like other commercial entities, takes necessary measures, including commercial risk insurance. International commercial activity involves organizing and executing the exchange of goods, services, and creative outputs between two or more parties to a commercial contract. This activity transcends national borders and includes the movement of property, goods, services, capital, or personnel, contributing to the formation of a global market.

The parties to a commercial transaction engage in various contractual relations, such as trade, property, investment, and

concessions, as defined by international legal instruments and national legislation. The predominant criterion for determining the commercial nature of transactions involving the state is the nature (character) of the actions. However, the purpose of the commercial contract should also be considered in certain cases.

International law, founded on the principle of equality of parties and the principle of *pacta sunt servanda*, mandates that all parties (both individuals and legal entities, including the state) fulfill their contractual obligations in good faith and enjoy equal rights. The principle of *pacta sunt servanda*, as a fundamental legal principle, applies uniformly across all legal systems and to all legal phenomena, binding both individuals and states.

However, a key issue arises when a state is a party to a commercial contract: as a sovereign entity, the state enjoys certain privileges that serve as exceptions to the principle of *pacta sunt servanda*, which do not apply to individuals and legal entities. These exceptions are closely tied to the concept of state sovereignty and aim to protect the public interests of the state. For instance, the state may have the right to nationalize foreign property on its territory in certain situations for the public good. Nevertheless, as arbitration practice demonstrates, "the state cannot unilaterally release itself from fulfilling its contractual obligations by invoking its sovereign power" [2]. When the state voluntarily undertakes obligations under a commercial contract, this commitment does not undermine its sovereignty or affect the application of *pacta sunt servanda*.

One way to ensure equality between parties and uphold the principle of *pacta sunt servanda* in commercial contracts involving a foreign state is through the use of a stabilization clause. It is important to note that a state, by virtue of its sovereignty, has the authority to change its laws at any time, which can alter the legal relations between the parties. According to G.R. Delom, "to prevent such scenarios, parties often include a stabilization clause (also known as a 'grandfather clause') in the contract. This clause stipulates that the contract will be governed by the law in effect at the time of its conclusion, and any subsequent changes in legislation will not affect the contract" [6]. An example of a stabilization clause is as follows: "This agreement cannot be canceled by the government, and the terms contained in the agreement cannot be altered in the future by any legislative act, administrative measure, or other actions of the executive branch" [17].

Regarding the legal effectiveness of the stabilization clause, it is important to note that not all legal systems may recognize it. From the perspective of constitutional law, a state cannot limit its legislative or executive powers by entering into a private contract [18]. Therefore, a court in the contracting state that reviews the validity of the stabilization clause may not use it to restrict the sovereign power of the state. Similarly, a foreign court might refuse to enforce a stabilization clause that conflicts with the sovereign power of another state, due to the doctrine of "act of state" [28].

4 Conclusion

In the second half of the twentieth century, the participation of states in international private legal relations with counterparties representing private law subjects of other states increased significantly. States are increasingly involved in such activities and are unique participants in these relations due to their immunity. These state participations in international private relations are governed by international legal instruments, with the European Convention on State Immunity of 1972 being particularly significant. The UN Convention on Jurisdictional Immunities of States and Their Property of 2004 also plays a role in this regulation, but it has not yet been ratified as required by Article 30.

Both conventions underscore state immunity but establish certain exceptions, with commercial activity being a principal exception. A state cannot claim immunity from jurisdiction in a foreign court if it is involved in a commercial transaction with a foreign individual or entity. Similar provisions are

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. Merezhko, 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

THE ESSENCE AND SCOPE OF UKRAINE'S VICTORY IN THE CONTEXT OF RUSSIA'S TOTAL WAR AGAINST THE UKRAINIAN STATE

^aANATOLII RACHYNSKYI, ^bOLEKSANDR ZIUZIA

^{a,b}*Taras Shevchenko National University of Kyiv, Educational and Scientific Institute of Public Administration and Civil Service, 12/2, Akademika Romodanova Str, 04050, Kyiv, Ukraine*
email: ^aanatolii.rachynskiy@knu.ua, ^bzu_alex@ukr.net

Abstract: The purpose of this article is to clarify the essence and scope of Ukraine's victory in the context of Russia's total war against the Ukrainian state. A system-situational approach, historical analysis, and modeling methods were employed to address the research questions. The article demonstrates that a military victory in the physical realm becomes less significant than its representation in virtual space, where it can be shaped through propaganda in the public consciousness. The factors influencing the dynamics of scientific and official discourse regarding perceptions of victory in modern warfare are identified. It has been established that the essence of Ukraine's victory in the total Russian-Ukrainian war is as follows: in the military context – the defeat of Russia and Ukraine's achievement of the political and military-strategic objectives of its national and just war; in the political context – subordinating Russia to the goals and objectives of Ukraine's diplomatic and strategic efforts aimed at restoring its territorial integrity; and in the praxeological context – Ukraine's achievement of a peace superior to that which existed before the war. Ukraine's victory in the total Russian-Ukrainian war, in substantive terms, consists of: in the military context – the defeat of Russian armed forces and the cessation of hostilities within Ukraine's borders; in the political context – the restoration of Ukraine's territorial integrity; and in the international political context – achieving victory with guarantees of state sovereignty, territorial integrity, and the inviolability of borders from NATO and the EU, as well as securing peace without Russia's geopolitical dominance, a peace based on the rule of international law rather than the rule of force.

Keywords: national security, state sovereignty, public administration, territorial integrity, total war, victory in the war, Ukraine, Russia, goals of war, phenomenological model of victory.

1 Introduction

In Ukraine's official national security discourse, the Russian Federation's aggressive actions against Ukrainian statehood are defined as direct threats to Ukraine's national interests [14]. This reality underscores the connection between the broader issue of ensuring Ukraine's national security and the critical scientific and practical tasks of studying how to achieve victory in the Russian-Ukrainian war.

Despite the substantial contributions of national scholars who have explored the problems of war and peace, it is important to acknowledge the lack of research specifically addressing the concept of Ukraine's victory in the context of the current Russian-Ukrainian war, which has taken on the characteristics of a total war.

Thus, the aim of this article is to clarify the essence and scope of Ukraine's victory under the conditions of Russia's total war against the Ukrainian state. This clarification, we believe, will facilitate the future development of a comprehensive set of effective measures to secure Ukraine's victory in this conflict.

2 Literature Review

The problems of war and peace, as well as the concept of victory in past and contemporary conflicts, have been examined in the works of national researchers, including V. Abramov [1; 21], P. Hai-Nyzhnyk [19], R. Dodonov [6], V. Golovchenko, M. Doroshko [4; 3], V. Horbulin [5; 24], O. Zozulia, A. Lepikhov, H. Khrapach, V. Kyrylenko, and M. Shevchenko [25-26; 7; 20]. These authors analyze issues of war and peace through the lenses of social philosophy, the philosophy of history, political science, and military history.

An analysis of the scientific contributions of these scholars reveals that the category of "victory" is employed across a wide range of processes and phenomena in the military, domestic, and foreign policy domains, including:

- The defeat and complete demilitarization of the armed forces of the aggressor state.

- The destruction of the aggressor state's economy and the overthrow of its political regime.
- The capture of territory from the aggressor state.
- The dismantling of the aggressor state's system of governance and its relationship with the public.
- The dissolution of the aggressor state's military and political alliances.
- The demoralization of the aggressor state's population and military forces, including the erosion of their capacity to resist.
- The cessation of hostilities on terms dictated by the victor, formalized through relevant international legal agreements.

3 Method

To address the research problems, the following methods were employed:

- A systemic-situational approach to identify the specific threats to Ukraine's state sovereignty amid the ongoing total Russian-Ukrainian war.
- A historical analysis method to examine the experiences of modern warfare and the pathways to achieving victory in these conflicts.
- A modeling method to describe a phenomenological model of victory in war.

The article explores the essential characteristics that a robust state security system should possess, one that needs to be developed within the Ukrainian state.

4 Results and Discussion

The national objective of Ukraine's security policy is victory in the Russian-Ukrainian war [14].

Traditionally, the concept of "victory in war" is understood as the defeat of the enemy and the achievement, by one of the belligerent parties (whether a state or a coalition), of the war's political and military-strategic objectives. In the context of military operations, the formula for victory in a conventional war between state actors remains consistent: it includes the inevitable defeat and destruction of the enemy's armed forces, the collapse of its economy, and the overthrow of its political regime, which often entails the occupation of its territory. Typically, the immediate consequence of victory is the cessation of hostilities on the victor's terms, formalized through an international legal document, such as an act of capitulation, an armistice agreement, or a peace treaty.

It should be noted that, by far, the primary manifestation of Ukraine's victory in the national war with Russia would be success in the armed struggle—specifically, the defeat of Russian armed forces and the liberation of Ukrainian territories under occupation. A direct victory in this war will be achieved through the military efforts of the Armed Forces of Ukraine. However, in the pursuit of victory in a modern war, it is essential to consider a number of factors that significantly, or even decisively, influence the course of the conflict and the attainment of victory, such as:

- 1) Transformations and erosion of state actors – The state's loss of its monopoly on violence, where the right to use force is increasingly privatized by other actors in international relations, particularly transnational corporations (TNCs), which maintain private military companies (PMCs) for various purposes [24].
- 2) Transformations in warfare, specifically:
 - Complication of the war domain – Modern warfare extends beyond the traditional military domain, encompassing social, psychological, and cognitive dimensions. The

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., & Ziuza, 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. Ziuza, 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>

Primary Paper Section: A

Secondary Paper Section: AD, AE

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: ^dgrinovamv@gmail.com, ^bbasenko_ruslan@ukr.net,

^eFazanvv@gmail.com, ^ddmitry.lobod@gmail.com,

^emarinazuenko1406@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.

Primary Paper Section: A

Secondary Paper Section: AM

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, ethnolinguistics, 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, 1, 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 шпionageжу?* (*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); *Передади 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 запустив 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 «військомотів»* (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 орється; 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 about the arrest warrant for 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» поспішно повернувся у владне крісло?** (Why did the most famous “political corpse” hurry back to the seat of power?) (<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 укряття 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 півдесяток 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 пустого в порожнє* (plough the sand) – “doing something unnecessary” [3], e.g.: *Переливання з пустого 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 пустого 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) націлювся 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:

- куди не глянь (не кинь) (as far as the eye can see) – “everywhere; everywhere; around from all sides; in all respects” [4], e.g.: *Кадровий голод – це той виклик, який більш ніж 30 років не може подолати держава: куди не глянь – скрізь брак професійних кадрів* (<https://lb.ua>, March 15, 2023);

- за зачиненими дверима (behind closed doors) – “secretly; confidential behind closed doors” [3], e.g.: *Раніше ЗМІ повідомляли, що з 17 липня в Офісі президента почнуться зустрічі з представниками бізнесу, які відбуватимуться «за зачиненими дверима»... (Previously, the mass media reported that from July 17 meetings with business representatives will begin in the President's Office, which will take place “behind closed doors...”)* (<https://www.pravda.com.ua>, July 17, 2023);

- купити kota в мішку (to buy a cat in a bag) – “means to make a purchase without viewing it” [3], for example: *Як не «купити kota у мішку»? (How not to “buy a cat in a bag”?)* (<https://lvivdps.gov.ua>, July 7, 2024); *Більше за «кота в мішку» платити не потрібно: в Україні запустили новий корисний сервіс (There is already no need to pay more for a “cat in a bag”: a new useful service has been launched in Ukraine)* (<https://fakty.ua>, March 30, 2023);

- кіт наплакав (as scarce as hen's teeth, idiom) – “very little; very insignificant, small” [3], e.g.: *В парках знову можна знайти вільну лавочку, в кав'ярнях порожньо – бариста жаліються, що відвідувачів кіт наплакав. ... Як війна вплинула на бізнес...* (<https://www.pravda.com.ua>, May 24, 2024).

During the period of the COVID-19 quarantine and the spread of other viruses, the stable phrase *масковий режим* (mask mode) entered the circulation of information consumers – “the obligation to wear a medical mask in public places”, for example: *ВООЗ закликали відновити масковий режим (WHO called for the restoration of the mask mode)* (<https://suspijne.media>, January 5, 2024); *У кількох регіонах Іспанії частково відновили масковий режим (In several regions of Spain, the mask regime was partially restored)* (<https://www.eurointegration.com.ua>, January 6, 2024).

Occasionally we record stable expressions in the topic of sports and recreation, for example:

- лебедина пісня (swan song) – “the last (mostly the most significant) work, manifestation of talent or abilities, activity, etc. anyone” [3], e.g.: *Лебедина пісня Пятова: збірна України назвала стартовий склад на матч із Вірменією в Лізі націй* (<https://tsn.ua>, June 11, 2022);

- яблуку ніде впасти (no room to turn in) – “1) there are many people, it is very crowded; 2) very tight; 3) extremely many” [12, c. 147], e.g.: *Яблуку ніде впасти: на Світіязі – анишлаз* (<https://vsn.ua>, June 22, 2024).

Journalists fragmentarily use stable expressions in the subject of art and science, e.g.:

- впасти як сніг на голову (to fall like snow on one's head) – “something unexpected, sudden” [12], e.g.: *Незалежність точно не впала як сніг на голову: у Чернівцях презентували книгу Олександра Зінченка (“Independence definitely did not fall like snow on one's head”: a book by Oleksandr Zinchenko was presented in Chernivtsi)* (<https://shpalta.media>, February 20, 2024);

- боротьба на всіх фронтах (struggle on all fronts) – “everybody's activity for some common cause” [3], e.g.: *Боротьба на всіх фронтах: 30 українських митців представили роботи на віртуальній виставці Art on the battlefield (Struggle on all fronts: 30 Ukrainian artists presented their works at the virtual exhibition “Art on the battlefield”)* (<https://espresso.tv>, March 8, 2023);

- за сімома замками (behind seven locks) – “to be in complete isolation, secrecy; very reliable; completely inaccessible, incomprehensible for cognition; under special supervision,

protection” [3], e.g.: *Тасмниця за сімома замками. Вчені розповіли, що знаходиться під дном Світового океану (The secret behind the seven locks. Scientists have told what is under the bottom of the World Ocean)* (<https://uazmi.org>, July 17, 2023).

Sometimes, established compounds function in lay news, e.g.:

- перемивати кістки (wash the bones) – “engage in slander, slander someone” [3], e.g.: *Єфросиніна заявила, що не хоче «перемивати кістки» Виннику та Ямі: що ведуча про них думає* (<https://www.unian.ua>, September 14, 2023);

- сім разів відміряй, один раз відріж (measure seven times, cut once) – “before doing something, it is needed to think about it many times” [3], cf.: *Сім разів відміряй, один раз відріж: яким знакам Зодіаку краще подумати, перш ніж діяти (Measure seven times, cut once: which zodiac signs should think better before acting)* (<https://meta.ua>, February 23, 2024);

- службовий роман (office romance) – “intimate relationships between colleagues” [3], e.g.: *Службовий роман: історія кохання мера та сенатора збурює Берлін (Office romance: the love story of a mayor and a senator stirs up Berlin)* (<https://amalberlin.de>, January 5, 2024);

- на сьомому небі (in seventh heaven) – “boundless happiness” [3], e.g.: *Ліндсі Лохан вперше стала мамою: «На сьомому небі від щастя» (Lindsay Lohan became a mother for the first time: “In seventh heaven from happiness”)* (<https://karavan.ua>, July 18, 2023).

As evidenced by the corpus of factual material, the established compounds of the analyzed sample make it possible to convey more deeply the inner state of the speaker, his feelings, emotions, evaluation of certain objects, facts, phenomena, processes of reality.

4 Conclusion

Thus, in the texts of modern Ukrainian mass media, proverbs, sayings, phraseological units, catchphrases, etc. function. The most stable expressions are presented in texts on the subject of the Russian-Ukrainian war, in particular in publications dedicated to the leaders of the states that support the war. Stable phrases are used in articles about international relations, various problematic and conflict situations, economic, managerial and business affairs, less often analyzed linguistic units are recorded in the topics of sports and recreation, art and science, as well as in lay news. The majority of compounds found in the mass media are presented in academic and online dictionaries, occasionally journalists use new formations, sometimes transforming well-known expressions. For the most part, persistent expressions indicate negative processes, actions, often negatively characterize famous persons. The analyzed phrases express the texts of the Ukrainian mass media.

We see research prospects in the study of modified expressions in various functional styles of the Ukrainian language.

Literature:

1. Barannyk, D. (1983). Actual problems of mass information language research. *Linguistics*, 6, 13-17.
2. Dictionary of the Ukrainian language in 11 volumes / edited by I. K. Bilodida. Kyiv: Scientific opinion. 1970-1980.
3. Gorokh: online library. <https://goroh.pp.ua>.
4. Kalko, V. (2020). Ukrainian paremias as speech acts. *Studia Ukrainica Posnaniensia*, 8(2), 33-44.
5. Kochukova, N. I. (2005). Transformed phrases in the language of the Ukrainian press: on the material of Ukrainian. presses of the late 20th - early 21st centuries. Kyiv University “Pulsary” Publishing House.
6. Kovalevska, T. Yu. (2001). *Communicative aspects of neurolinguistic programming*. Odesa: Astroprint,
7. Mamich, M. (2014). Media styling in Ukraine: problems and prospects. *Stylistyka*, 23, 275-282.

8. Navalna, M., & Isaikina, O. (2022). Media Communications in Digital Day. *Economic Alternatives*, 28(3), 429-443.
9. Navalna M., Kostusiak N., Mezhov O., Sovtys N., Khomych T., Hlushych V., Adakh N., Prymachok O., Skliarenko O., Holoiukh L. (2024). Nomens for Designation of Persons in the Ukrainian Media Discourse. *AD ALTA: Journal of Interdisciplinary Research*, 14(1), Spec. Issue XL, 54-59. https://www.magnanimitas.cz/ADALTA/140140/papers/A_08.pdf
10. Navalna M., Shynkaruk V., Kostusiak N., Prosiannyk O., Chernobrov Yu., Adamchuk N. (2023). Lexico-Semantic Innovations in the Texts of the Ukrainian Mass Media on Military Topics. *AD ALTA: Journal of Interdisciplinary Research*, 13(1), Spec. Issue XXXIV, 132-139. http://www.magnanimitas.cz/ADALTA/130134/papers/A_19.pdf.
11. Navalna, M., & Spis, O. (2022). Functional and semantic peculiarities of the use of military vocabulary in the language of the newspaper "Den". *Transcarpathian Philological Studies*, 25(1), 36-42.
12. Phraseological dictionary of the Ukrainian language (1993). Academy of Sciences of Ukraine, Institute of Ukrainian languages. [compiler: V. M. Bilozhenko and others, editor: L. S. Palamarchuk (head) and others]. Kyiv: Nauk. Dumka, Book. 1.
13. Phraseological dictionary of the Ukrainian language (1993). Academy of Sciences of Ukraine, Institute of Ukrainian language. [compiler: V. M. Bilozhenko and others, editor: L. S. Palamarchuk (head) and others]. Kyiv: Nauk. Dumka, Book. 2.
14. Prudnykova, T. I. (2020). Trends in the development of the economic vocabulary of the Ukrainian language against the background of social dynamics. [PhD dissertation]. Lutsk: East European National University named after Lesya Ukrainka.
15. Shevchenko, L. I. (2001). *Intellectual evolution of the Ukrainian literary language: theory of analysis*. Kyiv: VOC "Kyiv University".
16. Shevchenko, L. I. (2013). Media linguistics in modern Ukraine: analysis of the situation. *Actual Problems of Ukrainian Linguistics: Theory and Practice*, 26, 3-13.
17. Shumarova, N.P. (2010). The role of ZMK in the development of the language situation. *Scientific Notes of the Institute of Journalism of Taras Shevchenko Kyiv National University*, 11, 45-56.
18. Sizonov, D.Yu. (2024). Media phraseology in the information space of modern Ukraine: a linguistic-stylistic and communicative-functional resource. [PhD Dissertation]. Kyiv: Taras Shevchenko Kyiv National University.
19. Snytko, O. S. (2020). Strategic narratives in the system of mechanisms for countering informational influences. *Actual Problems of Ukrainian Linguistics: Theory and Practice*, 40, 99-118.
20. Styshov, O. A. (2019). *Dynamics of the lexical structure of the modern Ukrainian language. Lexicology. Lexicography*. Bila Tserkva: 'Authority'.

Primary Paper Section: A

Secondary Paper Section: AI, AJ

GRAPHO-BARBARISMS IN THE HEADLINES OF UKRAINIAN MEDIA TEXTS

^aMARYNA NAVALNA, ^bNATALIIA KOSTUSIAK,
^cOLEKSANDR MEZHOV, ^dLIUDMYLA MARCHUK,
^eOKSANA BUHAIOVA, ^fSVITLANA NOVOSELETSKA,
^gNATALIIA SHAPRAN, ^hTETIANA KHOMYCH, ⁱTETIANA
MUSIICHUK, ^jVADYM BOBKOV

^{a,h}T. H. Shevchenko National University «Chernihiv Colehium»,
53, Hetmana Polubotka Str., 14013, Chernihiv, Ukraine

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

^dKamianets-Podilskiy Ivan Ohiienko National University, 61,
Ohiienko Str., 32300, Kamianets-Podilskiy, Ukraine

^eNational Academy of Culture and Arts Management, 9, Lavrska
Str., 01015, Kyiv, Ukraine

^{f,g,i,j}National University of Ostroh Academy, 2, Seminarska Str.,
358000, Ostroh, Rivne reg., Ukraine

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

^dlyudmylamarchuk60@gmail.com, ^hkbugajova777@gmail.com,
^fSvitlana.Novoseletska@oa.edu.ua,

^gnataliia.shapran@oa.edu.ua, ⁱvantrans2015@gmail.com,

^jtetiana.musiichuk@oa.edu.ua, ^vvadym.bobkov@oa.edu.ua

Abstract: The article analyzes the most used graphic barbarisms (grapho-barbarisms) in the headlines of the most widely circulated Ukrainian mass media. In accordance with the goal, the functional features of grapho-barbarisms in the language of modern mass media were investigated, their potential and stylistic role were clarified. Achieving the set goal required solving the following tasks: 1) to establish relevant non-linguistic factors affecting the actualization of grapho-barbarisms; 2) to interpret different types of words and phrases written in Latin, to highlight the topics of publications where they are used; 3) to determine the expediency/inexpediency of using grapho-barbarisms in the language of mass media, to characterize them in the context of language adaptation and in comparison with Cyrillic variants. According to the results of the research, it was established that graphic barbarisms form the largest thematic groups, which denote types of weapons and military equipment, various support tools, foundations, charitable institutions, volunteer organizations, subjects and concepts of the field of information technologies, names of sources of information, magazines, publishers, sites, etc. It was concluded that graphic barbarism prevails in the headlines of news genres. It has been observed that sometimes journalists use Cyrillic versions, but this phenomenon is fragmentary. Borrowings reproduced in the Latin alphabet complicate the perception of messages by information consumers and litter the Ukrainian literary language. The source base of the research consisted of the headline complexes, which contained words and phrases written in Latin, mainly collected from the Ukrainian media in 2024.

Keywords: vocabulary, borrowings, barbarisms, grapho-barbarisms, anglicisms, foreign language inclusions, abbreviations, extralinguistic factors, stylistic role.

1 Introduction

The dynamism of lexical processes provides linguists with inexhaustible resources for research, and also attracts the attention of writers, journalists, and native speakers in general. Changes in the language system usually occur precisely during the period of global transformations in social life. In such periods, there is a need to identify and systematize language units caused by the emergence of new social realities, and to carefully study the peculiarities of language processes that cause them.

Dynamic transformations clearly expressed in the modern Ukrainian language include the process of borrowing foreign vocabulary, the specificity of which is certainly not exhausted by its intensity alone. Borrowings that appeared in the Ukrainian language as a result of lexical interference are subject to semantic and stylistic changes and, along with the actual Ukrainian vocabulary, are the object of all changes occurring in the language. During the last three decades, we have observed an unprecedented intensification of borrowing, which began in the late 20th and early 21st centuries.

The penetration of words from other languages into the Ukrainian-speaking space became a prerequisite for the study of this linguistic phenomenon. Features of the functioning of nominations of foreign language origin in the mass media text were studied by K. Demchenko [4], R. Vyshnivskiy [21], N. Kostusiak [15], M. Lychuk [16], T. Mastruk [10], O. Mitchuk [14], Y. Molotkina, M. Navalna [15], and others. Linguists used

borrowing in various aspects, including O. Telezhkina [18] in poetic text, V. Lopushanskyi in speech [9], while L. Arkhipenko [1], D. Borys [2], Ya. Bytkivska [3], E. Karpilovska [6] focus attention on the problem of foreign words in the modern Ukrainian language in general.

Linguists have developed various approaches to the classification of borrowed words, which have been analyzed in terms of changes in their semantic structure, stages of lexical adaptation, reasons for penetration, etc. Despite this, we did not find any studies that proposed the classification of the latest borrowed lexemes, reproduced in the language of the mass media in Latin, that is, grapho-barbarisms. Taking into account the widespread use and active replenishment of journalism with grapho-barbarisms, we consider it necessary to characterize them on the basis of mass media headline constructions, since these linguistic units now constitute a considerable part of the vocabulary among the total number of borrowings.

In the linguistic literature, “barbarism (Greek βαρβαρισμός - foreigner) is a word or phrase in a foreign language or created according to a foreign model, which has not become commonly used, does not correspond to the norms of the given language, retaining its national-connotative color” [20]. Sometimes, words or expressions in a language foreign to the original text, written in a foreign language, or transcribed without morphological or syntactic changes are called foreign language inclusions. “The foreign language component, consciously used by the author in the work, often functions as a stylistic means, becoming a characteristic feature of idiosyncrasy. The semantic load of foreign language inclusions can be extremely significant and vary from the need to create a specific “foreign” atmosphere in the work to the performance of the functions of a key fragment of the text, without which the understanding of the author’s intention seems impossible and which therefore does not imply any substitution or change of format or volume” [5, p. 62]. In our opinion, it is more appropriate to call expressions in a language foreign to the Ukrainian text, in particular those reproduced in Latin, grapho-barbarisms.

The purpose of the article is to investigate the functional features of grapho-barbarisms in the language of modern mass media, to find out their potential and stylistic role. Achieving the set goal involves solving the following tasks: 1) to establish relevant non-linguistic factors affecting the actualization of grapho-barbarisms; 2) to interpret different types of words and phrases written in Latin, to highlight the topics of publications where they are used; 3) to determine the expediency/inexpediency of using grapho-barbarisms in the language of the mass media, to characterize them in the context of language adaptation and in comparison with Cyrillic variants.

2 Materials and Methods

The source base of the research was the headline complexes, which contained words and phrases written in Latin, mainly collected from the Ukrainian media in 2024.

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 barbarisms collected from the language of the mass media; complex analysis directed at the study of barbarisms in the semantic aspect; contextual semantic analysis, which made it possible to consider barbarisms within specific speech situations; component analysis used to study the same characteristics of barbarisms.

3 Results and Discussion

Grapho-barbarisms are quite widely represented in the headline complexes of Ukrainian popular mass media. In terms of frequency of use and number, tokens written in Latin are predominant, denoting various types of military equipment and weapons, in particular:

1. **Patriot** is the designation of the anti-aircraft missile system (SAMS), which is in service with the armies of other countries, and now also Ukraine, e.g.: *Система ППО Patriot від Німеччини прибула в Україну – Зеленський* (*The Patriot air defense system from Germany arrived in Ukraine - Zelenskyi (headline)*) (<https://day.kyiv.ua>, July 22, 2024); *Система Patriot і зміцнення безпеки в Чорноморському регіоні: Україна та Румунія уклали безпекову угоду* (*The Patriot system and strengthening of security in the Black Sea region: Ukraine and Romania concluded a security agreement (headline)*) (<https://day.kyiv.ua>, July 11, 2024); *Зеленський обговорив із конгресменами США постачання додаткових систем Patriot* (*Zelenskyi discussed with US congressmen the supply of additional Patriot systems (headline)*) (<https://day.kyiv.ua>, July 1, 2024); *Україна в пріоритеті: США скасує замовлення інших країн на системи Patriot* (*Ukraine is a priority: the US will cancel orders from other countries for Patriot systems (headline)*) (<https://umoloda.kyiv.ua>, June 20, 2024). Since the English nomination belongs to the frequently used ones not only in the Ukrainian media space, but also in oral communication, it can be assumed that over time, as a result of the action of language adaptation, the analyzed barbarism will move to the passive language usage and will be replaced by the equivalent written in Cyrillic. We can see the tendency towards this in minor interspersions of Cyrillic variants, not recorded in the headlines, but present in the texts of the publications: «Ми обговорюємо кілька речей, які максимально потрібні: ППО, і передусім **«Пемпріомі»**, які збивають усі російські ракети, а також наша далекобійність і можливість знищувати російських терористів там, де вони є, включно з територією самої Росії. Нещодавній дозвіл на застосування західної зброї поза нашою територією для захисту Харкова та інших міст зміцнив нас від російських ударів. Але ми ще в пошуку додаткових **«Пемпріомі»** і потребуємо й надалі таких же сильних кроків, як були зроблені для нашої далекобійності...» – сказав Зеленський, виступаючи на саміті G7 в Італії в четвер (<https://interfax.com.ua>, June 13, 2024); *Військові аналітики кажуть, щоб захистити Україну, «Пемпріомі» мають прикривати всі її області* (<https://www.5.ua>, June 17, 2024). It is important to pay attention to the fact that the equivalent written in Cyrillic has undergone morphological development, which is evidenced by the acquisition of various case-number forms by this word, the expression of which involves endings.

2. **Starstreak** is the name of the British portable anti-aircraft missile complex, which is sometimes used with the abbreviation *HVM*, formed from the initial letters of the compound *High Velocity Missile*. In newspaper journalism of 2024, the token **Starstreak** functions in the context of the use of this type of weaponry in Ukraine and defense against threats from the air, e.g.: *Українські захисники під керівництвом британських інструкторів тренуються на системі ППО Starstreak у Британії* (*Ukrainian defenders under the guidance of British instructors train on the Starstreak air defense system in Britain (headline)*) (<https://day.kyiv.ua>, July 22, 2024). Similar to the nomination characterized earlier, the analyzed name also reveals some signs of adaptation to the system of the receptor language: we are talking about minor interspersions of the Cyrillic transliterate, which we come across both in the headlines and in the texts of publications printed, although not in 2024, but during the period of full-scale Russian-Ukrainian war: «Є! Знищили!»: ЗСУ вперше вразили ціль з британського ПЗРК **«Старстрік»** (headline). (<https://espresso.tv>, April 4, 2022); **«Старстрік»** призначений для ураження літальних об'єктів, що летять низько (<https://varta1.com.ua>, April 10, 2022). It happens that in one media article, the journalist uses both variants of the nomination of the anti-aircraft missile system in parallel: *Але для того, щоб Повітряні сили самотужки закрили небо над Україною одних ПЗРК **Стінгер** та **Старстрік**, наданих партнерами, недостатньо. **Stinger** та **Starstreak** – це переносні комплекси малого радіусу дії, призначені для знищення мало висотних цілей, такі як вертольоти* (*But for the Air Force to close the sky over Ukraine alone, the Stinger and*

Starstreak MANPADS provided by partners are not enough. Stinger and Starstreak are short-range portable systems designed to destroy low-altitude targets, such as helicopters) (<https://zmist.pl.ua>, April 30, 2024). The given context prompts to casually emphasize the transfer of the name of another portable surface-to-air anti-aircraft missile system, the formal explanation of which is related to the barbarism *Stinger* and its Ukrainian correlate *Стінгер*, that finds its way into media content occasionally.

3. **Hawk** is a token for the American long-range anti-aircraft missile complex, which is much smaller in size and weight compared to others. Its functions are also related to the destruction of aerial targets by missiles, e.g.: *Міністерство оборони Іспанії передасть Україні у вересні нову батарею ЗПК Hawk* (*The Spanish Ministry of Defense will hand over a new battery of Hawk air defense systems to Ukraine in September*) (<https://day.kyiv.ua>, July 25, 2024). In contrast to the previously characterized linguistic units, we did not find a Cyrillic counterpart to this grapho-barbarism.

4. **Mistral** is the name of an anti-aircraft missile complex, the purpose of which is to hit helicopters and airplanes. The analyzed lexeme is evidenced in newspaper journalism about the active use of these military and technical means, as well as about the prospects of receiving them from other countries: *Естонія доставила в Україну переносні ЗПК Mistral та ракети до них* (*Estonia delivered portable Mistral air defense systems and missiles to Ukraine (headline)*) (<https://day.kyiv.ua>, July 7, 2024). In the modern Ukrainian media space, we find cases of graphic transmission of this nomination by means of the Ukrainian language, e.g.: *Естонія передала Україні «Містралі» – ЗПК малої дальності з ракетами* (*Estonia handed over Mistral to Ukraine - a short-range air defense system with missiles (headline)*) (<https://news.liga.net>, July 6, 2024). The presented illustrative material proves that, in addition to graphic adaptation, the word undergoes morphological adaptation: it is implemented by inflection as an indicator of case and number categories.

The nominations for the designation of anti-aircraft missile systems are characterized by a certain commonality: they have been activated in the Ukrainian media publications since the beginning of the full-scale invasion of Russia. The analyzed lexemes function in publications in contexts about Ukraine's need for these military and technical means, about their supply and use in the occupied territories. All of these nouns often retain their English spelling, which can be explained by several factors: the use of the objects marked by them in many countries of the world; the fact that the English language has the status of the language of international communication; the fashion for anglicisms in the Ukrainian media. At the same time, it is worth noting the fragmentary attempts to convey these nominations using transliteration or transcription. In the first case, we trace a spelling close to the English variant, and in the second - an adaptation that implies a similarity in pronunciation. Despite the different ways of mastering, the studied Cyrillic correlates have a certain commonality: they often undergo morphological modifications, that is, they acquire the grammatical characteristics of the part of the language to which they fall.

5. **Leopard** is the name of a German combat tank, which is often accompanied by additional digital data, sometimes letters, that in the complex is the designation of the combat vehicle model. In the Ukrainian media space, the analyzed lexeme is used in the headlines of articles informing about the training of Ukrainian military to operate this type of equipment, as well as its use for the purpose of destroying the enemy: *На військовому полігоні в Польщі українські танкісти навчаються обслуговувати бойовий танк Leopard 2A4, – Генштаб* (*At the military training ground in Poland, Ukrainian tankers learn to service the Leopard 2A4 battle tank, - General Staff (headline)*) (<https://day.kyiv.ua>, August 5, 2024); *Україна отримала нову партію танків Leopard 2 від Іспанії* (*Ukraine received a new batch of Leopard 2 tanks from Spain (headline)*) (<https://day.kyiv.ua>, July 16, 2024). The headline *Хижак на*

фронти. Яка фішка танків **Леонард** і чому вони різні (<https://nv.ua>, March 12, 2024) is of interest, since it not only contains the Cyrillic version of the name of the military equipment, but also a secondary nomination that subconsciously leads to an associative connection with an animal that can quickly move and maneuver. Namely such characteristics are inherent in the tank of this model. Let us focus on the design of analyzed nominations in mass media. Mostly the English version, which works alongside the generic name, is written without quotation marks. According to this principle, the Cyrillic equivalent is often drawn up, which contradicts modern Ukrainian language norms, because the proper names of production brands of technical products, ships, planes, tanks, etc. should be put in quotation marks [13, p. 88-89], e.g.: *танк «Леонард»*.

6. **Apache** is the designation of an American helicopter that is in service not only with the US army, but also with other countries, cf.: *Польща купує у США 96 гелікоптерів Apache за \$10 млрд (Poland buys 96 Apache helicopters from the US for \$10 billion (headline))* (<https://www.pravda.com.ua>, August 13, 2024). Sometimes, the media write this name in Cyrillic, resorting to a transcription technique: *Створені компанією Boeing, «Апачі» можуть долати до 450 км (headline)* (<https://internetua.com>, July 20, 2024). Although such writing is fragmentary, it is evidence of the beginning of the language adaptation process. Incidentally, we would like to add that nowadays mass communication media use the designation *гелікоптер* more often, which is beginning to supplant the previously actively used lexeme *вертолім*. Presumably, this is related to its consonance with the Russian version, which causes negative associations with the enemy.

7. **Gripen** is the name of the Swedish fighter plane, the supply of which to Ukraine is currently being actively negotiated, e.g.: *Україна домовляється зі Швецією про передачу винищувачів Gripen, – Жовква (Ukraine is negotiating with Sweden on the transfer of Gripen fighters, - Zhovkva (headline))* (<https://day.kyiv.ua>, July 14, 2024). In the corpus of actual material, we do not observe the Cyrillic version of the lexeme under consideration, so the process of linguistic adaptation is not inherent to it yet.

8. **Nikken** – the designation of a machine intended for demining, e.g.: *Уряд Японії передав підрозділам ДСНС України ще 2 машини механізованого розмінування Nikken (The Japanese government handed over 2 more Nikken mechanized demining machines to the units of the State Emergency Service of Ukraine (headline))* (<https://day.kyiv.ua>, July, 10, 2024). The mentioned grapho-barbarism is presented in the mass media space only in this form.

9. **Trinity** is a token that serves as the name of aircraft-type drones, the production of which takes place in Germany: *Дрони, що сканують сотні гектарів території: що відомо про БПЛА Trinity, які німці безкоштовно передали Україні (Drones that scan hundreds of hectares of territory: what is known about Trinity UAVs, which the Germans gave to Ukraine for free (headline))* (<https://espresso.tv>, February 1, 2024).

10. **Magura** is the name of a Ukrainian surface unmanned boat, which has several graphic options: 1) in Latin and all capital letters, that is explained by such writing on a technical device; 2) in Latin only with the first capital letter (the specified design is justified by the fact that the formation of the lexeme is not related to the method of abbreviation); 3) in Cyrillic - this spelling is due to the Ukrainian production of an unmanned boat. Cf.: *Українські розвідники завдяки безпілотним морським дронам MAGURA V5 за півтора року уразили 18 російських суден (Ukrainian secret service men, thanks to unmanned MAGURA V5 marine drones, hit 18 Russian ships in one and a half years (headline))* (<https://day.kyiv.ua>, August 16, 2024); *Росіяни розібрали захоплений український морський ударний дрон Magura v5 та показали його складові та внутрішню будову (The Russians disassembled the captured Ukrainian Magura v5 maritime attack drone and showed its components and internal structure (headline))* (<https://suspilne.media>, March

1, 2024); *Морські дрони «Магура» українського виробництва вражають російські кораблі (headline)* (<https://suspilne.media>, April 19, 2024).

11. **DELTA** is a national military situational awareness system and another innovative product created by Ukrainians. We assume that writing in Latin is due to the use of this system not only by the Security and Defense Forces of Ukraine. It enables the exchange of information between various NATO allied states and enables the conduct of network-centric warfare. Similar to the nomination described above, the analyzed name also reveals a variant design, cf.: *Українська система DELTA отримала високу оцінку НАТО (The Ukrainian DELTA system received a high rating from NATO (headline))* (<https://umoloda.kyiv.ua>, July 14, 2024); *«Я бачу кожну нірку наших ворогів»: як українська система Delta палить російську армію (“I see every hole of our enemies”: how the Ukrainian Delta system burns the Russian army (headline))* (<https://armyinform.com.ua>, August 26, 2024); *«Це те, що ми можемо покласти на стіл світові». Як система «Дельта» допомагає воювати методами 2 сторіччя (headline)* (<https://www.pravda.com.ua>, August 28, 2024).

Among a number of grapho-barbarisms, phrases structured by two or more linguistic units are recorded, which denote companies, various types of military equipment and weapons. The Latin spelling of the names of foreign companies in Ukrainian media sources is explained by the fact that their activities usually take place outside Ukraine. In particular, the two-word nomination of the technological company Quantum Systems, which specializes in the design and production of small unmanned aerial vehicles, reveals such characteristics: *Держприкордонслужба отримала 28 картографічних дронів Quantum Systems типу «Trinity» (The State Border Service received 28 cartographic drones of the Quantum Systems of “Trinity” type (headline))* (<https://day.kyiv.ua>, July 30, 2024). The company recently opened a branch in Ukraine, which influenced the language adaptation of its name. A complex nomination, written with the help of graphic means of the Ukrainian language, but as close as possible to the original phonetic form, got into the mass media. It functions in parallel with its English counterpart: *Безпосередньо в Україну «Квантум-Системс» зайшли влітку 2023 року. Тоді в компанії повідомили про відкриття в Україні центрів сервісного навчання, підтримки та логістики. Досі Quantum-Systems постачала в Україну безпілотники-розвідники Vector від уряду Німеччини* (<https://espresso.tv>, February 1, 2024). The beginning of language adaptation is connected with the approach of transcription.

Several-word grapho-barbarisms can be complicated by an alphanumeric unit, such as the name of the Korean all-wheel drive SUV SsangYong Rexton RX 270 XDI, for example: *Прикордонники отримали позапляховик SsangYong Rexton RX 270 XDI та засоби радіоелектронної боротьби «Поліський РЕБ» (Border guards received the SUV SsangYong Rexton RX 270 XDI and means of radio-electronic combat “Polisky REC” (headline))* (<https://day.kyiv.ua>, July 5, 2024).

The nominations, written in Latin, include the name of the Sea Baby unmanned surface vehicle, developed by Ukrainian specialists. Despite the direct relationship of the product to Ukraine, its name is structured by two words from the English language, which, presumably, can be associated with the active process of European integration of Ukraine and the strengthening of its cooperation with various states, for example: *Sea Baby вразили мінами 4 кораблі РФ поблизу Криму – WSJ (Sea Baby hit 4 ships of the Russian Federation near the Crimea with mines - WSJ (headline))* (<https://umoloda.kyiv.ua>, June 24, 2024). In the same sentence, the source of information is indicated - the abbreviation barbarism *WSJ*, which is the name of a daily American newspaper, that we will analyze in more detail later.

A group of analytical grapho-barbarisms is structured by the combination *Storm Shadow* to denote a Franco-British air-to-ground cruise missile, e.g.: *Британія не дозволила Україні*

биту *Storm Shadow* під час наступу на Куриціні (Britain did not allow Ukraine to shoot by Storm Shadow during the Kurskchyna offensive (headline)) (<https://www.pravda.com.ua>, August 13, 2024).

Two-component one is the name of the AASM Hammer air-to-ground guided air bomb, the production of which, although not related to Ukraine, currently serves as a means of deterring the Russian offensive and destroying the enemy on the occupied territory of Ukraine, for example: *Повітряні сили оприлюднили рідкісні кадри застосування авіабомб AASM Hammer* (The Air Force has released rare footage of the use of AASM Hammer aerial bombs (headline)) (<https://www.pravda.com.ua>, August 14, 2024); *Нові французькі авіабомби AASM Hammer вже на фронті: де ЗСУ їх застосовують (відео)* (The new French AASM Hammer aerial bombs are already at the front: where the Armed Forces of Ukraine use them (video) (headline)) (<https://www.unian.ua>, March 3, 2024). The first component of the nomination is an abbreviation formed on the basis of the English compound *armement air-sol modulaire*, the second is a lexeme that, translated into Ukrainian, sounds like a hammer (*молот*) and serves as a means of implicit (hidden) indication of the power of the bomb and its performance in destroying the specified target. We hope that this name will be written in Cyrillic in the future. In this case, we recommend writing it in accordance with the current *Гаммер* spelling standards.

In the language of mass media, we trace a number of other English names containing complex abbreviated words. In particular, it is a token for the ATACMS tactical ballistic missile, which was transferred to Ukraine during the active phase of the Russian-Ukrainian war. The specified external factor influenced the activation of this name mainly in media news content, e.g.: *Не хочемо, щоб війна вийшла за межі України: речник Пентагону про заборону бити ATACMS по території РФ* (We do not want the war to go beyond the borders of Ukraine: the Pentagon spokesman on the ban on ATACMS strikes on the territory of the Russian Federation (headline)) (<https://day.kyiv.ua>, July 6, 2024). Since this designation is a combined abbreviation of *Army Tactical Missile System*, it is written only in capital letters. After entering the Ukrainian-speaking space and graphically adapting to the recipient language, the analyzed name underwent neutralization of the internal form of the word. The presence of only the first capital letter in the studied nomination indicates the loss of the derivational connection with the creative phrase. In addition, the coincidence of three consonants is not inherent in the Ukrainian language, which became a prerequisite for the penetration of the letter a between the letters k and m; it greatly simplified the pronunciation of the word, e.g.: *Україна отримала найновіші Атакамси* (headline)) (<https://nv.ua>, may 20, 2024).

The abbreviated word-form type is inherent in the barbarism *IRIS-T*, formed from the compound *InfraRed Imaging System Tail*. IRIS-T is an air-to-air missile equipped with an infrared homing head. Six countries, led by Germany, are involved in its creation, e.g.: *Оборонне відомство Німеччини має намір до кінця року поставити Україні ще два ЗПК IRIS-T, а також іншу зброю* (The German Ministry of Defense intends to deliver two more IRIS-T air defense systems to Ukraine by the end of the year, as well as other weapons (headline)) (<https://day.kyiv.ua>, August 16, 2024).

The group of sound abbreviations includes the name of the American reactive artillery system HIMARS, the formative basis of which is the compound *High Mobility Artillery Rocket System*, e.g.: *ЗСУ вперше вразили HIMARSами по курській області – зруйнована будівля ФСБ* (The Armed Forces of Ukraine hit by HIMARS for the first time in the Kursk region - the destroyed FSB building (headline)) (<https://umoloda.kyiv.ua>, June 24, 2024). The highlighted word in the given sentence is interesting because it combines a part written in Latin with a Cyrillic ending. The analyzed nomination belongs to the group of those ones that show signs of not only graphic mastery, implemented by means of transcription, but also grammatical, which is evidenced by the fact that the analyzed word belongs to

the group of variable nouns of the second declension and masculine gender: *Хаймарси знищили російські ЗПК у Білгородській області* (headline)) (<https://thepage.ua>, June 3, 2024). Sometimes the Cyrillic version is taken in quotation marks, which indicates the instability of writing and the continuation of the process of adaptation to the norms of the Ukrainian language, e.g.: *«Хаймарси» успішно викосили колону техніки РФ на території РФ збоку Харківщини, – Z-оглядач* (headline)) (<https://focus.ua>, June 2, 2024). A special colloquial and humorous flavor is given to the given media title by the figuratively used verb *викосити*, which serves as a means of expressing interstylistic transposition. Incidentally, we will add that in the means of mass communication, the adapted version *хаймарси* mainly functions in the plural.

In the media space, the alphanumeric designation of the single-engine fighter F-16 (Fighting Falcon F-16) is frequently used, understandable to the consumer of information even without adding a general concept. Such aircraft are very often mentioned in news content, interviews with military analysts, etc.: *Кулеба обговорив з главою МЗС Норвегії розширення ініціативи щодо F-16 та «формулу миру»* (Kuleba discussed with the head of the Foreign Ministry of Norway the expansion of the F-16 initiative and the “peace formula” (headline)) (<https://www.pravda.com.ua>, August 6, 2024); *Зеленський під час урочистостей до Дня Повітряних сил ЗСУ презентував винищувачі F-16 в українському небі* (Zelensky presented F-16 fighter jets in Ukrainian skies during the Air Force Day celebrations) (<https://day.kyiv.ua>, August 4, 2024); *Міністри закордонних справ України і Норвегії обговорили розширення коаліції F-16* (The foreign ministers of Ukraine and Norway discussed the expansion of the F-16 coalition (headline)) (<https://day.kyiv.ua>, August 9, 2024). Constant use in oral communication, frequent repetition in the language of the mass media of certain complex abbreviated words eventually makes them familiar to both journalists and native speakers; such language units become “long-lived abbreviations” [12, p. 33]. Among them, we note *F-16* and a number of other previously analyzed nominations, which are marked units of the corresponding time, as defined by O. A. Styshov, “nominations-marks of a certain era” [17, p. 161]. Over time, they go out of active use and replenish the passive fund of vocabulary, if the realities they denote are not relevant in society. In view of this, after the end of active military operations in Ukraine, most language units of military topics will become less used.

Under the influence of non-linguistic factors - the Russian-Ukrainian war - combined formations of the applied variety, which include abbreviations reproduced in Latin and Ukrainian full-meaning words, became active. Such a model is inherent in the name of one of the types of unmanned aerial vehicles – FPV drones, for example: *Бійці 53-ї ОМБр ударом FPV-дрона знищили прапор РФ у Нью-Йорку на Донеччині* (Fighters of the 53rd OMBR destroyed the flag of the Russian Federation in New York in Donetsk region with an FPV-drone strike (headline)) (<https://www.pravda.com.ua>, August 8, 2024); *Вперше Україна оголосила тендер на закупівлю вітчизняних FPV-дронів* (For the first time, Ukraine announced a tender for the purchase of domestic FPV drones (headline)) (<https://umoloda.kyiv.ua>, August 1, 2024); *Днями бійці 7 прикордонного Карпатського загону отримали від благодійників 50 FPV-дронів* (During these days, fighters of the 7th border Carpathian detachment received 50 FPV drones from benefactors (headline)) (<https://day.kyiv.ua>, August 9, 2024); *На Харківщині за останні місяці зафіксували понад 500 ударів FPV-дронами по цивільних* (More than 500 strikes by FPV drones on civilians were recorded in Kharkiv region in recent months (headline)) (<https://day.kyiv.ua>, July 31, 2024); *Мешканці Бучі передали «Сталевому Кордону» 90 FPV-дронів* (Residents of Bucha handed over 90 FPV drones to “Steel Border: (headline)) (<https://day.kyiv.ua>, July 10, 2024).

In the topic of the Russian-Ukrainian war, we single out barbarisms that denote various support tools, foundations, charitable institutions, volunteer organizations, e.g.:

1. **Ukraine Facility** – the name of the program, the purpose of which is to finance the state budget of Ukraine by the European Union, to stimulate investments, etc., e.g.: *Рада ЄС схвалила надання Україні €4,2 млрд в рамках Ukraine Facility (The Council of the EU approved the provision of €4.2 billion to Ukraine under the Ukraine Facility (headline))* (<https://www.pravda.com.ua>, August 6, 2024).

2. **MK Foundation** – nomination of a fund of competent targeted assistance in the field of logistical support and humanitarian demining, cf.: *Держприкордонслужба отримала 100 вантажних бусів від благодійної організації «MK Foundation» (The State Border Service received 100 freight beads from the charitable organization “MK Foundation” (headline))* (<https://day.kyiv.ua>, August 9, 2024).

3. **United24** is the name of the fundraising platform created at the initiative of the President of Ukraine Volodymyr Zelenskyi, the purpose of which is to raise funds to support Ukraine. Since it is foreseen that the donations will come from citizens of other countries, the nomination is submitted in English, and in media headlines it is formatted with all capital letters or only the first one, cf.: *Зеленський зустрівся з американським актором Метью Макконахі: говорили і про UNITED24 (Zelensky met with American actor Matthew McConaughey: they also talked about UNITED24 (headline))* (<https://day.kyiv.ua>, July 13, 2024) and *Підтримка «Охматдиту» після ворожої атаки: United24 та monobank вже збрали чверть мільярда (Support for “Okhmatdyt” after the enemy attack: United24 and monobank have already collected a quarter of a billion (headline))* (<https://day.kyiv.ua>, July 10, 2024). The first option corresponds to the name given on the website (<https://u24.gov.ua/uk>) and probably it influenced the spelling in some mass media. In our opinion, the graphic form with only the first capital letter is more in line with orthographic norms, because the analyzed lexeme does not belong to abbreviations.

4. **Q-tochok** – nomination of a project according to which an international organization will finance the construction of a modular town for internally displaced persons, e.g.: *Пілотний проєкт Q-tochok: на Сумщині збудують модульне містечко для переселенців (Q-tochok pilot project: a modular town for displaced persons will be built in Sumy Oblast (headline))* (<https://day.kyiv.ua>, August 4, 2024). The first letter Q, which is combined with the rest of the word by a hyphen, serves as a symbol of quality and the functional-semantic equivalent of the token *Quality*.

5. **Best Friends** is the name of the animal shelter, cf.: *Зруйнований російськими обстрілами притулок «Best Friends» відновлюється та приймає тварин з усієї України (The “Best Friends” shelter, destroyed by Russian shelling, is being restored and accepts animals from all over Ukraine (headline))* (<https://day.kyiv.ua>, July 19, 2024). The nomination, drawn up in English, draws the attention of not only Ukrainians, but also foreign citizens to problems related to animals, which have worsened due to hostilities.

6. **Grain from Ukraine** – the name of a humanitarian food program related to the supply of grain to the poorest countries, e.g.: *До Палестини в межах ініціативи Grain from Ukraine прямує перша поставка харчової допомоги для понад 100 000 сімей (The first delivery of food aid for more than 100,000 families is headed to Palestine within the framework of the Grain from Ukraine initiative (headline))* (<https://day.kyiv.ua>, July 18, 2024). The writing of the analytical nomination in English can be explained by several factors: firstly, the Ukrainian state seeks to draw the world's attention to the problems that Russia poses not only to Ukraine, but also to other countries, secondly, the negotiations with Russia regarding the grain transportation agreement took place with the participation of other countries. Much less often we find the Ukrainian name of the program in the headlines, for example: *«Зерно з України»: до Палестини прибула тисяча тонн пшеничного борошна – МЗС (headline)* (<https://suspinle.media>, July 18, 2024).

7. **Blue/Yellow** – the name of a public organization, in the structure of which two adjectives are used to indicate the colors of the flag of Ukraine, e.g.: *Волонтерська організація Blue/Yellow разом з литовською експрезиденткою Далєю Грїбаускаїте запустили збір на закупівлю дронів для України (The Blue/Yellow volunteer organization, together with Lithuanian ex-president Dalia Grybauskaitė, launched a collection for the purchase of drones for Ukraine (headline))* (<https://day.kyiv.ua>, July 3, 2024). The organization's activities are aimed at providing the Ukrainian military and volunteers with the necessary supplies through the donations of citizens from various countries.

Among the collected material, we single out grapho-barbarisms for the designation of objects and concepts in the field of information technologies. In Ukrainian linguistics, information technology terms were the subject of research by Yu. Molotkina, N. Kostusiak, and M. Navalna [15]. The researchers note that “technologicalization of society has affected the language - the share of borrowed terminological terms is one of the largest in terms of volume. The leader among foreign language terminological lexicon in journalism is a thematic group of lexemes to denote types of illegal activity on the Internet. Slightly inferior to it is the group of names of network programs and technologies, which is followed by thematic groups of English-language designations of calculation units on the Internet, tokens of social networks and names of devices. The composition of foreign language vocabulary is constantly updated due to the continuity of the lexical borrowing process, accordingly, the number of thematic groups of foreign language lexemes can change” [15, p. 200-201]. We agree that the problem of using lexemes of foreign language origin requires constant attention of researchers. Under the influence of non-linguistic factors, we record both known formations and new grapho-barbarisms in modern media sources. The collected corpus of graphic barbarisms presents:

1. **Gemini Live** is the name of the program that provides voice chat with an AI bot on a smartphone: **Gemini Live** – *новий голосовий асистент для смартфонів від Google (Gemini Live is a new voice assistant for smartphones from Google (headline))* (<https://www.pravda.com.ua>, August 14, 2024). In addition, the submitted title sentence uses barbarism *Google*, which, as is known, has acquired graphic and morphological adaptation in the Ukrainian language. In “Ukrainian spelling”, it is recommended to write this lexeme with a lowercase letter (гугл) if it is used without a generic word, and if it is present - with a capital letter (*пошукова система «Гугл»*) [13, p. 86]. Having undergone a morphological assimilation to the Ukrainian language, the noun *гугл* is usually applied as a variable word, which is declined according to the pattern of nouns of the second declension of the hard group. The presented arguments are in favor of the fact that journalists should give preference to the Ukrainian version.

2. **Signal** is the name of a client messenger developed by American organizations, e.g.: *У росіян проблеми з роботою месенджера Signal: росЗМІ пишуть про блокування (Russians have problems with the work of the Signal messenger: Russian mass media write about blocking (headline))* (<https://www.pravda.com.ua>, August 9, 2024). The English lexeme - the general name *signal* in Ukrainian – is corresponded by the word *сигнал* al, close in sound, which in the future may become the basis for calling the specified messenger its Cyrillic counterpart.

3. **OpenAI** – nomination of the artificial intelligence research laboratory, which developed the ChatGPT chatbot and the prototype of the SearchGPT search engine. All selected tokens are presented in the Ukrainian media space, e.g.: *OpenAI попереджає, що користувачі можуть занадто прив'язатися до голосового режиму ChatGPT (OpenAI warns that users may become too attached to the ChatGPT voice mode (headline))* (<https://www.pravda.com.ua>, August 9, 2024); *14 американських топових онлайн-видань заблокували доступ пошуковику SearchGPT (14 top American online*

publications have blocked access to the search engine SearchGPT (headline)) (<https://detector.media>, August 5, 2024).

4. **Grammarly** is the name of an online platform based in Ukraine, which on the basis of artificial intelligence helps in communicating in English, e.g.: *Компанія Grammarly запускає новий інструмент для виявлення тексту, згенерованого штучним інтелектом (The Grammarly company launches a new tool for detecting text generated by artificial intelligence (headline))* (<https://detector.media>, August 20, 2024).

Achievements related to information technologies are often used in various industries. In particular, in the headings of texts about banking, finance, and settlement methods, we come across the combined name *p2p-перекази* (*p2p transfers*), the second component of which is the Cyrillic version. The first part *p2p-* is semantically related to the language unit *peer-to-peer*, which indicates the transfer of funds from one person's bank card to another's card, e.g.: *Нацбанк планує встановити обмеження p2p-переказів для фізичних осіб на рівні 100 тис грн на місяць (The National Bank plans to set a limit of p2p transfers for individuals at the level of 100,000 UAH per month (headline))* (<https://www.pravda.com.ua>, August 13, 2024). In the studied media space, barbarisms of this group usually do not have Cyrillic equivalents.

The corpus of the collected material contains a number of grapho-barbarisms to indicate sources of information. A significant part consists of the names of well-known newspapers that are published in print and digital form, including the British *The Telegraph*, *The Sunday Times*, *Financial Times*, the American *The Hill*, *Wall Street Journal*, etc., for example: **The Telegraph**: *Україна не отримала дозволу від Британії щодо застосування ракет Storm Shadow для ударів по Курській області (The Telegraph: Ukraine did not receive permission from Britain regarding the use of Storm Shadow missiles for strikes on the Kursk region (headline))* (<https://day.kyiv.ua>, August 13, 2024); **Журналіст The Sunday Times** *поспілкувався із захопленими в Курській області російськими полоненими (The Sunday Times journalist spoke with Russian prisoners captured in the Kursk region (headline))* (<https://detector.media>, August 19, 2024); **Азійські ринки** *відновлюються вслід за сплеском на Уолл-стріт – Financial Times (Asian Markets recover after surge on Wall Street - Financial Times (headline))* (<https://www.pravda.com.ua>, August 7, 2024); **The Hill**: *Україні треба вирішувати, що робити з територією, яку вона утримує в Росії (The Hill: Ukraine must decide what to do with the territory it holds in Russia (headline))* (<https://www.pravda.com.ua>, August 12, 2024); *У РФ за «шпиунство» засудили репортера Wall Street Journal на 16 років (In the Russian Federation, a Wall Street Journal reporter was sentenced to 16 years for "espionage" (headline))* (<https://day.kyiv.ua>, July 20, 2024).

World-famous foreign companies, news agencies, and media organizations are often mentioned in the headlines. The information provided in them, in particular, related to military operations, weapons, etc., is sometimes transmitted in Ukrainian media sources with a reference to the source. Among such barbarisms, the tokens *Bloomberg*, *Reuter*, *Politico*, etc. are observed, for example: **Bloomberg** *назвав бої в Курській області першим вторгненням в Росію з часів Другої світової (Bloomberg called the battles in the Kursk region the first invasion to Russia since the Second World War (headline))* (<https://www.pravda.com.ua>, August 7, 2024); *Росія може оголосити нову мобілізацію через нестачу солдатів під Курськом та високі втрати на фронті, – Bloomberg (Russia may announce a new mobilization due to the lack of soldiers near Kursk and high losses at the front, Bloomberg (headline))* (<https://day.kyiv.ua>, August 14, 2024); **Bloomberg**: *Росія може оголосити нову хвилю мобілізації через високі втрати на фронті (Bloomberg: Russia may announce a new wave of mobilization due to high losses at the front (headline))* (<https://www.pravda.com.ua>, August 14, 2024); *Іран незабаром може передати РФ сотні балістичних ракет, – Reuters (Iran may soon hand over hundreds of ballistic missiles to the*

Russian Federation, Reuters (headline)) (<https://day.kyiv.ua>, August 10, 2024); *Іран може передумати здійснювати масовану атаку на Ізраїль – Politico (Iran may change its mind about carrying out a massive attack on Israel - Politico (headline))* (<https://www.pravda.com.ua>, August 8, 2024).

Close in terms of functional potential are grapho-barbarisms for marking the names of English-language magazines (*The Economist*, *Forbes*, *The Ukrainian review*, etc.), e.g.: *Величезні російські запаси бронетехніки радянських часів вичерпуються – The Economist (Huge Russian reserves of Soviet-era armored vehicles are running out - The Economist (headline))* (<https://umoloda.kyiv.ua>, July 17, 2024); **The Economist**: *постійні відключення електроенергії будуть звичайним явищем для України (The Economist: permanent power outages will be a common phenomenon for Ukraine (headline))* (<https://day.kyiv.ua>, July 17, 2024); **Forbes**: *цінаїмніше \$200 млн росія витратила на масованій удар по Україні 8 липня (Forbes: Russia spent at least \$200 million on a massive attack on Ukraine on July 8 (headline))* (<https://day.kyiv.ua>, July 8, 2024); *У Києві презентували багатомовний журнал «The Ukrainian review» (The multilingual magazine "The Ukrainian review" was presented in Kyiv (headline))* (<https://detector.media>, August 2, 2024).

Online platforms, in particular those based in Ukraine, contain a significant part of the information resource. They include the DeepState platform created during the Russian-Ukrainian war, which, by showing changes on the map, informs about the course of hostilities, e.g.: *Створили ударний кулак: війська РФ наступатимуть на борову – DeepState (They created a shock fist: Russian troops will advance on Borova - DeepState (headline))* (<https://umoloda.kyiv.ua>, June 18, 2024); *Окупанти просулися на північному фланзі Часового Яру, у Калинівці, – DeepState (The occupiers advanced on the northern flank of Chasovoy Yar, in Kalinivka, - DeepState (headline))* (<https://day.kyiv.ua>, July 18, 2024); *На Донеччині росіяни за добу провели 17 атак біля Прозресу: DeepState повідомляє про захоплення села (In Donetsk region, the Russians carried out 17 attacks in one day near Prozres: DeepState reports on the capture of the village (headline))* (<https://day.kyiv.ua>, July 21, 2024).

No less well-known in Ukraine is the online platform (portal) Dozorro, the name of which, according to the example of most nominations of this group, is designed in Latin, although it reflects information about orders and purchases in Ukraine, for example: *254,5 млн грн бюджетних коштів з початку року витратили на рекламу в областях, – Dozorro (UAH 254.5 million of budget funds have been spent on advertising since the beginning of the year in the regions, - Dozorro (headline))* (<https://detector.media>, August 15, 2024).

To the group of lexemes with the generalized meaning of the source of information, we include the names of social networks, among which the most famous are Facebook and Instagram, that have a large number of followers. The specificity of the first one is reflected by the presence of mostly short messages, accompanied by photos at the request of the contributor. Instead, the second social network is distinguished by the dominance of photos. Despite the presence of clear recommendations on how to write them correctly in the "Ukrainian spelling", we still find the barbarisms *Facebook* and *Instagram* in the mass media, for example: **Meta** *зняла обмеження з акаунтів експрезидента США Трамп у Facebook та Instagram (Meta removed restrictions from the accounts of former US president Trump on Facebook and Instagram (headline))* (<https://day.kyiv.ua>, July 14, 2024) – the grapho-barbarism *Meta* is also used in the submitted headline sentence, which denotes the corporation that owns both selected names of social networks. Let us remind that, according to the current orthographic requirements, lexemes for networks, which do not have a generic word next to them, must be written with a lowercase letter and without quotation marks, and the ones with a generic name - in quotation marks and with a capital letter, cf.: *фейсбук* and the *мережа «Фейсбук»* [13, p. 86]. The presence of regulated orthographic norms related to the

graphic design of foreign language lexemes, without a doubt, indicates their undisputed observance, in particular, in the media sphere.

Less known is the social network, which in the journalistic space is marked by the barbarism *Threads*. To register in it, users must first of all have an Instagram account, e.g.: *Соцмережа Threads тестує кілька нових функцій (The Threads social network is testing several new functions (headline))* (<https://detector.media>, August 16, 2024).

Abbreviations-acronyms, or initial abbreviations, are a special group among the names used to designate sources of information. "Acronym (from the Greek - *extreme* and *name*) is an abbreviation consisting of the initial letters or sounds of the words in a formative phrase. When creating acronyms, they consciously try to make them euphonic regarding the usual unabbreviated words of the language, sometimes even ignoring full ononymy" [19, p. 13]. Acronyms represent a large group of lexical abbreviations, which is actively replenished and used in journalism, e.g.:

1. *ISW* – *Institute for the Study of War*, see: *Влада кремля узаконює переслідування незгідних із його політикою та війною в Україні – ISW (Kremlin authorities legalize persecution of those who disagree with its policy and war in Ukraine – ISW (headline))* (<https://day.kyiv.ua>, July 23, 2024); *Росіяни не хочуть передислокувати війська на Курськ, щоб не зрвати наступ на сході України, – ISW (The Russians do not want to redeploy troops to Kursk in order not to disrupt the offensive in eastern Ukraine, - ISW (headline))* (<https://day.kyiv.ua>, August 9, 2024); *Українські війська діями в Курській області змогли досягти оперативної несподіванки, – ISW (Ukrainian troops were able to achieve operational surprise by their actions in the Kursk region, - ISW (headline))* (<https://day.kyiv.ua>, August 9, 2024); *Аналітики ISW кажуть, що українські війська просунулися до 10 км углиб Курської області РФ (ISW analysts say that Ukrainian troops advanced up to 10 km deep into the Kursk region of the Russian Federation (headline))* (<https://www.pravda.com.ua>, August 8, 2024).

2. *CNN* – the American television and radio company *Cable News Network*, one of the most famous and most authoritative in the world, e.g.: *Для протидії українському наступу росія перекинула у Курську область тисячі військових з окупованих територій, – CNN (To counter the Ukrainian offensive, Russia transferred thousands of troops from the occupied territories to the Kursk region, – CNN (headline))* (<https://day.kyiv.ua>, August 16, 2024).

3. *FT* – the British daily newspaper *Financial Times*, which contains news content in the field of business and economics, for example: *FT: Росія готувала свій флот для ракетних ударів по Західній Європі (FT: Russia was preparing its fleet for missile strikes on Western Europe (headline))* (<https://www.pravda.com.ua>, August 13, 2024).

4. *NYT* is a popular American daily newspaper, *The New York Times*, whose media policy is related to the coverage of internal and external news, reviews, etc., e.g.: *Українська мобілізація досягає рівня російської: щомісячний набір становить до 30 тисяч новобранців, – NYT (Ukrainian mobilization reaches the Russian level: monthly recruitment is up to 30 thousand new recruits, - NYT (general))* (<https://day.kyiv.ua>, July 31, 2024).

As evidenced by the previously presented illustrative material, abbreviations-barbarisms of the analyzed variety specialize in conveying the source of information from which the message was reprinted in the Ukrainian-language media publication. In headline complexes, they are characterized by specific punctuation. If such acronyms are in a preposition to the main message, they are followed by a colon. If abbreviations written in English are placed in a postposition, they are separated by a dash.

4 Conclusion

Thus, in the language of the Ukrainian mass media, a significant part of graphic barbarism functions, the activation of which is facilitated by extra-linguistic factors, in particular, the Russian-Ukrainian war, the active cooperation of Ukrainian institutions with other countries, the development of information technologies, etc.

According to the results of the study, it was established that grapho-barbarisms form the largest thematic groups, which denote various types of weapons and military equipment; support tools, foundations, charitable institutions, volunteer organizations, subjects and concepts in the field of information technologies; names of sources of information, including newspapers, magazines, websites, etc.

Grapho-barbarisms dominate the headlines of news genres. Borrowings reproduced in the Latin alphabet complicate the perception of messages by information consumers and litter the Ukrainian literary language. The barbarism that characterizes foreign realities is especially difficult to perceive. In informational genres, grapho-barbarisms do not serve as an expressive stylistic means and sometimes contrast with Ukrainian words. Sometimes Cyrillic variants formed by transcription or transliteration function in parallel with some borrowings. Usually, such nominations simultaneously underwent morphological development, which is evidenced by their acquisition of different case-number forms.

We consider the analysis of transliterated borrowings of other thematic groups of words that function in the language of Ukrainian mass media to be the perspectives of the research.

Literature:

1. Arkhipenko, L. (2005). Foreign lexical borrowings in the Ukrainian language: stages and degrees of adaptation (on the material of anglicism in the press of the late 20th - early 21st centuries). [PhD dissertation brief]. Kharkiv: Kharkiv National University named after V. Karazin.
2. Bytkivska, Ya. (2008). Tendencies of assimilation and development of the semantics of anglicisms in the modern Ukrainian language. [PhD dissertation brief]. Ternopil National Pedagogical University named after Volodymyr Hnatyuk.
3. Borys, D. (2017). Neoslangisms in the English language at the beginning of the 21st century: structure and semantics. [PhD dissertation]. Kyiv National Linguistics University.
4. Demchenko, K. (2005). Functioning of foreign language lexemes in journalistic style texts. *Culture of the Peoples of the Black Sea Region*, 69, 170-172.
5. Grynko, O. (2020). Foreign language inclusions: to the problem of functioning and translation. *Scientific Notes of the National University "Ostroh Academy": Series "Philology"*, 10(78), 62-65. <https://journals.oa.edu.ua/Philology/article/view/2909>.
6. Karpilovska, E. (2007). Trends in the development of modern Ukrainian lexicon: Factors of stabilization of innovations. *Ukrainian Language*, 4, 3-15.
7. Kostusiak, N.M., & Navalna M.I. (2022). Neosemanticization of lexemes strain, booster and language adaptation of nominations of coronavirus strains in modern mass media. *Ukrainian Language*, 1(81), 103-114.
8. Kostusiak, N., Navalna, M., Levchenko, T., Grozian, N., Prymachok, O., Prudnykova, T. (2021). Functional-semantic and derivative signs of nominations of covid and its synonymic correspondents in the latest media discourse. *AD ALTA: Journal of Interdisciplinary Research*. 11/02-XX, 191-196. http://www.magnanimitas.cz/ADALTA/110221/papers/A_34.pdf
9. Lopushanskyi, V.M. & Pyts, T.B. (2011). *German lexical borrowings in the south-western dialects of Ukraine: a study guide for students of higher educational institutions*. Drohobych: Posvit.
10. Mastruk, T.S. (2008). The nominative function of anglicisms of different semantic groups in journalistic style texts. *Philological studies: Scientific Bulletin of the Kryvyi Rih State Pedagogical University*, 2, 39-46.

11. Marцениук, O., Remenyak, S., & Kulyk, A. (2022). Barbarisms in the modern Ukrainian language. *A Young Scientist*, 4.1(104.1), 39-42. <https://doi.org/10.32839/2304-5809/2022-104.1-10>.
12. Matsko, O.M. (2000). Abbreviations as condensed language formulas in diplomatic texts. *Linguistics*, 1, 31-36.
13. Maznichenko, E., Makedon, V., Sharabanova, S., Yalovnycha, I. (Eds.). (2019). *Ukrainian orthography*. Kyiv: Naukova dumka.
14. Mitchuk, O.A. (2006). New words and their meanings in the language of the mass media of the Rivne region (1995-2005). [PhD dissertation brief]. Lviv National University named after Ivan Franko.
15. Molotkina, Yu., Kostusyak, N., & Navalna, M. (2021). Foreign language terminological vocabulary of information technologies in Ukrainian online publications. *Philological Volyn: Text and Context*, 31, 187-204. <https://volynxt.vnu.edu.ua/index.php/volyntext/article/view/967>.
16. Navalna, M., Molotkina, Yu., & Lychuk, M. (2021). *Dynamics of loanwords in the Ukrainian language at the beginning of the 21st century*. Kyiv: Publishing House of the FOP Yamchynskyi O.V.
17. Styshov, O.A. (2003). *Ukrainian vocabulary of the end of the 20th century (based on the language of mass media)*. Kyiv: Educational KNLU Center.
18. Telezhkina, O.O. (2012). Barbarism as an organic component of a poetic text (on the example of D. Pavlychka's poetic work). *Scientific notes of the National University "Ostroh Academy"*. *Philological Series*, 26, 322-324.
19. Ukrainian language: Encyclopedia (edited by Rusanivskyi V.M. et al.). 2nd ed. Kyiv: Publishing House "Ukrainian Encyclopedia" named after M. P. Bazhan, 2004.
20. Voronych, H. (2005). *Barbarism. Encyclopedia of Modern Ukraine*. Kyiv: Institute of Encyclopedic Research of the National Academy of Sciences of Ukraine. <https://esu.com.ua/article-33136>.
21. Vyshnivskyi, R. (2015). English barbarisms in the language of modern Ukrainian electronic mass media. *Mandrivetz*, 1, 97-101. http://nbuv.gov.ua/UJRN/Mandriv_2015_1_21.

Primary Paper Section: A

Secondary Paper Section: AI, AJ

MUSICAL AND INSTRUMENTAL FORM CREATION AS A STRUCTURAL AND PROGRESSIVE PHENOMENON: GUIDING PRINCIPLES

^aYULIIA IVANOVA, ^bLI JUAN, ^cWEN WEN, ^dXU NIANJIA,
^eLIU LU

^{a-e}A.V. Nezhdanova Odesa National Academy of Music, 63,
Novoselskogo Str., 65000, Odessa, Ukraine
email: ^aivanovaulia@yahoo.com, ^bmusic_ggx@sina.com,
^c252455851@qq.com, ^dc.p.ninja@qq.com, ^e569315499@qq.com

Abstract: The article addresses the issue of form creation in instrumental music, which is considered one of the central topics in musicology. Instrumental music, due to its "purity" and lack of extramusical elements, serves as a basis for analyzing the structure of musical form. The author emphasizes the importance of musical form within the cultural system and its connection to the genre and stylistic features of a work. The article explores the role of theme, cyclicity, and programmatic elements in constructing a musical composition, as well as the significance of performative form, which is manifested through repetition. Special attention is given to the interaction of semiological, epistemological, and praxeological approaches in the study of musical form.

Keywords: musical form, musical-instrumental form creation, principles of form creation, methodological pluralism, musical thematism, musical chronotopes, dichotomy of identity and renewal, repetition, cyclicity, programmatic content.

1 Introduction

The problem of form creation in instrumental music is one of the most fundamental issues in the study of musical art' nature and specifics, as instrumental sound exemplifies "pure" absolute musical expression. It is devoid of extramusical elements and relies directly on the principles of musical thinking, presenting sound images free from verbal and visual origins. The structural norms of musical composition and its procedural logic - both as an existence within a specific time-space and as a realization under defined communicative conditions - are determined by the foundations of instrumental genres (see more in [3; 2; 18]).

The concept of form in music carries its own connotations, shaped by both musicological discourse and creative practice. It reflects the collective experience of music within the cultural system. In this regard, the phenomenon of form in music is central and organizing, perhaps even to a greater extent than in other art forms. In a broad sense, this concept encompasses the characteristics of musical content, as both an artistic-aesthetic and technological process, with specific outcomes that are immediately integrated into the cultural dynamics of movement and change [17]. The category of musical form pertains not only to the overall constitution of musical art but also to its structural components, extending to individual linguistic means and the uniqueness of its symbolic formations.

The relevance of the issues addressed in this article arises primarily from the fact that musical form lies at the intersection of semiological and value-aesthetic approaches to musical creativity, particularly regarding the specific temporality of music and its communicative and suggestive properties [1; 14]. Recently, this concept - musical form - has increasingly been examined in terms of genre and style formation, necessitating the activation of epistemological and praxeological approaches and their combination based on musical textology [8; 12]. The engagement of these approaches highlights the need for methodological pluralism in studying musical form creation, and growing attention to the performative elements of the musical process, along with the expansion of functional resources in musical interpretation [5; 6; 9; 11; 15].

Genre and style nominations help to clarify the form-content possibilities of musical material and action. This, in turn, allows for the refinement and typologization of compositional structuring principles and the construction of individual works - differentiating and defining the text-based time-space of musical art. Ultimately, the formal features of a musical work serve as conduits for the semantic intentions of the musical content, explicating principles of thought through the structural qualities of the musical text, including its melodic and harmonic

construction [7]. A critical aspect of studying musical form creation is thematism, specifically the concept of the theme, which gains full autonomy in the context of a musical composition. It reflects the continuity and discreteness of musical thinking within a defined text, a necessary antinomy manifested across all genre and style environments [13; 16].

Given the importance of the self-realization of the musical text as a collection of specific musical syntagms, the concept of performance form is integrated into the theoretical discourse of musical form. Performance form is a relatively stable result of music's existence in live sound, transmitted orally and performatively, representing the most articulated and formalized aspect of musical communication (see more in [8; 4]). The significance of the performative aspect of the musical creative process is reinforced by the fact that this action-based sphere embodies and affirms the essential principle of repetition in musical form, particularly repetition across various levels of temporal organization, from compositional time to historical and cultural time. Notably, in no other art form, besides music, does the principle of repetition hold such a fundamental position, which can be attributed to the dominant temporal nature of musical sound and action.

Thus, considering the complexity and integrity of musical form creation, with its inherent and performance-driven procedural characteristics, this article aims to identify the main structural-compositional, genre, and stylistic precedents in the construction of instrumental musical form and its unfolding in time and space. The unity of genre and stylistic evaluations of instrumental musical form creation (as the most "pure" type of musical thinking) allows for a sufficiently abstract level of typologization in the textological organization of music.

2 Method

The research is based on the methodological principle of a holistic historical study of musical performing arts. The scientific and theoretical basis of the research is made up of works in the field of aesthetics and composition techniques in music, aesthetics of music and art, and musical experimentalism. The work uses philosophical-aesthetic, cultural and musicological methods, as well as musical-textual and creative-performing analytical approaches, which create a unified methodological basis for the research.

3 Results and Discussion

Starting from the Baroque era, when instrumental musical practice became sufficiently independent, stable principles of musical-textual presentation began to form. These principles interact and combine within a single work, with one principle typically dominating as the foundational one. This foundational principle, which assumes the status of a rule, governs the overall temporal structure of the work and the norms of spatial organization, including performance conditions and communicative situations. As S. Shyp aptly notes [18], in most instrumental compositions, a leading principle of form creation can be identified, even when the composition is considered "free". According to Shyp, the universal keys to a composition's structure are determined by its complexity, the prevailing method, the number of parts and thematic sections, the nature of thematism, and the composer's approach to developing themes.

Furthermore, all formal means are, to some extent, secondary to the artistic idea, conceptual design, and aesthetic experience - that is, to the ideal components of the work of art. Form, as a material-technological entity, is ultimately necessary only for the embodiment, transmission, or perception of certain semantic content. As Shyp asserts, "technique" is the most organized, visible, and rational component of artistic creativity. The process of transitioning content into form begins in the realm of imagination and thought, grounded in deep psychological

foundations; any musical ideas are already formalized representations, possessing a structure and symbolic markers [18]. Even in relation to an ideational phenomenon such as style, Shyp observes that in a stylistic system, the unity of formal means and techniques predominates, through which specific artistic and conceptual demands are conveyed.

The semantic approach, which emphasizes the unity of technique and its conceptual-meaningful significance, is reflected in semiological definitions and consistently requires in-depth analytical perspectives, as seen in the studies of V. Kholopova [16–17]. Kholopova notes: “Both semantic and musical compositions - their types, varieties, and individual cases - reflect the nature of musical thinking. This thinking is multilayered, reflecting the ideas of an era, a national artistic school, a composer’s style, and so on. Therefore, within both objects of study - the forms and compositions of musical works - the methods of analysis must be connected to the expressive-meaningful sphere of music” [16]. The researcher correctly associates the category of musical form with the expressive-meaningful thematic and intonational essence of a musical work, aiming to characterize musical form as an aesthetic phenomenon with a “special style”: “...it is an ideal world of beauty that carries the ethical idea of goodness toward humanity, the aesthetic idea of harmony in the universe, and, psychologically, the emotion of joy... Accordingly, the science of musical form is the science of musical beauty, science about the ideal, ‘special’ layer of music’s content” [16]. This highlights the distinctive general-stylistic function of musical form, operating at the level of the integral nature of musical art, which can be further specified based on the historical typology of musical composition through genre semantics.

The level of genre semantics is more specific and distinct, as Kholopova explains: “Of the three content levels of musical form, the first, a meta-level, is universal and present in all musical works. The second, closely related to the category of genre in a semiotic sense and the clearest semantically, is historically localized. The third level is essential but ranges from minimal deviation from the standard of typical form to a completely unique, unrepeatable musical composition” [16]. This third level is specifically linked to the authorization of musical form, both through original composition and performance interpretation.

In the transition from the second to the third level, two primary precedent conditions emerge: cyclicity and programmability. The former pertains to the organization of compositional time and the individuation of musical chronotopes; the latter refers to integration into the spatial context of culture and the alignment of musical and stylistic positions with the broader artistic worldview. A key observation is that these two foundational principles of musical form construction interact at both the highest stylistic level and at more specific genre levels, allowing for a multiplicity of interpretive decisions by composers and performers.

It should also be noted that certain prerequisites for transferring the phenomenon of cyclicity from the realm of composition to the logic of performance form are revealed in works that offer semantic evaluations of musical pieces as processual-dynamic, taking into account the specificities of the performance chrono-articulatory process (see: [4; 9; 13]). The general theoretical justification for cyclicity is strongly supported by V. Bobrovskiy’s systemic aesthetic-semiological approach, which develops a dichotomous evaluation of musical form as a unity of identity and renewal, similarity and contrast. He sees these phenomena as a total convergence of the aesthetic and logical-compositional functions of the musical text. According to Bobrovskiy, musical form is a multi-level hierarchical system whose elements possess two inseparably linked aspects - functional and structural - existing in indivisible unity. The functional aspect, as the researcher notes, refers to everything related to meaning, dramatic roles, and the figurative and logical purpose of the element within the compositional system proposed by the creator. The structural aspect, on the other hand,

pertains to the material embodiment and the specific appearance of particular form-building components. Bobrovskiy introduces the crucial concepts of functional and structural similarity, which serve as indicators of the equivalence and transitivity of certain system components. These elements, existing at different levels, always ensure the system’s integrity. In the context of musical form, this primarily concerns methods of thematic organization and the logic of texture. The transition of an image from an aesthetic function to a logical-compositional purpose within a theme is fundamental, as it connects the embodiment of an ideal phenomenon with the materiality of intonational-thematic combinations. Bobrovskiy proposes a method of functional analysis that studies the principles governing the connections between musical phenomena based on multi-level functional-structural relationships. This allows for a rhythmically and harmonically organized process of thematic comparisons and development [3].

Bobrovskiy also suggests focusing on the processual nature of music, as it best corresponds to the essence of the art form. Musical form, organized purely through musical means, represents a unity between the tendencies toward similarity and renewal, present at all functional levels of the thematic formation process, and by extension, in the creation of genres and styles.

Bobrovskiy’s functional approach enables E. Nazaikinskyi to provide a comprehensive rationale for the phenomenon known as the logic of musical composition. Moreover, Nazaikinskyi’s research emphasizes the interdependence of cyclicity and broadly interpreted programmability, viewing them as sources of meaning and narrative in music, while highlighting their reliance on repetition.

Nazaikinskyi’s theory of musical composition [13] synthesizes the principles of instrumental music within the European academic tradition, examining them in a broad historical context that incorporates natural conditions, social life, and musical culture as a whole. The primary focus of his study is the principles of chronotopic formation in musical composition, from which the semantic factors that shape musical texts are derived.

According to Nazaikinskyi, it is the logic of musical composition, rather than the system of forms and their technical features, that serves - alongside intonational syntax - as a shared element for composers, performers, and listeners. This common element enables them to follow the development of images, emotions, and ideas within a musical work. It also forms the basis for constructing a performance plan that aligns with the composer’s vision or poetically describes the artistic impressions evoked by the music [13].

An example supporting the notion that the development of musical form is influenced by the growth of programmatic and aesthetic elements in music can be found in the compositional and dramaturgical innovations of Romanticism. V. Kholopova suggests that the primary achievements of Romantic music are tied to the integration of programmatic elements into the imaginative world of poetry and the mastery of its expressive and semantic logic. As Kholopova notes, these literary-poetic influences lead music to adopt a different relationship with the concept of time.

All the types of Romantic musical forms identified by Kholopova exhibit qualities of cyclicity and generalized programmatic content. What distinguishes Romantic form-building from classical cyclicity is the emphasis on programmatic content, which justifies the cycle’s existence. The way the cycle is constructed reveals the aesthetic dominant of the work. Particularly noteworthy is Kholopova’s distinction between two types of cyclic form: sonata-cyclic and suite form. In our view, the contrast-based composite form can be considered a complement to the latter. As one of the most significant innovations in Romantic music, the contrast-based composite form influences the principles of form-building across all genres.

Kholopova's proposed definition of this form is quite interesting: a contrast-based composite form consists of two or more sections structured by contrast (in tempo, thematic material, or tonal scheme), where one or more sections maintain independence while being unified by sound, content, and motivic-thematic connections. It is important to emphasize that the contrast-based composite form can also be implemented within a single-movement composition. In Romantic music, the contrast-based composite form and cyclicity are often complemented by a poetic quality, which, as it is well-known, vividly expresses the interaction between genre and individual compositional levels of form.

However, while advocating for such a programmatically oriented approach, V. Kholopova does not consistently apply it. As a result, she overlooks the unique methods of genre-style dialogue specific to the Romantic approach, which not only influenced compositional traditions but also shaped performance practice. The prerequisites and sources of neo- and post-romanticism, which took root in 20th-century European music - particularly in form-building and the meaningful interpretation of form - are similarly neglected.

The discussion of the mixed sonata-suite form, associated with dance and song genres, is also treated somewhat briefly. Although the convergence of sonata and suite can be considered one of the paradoxes of Romantic music, as they represent fundamentally different types of cycles (a point emphasized in V. Bobrovskiy's research), their combination becomes a notable feature of instrumental poetics by the end of the 20th century, particularly in the works of American composer Leo Ornstein.

A distinctive feature of form-building in 20th-century music is that the primary types of forms composers relied upon remained consistent (classical, Baroque, Romantic); however, the organizing elements of musical language - such as thematic material, harmony, rhythm, melody, and texture - underwent significant renewal. The relationships among these elements in the construction of musical form also evolved. It is important to note that while these forms retain their original types, the substantial reconfiguration and updating of their foundational elements result in qualitative transformations, preserving only their architectural integrity. For example, instrumental cycles have adopted new properties, notably the synthesis of leading themes from the first and subsequent movements in the finale, and the integration of distinct sections functioning as reprise-postlude within the cycle.

Cyclicity, as a representative of musical logic, operates at both the genre-form and compositional-texture levels - directly embodying the textural resolution of musical ideas and stylistic semantics. Thus, it serves as a unifying factor in the entire musical-textual organization. In Ma Sinsin's study, it is emphasized that this principle is particularly prominent in the piano works of Romantic composers, where it is expressed as a temporal sequence of distinct moments or stages of musical sound, functioning as a system for structuring the procedural unfolding of musical compositions. Furthermore, the researcher highlights that in today's classification of Romantic musical forms, cyclicity's defining characteristic emerges as a programmatic-content orientation. As a qualitative indicator, cyclicity permeates various genre levels of musical creativity, applicable to both instrumental and vocal-theatrical works. It holds particular significance in instrumental music, where it manifests in two primary logical-compositional varieties: sonata and suite.

Ma Sinsin's research convincingly demonstrates the universal role of cyclicity as a specific logical quality of musical thought, reflected in the textological properties of instrumental creativity. This results in the formation of a unique intertextual logic that offers greater freedom in compositional and performative choices. Key programmatic-cyclical factors in composition emerge, such as specified thematic syntagms, distinctive "figures of meaning", and new musical rhetoric, which correspond to the processes of speech-presentation, action-eventfulness, and experience-sensory introspection.

According to Ma Sinsin, an essential compositional and stylistic condition for performative creativity is the reliance on oratorical qualities, motoric elements, and melodicy as common vectors of text creation. These elements provide a group of structurally-semantic techniques that correspond to the grammar and syntax of musical language, thereby enabling potential semantic connotations in performance interpretation.

Cyclicity, along with contrastive form structures and programmability as general compositional principles, has acquired new qualities in the instrumental creativity of the 21st century, particularly in the works of Finnish composer Kaija Saariaho. Saariaho's primary stylistic foundation lies in French spectralism, from which she has developed her own compositional methods and a unique mode of thinking, based on various genre and technological syntheses. For Saariaho, composition is predominantly the organization of sound material and the creation of new forms, which involves devising methods for structuring and shaping diverse musical elements, including the incorporation of bodily sensations. As she explains: "In a certain sense, I feel a connection between the body and the mind, just as I do between form and content, inseparable like the material and form of a musical work" [10]. Saariaho has also used her recorded voice, whispers, and traces of sound as material for her compositions. According to Saariaho's lexicon, the fundamental character of a piece - its tone or "smell" - emerges from initial impressions and the thoughts they evoke. For instance, her experience studying Claude Monet's water lilies provided the inspiration for *Nymphaea* (1987) [10]. The starting point for *Nymphaea* was a musical exploration of the visual form of the flower, its colors, and the shifts in light. As musicologist P. Moisala notes, Saariaho sought to "feel" the essence of the plant itself. In the concert program, Saariaho described some of the images that arose in her mind while "painting the piece". These include "the image of the symmetrical structure of the water lily, gently floating on the water and transforming. Various interpretations of the same image in different dimensions, a one-dimensional surface with its colors, shapes, etc., on one side, and different materials that can be felt, forms, sizes, the white water lily nourished by underwater silt" [10]. *Nymphaea* also showcases Saariaho's distinctive synesthetic approach to music, where the imagery and "feel" of the water lily are transformed into purely musical sound forms, granting the flower new meanings and revealing a metaphorical spiritual essence. Saariaho's music is never merely descriptive, as in musical sketches or paintings. For example, *Lichtbogen* (1986) does not depict the northern lights or their colors directly, but instead captures the intense experience of witnessing them, generating specific sound images and methods of organizing the sound material. Saariaho musically transforms the core essence of the original source - the impulse that inspired her - particularly the impression of a natural phenomenon, into a musical form where "music consists of small fragments or large ideas directly as sounds for the composer's mind". Saariaho reflects, "Sometimes I ask myself whether music arises from the collision between the musician and the surrounding world, or rather from the energy received from nature and other arts? In my specific case, perhaps the latter, maybe both. I also feel that smells, light, and colors are sources of musical ideas" [10]. The initial impulse, whether a multisensory experience or an association, often determines the title of a work, shaping its thematic focus and guiding the logic of its compositional development. Programmatic titles help Saariaho define the musical material, organizing it within time and space, which she considers the most crucial aspect of composition. For listeners, the title serves as a point of reference for perception, or even as a key to understanding the composer's intention. In this sense, Saariaho's works, which frequently reference natural phenomena, form a kind of programmatic cycle, revealing shared musical-linguistic processes and a particular relationship with time and space. She is the creator of a unique artistic practice that synthesizes various sensations and artistic means, integrating and concentrating them into sound-shaped forms.

Thus, a new concept of cyclicity emerges as a mode of thinking that integrates various temporal and spatial phenomena,

encompassing both external and internal factors in musical representation. This anticipates entirely new programmatic definitions for the sound palette of the musical composer.

The scientific novelty of this article lies in the development and expansion of the structural-processual approach, transitioning from traditional characteristics and established academic musical phenomena to contemporary, innovative interpretations of musical text and performance form. It is important to highlight that at the core of musical-instrumental form is a dichotomy between identity and difference (similarity and renewal), which structures all levels of the musical-expressive system, linking the principles and techniques of compositional and performative interpretation.

In conclusion, it should be mentioned that musical-instrumental form implies not only specific genre prerequisites, particularly in relation to the creation of musical themes, but also the extension of general stylistic trends. These trends, having entered the textual continuum of musical creativity, persist as enduring features of meaningful content.

Within the broader historical trajectory of the structural-processual aspects of musical-instrumental form - especially when viewed in the context of precedent genre-stylistic phenomena - repetition acquires importance as a universal, systemic creative-pragmatic principle, capable of generating a wide range of derivative artistic techniques.

Literature:

1. Baumgarten, A. (1964). *Aesthetics*. In *History of aesthetics: Monuments of world aesthetic thought* (Vol. 2). The Art.
2. Bobrovskiy, V. (1978). *Functional foundations of musical form*. Muzyka.
3. Bobrovskiy, V. (1979). *Thematicism as a factor of musical thinking: Essays*. Muzyka.
4. Chebotarenko, O. (1997). *Cultural aspects of performative form in music* (Unpublished candidate dissertation). Kharkiv State Academy of Culture, Odesa, Ukraine.
5. Katrych, O. (2000). *The individual style of the performing musician (Theoretical and aesthetic aspects)* (Unpublished candidate dissertation). National Music Academy of Ukraine named after P.I. Tchaikovsky, Kyiv, Ukraine.
6. Kashkadamova, N. (2010). *Performing music on keyboard string instruments: Educational manual*. Kyiv, Ukraine: Osvita Ukrainy.
7. Konovalova, I. (2021). Theoretical aspects of the correlation between melodic and harmonic factors in the system of homophonic thinking. *Current Issues in Humanities*, (40), 23–29.
8. Ma, Sinsin. (2018). *Textological principles of performative interpretation in piano composition (From stylistic content to semantic typology)* (Unpublished candidate dissertation). Odesa, Ukraine.
9. Ma, Sinsin. (2016). Categorical foundations of musicological study of piano-performance tradition. In O. V. Sokol (Ed.), *Musical art and culture: Scientific bulletin of Odesa National Music Academy named after A.V. Nezhdanova* (Issue 22, pp. 356–366). Odesa, Ukraine: Astroprint.
10. Moisala, P. (2009). *Kaija Saariaho*. Urbana, IL: University of Illinois Press.
11. Moskalenko, V. (2008). Analysis in the context of musical interpretation. *Journal of the National Music Academy of Ukraine named after P.I. Tchaikovsky*, (1), 106-112.
12. Moskalenko, V. (2001). The musical work as text. In *Kyiv musicology: The text of a musical work: Practice and theory* (Issue 7, pp. 3–10). Kyiv, Ukraine.
13. Nazaikinskyi, E. (1982). *The logic of musical composition structure*. Moscow, Russia.
14. Samoilenko, O. (2020). *The psychology of art: Contemporary musicological projections* (Monograph). Odesa, Ukraine: Helvetika Publishing House.
15. Syriatska, T. (2008). *Performative interpretation in the aspect of musician-artist psychology* (Unpublished candidate

dissertation). Kharkiv State University of Arts named after I.P. Kotlyarevsky, Kharkiv, Ukraine.

16. Kholopova, V. (1990). *Music as a form of art*. Moscow, Russia: Conservatory.

17. Kholopova, V. (1999). *Forms of musical works: Educational manual*. Lan'.

18. Shyp, S. (1998). *Musical form: From sound to style: Educational manual*. Kyiv, Ukraine: Zovit.

Primary Paper Section: A

Secondary Paper Section: AL

THE VOCAL HERITAGE OF JOHANNES BRAHMS WITHIN THE CONTEXT OF THE RELIGIOUS AND ETHICAL PRINCIPLES OF 19TH-CENTURY GERMAN CULTURE

^aOLHA MURAVSKA, ^bLARISA GORELIK, ^cLARYSA LOBODA, ^dHALYNA SHPAK, ^eYAOLISHA FANG

^{a-c}A.V. Nezhdanova Odesa National Academy of Music, 63, Novoselskogo Str., 65000, Odesa, Ukraine
email: ^aolga@noc.od.ua, ^bgesang2016@gmail.com, ^cloboda_1@i.ua, ^dgalina.shpak425597@gmail.com, ^em1786288518@163.com

Abstract: The article is devoted to the exploration of spiritual and religious principles in the works of Johannes Brahms and their manifestation in the composer's vocal and choral opuses. The aim of the study is to reveal the spiritual, ethical, and religious foundations of Brahms' creative personality and their reflection in the composer's vocal heritage (using *A German Requiem* and the vocal cycle *Four Serious Songs* as examples). The methodology combines intonational, genre-stylistic, etymological, and hermeneutical approaches. The scientific novelty of the study is marked by the introduction into musicology of not only materials concerning the religious worldview of Brahms but also their influence on the formation of the conceptual content inherent in his works, shaped at the intersection of Protestant-Lutheran principles of the German cultural-historical tradition and their metamorphoses during the spiritual quests of the Romantic era. The findings show that the generalization of bibliographic and analytical sources on Brahms' works, including his vocal heritage, reveals the depth of the spiritual, ethical, and religious principles of his creative personality, which trace back to the German Protestant tradition and the culture formed on its basis. At the same time, these principles were enriched by the spiritual searches of German Romanticism and the Biedermeier period. The appeal to the age-old principles of past national culture and its illustrious representatives, combined with the revival of the "spirit" of the nation and the characteristic Protestant convergence and mutual spiritualization of sacred and secular genres, contributed to the consolidation of German society and its movement towards the unification of Germany. These aspects are also reflected in the poetics of Brahms' *A German Requiem* and the vocal cycle *Four Serious Songs*, which exhibit the tradition's characteristic focus on eternal themes of life and death in their Protestant interpretation, the use of relevant biblical texts and their authorial re-interpretation, as well as the appeal to the "intonational dictionary" of the Protestant chorale, ranging from direct citation to free compositional realization of broadly interpreted chorality.

Keywords: Brahms' chamber-vocal works, Brahms' choral heritage, Romanticism, German Romanticism, vocal cycle, *A German Requiem*, genre, style, German Protestant culture, Protestant chorale.

1 Introduction

"A beautiful, genuine person remains calm in joy and calm in suffering and grief" [25]. These words by Johannes Brahms can be considered a kind of spiritual credo of his life, a moral duty that guides and imbues his existence with profound meaning, understood as his undeniable law. At the same time, this spiritual and ethical "vector" of the artist's worldview defines the semantic content of many of his works, particularly his chamber-vocal and choral compositions, which continue to be in high demand in performance practice today, including among representatives of the Odesa Choral School, where Brahms' *German Requiem* holds a prominent place in the repertoire. A striking example of the interpretation of this work can also be considered its premiere in Ukrainian translation, which took place on April 21, 2011, in Kyiv. The work was performed by the Kyiv Symphony Orchestra and Choir under the direction of Roger McMurrin [5]. A similar level of popularity also characterizes the presence of Brahms' *Four Serious Songs* in Ukrainian chamber-vocal performance, represented in recent decades by original interpretations from Ukrainian vocalists such as Andriy Koshman (baritone) and Volodymyr Chibisov (bass-baritone).

Such performance experience not only demonstrates interest in the composer's work but also reflects an attempt to grasp, through the poetic and intonational language and translation of biblical texts, the depth of his spiritual world, which was genetically linked both to the pursuits of Romanticism and to the centuries-old precepts of German cultural-historical and musical traditions. According to K. Tsariova, "the idea of preserving the legacies of his great predecessors permeates all of Brahms' work. His art, which inherits the romantic psychology of Schumann, absorbs the natural song-like breath of Schubert's music, the wisdom of late Beethoven's revelations, and the Bachian discipline of thought and feeling. In doing so, there is a gradual departure from the acute psychological individualism

that generally characterizes Romanticism. Brahms' synthesis seems suited 'for all time'" [6], which explains the relevance of returning to his heritage in both contemporary performance and musicological studies.

The latter are represented in Ukrainian musicological thought by a significant number of studies addressing various genre spheres of Brahms' work. A substantial portion of these works focuses on the poetics of the composer's instrumental compositions, as evidenced by the dissertations and accompanying publications of D. Kashuba [8], V. Lebedeva [9], and D. Startsev [20]. In several studies of recent decades, there has been an attempt to summarize the world of the artist's "musical thinking" [25] and to identify the key elements of his authorial style [3; 16; 24]. A vivid subject of research in this regard is the metamorphosis of Brahms' chamber-vocal works, which evolved from the lyrical-romantic "waltz" cycle-garlands [14; 19] to their spiritual and religious reinterpretation in one of the composer's last works - *Four Serious Songs*, Op. 121 [6]. Its central theme, aimed at contemplating the essence of life and death, not only reveals the evolutionary paths of the chamber-vocal cycle in the culture of Romanticism but also the direct connection of this composition with the grand concept of *A German Requiem* [12; 17]. These works, along with related choral compositions (see the works of A. Tatarnikova [22], E. Tkachenko [23], K. Berdyennikova [2]), serve as a kind of "code" in the study of not only the main religious and ethical guidelines of Brahms' work but also the entirety of 19th-century German culture in its aspiration for the spiritual unity of the nation. More detailed information on this issue can be found in the fundamental works of some authors, especially M. Kalbeck [7], J. Swafford [21], and H. Gal [4].

The purpose of the study is to identify the spiritual-ethical and religious principles of Johannes Brahms' creative personality and their reflection in his vocal heritage (as exemplified by *A German Requiem* and the vocal cycle *Four Serious Songs*). The methodology of the study involves a combination of intonational, genre-stylistic, etymological, and hermeneutic approaches. The scientific novelty of the work is defined by introducing into musicological discourse not only materials related to the characteristics of Brahms' religious worldview but also their influence on the formation of the thematic concepts in his works, shaped at the intersection of Protestant-Lutheran principles of the German cultural-historical tradition and their metamorphosis within spiritual quests of the Romantic era.

2 Method

The methodology of the research is a set of approaches developed in musicology. It includes methods of cultural-historical, structural-functional, intonational-thematic, comparative, stylistic analysis aimed at understanding the synthetic nature of the connection between music and words in Brahms' vocal-symphonic works. The axiological method made it possible to identify the universality and semantic value meanings of Brahms' musical heritage.

3 Results and Discussion

The works of Johannes Brahms are remarkably diverse in terms of genre, encompassing various fields with the exception of music theater. The colorful intonational palette of his numerous compositions ranges from the authorial reinterpretation of the German *Lied*, popular Viennese waltzes, *Hungarian Dances*, symphonies, quartets, and piano works to the spiritual heights of his *A German Requiem* and the aforementioned cycle *Four Serious Songs*, set to biblical texts.

The German national musical heritage of the past, to which Brahms always paid close attention, held value for him not only from the perspective of compositional professionalism but also in terms of its spiritual and meaningful orientation. "It is precisely for this reason that the German spiritual-musical

tradition became a bearer of meaning and a moral foundation in the significant 19th-century processes of searching for ideals of wisdom, beauty, and Truth, whose origins dated back to early Christian traditions. For mid-century Germany, such spiritual orientations also became a stimulus for the activation of efforts towards national unification. As it is well known, this was also one of the ideals of life of Brahms', in whose mind the formation of a unified Germany and the completion of the full edition of Johann Sebastian Bach's works were kindred events" [17].

From this perspective, the artistic and aesthetic activity of representatives of this era of German culture and music was closely linked to the religious and confessional principles of their existence. This view resonates with the Romantic worldview and its spiritual "dominants," oriented towards the revival of Christian ethical values, their cultural expressions, and their alignment with the creative personality and musical heritage of Brahms.

The spiritual and religious beliefs of Johannes Brahms and their various manifestations have always been a focal point for his biographers and scholars studying his work. Most of the sources dedicated to the composer's life path affirm the Protestant-Lutheran spiritual orientation of his family. However, Brahms himself never sought to declare his religious or confessional beliefs, leaning more towards a pluralistic understanding of Christian dogma. According to biographers, "nothing outraged him more - as the author of many works associated with religious texts - than being perceived as a composer of the orthodox church. When asked by one of his friends about his religious beliefs, Brahms sharply replied: "I have my own faith!" [15]. Nevertheless, an analysis of the composer's approach to biblical texts (including in *A German Requiem* and the *Four Serious Songs* cycle), his selection of texts in constructing the conceptual framework of his works, combined with biographical facts and his interpretation of sacred themes, reveals the significant role of Protestantism as a foundation for his worldview.

The Protestant-Lutheran principles of existence, characteristic of German spiritual consciousness and the culture shaped by it, dating back to the Reformation, are marked by the "fusion" of the spiritual and secular elements and their mutual spiritualization. According to the generalizations of S. Averintsev, the boundaries of Protestantism "appear simultaneously both narrowed and expanded. On the one hand, religion itself is reduced to faith, while on the other, instead of a closed sphere of churchliness, it encompasses all of life; everyday practical activity acquires religious significance <...> While for medieval Christianity, religion was either cult or asceticism requiring special dedication <...> from the perspective of Protestantism, dedication is already achieved through baptism, which, in Luther's words, 'consecrates us all to priesthood'. <...> According to Luther, who revived the views of early Christianity, 'serving God is serving one's neighbor, whether it be a child, a wife, a servant <...> anyone in physical or spiritual need; and this is divine service'" [1].

Brahms' "service" is concentrated precisely in his creative work, where eternal themes and spiritual topics hold a significant place, revealing not only personal aspects of the composer's religious worldview but also the preaching "pathos" of his entire oeuvre. This quality is also known to be a fundamental trait of German Protestantism and its musical component, centered in the notable phenomenon of German sacred music – *Hauptmusik* – "the main music of the day", aligned with the sermon and rooted in the intonations of the Protestant chorale. This approach is evident in many of Brahms' works, where the *melos* of Protestant church tradition forms the intonational core for both spiritually oriented compositions (*A German Requiem*) and secular genres (the vocal cycle *Four Serious Songs*).

Brahms' connection to the age-old traditions of Lutheranism is evident in his treatment of the themes of "life" and "death". By presenting "justification by faith" as the most important principle of his doctrine, Protestantism views the service to God not as the privilege of a chosen clergy but as a function of the lives of all

believers. Professional secular activity is regarded within this confessional branch of Christianity as the embodiment of "God's calling (*Beruf*), a high task set by God for each person, who throughout their life must resolve it, that is, realize all his potential capabilities instilled in him by the Creator" [11]. This position of "faith in action" defines the high spiritual significance of human existence within Protestantism. Death, within this concept, is primarily interpreted as the inevitable outcome of a person's active life and is perceived, according to F. Ariès, "not as the physical or moral horror of agony, but as an anti-life, the exhaustion and emptiness of life, prompting the mind not to cling to earthly existence. In this death, there is neither anxiety nor drama". It becomes a desired reward... The conclusion of earthly life is viewed [in German Protestantism] as a new birth, as an ascent to eternal life, and, therefore, the Christians should await their death with joy" [11].

In this interpretation of the "eternal" theme, the connection between Protestantism and the positions of early Christianity, including its Byzantine interpretation, is evident. In the latter, the emphasis was not so much on mourning the deceased but rather on consolation. This is why "the entire complex of the Christian burial rite was aimed at comforting, inspiring, and educating those around" [18].

The aforementioned characteristics of the interpretation of the essence of life and death in the German Protestant tradition, which genetically traces back to the origins of Christianity, including its Eastern Christian (Byzantine) foundation, manifested not only in the theological works of the Lutheran orientation but also in German liturgical music associated with this tradition and represented by figures such as Heinrich Schütz (*Musikalische Exequien*), J.S. Bach (spiritual cantatas No. 106, 32, 60, 73, 161, 198, among others), and their contemporaries. As a representative of German Romanticism and pre-Neoclassicism, Brahms also addressed these themes in the second half of the 19th century. The composer's words mentioned at the beginning of this article regarding his spiritual ideal of a person who is "calm in both joy and sorrow" directly resonate with the key thesis of Bach's Cantata No. 198 – "in life, the pious are calm in death". Analogies with the aforementioned authors are also evident in the tonal language of many of Brahms' works, which appeal to the poetics of Protestant chorales, thereby revealing a notable continuous connection for Brahms, not only with the "spirit" of his time but also with its sacred sources. This thematic issue is most fully reflected in the concept of *A German Requiem* and the vocal cycle *Four Serious Songs*, which marked both the flourishing and triumphant "ascent" of the composer as well as the spiritual-philosophical conclusion of his creative and life journey.

Brahms' *German Requiem* was composed in the late 1850s to early 1860s as a tribute to the memory and respect of two people closest to him - Robert Schumann and his mother. The genre designation defines the substantive content of this work, oriented toward the sacred themes that were actualized during the Romantic era – "life and death, the meaning of human existence, conscience as its moral-ethical law, labor and creativity as the guarantee of the immortality of the human spirit, consolation, peace, and joy as rewards for tears and suffering for those who 'have worked a little' and spiritually realized themselves, and, finally, the unity of all that exists" [17]. Their profound spiritual content is primarily conditioned by the nature of the textual source, represented by fragments from the Bible in Martin Luther's German translation, which were selected and compiled by Brahms himself. This is not so much an exemplary authorial approach typical of Romanticism but rather an adherence to the ideas and principles of the Lutheran spiritual-musical tradition, as the composer mentioned in one of his letters to Clara Schumann, describing his work as "a choral piece of the German requiem kind" [11].

This work by Brahms is distinguished among similar compositions of the Romantic era (by composers such as H. Berlioz, G. Verdi, A. Dvořák, etc.) by its avoidance of musical-theatrical techniques and its marked non-operatic nature, as

evidenced by the emotional tone of *A German Requiem*, which is directed toward the ideas of “peace” and “consolation”. The composition is characterized by a predominance of slow tempos, a practical absence of dynamic contrasts, and frequent use of sustained organ points, all of which reveal an inclination toward prayerful contemplation and meditateness. A key original element in the tonal language of Brahms’ work is the unique authorial reinterpretation of the Protestant chorale “Wer nur den lieben Gott lässt walten”, which permeates almost all its sections, its polyphonic constructions, and its modal-intonational language, thereby embodying not merely the principle of quotation but rather a “broadly interpreted chirality” [12].

The depth of the spiritual themes and their tonal implementation in Brahms’ *German Requiem* was of such significance to the composer that it received a kind of “continuation” in the chamber vocal cycle *Four Serious Songs*, which attained the status of a spiritual-ethical summation of the composer’s creative path.

The historical pathways of the development of the vocal cycle genre in the European musical-historical tradition indicate a certain mobility of its typological characteristics, which are not predetermined by a specific number of sections, as the defining feature of this genre is the presence of an “overarching idea” or concept that can be realized with varying numbers of components in the cycle (“interconnected thoughts”). “Each song in the cycle, reflecting a certain ‘momentary’ feeling or image (as does a poem), becomes an important component of a larger whole within the cycle, capturing through the author’s (or authors-poet’ and composer’) worldview an understanding of the human life path in both existential and everyday manifestations. This aligns with the semantics of the word ‘cycle’, which etymologically relates to embodiment of God, ‘Cosmos’, and represents the ‘Life of the Heart, Spirit, and Soul’, most fully and meaningfully realized in the Romantic era through the means of chamber vocal music” [6].

Thus, the Romantic vocal cycle focuses on the idea of the human life path and its illumination by the profound feeling of love, which serves as a source of inspiration and happiness or personal tragedy. This genre is exemplified in the classical works of Austro-German Romanticism - specifically in the compositions of F. Schubert, R. Schumann, and their contemporaries. In his extensive chamber vocal legacy, which encompasses approximately four hundred works, including arrangements of folk songs and numerous vocal duets and quartets that embody the stylistic features of German Romanticism and Biedermeier, J. Brahms pays homage to this tradition (e.g., “15 Romances from ‘Magelone’, Op. 33; cycles Op. 43, 47, 48, 57”; 18 Waltzes for Piano Four Hands; and the vocal quartet ‘Lovesongs’, Op. 52, among others). At the same time, while preserving the memory of the ancient traditions of the German sacred Lied, which were once instrumental in the formation of the Protestant chorale, Brahms, in the later period of his life and creative output, effectively arrived at the creation of a “spiritual vocal cycle”, focused primarily on the contemplation of “eternal” sacred images and themes. Here, the comprehensive exploration of the theme of love yields to a consideration of the essence of life and death, the meaning of human existence, and more. This thematic focus characterizes the songs of Op. 105 and, most notably, the substantive “content” of the cycle “Four Serious Songs”, Op. 121.

It is important to note that this spiritual direction in the development of the vocal cycle is characteristic not only of J. Brahms. A range of his forerunners can, to some extent, include Beethoven’s “6 Songs on Texts by H. Gellert”, which reveal aspects of the spiritual and religious worldview of the great German composer. In this regard, the experience of R. Schumann is also noteworthy, as represented in his vocal cycle based on children’s poems by Elisabeth Kulmann. This cycle embodies the angelic world of a terminally ill girl who contemplates the approach of her own death while simultaneously rejoicing in each day of her short life [13].

Similar sacred motifs also permeate M. Reger’s “Orchestergesang”, Op. 124 and Op. 136.

J. Brahms’s “Four Serious Songs”, composed in 1896, not only summarize the active creative life of the composer but also reflect the tumultuous Romantic century in which he lived. The textual foundation of the work consists of biblical fragments, chosen by the composer himself, similar to his approach in the “German Requiem”. The first and second movements are drawn from the Book of Ecclesiastes, which has long been characterized by its preachy orientation. Verses 3 and 4 of this biblical source are complemented by fragments from the Book of Wisdom of Jesus, Son of Sirach (chapter 41, verses 1-4) (III movement) and from the First Epistle of the Apostle Paul to the Corinthians (chapter 13, verses 1-3, 12, 13) (IV movement), both addressing the spiritual meaning of human life and death as its inevitable conclusion. Ultimately, all four components of Brahms’s vocal cycle symbolically depict the human life path and the realization of spiritual values, thus revealing an evident parallel to the spiritual concept of the “German Requiem”, albeit implemented according to the Biedermeier principle of embodying “the great in the small”. This explains the metaphorical definitions of the essence of this work, represented in the analytical summaries of researchers examining the composer’s creativity. For instance, K. Tsaryova describes this vocal cycle as a “chamber new “German Requiem” for bass and piano”, while K. Geiringer sees in it the characteristics of a “grand solo cantata” or “solo oratorio” [6].

The poetics of the vocal cycle Op. 121 clearly intersect with the typological features marked by the “German Requiem” and the national spiritual worldview. This is evident in the author’s selection of biblical text, whose themes parallel those of its choral “predecessor”, as well as in the narrative and conceptual structure of the work, which symbolically encompasses themes related to the relationship between life, death as a conclusion, and the understanding of their spiritual significance. The optimistic “tone” of the cycle is also reflected in the tonal plan of the work, showcasing a sequential movement from the tragic D minor to the heroic E-flat major. A central theme in both works is the Old Testament notion of the insignificance and transience of humanity: “For all flesh is as grass, and all the glory of man is as the flower of grass”. Both the “German Requiem” and the analyzed cycle Op. 121 focus on themes of consolation, comfort, and the spiritual understanding of love, which, according to the Apostle Paul, is “the greatest of Christian virtues”.

The intonational language of the vocal part in the cycle ‘Four Serious Songs’ embodies, in analogy with the “German Requiem” Op. 45, the principle of “broadly interpreted chirality”. Moreover, in the third song of the cycle, Brahms refers to the initial intonations of the ancient Lutheran chorale “Mein Jesu, der du mich” (“My Jesus Calls to Me”), which were previously articulated in the main theme of the first movement of his Fourth Symphony and also formed the thematic basis of the first of the eleven chorale organ preludes of the composer, Op. 122 [10].

4 Conclusion

In summary, it can be noted that the synthesis of bibliographic and analytical sources dedicated to the works of Johannes Brahms, including his vocal heritage, reveals the depth of the spiritual, ethical, and religious principles that shaped his creative identity, rooted in the German Protestant tradition and the culture formed against this backdrop. Simultaneously, these principles were enriched by the spiritual explorations of German Romanticism and Biedermeier. The appeal to the enduring principles of national culture and its illustrious representatives, combined with the revival of the “spirit” of the nation and the characteristic for Protestant culture convergence and mutual spiritual enrichment of the sacred and secular genres of creativity, contributed to the processes of consolidation within German society and its movement toward the unification of Germany.

This influence is evident in the poetics of Brahms's "German Requiem" and the vocal cycle "Four Seasons Songs", which manifest a notable inclination towards eternal themes of the relationship between life and death in their Protestant interpretation. This is demonstrated through the reference to corresponding biblical texts and their authorial arrangement and interpretation, as well as the appeal to the "intonational vocabulary" of Protestant chorales, which spans from direct quotation to free compositional representation at the level of "broadly interpreted chirality".

Literature:

1. Averintsev, S. (2006). *Collected works* (N. P. Averintseva & K. B. Sigov, Eds.). Sofia-Logos. Dictionary. Kyiv: Dukh i Litera.
2. Berdennikova, E. M. (2013). The poetry of J. W. Goethe in the music of J. Brahms ("Rhapsody," "Song of the Parson"). *Scientific Bulletin of the National Music Academy of Ukraine named after P. I. Tchaikovsky*, 101, 17-28.
3. Chervinskaya, N. (2014). The role of Johannes Brahms in the history of polyphony. *Problems of the Interaction of Art, Pedagogy, and Theory and Practice of Education*, 39, 112-126.
4. Gal, H. (2015). *Johannes Brahms: Leben und Werke*. FISCHER Taschenbuch.
5. German Requiem (Brahms). Retrieved September 18, 2024, from [https://uk.wikipedia.org/wiki/Німецький_реквієм_\(Брамс\)](https://uk.wikipedia.org/wiki/Німецький_реквієм_(Брамс))
6. Horelik, L. M. (2020). The vocal cycle of J. Brahms "Four serious songs": Spiritual and genre-style aspects. *Musical Art and Culture*, 30(2), 6-20.
7. Kalbeck, M. (2012). *Johannes Brahms*. Jazzybee Verlag.
8. Kashuba, D. V. (2023). Dialogue in the piano concertos of J. Brahms: Composer and performer aspects. [Senior PhD dissertation]. Kharkiv National University of Arts named after I. P. Kotlyarevsky.
9. Lebedeva, Z. D. (2014). Unity of the cycle of romantic miniatures: Artistic introversion of four ballads for piano, Op. 10 by Johannes Brahms. *Bulletin of NAKKKiM*, 3, 254-257.
10. "Mein Jesu, der du mich." <https://hymnary.org/hymn/DDPK1764/a321>
11. Muravska, O. V. (2010). *Essays on the history of foreign musical culture*. Odesa: Astropint.
12. Muravska, O. V. (2004). German funeral music of the Lutheran tradition as a phenomenon of European culture from the 17th to the 20th centuries. [PhD dissertation brief]. Musical Art. Odesa National A. V. Nezhdanova Academy of Music.
13. Oleinikova, Yu. V. (2010). Biedermeier and his manifestations in vocal music of the 19th–20th centuries. [PhD dissertation brief]. Musical Art. Odesa National A. V. Nezhdanova Academy of Music.
14. Petrova, O. V. (2020). Songs by J. Brahms, Op. 37 (On the issue of compositional and dramaturgical wholeness of the cycle). *Bulletin of NAKKKiM*, 2, 208-213.
15. Robertson, A. (1967). *Requiem: Music of mourning and consolation*. New York, Washington, Praeger.
16. Sadovnikova, O. S. (2007). The authorial style of J. Brahms (Theoretical-methodological and analytical aspects). [PhD dissertation brief]. Kharkiv State University of Arts named after I. P. Kotlyarevsky.
17. Shpak, H. S. (2024). Hermeneutic aspects of the "German Requiem" by J. Brahms and their interpretation by descendants of the choral school of K. Pihrov. In *Vocal and choral art and education: Historical research, performance concepts, modern trends: Scientific monograph* (pp. 257-273). Riga, Latvia: Baltija Publishing.
18. Sorochan, S. B. (2013). Death in Byzantium. In *Byzantine mosaic: Collection of public lectures of the Hellenic-Byzantine lectures at St. Panteleimon Church* (pp. 96-128). Kharkiv: Maidan.
19. Stanishevskaya, O. (2019). The interaction of poetic text and music in Opus 49 by J. Brahms. *Aspects of Historical Musicology*, 16, 158-169.
20. Starcev, D. A. (2019). Graphic signs in the musical texts of Johannes Brahms. *Kyiv Musicology*, 59, 3-14.
21. Swafford, J. (1999). *Johannes Brahms: A Biography*. Vintage, 752 pages.
22. Tarnikova, A. (2019). The triumphal song by J. Brahms in the context of the German spiritual, historical, and musical tradition of the 19th century. *Bulletin of the National Academy of Culture and Arts Management: Scientific Journal*, 3, 342-347.
23. Tkachenko, E. (2012). Protestant motet in the works of J. Brahms. *Kyiv Musicology: Collection of Articles*, 44, 88-96.
24. Yuriichuk, N. (2022). Features of the late style of J. Brahms (Based on the example of the cycle of organ chorale preludes). *Musicological Thought of Dnipropetrovshchyna*, 22, 361-371.
25. Zaitseva, M. L. (2016). Features of Johannes Brahms's musical thinking. *Trajectory of Science*, 2(9), 1-9.

Primary Paper Section: A

Secondary Paper Section: AL

TRANSLATION TRAINING OF FUTURE PHILOLOGISTS USING MODERN INFORMATION TECHNOLOGIES

^aVIKTORIYA IHNATENKO, ^bIRYNA VAKULYK, ^cIRYNA VORONIUK, ^dMYKOLA PROKHOROV, ^eHALYNA MELEKH

^a*Bila Tserkva National Agrarian University, 8/1, Soborna Sq., Bila Tserkva, 09117, Kyiv oblast, Ukraine*

^b*National University of Life and Environmental Sciences of Ukraine, 15, Heroyiv Oborony Str., 03041, Kyiv, Ukraine*

^c*National University Zaporizhzhia Polytechnic, 64, Zhukovsky Str., 69063, Zaporizhzhia, Ukraine*

^d*Yuriy Fedkovych Chernivtsi National University, 2, Kotsiubynskoho Str., 58012, Chernivtsi, Ukraine*

^e*Drohobych Ivan Franko State Pedagogical University, 24, I.Franka, Str., 82100, Drohobych, Ukraine*

email: ^a*victoria_ignatenko@btsau.edu.ua*, ^b*vakulyk@ukr.net*, ^c*Irynavoronyuk@gmail.com*, ^d*m.prokhorov@chnu.edu.ua*, ^e*melekhelen@gmail.com*

Abstract: The article represents an attempt to systematize specific features of translation training of future philologists within the environment of digital transformation. Special attention is paid to the necessity of shaping in future graduates the competence sufficient to effectively work in the sphere of B2B translation services. A concept of today integrative competence of future philologists-translators is covered and the need to apply a cross-disciplinary approach to designing curricula for teaching translation is emphasized. Core specifics and challenges of teaching localization is investigated in detail, based on both theoretical provisions and case studies. A potential of gamification and AI/ML application in translation training is outlined.

Keywords: translation training, digital transformation, IT, gamification, localization, competence.

1 Introduction

The digital educational environment is the reality in which modern society lives today. In the digital learning environment, students in higher educational institutions develop many important qualities and skills that are in demand by 21st century society. They determine the personal and social status of a modern person: information activity and media literacy, the ability to think globally, the ability for continuous education and solving creative problems, willingness to work in a team, communication and professional mobility. Therefore, it is not difficult to imagine that the next period in professional education will be devoted to the formation of a new generation of specialists who have digital competencies and are ready to function in the digital space of modern society [25]. Consequently, the vocational education system will be modernized, and there will be a need to provide educational institutions with modern equipment, digital educational technologies, and relevant teaching staff capable of transforming the entire educational process.

It should be noted that the educational process at a higher education institution that employs digital technology encourages each student to work autonomously, produces a favorable communicative environment, and provides all of the circumstances for the development of an individual's creative potential. The use of digital technologies increases students' motivation and cognitive activity, improves individualization, differentiation, and intensification of the learning process, broadens and deepens interdisciplinary connections, systematizes and integrates knowledge of individual academic disciplines, organizes systematic and reliable control, and eliminates subjectivity in assessment [19,23].

Researchers note that the advantage of integrating digital technologies into the educational process is that they allow students to control the strategies and resources from which they learn, thereby personalizing their learning experience [27]. Digitalization promotes innovation in the field of education, including changes in methods and approaches to teaching and management of educational resources. At the same time, the penetration of digitalization into teaching processes contributes to the effective use of quality educational resources by students

and constant innovation in higher education institutions [22]. Adaptation of education to the capabilities and abilities of students since all subjects of the educational process feel comfortable, and, consequently, motivation to learn increases.

In particular, the digital educational environment allows future philologists to use a wide range of modern information technologies, including when learning translation.

The introduction and development of digital technologies, digitalization and digital transformation of a translator's professional activity have changed traditional ideas about his professionalism. A modern professional translator must not only speak his native and foreign languages, know the basics of translation, and be an expert in a specific subject area, but also be able to use the latest IT as tools for his work, which allow him to significantly reduce the time spent searching for dictionaries, reference books, translation equivalents and correspondences, make design of the translation text depending on the customer's requirements, etc.

Furthermore, translation-oriented technology, i.e., those specifically designed for translators, may not only suit translators' needs, such as greater usability, flexibility, and integration with other resources or devices. They may also create new needs (for example, the continuous release of new versions of translation memory systems or the emergence of competitors in the translation memory market) or require translators to broaden their skill set (by managing crowd translation projects, participating in collaborative pro bono translation, or post-editing machine-translated texts). In actuality, if we look at the big picture, we could find that we, as individuals, are far more than "one or two steps behind" technology.

Digital technologies have served as 'enablers' of translation (e.g., machine translation for non-translators or monolingual individuals), 'facilitators' of translation (e.g., translation memory systems for translators), and even the 'object' of translation (e.g., software and websites that must be translated). As a result, technological advancements have called into question our understanding of translation (as a product, a process, or a phenomenon), to the point that any attempt to prescribe or idealize a translation process is doomed to be oversimplistic or out of date from the start. Individual preferences/skills and a variety of circumstances now drive translation processes, including budget, institutional or national regulations, technological resources, time, client requests, quality expectations, text type, subject matter, and translator availability for a specific language pair, to name a few. In certain circumstances, the technology selected by the language industry may have the last say on translator behavior when it comes to translation, pre-editing, post-editing, localization, editing, and rewriting. Even in the university classroom, the teacher is unlikely to know how students are performing their translation tasks as they progress at their own risk along a continuum from translating strictly (i.e., using only or mostly their own mental resources) to translating broadly (e.g., slightly post-editing MT outputs or at least drawing "inspiration" from MT outputs).

Evidently, the landscape of information technologies used in translation became very multifaceted and convergent, which necessitates appropriate agile transformation of the concept, strategies, and tools applied in translation training, especially for the area of philology specialties.

2 Materials and Methods

The work uses theoretical methods of summarizing and analyzing scientific data on the research problem (from the standpoint of pedagogy, translation studies, psychology, psycholinguistics, didactics, etc.), modeling the process of learning to translate scientific and technical texts using IT. The

concept of digital transformation is education is employed throughout of the research.

3 Results and Discussion

Translation is experiencing a time of revolutionary change. The impact of digital technology and the internet on translation is ongoing, extensive, and significant. The translation revolution is all around us, from automatic internet translation services to crowdsourced translation and the spread of smartphone translation apps. This revolution will have far-reaching and severe consequences for human languages, civilizations, and society. In the Information Age, often known as the Translation Age, new ways of speaking and thinking about translation that account for substantial developments in the digital world are urgently required. In 2012, Michael Cronin [8] investigated the role of translation in the debates surrounding emerging digital technologies, attempting to analyze their social, cultural, and political consequences, guiding readers through the origins of translation's engagement with technology as well as the key issues of the twenty-first century. Cronin questions the dominant instrumentalist conceptions of language, which result in "the tyranny of transitivity in translation understandings". Instead, he suggests translation as an intransitive activity, which means that it does not have to correspond to an aim of "producing" anything, but might be a goal in and of itself. This has implications for our understanding of translation and the relationship between translators and technology. For example, it questions long-held divisions like "culture language" and "service language", and it reveals a "dance of agency" between translators and technology. Drawing on Iulia Mihalache, Cronin contends that the digital age has resulted in a change from "information society" to "interaction society" [4, 8]. The digital age evolves into the interaction age.

Translators nowadays are referred to as "co-creators of digital transformation" [28], and it is critical to implant this concept in students, promoting their ongoing growth in the IT environment within the area of translation. According to Turkish researcher Çakici [5], the increase of tech-savvy customers and their new demands forces businesses to rethink their business strategies in order to react to this changing market. In this sense, digital transformation improves the customer experience and satisfies digitally empowered consumers by integrating digital technology into all aspects of a business, changing how a company runs and provides value to customers. The generation of value is replaced by co-creation, which engages both customers and businesses in the value creation process.

The transition of many businesses from a typical goods-dominant (G-D) to a service-dominant (S-D) rationale has sparked more VCC and service research, and translations are now part of the conversation. Figure 1 depicts the whole paradigm transition from G-D to S-D logic.

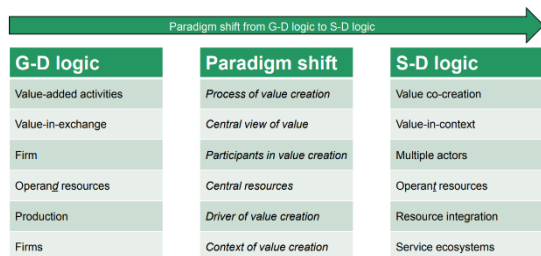


Figure 1. Paradigm shift from G-D logic to S-D logic [28]

The research on value co-creation predominantly focuses on two theoretical dimensions, each containing three parts [18]:

1. Value co-production

- Sharing of knowledge
- Sharing of control
- Actor interaction

2. Value-in-use

- Experience
- Personalization
- Relationship

With the rise of digitalization, value creation is once again driven by how its players use digital technologies. As a result, this is also common in the translation field. Today's consumers, particularly in the B2B sector (the largest area of the translation business), are technologically sophisticated and want translators to be proficient in using IT tools. The interaction between the customer and the CEO in the B2B translation industry is continual and collaborative, with value co-creation taking place. Future philologists will lack the competency required in today's digitally altered environment unless they comprehend the principles of cooperation and value co-creation.

One of the crucial challenges of teaching translation is to shape cross-disciplinary skills in students – first of all, cross-cultural skills and strong capability of understanding cultural and cognitive context of target language.

Translation cannot simply replace terms from one language with comparable words from the target language ('metaphrase'). Translators must resist the urge to reuse source language (SL) vocabulary in the target language ('transliteration'); instead, they must popularize comparable terminology in the target language (TL) or create new phrases that are more indicative of the TL and culture of TL communities. Translation must bring the text closer to the local culture in order to convey meaning. Translated resources must be concise, with no detailed explanations or remarks on the source text.

Translation is a difficult process that involves a variety of talents. The translator must be able to read and write both the SL and TL. She/he must grasp the substance of the SL and write it in the context of the TL. This also needs a strong vocabulary, including mastery of terms and idioms in both languages to represent cultural subtleties in translation, as well as a reasonable understanding of the area. For articles about Mathematics instruction, the translator must be conversant with the concepts and idioms used in Mathematics, as well as have a larger grasp of education, its philosophies and methods.

Translation allows readers to comprehend and benefit from the culture of those who speak the SL. It also adds fresh thoughts to the TL. According to investigators, "when we evaluate concepts across cultures, we cannot be looking for equivalences, but only for the potential to bear possible meanings, what is referred to as "meaning-bearing capacity" [13]. Translation "requires not formal equivalence but affective equivalence" [21]. The problem is to convey the substance of the piece, such that a TL reader can have similar experiences to the SL reader while remaining in their own environment. Given these intricacies, 'translation' is frequently referred to as 'trans-creation' [14].

Localization is one of the specialized topics of translation that pose a significant challenge to both students and professors of philology specializations. Localization refers to the linguistic and cultural adaptation of a product or content to a specific market or region, such as a nation or area with its own culture and language. Translation is one of its essential steps, but other procedures include adapting design, visuals, layout, local formats, currencies, and units of measurement; "modifying content to suit the tastes and consumption habits"; and "addressing local regulations and requirements" [21].

A maxim in game localization is that it is meant to give its consumers from various nations with distinct experiences as if its goods had been designed specifically for them as end users [17]. Even while this maxim is coherent from a commercial standpoint, applying it to academics misses numerous breakthroughs in Translation Studies since it insists on giving the target cultural player with the same gaming experience as the original version's players. Some works in Translations Studies promote the translator's invisibility [26] and the notion of

translation as a neutral practice of "transferring" content from a source language into a target language [6], despite Bernal-Merino's claims that we can learn the concepts of "co-creating" and "shared-authorship" in recognition of the necessary translator input.

Despite the rapid growth of the localization sector and the establishment of multiple translation training programs globally, industry and academics have progressed independently and neglected one another in a variety of ways [9]. For instance, unauthentic materials and tools for localization learning have been used in translation programs, usually from a theoretical rather than a practical standpoint. Meanwhile, the translation industry seems to ignore intertextuality/hyperlinks, multimodality, and narrative sequence, hiring multiple translators or translation agencies to translate spreadsheets devoid of context, images, and videos. Additionally, a number of scholars have insisted on focusing only on the linguistic features of multimedia interactive entertainment software (MIES) products [3], ignoring the usage of both user- and non-user-friendly technology as well as non-linear storytelling [7]. Trainers and academics who work with translation technology, like us, seem to favor one translation tool over another at the same time, instead of emphasizing fundamental skills that should enable students to adjust to the various needs and preferences of clients or agencies as well as the quick changes in translation technology [2].

Thus, translation training of future philologists should be built on multidisciplinary paradigm, for shaping integrative competence, which includes not only linguistic knowledge and skills, but also cross-cultural skills, customer management skills, basic array of knowledge in STEM fields [12]. For this, AI and ML technologies, as well as gamification tools seem to be not only expedient but obligatory for application in higher educational institutions.

Despite the tremendous expansion of the game localization business in recent years, translation undergraduate curricula still lack official instruction in game localization, frequently leaving rookie translators with little choice except to seek out the necessary skills informally in game translation forums. Designing a video game localization course for translation undergraduate programs at public universities is a challenging task in today's environment, especially considering the scarcity of free and legitimate materials. Esqueda and Stupiello's paper [11] describes a game localization teaching experience at the undergraduate level in Brazil, with a particular emphasis on how to handle the linguistic assets of the online race game SuperTuxKart, while also attempting to shed some light on potential entertainment software translation requirements and their incorporation into translation programs.

One of the most difficult issues in localization is producing clear and succinct language within the constraints of a user interface. Translators working with localization must be highly imaginative in order to correctly capture the same message as the original while without exceeding the allowable amount of characters [10]. Furthermore, the online arena has provided corporations with access to customer input on Massive Multiplayer Online (MMO) games, enhancing the sophistication of video games that mix graphic and filmic arts, literature, computer science, and audiovisual communication. One of the challenges posed by these various game platforms is how to teach translation students the knowledge and skills needed to comprehend the medley of archives that comprise these multimodal materials to be translated and localized into another language, given that the primary strategy of this industry is to reach out to different locales with the promise of guaranteed playability and gameplay experience among people from various countries.

Localization tools are always being developed and refined to allow translators to manipulate such contents with a target market in mind, because different approaches are needed when translating different types of linguistic content in a game (such as manuals, packaging, "read me" files, official web sites,

dialogues for subtitling, dubbing, and voice-over, including the user interface). Similarly, traditional training techniques must be evaluated and altered to correspond with the evolving image of localization competence. Translation and localization training, as well as translation tools for localization projects, must be priority. One step toward this objective may be to incorporate a game localization teaching experience into undergraduate translator training, as recommended by Esqueda and Stupiello [11]. These authors claim that, while many (commercial) CAT (Computer Aided Translation) tools can read various file formats in order to make the translator's or localizer's job easier (by extracting the translatable text and protecting the rest of the content), the majority of them cannot read open-source .pot files. Because .pot and .po files are already meant to be free and open-source, the full translation process may be completed with free and open-source localization tools like Drupal, Poedit, or Virtaal.

Translation entails not only language and cultural transmission, but also the adaptation of visuals, pictures, re-designing the source material or production in the target location, and so on. As a result, in courses that include game localization, student translators must also learn about computer technology, software engineering, and how to use translation tools. To achieve this goal, the associated courses must be supplemented by optional courses from other departments that focus on technology (e.g., computer engineering, software engineering, computer programming) [16]. The digital revolution causes profound changes in the translation profession, requiring practitioners to master new information and abilities or gain new competencies.

However, evidently, it relates not only to game localization, but to localization of business software, as well as translation of law documents, reports and White papers, etc. The nation-specific features should be taking into account in any translations. Moreover, even complex international affairs aspects should be considered by a translator [20], in order to attempt to avoid "sharp corners" in text and provide more "streamlined shape".

To far, the most successful application of gamification in translation and localization has been crowdsourcing models that trade recognition for project effort. Facebook, LinkedIn, and Steam have all seen success - and occasional controversy - with this strategy. Even commercial product developers have found success with gamified components in efforts to bridge the language divide for areas that do not warrant a full-fledged commercial translation effort [1].

Duolingo, one of the most renowned adopters of gamification in the language area, provides language learning classes and rewards users with badges for utilizing the platform. Although site visitors would be hard pressed to tell that Duolingo is anything other than a language-learning tool, it began as a commercial translation business that tried to convert language learners' efforts into quality translation. The company's marketing no longer stresses this feature, although its terms of service indicate that it still provides these services. Gamification engages site users in their duties and ensures that they continue to work on the tasks required by Duolingo to deliver commercial services.

Another famous example, which may precede the emergence of gamification, is ProZ's KudoZ platform. KudoZ are points awarded to translators who assist other linguists. Translators with more points rank higher in search results and are more likely to be picked for paid work through the platform. In this situation, the goal is to combine compassion and self-interest so that translators may help one another. This platform may be effectively utilized in the educational process to immerse students in the real world of translation.

The Content and Language Integrated Learning (CLIL) technique, which is based on an integrated multidisciplinary approach, can help students enhance their language proficiency [29]. It encourages international understanding and innovative thinking, as well as the development of professional and general language skills [15]. The LISTiG13/LISST14 e-learning system

is a useful instrument for building intellectual linguistic resources [24,28]. This intelligent tool was created with the help of several companies, including university research units and respected non-university units with a global reputation in the IT sector and linguistic tool creation. The LISST/LISTiG system is a complicated instrument that combines translation and glotodidactic e-learning methodologies. It gives pupils immediate feedback in reaction to the information they enter, including song lyrics. Students who complete translation tasks receive thorough feedback on their translated sentences. The technology also automatically identifies different sorts of translation faults and offers students with information so that they may remedy them. The teacher interface enables students to become acquainted with various translation possibilities and link error messages with specific linguistic occurrences. The technology also automatically assesses typed texts for grammar and spelling, comparing them to accurate translation versions and example responses already entered by teachers. Students receive automated feedback messages that indicate flaws in their translations when compared to example replies. The system also analyzes specific sentence fragments input by students to information already recorded by the instructor.

Yuxiu [30] presented an intelligent translation teaching method using artificial intelligence translation technology to address the shortcomings of the current teaching approach. The system primarily decodes and encodes the original text using a neural machine translation algorithm to produce the related translation. Simultaneously, a statistical machine translation technique was utilized to create a natural language translation model, which improved translation quality and accuracy. This allows teachers and students to benefit from a novel learning experience while also reforming traditional translation instruction.

The AI translation teaching system module may assist students grasp and master translation abilities, as well as improve translation quality and efficiency. Figure 2 shows the modular structure of Yuxiu's proposed artificial intelligence translation training system.

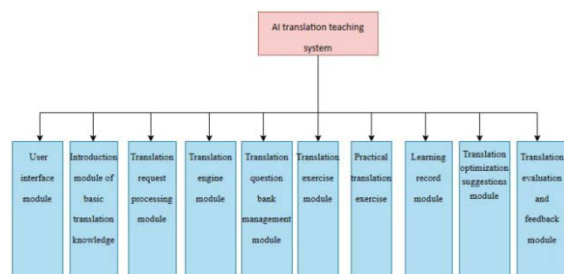


Figure 2. AI translation teaching system module [30]

By integrating the necessary modules indicated in Figure 2, this system may provide students with focused, efficient, and adaptable translation teaching aid services, meeting the aim of increasing students' translation abilities. Meanwhile, it may successfully assist instructors in understanding and mastering students' translation capabilities, as well as providing teachers with focused, individualized instruction based on students' various translation abilities.

Thus, the landscape of IT tools and digital strategies expedient in translation teaching of future philologists is very broad, and every educational institution can choose among them what is best aligned to the institution' profile and curriculum design. At the same time, as it was noted above, an integrative cross-disciplinary approach should be applied, to shape students' competence which would allow graduates working successfully in any sector of translation services, including B2B.

Literature:

1. Alcaide-Martínez, M., & Taillefer, L. (2022). Gamification for English language teaching: A case study in translation and

interpreting. *Lebende Sprachen*, 67(2), 283-310, DOI: 10.1515/les-2022-1015

2. Bećirović, S., Brdarević-Čeljo, A. & Deliđ, H. (2021). The use of digital technology in foreign language learning. *SN Social Science*, 1, 246, DOI: 10.1007/s43545-021-00254-y

3. Bernal-Merino, M. (2015). Translation and localisation in video games: Making entertainment software global. Routledge, DOI: 10.4324/9781315752334

4. Borodin, Y., Sorokina, N., Tarasenko, T., Volkova, N., Akimova, L., & 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

5. akıcı, N. (2022). Digital transformation and co-creation of value: The role of digital agility. In: M. Rodrigues & J. Proenca, eds. Impact of digital transformation on the development of new business models and consumer experience, 23-36. IGI Global, DOI: 10.4018/978-1-7998-9179-6.ch002

6. Catford, J. (1965). A linguistic theory of translation. Oxford University Press.

7. Coelho, B., & da Silva, I. (2017). Towards a multimodal methodology for the analysis of translated/localised games. *Domínios de Lingu@Gem*, 11(1), 6-16, DOI: 10.14393/DL28-v11n1a2017-1

8. Cronin, M. (2012). Translation in the digital age. Taylor & Francis, DOI: 10.4324/9780203073599

9. Da Silva, I., Bernal-Merino, M., & Esqueda, M. (2020). Translation and digital technology: Practices, theories, research methods, and the classroom. *Belas Infieis*, 9(4), 3-13, DOI: 10.26512/belasinfieis.v9.n4.2020.31444

10. Diaz, I., Cespon, M., Lage, J., Perez, S. (2023). *Current trends on digital technologies and gaming for teaching and linguistics*. Peter Lang.

11. Esqueda, M., & Stupiello, E. (2018). Teaching video game translation: first steps, systems and hands-on experience. *Linguagem e Tecnologia*, 11(1), 103-120, DOI: 10.17851/1983-3652.11.1.103-120

12. Gavkalova, N., Akimova, L., & Akimov, O. (2023). Anti-crisis Management Mechanism in the Digital Age. *Marketing and Management of Innovations*, 14(4), 188-199. <https://doi.org/10.21272/mmi.2023.4-14>

13. Harrak, Y. (2017). *Translation and cultural/contextual constraints*. LAP LAMBERT Academic Publishing.

14. Katan, D., & Taibi, M. (2021). *Translating cultures*. Routledge.

15. Kruger-Marais, E. (2024). Subtitling for language acquisition: Eye tracking as predictor of attention allocation in education. *International Journal of Language Studies*, 18(2), 129-150, DOI: 10.5281/zenodo.10475319

16. Odacioglu, M., Loi, Ch., Kokturk, S., Uysal, N. (2016). The position of game localization training within academic translation teaching. *Journal of Language Teaching and Research*, 7(4), 675-681, DOI: 10.17507/jltr.0704.06

17. O'Hagan, M. (2020). *The Routledge handbook of translation and technology*. Routledge.

18. Ranjan, K., & Read, S. (2016). Value co-creation: Concept and measurement. *Journal of the Academy of Marketing Science*, 44(3), 290-315.

19. Palshkov, K., Shetelya, N., Khilus, N., Vakulyk, I., & Khyzhniak, I. (2024). Impact of mobile apps in higher education: Evidence on learning. *Amazonia Investiga*, 13(74), 115-128, DOI: 10.34069/AI/2024.74.02.10

20. Sapała, B., & Turska, M. (2022). The recovered past? Deliberations on translation in the context of historical knowledge and collective memory. *Babel*, 68(1), 114-138, DOI: 10.1075/babel.00252.sap

21. Scholz, K. (2012). *The art of translation: With special reference to English renditions of the prose dramas of Gerhart Hauptmann and Hermann Sudermann*. Nabu Press.

22. Siregar, M. (2019). Pedagogical translation use by scientific approach in teaching English. *Budapest International Research and Criticism in Linguistics and Education (BirLE) Journal*, 2(4), 111-119, DOI: 10.33258/birle.v2i4.524

23. Vakulyk, I., Koval, V., Lukiianchuk, I., Romanenko, N., & Grygorenko, O. (2022). Formation of a professional communication culture among the students using information

technologies. *IJCSNS International Journal of Computer Science and Network Security*, 22(9), 12-22. DOI: 10.22937/IJCSNS.2022.22.9.12

24. Vakulyk, I., Vasylyshyna, N., Vyselko, A., Lakhmotova, Yu., & Ponomarova, M. (2023). Organization of students' independent work for learning English in the modern conditions of digital education: Comparative context of China and Europe. *Ad Alta*, 3(2), 63-73, WOS:001027993900010

25. Vaniushyna, O., Gaivoronska, T., Dunayeva, L., Lanska, S., Kuzmina, M., Varnava, U. (2024). Social and psychological prevention of professional burnout of social sphere employees under the conditions of the martial law. *Ad Alta: Journal of interdisciplinary research*, 14(1), XL, 78-81. <https://www.webofscience.com/wos/woscc/full-record/WOS:001222983700007>

26. Venuti, L. (1995). *The translator's invisibility: A history of translation*. Routledge.

27. Waller, L. (2022). *Digital transformation for higher education institutions: A framework for the future*. Ian Randle Publishers.

28. Winter, R. (2017). *A language for value co-creation*. University of St.Gallen, Institute of Information Management.

29. Yefymenko, T., Bilous, T., Zhukovska, A., Sieriakova, I., & Moyseyenko, I. (2024). Technologies for using interactive artificial intelligence tools in the teaching of foreign languages and translation. *Amazonia Investiga*, 13(74), 299-307, DOI: 10.34069/AI/2024.74.02.25

30. Yuxiu, Yu. (2024). Application of translation technology based on AI in translation teaching. *Systems and Soft Computing*, 6, 200072, DOI: 10.1016/j.sasc.2024.200072

Primary Paper Section: A

Secondary Paper Section: AE

INCLUSIVE PEDAGOGY IN SOCIETY 5.0: SOCIAL ASPECT

^aLARYSA SUSHCHENKO, ^bROMAN SUSHCHENKO,
^cTETIANA MARTYNIUK, ^dIRYNA PUSHCHYNA, ^eALONA
SADYKINA, ^fGNAT STRYZHAK

^aZaporizhzhia National University, 66, Zhukovsky Str., 69600,
Zaporizhzhia, Ukraine

^{b,d}National University Zaporizhzhia Polytechnic, 64, Zhukovsky
Str., 69063, Zaporizhzhia, Ukraine

^cLesya Ukrainka Volynian National University, 13, Voli Ave.,
43025, Lutsk, Ukraine

^eNational University Zaporizhzhia Polytechnic, 64, Zhukovsky
Str., 69063, Zaporizhzhia, Ukraine / Classical Private
University, 70-b, Zhukovsky Str., 69002, Zaporizhzhia, Ukraine
email: ^azcpu@ukr.net, ^brvstt@zp.edu.ua,

^cMartynyuk.t@gmail.com, ^dpushchyna@zp.edu.ua,

^ealena980320@gmail.com, ^fignat201120112012@gmail.com

Abstract: The article represents an attempt to comprehend and conceptually describe features of inclusive pedagogy within Society 5.0, which is the convergence of innovative technologies, including artificial intelligence, the Internet of Things, big data, and robotics. It is shown, in particular, that digital technology can make a sound contribution to this improvement agenda in the inclusive education environment by enriching education across all areas of Curriculum for Excellence. Multimodal learning is embraced by inclusive EdTech, giving students several ways to interact with the material. Moreover, EdTech, applied within project-based learning and Agile paradigm, is capable of providing training of life skills in the inclusive education system students - 4C: Creativity, Critical Thinking, Communication, Collaboration.

Keywords: inclusive pedagogy, Society 5.0, excellence, curriculum, technology, migrants, internally displaced persons.

1 Introduction

The idea of a technology-based society has evolved into the "Society 5.0" age, which emphasizes the integration of artificial intelligence, the Internet of Things (IoT), and people to attain inclusive social welfare. Education is essential for establishing a foundation of pertinent information, skills, and values in the face of these shifting dynamics.

Simultaneously, Society 5.0 tackles the extent and objectives of an all-encompassing society capable of accommodating both personal preferences and societal variety. It goes beyond innovations in technology, imagining a day where people are the primary emphasis. According to this viewpoint, society should be inclusive, harmoniously balance social variety, provide room for personal preferences, and be technologically advanced. The idea recognizes that development is truly valuable when it empowers people and improves their quality of life - rather than just being about technology. Therefore, Society 5.0 lays the groundwork for a society that values variety and recognizes the individuality of every person [27].

In the context of Society 5.0, education necessitates that students be more inventive, productive, flexible, and competitive. Furthermore, life skills education, or what is referred to as the 4C, is necessary in the twenty-first century. Here, "4C" stands for creativity, critical thinking, collaboration, and communication.

The introduction of education for students has been significantly impacted by the Era of Society 5.0, which offers chances and difficulties for educators in each educational unit. Inclusive education is one area of education that is affected by this. Special assistant instructors in inclusive education learning designs likely to be more social constructivist than normal education teachers [23]. According to their circumstances and community requirements, children with special needs can grow to their full potential with the support of an inclusive education learning design. It is obvious that inclusive education learning designs that are appropriate for Era Society 5.0 must be created based on national education standards, which include requirements for infrastructure, standards for instructors, and standards for procedures [14].

In today's classrooms, teachers engage with more diverse groups of students than ever before, but they commonly express a lack of preparation for the role [5]. This is mostly due to the fact that the reality of education paradigms in Society 5.0 and the abilities of instructors using current inclusive pedagogy are out of alignment.

Although inclusive teaching begins with the premise that all students differ, this does not imply that individual differences are insignificant. For instance, when asked to deduce meaning from a text, two students in a class can have identical difficulty. The nature of the learning difficulties could differ, though, if one is learning English as a second language while the other is autistic. In order to achieve the goals of the lesson, the teacher must employ tactics that are appropriate for the students and modify them accordingly. Therefore, the teacher can use graphic organizers to structure and record the discussion in order to encourage participation from the child on the autistic spectrum. They can also share information about a subject to support students who are learning English as a second language and introduce a story through a discussion. This method would have the advantage of meeting each learner's unique demands while also offering an interesting environment and encouraging visual clues that would help all learners [29]. In this case, specifically, the use of Society 5.0 education technology may be the most effective means of achieving pedagogical objectives while also making it easier for students with special needs to fully integrate into the contemporary, digitally altered educational environment.

2 Materials and Methods

To solve the tasks set in the research, the study and comparative analysis of sources, as well as the analysis and generalization of theoretical and empirical scientific material on the problem of inclusive education were used. The theoretical and methodological basis of this work consisted of the provisions in the field of application of the systemic approach in education, in the field of structural and functional analysis and synthesis, as well as in the field of development of a personality-oriented approach in education.

3 Results and Discussion

The confluence of cutting-edge technology, such as robots, big data, the Internet of Things, and artificial intelligence, is fundamental to the concept of Society 5.0 [15]. It is intended for these developments to become a seamless part of society, going beyond traditional bounds to enhance social well-being, environmental sustainability, and economic prosperity. The concept of Society 5.0 is an all-encompassing strategy that goes beyond simple technical progress, putting the needs and goals of people at its center [8].

Key elements of Society 5.0 imply the following [11]:

- **Human-Centered Approach:** Enhancing peoples' quality of life is a top priority in Society 5.0. It seeks to address social issues while making sure that technology meets people's needs and promotes their wellbeing
- **Integration of the Real and Virtual Worlds:** The idea presents a highly networked society in which the digital and real worlds coexist peacefully. Better data exchange, analysis, and decision-making are made possible by this integration, enabling successful social issue resolution
- **Sustainable Development:** The goal of Society 5.0 is to establish a sustainable society that strikes a balance between environmental preservation and economic progress. It aims to use technology to reduce waste, create clean energy solutions, and encourage eco-friendly behavior
- **Cross-Sector Collaboration:** Society 5.0 acknowledges the value of cooperation amongst many sectors, such as the public sector, private sector, academic institutions, and private individuals. It promotes collaboration and partnerships in order to tackle societal issues as a group.

Employing the tenets of inclusive pedagogy in the context of Society 5.0 challenges certain presumptions and methods related to education. Teachers are especially ready to acknowledge that it is neither beneficial nor required to forecast or predetermine students' learning outcomes prior to instruction. Instead, choices are made based on how to guarantee high levels of motivation and engagement.

Inclusive pedagogy differs from other approaches in that it considers the ways in which teachers respond to individual variety, make decisions that influence how children and adolescents learn together, and employ specialized knowledge. For instance, deaf kids are frequently integrated into regular classes with extra assistance from a teacher who specializes in teaching the deaf. Nonetheless, whether or not the practice is inclusive depends on how the specialist instructor interacts with the learner. The additional assistance will be helpful if the specialist and the class teachers adopt a collaborative teaching approach, ensuring that the deaf kid is not isolated by the presence of an additional adult. What matters in this case is how educators collaborate to make sure that nobody feels excluded from the classroom. Furthermore, this method does not deem classroom teachers unable to instruct specific students. Instead, they have the freedom to collaborate with their peers to improve the learning possibilities they offer to everyone [22].

It is critical to avoid seeing some students as less capable or as additional labor for educators. The tenets of inclusive education encompass acknowledging diversity without framing it as an issue. This method opposes the idea that failure is inevitable for some students while acknowledging the distinctions amongst them.

An important area of inclusive pedagogy is strategies to make education refugee-inclusive. Refugees and internally displaced persons belong to the category of vulnerable population, and a framework for the promotion of inclusive school systems that ultimately look to create quality learning environments that prevent discrimination, and support migrant and internally displaced students' holistic needs is of great importance. Moreover, teachers who are migrants, refugees, or internally displaced also frequently encounter insurmountable obstacles. Many migrant and refugee teachers lack the chance to perform their profession in their home nation or area, despite having extensive training and experience. Thus, this issue also needs addressing.

By 2030, all learners should have access to inclusive, egalitarian, high-quality education and lifelong learning, according to UN Sustainable Development Goal (SDG) 4. In Europe, the 2018 the Brussels Declaration defined inclusive education as "...the right to safe, quality education and learning throughout life ...that requires particular attention be given to those in vulnerable situations, persons with disabilities, indigenous peoples, those in remote rural areas, ethnic minorities, the poor, women and girls, migrants, refugees, and displaced persons whether as a result of conflict or natural disaster". This concept places special emphasis on those groups that are exposed to social and educational marginalization due to their circumstances. Although migrants constitute one of these categories, it is crucial to recognize that families and young people coming to search for a new home do not form a monolithic group. Although they may be recognized as migrants, this is only one of the aspects of who they are.

In all this context, it is expedient to note that the objectives of Curriculum for Excellence, which was created by Scottish educators and has now expanded to other European nations, are quite consistent with the tenets of inclusive pedagogy [20]. Schools now have more freedom to choose the curricular frameworks they use thanks to curricular for Excellence. The two primary points of this concept's vision are as follows [24]:

- Excellence by increasing attainment: making certain that each student reaches the greatest requirements in all subject areas as outlined in the Curriculum for Excellence levels and that they have the necessary combination of

abilities, credentials, and accomplishments to be successful;

- Achieving equity is making sure that every student has an equal chance to thrive, with an emphasis on reducing the achievement gap that is associated with poverty.

Digital technology has the potential to significantly advance this development goal by enhancing instruction in all Curriculum for Excellence subject areas. Digital technology has the potential to improve education when utilized wisely and efficiently. It can also provide kids and teenagers the tools they need to succeed in the digital age and, most importantly, increase learning results in inclusive classrooms.

Digital technologies have the ability to guarantee inclusion in its fundamental paradigm, even though even the most effective instructional approaches and procedures really result in integration rather than true inclusion (see Figure 1 below).

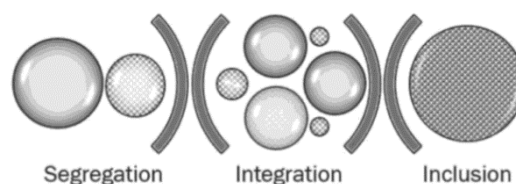


Figure 1. Continuum of segregation, integration and inclusion [10]

The path to inclusive education through ICT includes a range of options, from basic tools to cutting-edge technology breakthroughs, even if there is no "magic bullet" for creating accessible digital solutions [9]. There are several possible ways to support inclusiveness in both in-person and online learning contexts.

A number of factors should be taken into account when choosing the right technology for children with disabilities, including accessibility and age appropriateness, the students' degree of digital proficiency, their physical and cognitive demands, and the curriculum's or content's relevancy [5]. It is critical to recognize the requirements of learners and the contextual elements influencing EdTech and digital inclusion.

The ecosystem of digital and non-digital materials to support inclusive educational environment is depicted in Figure 2 below.

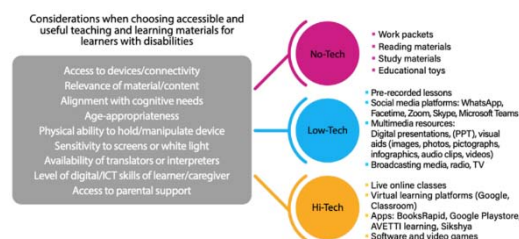


Figure 2. Ecosystem of digital and non-digital materials to support inclusive educational environment [19]

The World Bank Group released the "Landscape Review of ICT for Disability-Inclusive Education" in 2022 after realizing the critical role that technology plays in advancing inclusive education. This report served as a roadmap, outlining the main obstacles to and opportunities presented by utilizing technology for inclusive learning. The six key elements of the complete ecosystem - people, goods, pedagogy, policy, location, and provision - are summed up in the 6Ps framework (see Figure 3).

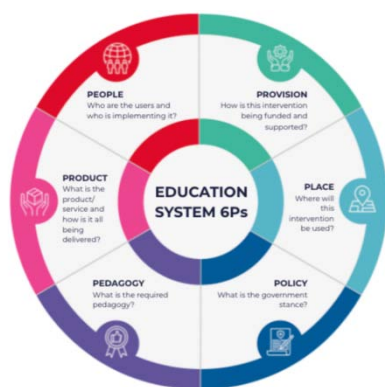


Figure 3. 6Ps Framework for Digital Technology [28]

In an attempt to help academics, practitioners, and policy makers figure out what is and is not working, the framework places a strong emphasis on the interactions between each of the six components.

The Tech-Enabled Disability Inclusive Education (TEDDIE) Costing Tool was also introduced by the World Bank Education Global Practice. In light of the dearth of evidence regarding the costs of digital solutions, the tool uses the 6Ps framework to support education policy makers and decision-makers in planning, budgeting, and costing for inclusive digital solutions that support students with disabilities [28]. In addition to the initial cost of purchase, the TEDDIE tool may be used for data collecting and analysis, including market analysis based on local prices for technology maintenance and repair. It may also be used to ascertain what kind of further training educators and other stakeholders will require in order to use digital technologies in the classroom efficiently. The TEDDIE tool provides a comprehensive knowledge of the expenses involved with deploying ICT solutions for students with disabilities, which aids in decision-making and resource allocation. This ensures the successful implementation and long-term viability of inclusive and tech-enabled education programs.

Students' abilities should not be a barrier to their participation in class or achievement of their learning objectives. All special needs students need are specific tools. Additionally, a whole new generation of technological instruments is prepared to handle learning difficulties and unique demands. According to the Getting Smart team, schools that utilize Microsoft Office 365 have access to software that improves accessibility for reading. A visual dictionary and an Immersive Reader are included in this software package. A certain requirement may be helped by certain applications. A wearable scheduler based on pictures, such as the one provided by learning solutions supplier Enuma, might be beneficial for kids with autism. When using a literacy help tool like Spell Better, dyslexic students may be more engaged with the material covered in class.

According to Alvarado et al. [1], a case study on autistic children produced positive outcomes for the system's assistive technology for instruction and learning. The authors emphasize how assistive technology may aid students with impairments in the areas of education, psychology, and social interaction. From a psychological standpoint, assistive technology use may be transformational and facilitate social and academic involvement.

Another field that is still developing and helping students learn is robotics. Particularly beneficial to those with autism are robots.

Early research has shown that engaging technologies, such as robots, can increase autistic children's involvement in therapy sessions and teach them useful skills and behaviors for everyday life [7, 16]. Milo is one robot that has a lot of potential; using voice-activated instruction, kids may practice recognizing facial expressions and emotions. Milo, a 2013 RoboKind release, is a set of voice-activated courses designed to improve the social and emotional, behavioral, and communication abilities of autistic

kids. Students engage through modules with an instructor, such as recognizing emotions and showing empathy, while paying attention to Milo's facial expressions and spoken signals. Throughout a session, Milo's head and boyish body sway to convey a variety of facial expressions, including anger, sadness, happiness, and frustration; on occasion, he even dances to get the right answers [6].

Virtual reality is a rapidly developing technology that has several applications. EyeFlite, a startup, is one such. The Oculus Go VR headset is being used by EyeFlite. Researchers are working on software that would enable those who have trouble typing or touching a touch screen to use their eyes to operate a computer.

Users with impairments may play games, exchange texts, and access the internet with ease thanks to virtual reality. This kind of technology can make it easier for kids who have trouble using their hands or arms to obtain information, communicate, and play with other students.

Increasing the dynamic, effective, and interactive nature of learning via the use of technology tools may enhance inclusive education [3]. Virtual reality (VR) has the potential to change students' learning styles in inclusive education systems by offering additional difficulties, focusing and attracting students' attention, giving sufficient control over the learning environment, and emotionally involving the participants [12]. In order to address these issues, a learning platform that exposes kids to social teachings like "a route to school", "behavior in computer class", "interaction with peers", or "safety skills" was developed using virtual reality and machine learning [12].

Given that virtual reality (VR) offers the possibility of user involvement and immersion in a virtual world, this may also apply to children with disabilities, particularly those with intellectual impairments who reject actual experiments and encounters [21]. This allows for the provision of an accurate description of the real world devoid of any fantastical elements, the visual aiding of abstract concepts, and the placement of children in situations in which they are unable to be placed in real life due to various social constraints, resource limitations, or disability-related constraints. For instance, virtual reality (VR) offers authenticity and realism in a regulated setting for kids with autism, which can improve learning and perception processes and help them acquire practical skills [17].

Virtual reality (VR) settings may be used to teach logical-mathematical ideas or even for recreational purposes, including preventing accidents [4]. Through the assistance of VR in overcoming obstacles related to handicap, depression may be avoided and self-esteem and empowerment can be increased. Lastly, there is always room for improvement in the interactions and exchanges between students and professors.

Scripting languages may be used to design 3D objects and define their behavior in virtual world systems like Second Life or OpenSim. Students are able to construct their own buildings, such as a museum or a home. Avatars, which are self-representations of individuals in virtual worlds, may play particular roles to solve problems and can cooperate and interact with other avatars in collaborative activities that can be developed in virtual worlds. Virtual environments give users the chance to experiment with different social interactions, which promotes introspection on emotions and ideas [18]. Virtual environments for inclusive education can provide a secure setting for skill practice without the dangers of the real world.

It should be mentioned that specific needs of impaired students can be met through customization of virtual reality (VR). It offers the chance for customized learning experiences, which might be very beneficial for the program's enrolled students.

VR and AR labs and simulations offer secure settings for training and skill improvement. Through social simulations and avatars, they also help with social skills and communication. Furthermore, these technologies convert instructional resources

into accessible and interactive formats, improving the content's readability and engagement - a critical component of inclusive pedagogy.

In addition, to guarantee inclusive and broadly accessible VR and AR experiences, cooperation between educators, developers, and accessibility specialists is essential.

Towards the end of the 1990s, a brand-new paradigm in human-computer interaction known as "Tangible User Interfaces" - in which users interact with digital content using common physical objects - arose. It is possible to run serious games with instructional objectives using tangible interfaces. When educational games are designed with the skill levels of the players in mind, they work better. If the degree of difficulty is too high or too low, the user may become discouraged or bored.

Activities that test cognitive and physical abilities via the use of many senses - vision, hearing, and touch - are made easier by tangible interfaces. Additionally, students gain skills in space sharing, teamwork, organization, and problem-solving planning, all of which support contextual learning. Tangible interfaces provide a multitouch interface, encourage group conversation, and improve action visibility so that children may learn by copying their peers' actions [17]. Children and those with learning difficulties can utilize tangible interfaces more easily and intuitively. Students' ability to reflect may grow when they physically work with concrete items. Furthermore, it is crucial that kids study in an environment that is more carefree, enjoyable, and amusing.

Because mixed reality technology offers immersive and engaging learning experiences, it has the potential to completely transform the special needs education sector. For kids with a variety of special needs, mixed reality opens up new possibilities for individualized learning, skill development, and social engagement by fusing the actual and virtual worlds. The uses of mixed reality in special needs education are numerous and exciting, ranging from augmenting sensory experiences and strengthening motor abilities to fostering social communication and cognitive growth.

All-inclusive With the multimodal approach to learning that EdTech adopts, students may interact with the material in a variety of ways. For instance, text-based resources, audio lectures, interactive simulations, and films may all be used to teach students. This wide array of resources accommodates varying learning styles and lets students select the format that best fits their comprehension. With the help of EdTech, students may collaborate on projects and assignments with one another wherever they are in the world. Students may work together in real time through collaborative document editing, video conferencing, and virtual classes, which encourages cooperation and peer support. Additionally, EdTech gives teachers useful information about the performance and advancement of their students. Teachers who keep an eye on their students' learning journeys are better able to see any problems early on and provide timely solutions. This data-driven strategy makes sure that students get the help they need to overcome obstacles and be successful in their academic endeavors.

The use of EdTech in inclusive education is becoming ever more promising as technology develops. Teachers can build learning environments that celebrate diversity, give every student a sense of empowerment, and foster a lifelong love of learning by adopting and implementing inclusive EdTech solutions. A future of education that is more inclusive and fair is being paved by educators, students, and technology working together.

Universal Design for Learning (UDL) is a fundamental tenet of inclusive learning in EdTech. The goal of Universal Design for Learning (UDL) is to provide access to education for every learner. It entails developing several avenues for students to interact with the subject, including giving them alternatives for student involvement, a variety of content forms, and ways to demonstrate what they have learned. The fundamental tenet of UDL is that there is not a single, universally applicable strategy

for teaching and learning. Teachers may design a flexible, responsive learning environment that meets the requirements of every student by implementing UDL principles [25].

With its emphasis on equality and inclusion for all people, inclusive education may also be used through the Project Based Learning (PjBL) paradigm, which gives students - including those with special needs - the opportunity to engage in meaningful and in-depth learning experiences. A useful strategy for motivating inclusive students to participate actively in their education and get fresh insights into pedagogy and learning methodologies is project-based learning [26]. The integration of Project-Based Learning into the inclusive education framework significantly improves students' abilities. In addition to being effective teaching methods, project-based learning motivates students to actively search for knowledge and engage in project work. We believe that the Agile methodology and the distribution of team responsibilities, particularly those that, according to Belbin, are focused on fostering a varied and inclusive environment, are crucial to the success of teams [13]. These factors have a great deal of potential to improve the inclusive pedagogic environment in Society 5.0. Research indicates that learners in Belbin teams outperformed learners in self-selected teams. In addition, teamwork, positive interdependence, and interpersonal skills were mandated [2]. With the help of this team-building technique, students may learn about their own strengths and shortcomings as well as the roles and behaviors of their colleagues. Additionally, it pushes students to concentrate specifically on group work abilities.

Consequently, incorporating agility into teaching and learning methods has to be a powerful means of breaking down barriers and putting universal education ideas into action. Adaptability and flexibility are essential building blocks of agile processes. This relates to education and is about acknowledging that every student has a unique learning style, capacity, and affordances. Scrum masters are advised by agile approaches to have several feedback sessions so they can keep an eye on student performance and adjust as needed. Since no learner should be left behind, the cyclical approach enables the educators to personally cater to the requirements of each individual student.

Agile methodologies have a number of observable advantages for advancing diversity in the classroom:

1. **Personalized learning.** The fundamental ideas of Agile approaches demonstrate how much instructors value using a customized approach when giving instructions, which in turn enables them to modify the curriculum to better meet the requirements and preferences of their students. As to the findings published in the *Journal of Educational Technology & Society*, "technology enhanced personalized learning environments improve learners' engagement and achievement".
2. **Accessibility.** Learning materials should be made available to all students, not only those with disabilities, in accordance with the principles of "inclusive education". Agile methodologies recommend that curriculum accessibility be taken into account from the very beginning of the design process. It is important to develop a wide variety of material that is accessible to everyone.
3. **Continuous improvement.** The idea of continuous improvement, which calls on educators to consider their work and consider ways to make it better, is one of the fundamental ideas behind agile approaches. This means that, in the context of education, self-evaluation will entail assisting teachers in considering how they instruct, providing feedback to peers and students, and using iterative techniques to enhance the process of teaching, learning, and assessment for the underprivileged.
4. **Empowerment.** Giving students authority over the process and empowering them to make decisions is the fundamental tenet of adopting the agile methodology. For handicapped kids who may suffer from the consequences of inclusion or exclusion in conventional educational systems, this kind of school is extremely relevant.

Literature:

1. Alvarado, Y., Guerrero, R., & Seron, F. (2023). Inclusive Learning through Immersive Virtual Reality and Semantic Embodied Conversational Agent: A case study in children with autism. *Journal of Computer Science & Technology*, 23(2), 107-116.
2. Aranzabal, A., Epelde, E., & Artetxe, M. (2022). Team formation on the basis of Belbin's roles to enhance students' performance in project based learning. *Education for Chemical Engineers*, 38, 22-37.
3. Badilla-Quintana, M. G., Sepulveda-Valenzuela, E., & Salazar Arias, M. (2020). Augmented reality as a sustainable technology to improve academic achievement in students with and without special educational needs. *Sustainability*, 12(19), 8116.
4. Chițu, I., Tecău, A., Constantin, C., Tescașiu, B., Brătucu, T., Brătucu, G., Purcaru, I. (2023). Exploring the opportunity to use virtual reality for the education of children with disabilities. *Children (Basel)*, 10(3), 436.
5. Coflan, C., & Kaye, T. (2020). Using Education Technology to support students with Special Educational Needs and Disabilities in low- and middle-income countries. (EdTech Hub Helpdesk Response No. 4) DOI: 10.5281/zenodo.3744581.
6. Daniela, L. (2022). *Inclusive digital education*. Springer.
7. Daniela, L., & Lytras, M.D. (2018). Educational robotics for inclusive education. *Technology, Knowledge and Learning*, 24, 219-225.
8. De Villiers, C. (2024). The Impact of Society 5.0 on Curriculum Development in Higher Education. *Journal of Ethics in Higher Education*, 4, 1-5.
9. Florian, L., & Beaton, M. (2017). Inclusive pedagogy in action: getting it right for every child. *International Journal of Inclusive Education*, 22(8), 870-884.
10. Graham, L. (2024). *Inclusive education for the 21st century: Theory, policy and practice*. Routledge.
11. Hitachi-UTokyo Laboratory (2020). *Society 5.0: A people-centric super-smart society*. Springer.
12. Horbova M., Andrunyk V., Chyrun L. (2020). *MoMLeT+ DS*. Modern Machine Learning Technology & Data Science Workshop; Lviv, Ukraine: 2020. Virtual Reality Platform Using ML for Teaching Children with Special Needs; pp. 209-220.
13. Isaac, M., & Karson, K. (2016). *A Guide to Belbin Team Roles: How to increase personal and team performance*. Bridge Publishing.
14. Judijanto, L., Ili, L., & Wardhana, M. (2024). Education 5.0: Collaboration and creativity in improving students' digital intelligence. *International Journal of Social and Education*, 1(3), 682-693.
15. Karpa, M., Kitsak, T., Domsha, O., Zhuk, O., Akimova, L., & Akimov, 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
16. Kuzmin, V., Kuzmina, M., Ivanchenko, A. (2017). Psychosocial life trajectories of orphaned individuals (resurvey). *Science and Education*, 10, 95-100.
17. Lalotra, G.S., Kumar, V. (2024). The Impact of Virtual Reality and Augmented Reality in Inclusive Education. In: Kaluri, R., Mahmud, M., Gadekallu, T.R., Rajput, D.S., Lakshmana, K. (eds) *Applied Assistive Technologies and Informatics for Students with Disabilities*. Applied Intelligence and Informatics. Springer, Singapore.
18. Mateu, J., Lasala, M., & Alamán, X. (2014). VirtualTouch: A tool for developing mixed reality educational applications and an example of use for inclusive education. *International Journal of Human-Computer Interaction*, 30(10), 815-828.
19. McClain-Nhlapo, Ch., Singh, R., & D'Angelo, S. (2023, November 20). Bridging divides: The role of inclusive technology for learners with disabilities. *CPE*. <https://www.globalpartnership.org/blog/bridging-divides-role-inclusive-technology-learners-disabilities>
20. OECD (2021). The Curriculum for Excellence in Scotland: an implementation assessment. https://www.sqa.org.uk/files_cc

[c/foi-21-22-051-oecd-draft-report-sqa-fact-check-final-202102-09-mw.pdf](https://www.sqa.org.uk/files_cc/foi-21-22-051-oecd-draft-report-sqa-fact-check-final-202102-09-mw.pdf)

21. Ott, M., & Freina, L. (2015, April). A literature review on immersive virtual reality in education: state of the art and perspectives. In *The international scientific conference elearning and software for education* (Vol. 1, No. 133, pp. 10-1007).
22. Perez, C., Alvarez, A., Pasarin-Lavin, T., Shohel, M. (Eds.). (2024). *Inclusive pedagogy in contemporary education*. IntechOpen.
23. Purnomo, Y. (2020). *Educational innovation in Society 5.0 era: Challenges and opportunities*. Routledge.
24. Raitt, H. (2019). *Curriculum for Excellence: Benchmarks*. SeeHearTeach.
25. Salgues, B. (2018). *Society 5.0: Industry of the future, technologies, methods and tools*. Wiley-ISTE.
26. Sormunen, K. et al. (2019). *Maker-Centered Project-Based Learning in Inclusive Classes: Supporting Students' Active Participation with Teacher-Directed Reflective Discussions*. *International Journal of Science and Mathematics Education*.
27. Vários (2020). *Society 5.0: A People-Centric Super-Smart Society*, Springer Open 2020. https://library.oapen.org/bitstream/handle/20.500.12657/41719/2020_Book_Society50.pdf?sequence#page=59
28. World Bank Group (2022). A landscape review of ICT for disability-inclusive education. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099840001312211991/p17136805cfid1f074095390cb6b01c0c715>
29. Yamada, R., Yamada, A., & Neubauer, D. (2023). *Transformation of higher education in the age of Society 5.0*. Springer.

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

PHYSICAL CULTURE AND A HEALTHY LIFESTYLE IN THE LANDSCAPE OF SUSTAINABLE DEVELOPMENT

^aYURIY YAKIMETS, ^bIVAN ILNYTSKYI, ^cNATALIIA KORZH, ^dOLGA SOKOLOVA, ^eINNA PAVLENKO

^{a,b}Ivan Boberskyi Lviv State University of Physical Culture, 11, Tadeus Kostyushko Str., 79007, Lviv, Ukraine

^cNational University Zaporizhzhia Polytechnic, 64, Zhukovsky Str., 69063, Zaporizhzhia, Ukraine

^dZaporizhzhia National University, 66, Zhukovsky Str., 69600, Zaporizhzhia, Ukraine

^eSumy State Pedagogical University named after A. S.

Makarenko, 87, Romenska Str., 4000, Sumy, Ukraine

email: ^ajkimec@ukr.net, ^bvanjaboxer@gmail.com,

^cnata2008korzh@gmail.com, ^dsokolovaznu@gmail.com,

^ebyyf1202@ukr.net

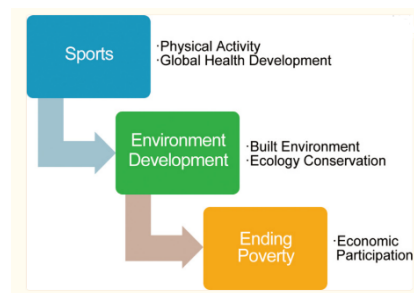


Figure 1. Sports contribution in vital development actions [26]

Abstract: The article emphasized that sport and physical activity are seen as important drivers for social transformation and enablers of sustainable development, i.e., as important means of achieving the 17 Sustainable Development Goals (SDGs). The research is carried out within systemic perspective, with consideration of social and human capital dimension of physical culture and healthy lifestyles. Based on global trends, as well as the experience of the USA, China, and Australia, global and local levels of promoting healthy lifestyle are considered, in particular within the plane of physical education.

Keywords: physical culture, physical education, healthy lifestyle, sustainable development, SDGs, agenda.

1 Introduction

As part of the transition period to the recently developed 2030 Agenda for Sustainable Development, the world has shifted its focus to the Sustainable Development Goals (SDGs) after 15 years of progress towards the historic Millennium Development Goals (MDGs). To evaluate the progress and unsolved issues connected to the eight MDGs, the international community conducted a comprehensive consultation process with all social stakeholders, guided by the United Nations.

As a result, 17 SDGs were agreed upon to be pursued over the ensuing years. The 2030 Agenda, which has as its overriding goal the advancement of humanity and the earth while leaving no one behind, offers a rare chance to spur international action for development, particularly in the areas of physical culture and sport for development and peace. The Sustainable Development Agenda places a high priority on leading healthy lives [16].

Physical culture and sport have shown to be an adaptable and affordable instrument for advancing goals related to development and peace. Numerous General Assembly resolutions have acknowledged the critical role that sport has played in advancing each of the eight Goals since the MDGs' establishment in 2000. The 2015 resolution 70/1, "Transforming our world: the 2030 Agenda for Sustainable Development", further recognizes the contribution of sport to social advancement.

Physical culture and sports are two more significant factors that support sustainable growth. As noted in Fig. 1, sport offers a "peaceful and soft way" for important developmental tasks including education, health promotion, and the building of a sustainable environment. The UN acknowledges the growing role that physical culture and sport play in promoting tolerance and respect, empowering women and young people, individuals, and communities, and advancing health, education, and social inclusion goals in the context of development and peace [26].

Regular participation in sports and physical activities has many positive social and health effects. It has a direct impact on physical fitness in addition to assisting kids and teens in leading active lifestyles and avoiding non-communicable diseases. The World Health Organization has also conducted a number of studies that show how exercise is good for the development of the mind and cognitive abilities. Exercise has been linked to improvements in self-worth and confidence as well as positive effects for individuals who are worried and depressed.

Young people and children get a great deal from physical activity. Sport and physical education must be combined with a school curriculum in order to provide a comprehensive education (Goal 4: Ensure inclusive and excellent education for everyone and encourage lifelong learning). For kids who are unable to attend school, sports offer an alternative kind of instruction that promotes lifetime learning. Students who participate in physical education and sports alongside their academic studies are exposed to the fundamental principles of sports, such as discipline, tolerance, collaboration, fair play, respect for others and the rules. These abilities can promote social cohesiveness among communities and cultures and are necessary for future engagement in group activities and the workforce. Increasing access and participation in sport is a major development aim because of the advantages it provides for social and personal development [24].

The need to resolve the state task of a strategic direction that ensures the sustainable development of the physical culture industry justifies the importance of promoting a healthy lifestyle among the population, which allows citizens to form a conscious need for physical activity and its subsequent stimulation.

The fourth most important risk factor for death worldwide is inactivity. Engaging in physical education and sports can serve as an extremely effective means of inspiring individuals to increase their level of physical activity, hence aiding in the decrease of "premature mortality from non-communicable diseases" and the related medical expenses (SDG 3.4).

Research indicates that engaging in physical education, sports, and physical exercise is linked to better psychological and social outcomes as well as the prevention and management of substance misuse (SDG 3.5). Frequent involvement promotes children's and teenagers' healthy development, including their psychological and cognitive growth [2]. Large-scale physical activity initiatives and sporting events may also serve as a venue for community health empowerment and message, reaching a variety of audiences that traditional health care would not be able to. This backs initiatives to combat infectious diseases and increase accessibility to services related to sexual and reproductive health (SDG 3.3 and 3.7).

However, social and economic issues like housing, poverty, and education have an impact on an individual's health and well-being in addition to diseases and treatments. Therefore, there are health-related objectives in all of the other SDGs. Specifically, in the WHO European Region, physical inactivity is one of the

main risk factors for death and disability as well as a major contributor to early mortality. Therefore, the question of how physical culture and a healthy lifestyle fit into the framework of sustainable development is systemic in nature, dependent on global social, economic, and political processes, and requires the application of constructivist paradigm.

2 Materials and Methods

The methodological basis of the work is a system-functional approach based on analysis of the category of state. This choice is due to the general logic of the process of cognition and the structural organization of the categorical apparatus, reflecting the structural and systemic integrity of the object and subject of the study. The methods of analysis, generalization, and systematization were used.

The basis of the study is modern philosophical and political ideas about a healthy lifestyle and physical culture in the context of sustainable development. In particular, the method of socio-cultural analysis of health problems was used.

3 Results and Discussion

The 2030 Sustainable Development Goals would undoubtedly support funding for laws that encourage bicycling, walking, sports, outdoor recreation, and play. The policy actions pertaining to physical activity have multiplicative healthcare and economical advantages. In addition to SDG2 (ending malnutrition in all aspects of health), SDG4 (quality education), SDG5 (equality between men and women), SDG8 (decent job and economic development), SDG9 (industry, innovation, and infrastructure), and SDG10 (reduced inequality), they would directly lead to SDG3 (wellness and good health).

The Bangkok Declaration on Physical Activity for Global Health and Sustainable Development [23] states that physical activity can directly support eight Sustainable Development Goals (SDG 3 Health and wellbeing, SDG 4 Quality education, SDG 5 Gender equity, SDG 10 Reduced inequalities, SDG 11 Sustainable cities and communities, SDG 13 Climate action, SDG 15 Life on land, SDG 16 Peace and justice) (see Fig. 2).



Figure 2. Physical activity' potential contribution directly to eight Sustainable Development Goals [34]

It is interesting to note that the Olympic Games fall short of their claim to be global role models for sustainability and an inspiration for sustainable futures: from 1992 to 2020, the sustainability index - which takes into account ecological, social, and economic factors - was only mediocre and gradually decreased (Müller et al., 2021). Studies repeatedly demonstrate that persons with migratory backgrounds, feminine gender, lower educational attainment, or disabilities have disadvantages

when it comes to their involvement in organized sports [12; 15]. As a result, organized sports can only partially live up to their reputation as agents of social integration and inclusion. Traveling for sports causes greenhouse gas emissions, which are a contributing factor to environmental issues including climate change for active sport players [33]. Although the precise and long-term consequences have been seldom measured, outdoor sports and recreation activities are also being addressed as having negative effects on fauna, flora, and soil [23].

The aforementioned quotes highlight the ways in which sport and physical exercise are ingrained in the social, cultural, political, and economic frameworks that support them. These frameworks can be seen in the environment, in events, in the infrastructure, or in the sports equipment business. However, ecological, social, and economic factors need to be considered when analyzing sport and physical activity in the context of a comprehensive knowledge of sustainable development. It should be highlighted that there are reciprocal, intricate linkages and feedback loops between sport and physical activity, society, and the environment [4]. Therefore, it is important to view sport and physical activity as both a problem and a solution when it comes to sustainable development.

Over the past several years, many new methods to health promotion have been created and implemented. These cutting-edge techniques need to be based on coordinated multilevel treatments. The primary focus to enhance health and well-being is on reorienting health services and governmental policies, as well as creating healthy settings through community engagement [8]. The SDGs related to physical activity, sports, and health promotion are displayed in Figure 3.

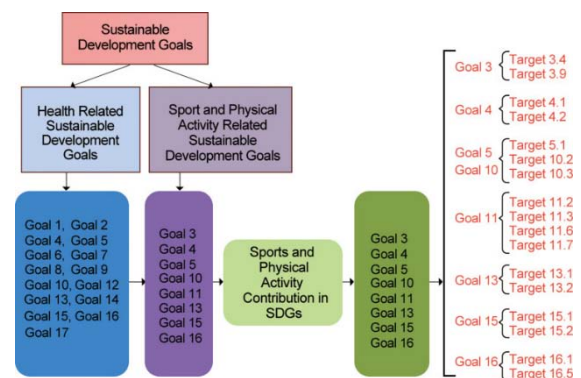


Figure 3. Health, sport, and physical activity-related SDGs [24]

Fifty indicators pertaining to health and a total of 232 monitoring indicators to track and assess Member State progress were released by the Inter-Agency and SDG Indicators Group. The SDGs' monitoring of health is one of the projects that have been launched to monitor worldwide progress toward the health-related SDGs [27].

Engaging in physical exercise has enormous benefits for a country's health. In light of this, the World Health Organization released the Global Action Plan, which attempts to give member nations a framework for taking action by encouraging the development of dynamic environments, systems, people, and society. By 2030, a 15% decrease in levels of physical inactivity is the goal.

In their analysis, Baena-Morales et al. [1] identify the particular SDG goals that may be applied to the field of physical education and then connect these goals to several models derived from physical education activities. The authors point out that three main areas of intervention were identified by the Sixth International Conference of Ministers and Senior Officials Responsible for Physical Education and Sport (MINEPS VI), with the goals of (I) creating an inclusive vision of access for all to physical education (PE) and PA, (II) maximizing sport's contribution to sustainable development and peace, and (III)

safeguarding the sport's integrity. In addition, a study outlining sport as a vehicle for working towards sustainable development was jointly issued by the Ibero-American General Secretariat and the Ibero-American Sports Council. While establishing a thorough analysis of how this relationship occurs (one-way or two-way), they chose those SDGs that could be addressed through sports practice or sport as an institution. They also proposed a number of partnerships and strategies for the promotion of sustainable development. Crucially, in this context, the word "sport" refers to any physical activity, recreation, dancing, organized, spontaneous, competitive, traditional, and indigenous sports and games in all of its forms.

The very priority that UNESCO attaches to physical education might serve as justification for the relevance of this relationship analysis between physical education and SDGs. One way to look at this is the way the International Charter of Physical Education and Sport has been in effect since 1978. Physical education and sports were praised as essential rights for everybody. Sport can "increasingly contribute to making development and peace a reality by promoting tolerance and respect", according to Agenda 2030, which also acknowledges sport as an "important facilitator of sustainable development and peace". Other goals that sport can help achieve include health, education, and social inclusion, as well as the empowerment of women and youth, individuals, and communities [32].

As physical activity has a direct correlation with promoting physical and mental health and well-being, raising life expectancy, lowering the risk of obesity and non-communicable diseases, and increasing life expectancy, it seems that sport and physical education have the greatest positive effects on health and well-being (Goal 3). All age groups can participate in sports, but for it to have a long-lasting effect, it needs to be marketed as a lifetime activity. The younger generations need to use physical education, and the ideal way to achieve this would be to include it in elementary and secondary education, which would align nicely with the Quality Education SDG.

Physical education and sport have also developed into effective tools for addressing issues of gender and economic equality, especially for the empowerment of women and young girls. By giving them access to sporting opportunities, these programs help them develop their self-confidence, make wise decisions about their lives, and gain access to resources [25].

Furthermore, as physical education and sport foster the ideas of social cohesiveness, solidarity, and camaraderie, they are being utilized more and more to advance peace and harmony, particularly among young people entangled in conflict [10]. Therefore, physical education and sport are essential to achieving the UN's SDGs for gender equality, decreased inequality, and peace and justice.

According to a recent study conducted by scholars at Washington University in St. Louis' Brown School, there is fresh evidence to support include initiatives to encourage increased physical activity as a crucial component of the action plan for accomplishing the UN Sustainable Development Goals [30]. It seems to be the first study to methodically examine the connections between the 17 U.N. development goals and the seven tactics that are known to be successful in encouraging physical activity on a large scale. The authors stress that the promotion of physical activity and the Sustainable Development Goals are highly synergistic, offering exceptional chances to concurrently address various public health problems and to achieve several SDGs. Eight of the seventeen SDGs—good health and well-being (SDG 3), gender equity (SDG 5), industry, innovation, and infrastructure (SDG 9), decreased inequalities (SDG 10), sustainable cities and communities (SDG 11), climate action (SDG 13), peace, justice, and strong institutions (SDG 16) - were found to have strong correlations with physical activity promotion strategies. According to Deborah Salvo, assistant professor of public health and research lead author, "physical inactivity has been characterized as a pandemic, accounting for 7% of all premature deaths per year globally and resulting in billions of dollars spent on health-related expenditures". She

underlined that although there are recognized, practical remedies to address this significant public health issue, they are not being used widely or effectively.

Using a unique simulation model that they created, Salvo and her co-authors [30] tested many scale-up scenarios of various physical activity promotion tactics in city types that reflected low-, middle-, and high-income national contexts. According to the modeling results, nations with lower and intermediate incomes should anticipate higher improvements in physical activity. Promoting physical activity can help lower air pollution and traffic-related deaths in high-income countries where cars are widely used. However, in order to mitigate climate change and encourage more active modes of transportation and recreation, complementary policies that discourage driving may be needed.

There are significant financial, political, and societal advantages to increasing physical exercise. According to the Sport and Fitness Industry Association's definition of "active to a healthy level", which is less than the WHO Global Physical Activity Guidelines, 31.9% of children participated in 25 minutes of vigorous physical activity three times a week, according to research from the Johns Hopkins University (JHU) Global Obesity Prevention Center. In contrast, if half of children engaged in this level of physical activity, the number of obese and overweight youth decreased by 4.18%, saving \$8.1 billion in medical costs and \$13.8 billion in lost productivity annually. If children continued in this trend, \$1.1 trillion in medical costs and \$1.7 trillion in lost productivity would result annually. Every year, \$11.4 billion in medical expenses and \$25.1 billion in lost productivity might be avoided if 50% of children followed the WHO Global Physical Activity Guidelines and the U.S. Physical Activity Guidelines throughout the duration of their childhood [22]. Through sport, practitioners can address physical inactivity and ACEs, which can help prevent obesity and promote positive behaviors associated with physical activity, such as a 15% increased likelihood of attending college, a decreased likelihood of smoking, higher lifetime earnings, a lower prevalence of non-communicable diseases (NCDs), and an increased likelihood of becoming an active adult [28].

Similarly, these advantageous effects were formalized in the Human Capital Model (HCM) by sport scientist researchers working with Nike [3]. The HCM discusses the social benefits of physical activity in an effort to shift the conversation around it from one that emphasizes its negative effects (e.g., "fighting" heart disease) to one that highlights its beneficial effects. Based on data from more than 500 publications on physical activity, the six domains of HCM - intellectual, financial, physical, social, individual, and emotional capital - are developed. Physical capital is frequently mentioned as the main advantage of physical exercise, such as the reduction of NCDs. Practitioners illustrate how physical activity programming benefits people and communities in domains other than physical health by talking about elements from other domains, such as productivity, job attainment, and cognitive functioning [20]. This shows how effective physical activity programming is as a multifaceted intervention.

"Shape up Somerville", a citywide initiative to prevent and reduce childhood obesity among elementary school students in Somerville, Massachusetts, was one of the first effective applications of Collective Impact (CI) to physical exercise. It was launched in 2011. Tufts University, the CDC, the Robert Wood Johnson Foundation, Blue Cross Blue Shield of Massachusetts, United Way of Massachusetts Bay and Merrimack Valley, as well as public servants, educators, corporations, nonprofit organizations, and private people were among the important players. Practices for preventing weight gain and wellbeing were outlined by the constituents. Schools dedicated to providing better food options, educating students about nutrition, and encouraging physical exercise. If a local restaurant served high-nutrition, low-fat meals, they were certified. In addition to providing incentives for a healthy lifestyle and farmers' markets, the local government upgraded

sidewalks and crosswalks to encourage students to walk to school. Children in the community saw a statistically significant drop in their BMI between 2002 and 2005, proving the effectiveness of CI [19].

Growing rates of sedentary lifestyles are a major problem in wealthy nations. The main cause of NCD incidence is a sedentary lifestyle. Engaging in sports and physical exercise is the only suggested way to prevent NCDs [7]. For the past fifteen years, physical inactivity has been a concern. In order to enhance the health of the Chinese people via sports and physical exercise, the Chinese government launched the National Fitness Plan (NFP), which is in line with the SDGs for physical activity, health, and sports. The national fitness plan (NFP) states that sports are essential for encouraging healthy lifestyles and preventing non-communicable diseases (NCDs) in Chinese society. China has initiated an industrial revolution in sports, whereby the government is implementing various efficacious measures to realize the objective of a "Healthy China" through the establishment of conducive conditions for sports and physical exercise. The WHO states that the main hazard to life in China is NCDs. Sports are a major factor in the prevention of NCDs because they encourage Chinese people to be more physically active. Furthermore, in accordance with SDG 17 (Strengthening Adoption and Revitalizing the Sustainable Development Global Partnership), Chinese authorities stated that sports are critical for fostering a healthy lifestyle and for enhancing China's soft power. The National Fitness Plan (NFP) has the lofty goals of promoting safe living, improving nutrition, and increasing physical participation [31].

In response to the SDGs pertaining to health, the Chinese government has unveiled the Healthy China 2030 plan. Under the Healthy China 2030 plan, the Chinese government has implemented a variety of initiatives aimed at achieving the SDGs relating to physical activity and sport and health. The SDGs pertaining to physical activity, sport, and health are aligned with the Healthy China initiative. In order to increase the country's level of fitness and avoid NCDs, China's older population is now engaging in sport and physical activity thanks to the introduction of the program with sustainable built environment intervention. Sport is helping Chinese people become more physically active, which is a key factor in reducing NCDs. Engaging in sports and physical exercise is essential for achieving the 2030 "Healthy China" target as well as other health-related SDGs. China's localization strategies for achieving the SDGs have an international influence since they help the BRI member nations globalize, strengthen their public health systems, and advance global health governance [7].

According to Iranian scientist Farhud [9], an unhealthy lifestyle puts societal and human resources at risk. An inadequate way of living causes anti-values to take the place of human values, disrupting social networks. Unhealthy lifestyle choices provide significant obstacles to both physical and mental health as they drive progress and growth. The study also notes that economic capitals are significantly impacted by lifestyle choices. One worldwide issue, for example, is materialism as an insufficient way of living. Every culture wastes time, money, and energy as a result of consumerism. Despite being a politically endorsed approach, consumerism contributes to the wastage of financial resources. According to Farhud, leading a healthy lifestyle is a crucial requirement for sustained growth. A healthy lifestyle may set the stage for progress in the social, economic, and environmental spheres by having a major influence on national capitals such as the cultural, economic, and social capitals. Consequently, paying positive attention to lifestyle is one of the strongest strategies for maintaining and growing national capital.

The advantages of physical exercise for public health as well as the intricate problem of health outcomes disparity and sport/recreation participation related to class, ethnicity, gender, sexual orientation, age, and disability are now well acknowledged [11]. A significant conflict exists in government health programs between acknowledging the impact of socioeconomic determinants and inequality and articulating

neoliberal ideologies that place personal accountability for risk, lifestyle modifications, and health behaviors [13]. Government policies in the US, UK, Australia, and South America are still centered on encouraging "minutes per day" of physical exercise. In order to increase physiological "fitness", this quantification of active embodiment is designed as a type of personalized behavior modification that ignores the social environment that determines opportunity, inequity, and meaning. It is important to stress that health is culturally created, particularly in light of these major policy conflicts.

Positive mental wellness was noted as a key result of introducing Australian Indigenous children to cultural traditions, and it was shown that good lifestyle habits (such as physical exercise and a balanced diet) were linked to Australian Indigenous culture [6]. Therefore, developing health interventions requires an awareness of the significance of culture and how it influences healthy behaviors. It is improbable that health treatments can be implemented in a "one size fits all" manner.

Hulko et al. [5, 17, 21, 29] correctly point out that these problems must be solved on a local, regional, and worldwide scale in order for civilization to evolve sustainably. Sedentary lifestyles and non-communicable illnesses (cancer, heart disease, diabetes, obesity, etc.) are becoming major public health issues in both the global North and South. In order to comprehend physical (in)activity as a very biopolitical kind of body practice and embodied mobility, new sociocultural perspectives are required [11]. Particularly when it comes to enhancing the health and happiness of nearby communities, culture and leisure are quite important. By actively addressing this agenda, the industry can demonstrate that it is committed to solving health-related problems and can play a significant role in addressing unhealthy lifestyles, social determinants of health, providing affordable solutions, bringing innovative ideas to the table, and assisting families, communities, and individuals in taking charge of their own well-being.

A genuine focus on a significantly larger range of health factors may be made possible by giving local authorities more authority over public health. Numerous services provided by local government can positively influence health outcomes. The obvious ones are the availability and quality of local housing, the ability for people to receive social care support, environmental health, which includes handling hazardous materials and preparing food safely, and access to recreational centers where people can go for exercise.

Cultural services encompassing the arts, heritage, sports and leisure, parks and open spaces, libraries, and archives are important services that may support this preventative approach. Sport and recreational physical exercise are probably the most evident of them. When compared to sedentary lives, regular physical exercise has the potential to lower all-cause mortality and increase life expectancy.

In order to facilitate a more nuanced policy discussion, it will be necessary to engage in discourse with experts from a variety of fields and policy domains, including housing, city planning, health, education, and sport [14, 18]. Participatory procedures will also play a key role in elevating the perspectives of a broad range of individuals.

Literature:

1. Baena-Morales, S., Jerez-Mayorga, D., Delgado-Floody, P., Martínez-Martínez, J. (2021). Sustainable development goals and physical education. A proposal for practice-based models. *International Journal of Environmental Research and Public Health*, 18, 2129.
2. Balukh M., Kryshchanovych S., Buchkivska G., Chubinska N., Ilina D. (2021). The Use of Health Pedagogy in the Context of the Formation of Physical Education among Schoolchildren. *Annals of Applied Sport Science*. DOI: 10.52547/aassjournal.1001
3. Bergholz, L., Stafford, E. & D'Andrea, W. (2016) Creating trauma-informed sports programming for traumatized youth:

- Core principles for an adjunctive therapeutic approach. *Journal of Infant, Child, and Adolescent Psychotherapy*, 15(3), 244-253.
4. Bernard, P., Chevane, G., Kingsbury, C., Baillot, A., Romain, A.-J., Molinier, V., Gadais, T., & Dancause, K. N. (2021). Climate change, physical activity and sport: a systematic review. *Sports Medicine*, 51(5), 1041-1059.
 5. Bilyk, O., Kryshtanovych, S., Shayner, H., Barabash, O., & Bondarenko, V. (2021). Study of the Experience of the Formation of Professional Competence in Future Managers of Physical Education and Sports. *Revista Romaneasca Pentru Educatie Multidimensionala*, 13(1Sup1), 162-176. <https://doi.org/10.18662/rrem/13.1Sup1/390>
 6. Crowe, R., Stanley, R., Probst, Y., McMahon, A. (2017). Culture and healthy lifestyles: A qualitative exploration of the role of food and physical activity in three urban Australian Indigenous communities. *Australian and New Zealand Journal of Public Health*, 41(2), 106.
 7. Dai, J., & Menhas, R. (2020). Sustainable development, sports and physical activity: The localization of health-related sustainable development goals through sports in China: A Narrative Review. *Risk Management and Healthcare Policy*, 13, 1419-1430.
 8. Edington, D.W., Schultz, A.B., Pitts, J.S., Camilleri, A. (2015). The future of health promotion in the 21st century: a focus on the working population. *American Journal of Lifestyle Medicine*, 10(4), 242-252.
 9. Farhud, D. (2017). Life Style and Sustainable Development. *Iranian Journal of Public Health*, 46(1), 1-3.
 10. Froberg, A., & Lundvall, S. (2022). Sustainable development perspectives in physical education teacher education course syllabi: An analysis of learning outcomes. *Sustainability*, 14, 5955.
 11. Fullagar, S. (2019). A physical cultural studies perspective on physical (in)activity and health inequalities: the biopolitics of body practices and embodied movement. *São Cristóvão*, 12(28), 63-76.
 12. Gehrman, S., Kraus, C.-I., Fast, N., Kleindienst-Cachay, C., & Kastrop, V. (2022). Sportengagement von Mädchen mit und ohne Migrationshintergrund – Analyse der Entwicklung auf Basis der SOEPJugendbefragungen 2000–2018. *Forum Kinder und Jugendsport*, 3(2), 87-98.
 13. Gorban I., Kornat L., Kryshtanovych 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. DOI: 10.22937/IJCSNS.2022.22.6.92
 14. Helesh, A., Eremenko, O., & Kryshtanovych, 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>
 15. Hoenemann, S., Köhler, M., Kleindienst-Cachay, C., Zeeb, H., & Altenhöner, T. (2021). Migration und Sport – eine empirische Studie zur Untersuchung der Partizipation von Jugendlichen mit Migrationshintergrund am organisierten Sport. *Prävention und Gesundheitsförderung*, 16(1), 53-61.
 16. Hole, T., Kvangarsnes, M., Bardsgjerdem E., Tippet-Spirtou, E. (2024). *Towards sustainable good health and well-being: The role of health literacy*. Springer.
 17. Hulko, T., Yopa, T., & Kravchenko, M. (2023). Training of specialists in physical culture and sports in the conditions of sustainable development of society. *Collection of scientific papers "SCIENTIA"*, October 6, 2023, Valencia, Kingdom of Spain, pp. 57-59.
 18. Huzar, U. & Zavydivska, O. & Kholyavka, V. & Kryshtanovych, M. (2019). Formation of psychological peculiarities of time-management of a modern expert in the field of finance. *Financial and credit activity: problems of theory and practice*, 4(31), 477-486. DOI: 10.18371/fcaptop.v4i31.191001
 19. Kania, J., & Kramer, M. (2011). Collective Impact. *Stanford Social Innovation Review*, 9(1), 36-41.
 20. Kryshtanovych, S., Bilostotska, O., Ulianova, V., Tkachova, N., & Tkachov, A. (2020). Experience in the application of cognitive techniques in the field of physical education and sports. *Broad research in artificial intelligence and neuroscience*, 11(2), 147-159. <https://doi.org/10.18662/brain/11.2/79>
 21. Kryshtanovych, S., Horoshko, V., Pasko, O., Prudka, L., & 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. Lee, B., Adam, A., Zenkov, E., Hertenstein, D., Ferguson, M., Wang, P., ... Brown, S. (2017). Modeling the economic and health impact of increasing children's physical activity in the United States. *Health Affairs (Project Hope)*, 36(5), 902-908.
 23. Lohmann, J., Tittlbach, S. & Steinbauer, M.J. (2024). Sustainable development in sport and physical activity - perspectives and challenges. *German Journal of Exercise and Sport Research*, 54, 1-5.
 24. Lynch, T. (2016). *The future of health, wellbeing and physical education: Optimising children's health through local and global community partnerships*. Palgrave Macmillan.
 25. Mayes, Ch. (2017). *The biopolitics of lifestyle: Foucault, ethics and healthy choices*. Routledge.
 26. McCullough, B., Kellison, T., & Melton, N. (Eds.). (2022). *The Routledge handbook of sport and sustainable development*. Routledge.
 27. Mokdad, A.H. (2004). Actual causes of death in the United States, 2000. *JAMA*, 291(10), 1238.
 28. Otterbein, M. (2020). *Physical Activity & The Sustainable Development Goals: A Public Health Approach Towards Advancing the Power of Movement*. George Washington University.
 29. Pavlenchyk, N., Kryshtanovych, S., Pavlenchyk, A., Kryshtanovych M., Romanchuk, O. (2020) Training Professional Competence of Physical Culture and Sports Managers. *35th IBIMA Conference: 1-2 April 2020, Seville, Spain*, 487-496 <https://ibima.org/accepted-paper/training-professional-competence-of-physical-culture-and-sports-managers/>
 30. Salvo, D., Garcia, L., Reis, R., Stankov, I., Goel, R., Schipperrijn, J., Hallal, P., Ding, D., Pratt, M. (2021). Physical Activity Promotion and the United Nations Sustainable Development Goals: Building Synergies to Maximize Impact. *Journal of Physical Activity and Health*, 18(10), 1163-1180.
 31. Tan, T.-C. (2015). The transformation of China's National Fitness Policy: From a major sports country to a world sports power. *International Journal of the History of Sport*, 32(8), 1071-1084.
 32. The Commonwealth (2023, June 27). The global sport and sustainable development goals impact report. Policy Brief. <https://thecommonwealth.org/publications/global-sport-and-sustainable-development-goals-impact-report>
 33. Wicker, P. (2019). The carbon footprint of active sport participants. *Sport Management Review*, 22(4), 513-526.
 34. World Health Organization (2018). Global action plan on physical activity 2018-2030: more active people for a healthier world. Geneva; WHO.

Primary Paper Section: A

Secondary Paper Section: AE, AK, AO

CYBERSECURITY AS A COMPONENT OF INTERNATIONAL SECURITY

^aOLEKSANDR HOMANIUK

^a*Lesya Ukrainka Volyn National University, 13, Voli Ave, 43025, Lutsk, Ukraine*
email: "alex.ua.man@gmail.com"

Abstract: This article examines cybersecurity issues in the modern world, where information technologies play a critical role in political, economic, and military spheres. The growth of digital infrastructure is accompanied by an increase in cyber threats, which can be directed against both individual states and the international community. The article emphasizes that cybersecurity is becoming a critically important aspect of both national and international security, requiring collective efforts to protect against potential threats such as cyberattacks on government institutions, critical infrastructure, as well as espionage and social engineering. Special attention is given to analyzing various forms of cyber threats and their impact on global security. Specific examples of cyberattacks are described, including interference in the U.S. election processes and attacks on Ukraine's energy infrastructure. The authors highlight key aspects of cybersecurity, including technical, legal, and educational measures aimed at ensuring security in the digital space. The article also addresses the role of international cooperation in the context of cybersecurity, emphasizing the importance of joint efforts by governments, the private sector, and international organizations such as the UN, NATO, and the EU. The strategies of various countries, including the U.S. and Israel, in the field of cyber defense, as well as steps taken by Ukraine to strengthen its cybersecurity amid Russian aggression, are also reviewed. The article discusses the challenges related to cybersecurity, including insufficient funding, the rapid pace of technological advancement, the human factor, and the absence of unified international legal frameworks in cyberspace. The article underscores the need for the development of national cybersecurity strategies and close cooperation among states to counter the growing cyber threats in a globalized world.

Keywords: cybersecurity, cyberattacks, cyber threats, information security, critical infrastructure, hybrid warfare, international cooperation, national security, digital infrastructure.

1 Introduction

In the modern world, information technologies play a key role in all areas of life, including the economy, politics, military operations, and interpersonal communications. As digital infrastructure evolves, the number of cyber threats that endanger both individual states and the international community as a whole continues to grow. Cybersecurity has become one of the critical components of both national and international security, requiring collective efforts for its provision. This issue encompasses various aspects, from protecting critical infrastructure to preventing global cyberattacks capable of destabilizing the geopolitical landscape. It is not only a technological issue but also a geopolitical one, as threats can originate from individual hackers or state actors. Given the rise of hybrid warfare, cyberattacks, and information campaigns actively used as tools of influence, the protection of national interests in cyberspace has become one of the primary tasks for governments. For Ukraine, which has long been subjected to military aggression from the Russian Federation, cybersecurity is a crucial component of national security, particularly in light of the large-scale cyberattacks accompanying military actions. Despite the declared intentions of major geopolitical actors to counter the militarization of cyberspace, the increasing role of purely military structures in ensuring the security of critical national infrastructure (national cyberspace) is evident. Initiatives within the United Nations to develop comprehensive approaches to international information security are likely to either fail completely or achieve limited success (in the form of declarative agreements). In such conditions, Ukraine must be prepared not only for defensive cyber warfare but also for actively developing its own offensive capabilities in cyberspace. The aim of the study is to analyze modern cyber threats, particularly in the area of protecting the state's critical infrastructure, and to determine the role of international cooperation in countering cyberattacks and hybrid threats. The research focuses on how to effectively strengthen information security and increase resilience to cyberattacks in a globalized digital environment.

2 Materials and Methods

Document analysis – the study of legislative acts, international agreements, and cybersecurity strategies; comparative analysis –

a comparison of cybersecurity approaches in different countries; case study method – analysis of specific examples of successful and unsuccessful cyber defense operations and attacks; empirical research – the collection and analysis of data on current cyber threats and incidents; content analysis – the examination of media reports and information campaigns in the context of hybrid warfare. These methods provide a comprehensive assessment of both the current state of cyber threats and the necessary measures to address them.

3 Results and Discussion

Cybersecurity is defined as a set of measures aimed at protecting information systems, computer networks, and data from unauthorized access, attacks, destruction, and misuse. It encompasses technical, organizational, legal, and educational aspects, all designed to ensure the uninterrupted and secure operation of systems. The importance of cybersecurity grows in direct proportion to the level of digitalization in society and its reliance on information technologies.

According to the ISO/IEC 27032:2012 standard, cybersecurity or cyberspace security refers to the preservation of the integrity, confidentiality, and availability of information circulating within a cyber system (i.e., information entering, accumulating, and being stored in the cyber system for further processing) to ensure the resilience and continuity of the system's management functions over relevant objects of control [12]. Correspondingly, cyberspace is the part of the information space formed by information flows and fields generated during the operation of cyber systems [9].

In a world where financial systems, government institutions, energy infrastructure, military networks, and even household technologies depend on the Internet, any vulnerabilities can have global consequences. According to various studies, cyberattacks cause annual losses in the trillions of dollars and have the potential to destabilize national economies, undermine trust in governments and corporate structures, and result in human casualties in the event of attacks on critical infrastructure.

Cyber threats take various forms and can target different entities. Among the most common threats are [13]:

- Cyberattacks on government institutions. These include attempts to steal information, breach national security systems, or influence political processes, such as elections. A notable example is the interference in the 2016 U.S. elections, where hackers sought to affect the election outcome.
- Attacks on critical infrastructure. Energy systems, water supplies, transportation networks, and other essential services may be targeted in cyberattacks, leading to catastrophic consequences. The 2015 attack on Ukraine's energy system was one of the first examples of a cyberattack on critical infrastructure.
- Malware and viruses. Malicious software, such as viruses, Trojans, and ransomware, can be used to steal data, damage systems, or extort money. For example, the WannaCry virus in 2017 locked computers worldwide, demanding a ransom for their release.
- Cyber espionage. States may use cyber tools to spy on other nations or steal classified information, potentially escalating international conflicts.
- Social engineering and phishing. These techniques exploit psychological manipulation to trick users into revealing confidential information or downloading malicious software.

Today, many countries have integrated cybersecurity as an essential part of their national security strategies. Governments are establishing specialized agencies and centers focused on cybersecurity, developing relevant legislation, and supporting the growth of necessary infrastructure. For example, in the

United States, the Cybersecurity and Infrastructure Security Agency (CISA) is responsible for protecting both public and private entities from cyber threats. In the European Union, the European Union Agency for Cybersecurity (ENISA) assists member states in coordinating their cybersecurity efforts.

Many nations are also incorporating cybersecurity into their military strategies. Cyberspace is now considered the fifth domain of warfare, alongside land, sea, air, and space. Military cyber divisions are engaged in both defending their own systems and developing offensive cyberattack capabilities. This includes the potential to disable enemy command, communication, energy, and other critical infrastructure systems.

Threats in cyberspace are becoming increasingly complex and diverse. The primary threats include:

- Cyber espionage. The use of cyber tools to gather information on government, military, and economic structures of other states can pose a serious threat to national security. Stolen information can be used to influence internal and external political processes.
- Cyberterrorism. Hackers may target a country's critical infrastructure, such as power plants, water supply systems, and transportation networks, potentially leading to mass disasters and destabilization.
- Cyber warfare. In modern military conflicts, cyber weapons are used alongside traditional military means. States are developing cyber military units to conduct offensive and defensive operations in cyberspace.
- Destabilization of the information space. Fake news, disinformation, and propaganda can disrupt political stability and undermine trust in government institutions, directly impacting national security.

Cyberattacks targeting Ukraine share common characteristics: Russian intelligence services actively employ cyber tools to gather information on political, military, and economic processes in Ukraine. These attacks aim to acquire strategic information and use it to destabilize the situation. As demonstrated by attacks on energy systems, cyberattacks can paralyze critical infrastructure, causing significant harm to the country's economy and security. Cyberattacks are often accompanied by information operations designed to undermine trust in Ukrainian institutions, create panic, or influence public opinion. Given that many strategically important infrastructures are privately owned, attacks on companies represent another form of cyber threat [7].

International cybersecurity cannot be achieved without close cooperation between states, as cyberattacks transcend borders. The Internet is global, and attacks launched from one country can cause harm in others. Therefore, international collaboration is crucial to developing effective mechanisms to counter cyber threats.

Organizations like the United Nations, NATO, the European Union, and others are actively developing standards, policies, and strategies in the field of cybersecurity. For example, within NATO, cyber defense is one of the top priorities for collective security, and a cyberattack may be considered grounds for invoking Article 5 of the NATO Charter, which calls for collective defense. The UN hosts conferences and consultations aimed at establishing global rules and norms for state behavior in cyberspace. Efforts to create an international code of conduct in cyberspace are focused on limiting the use of cyber tools for military purposes and ensuring the stability of the digital space.

Despite all efforts, cybersecurity remains a significant challenge for the international community. A critical issue is the lack of unified international rules and norms in cyberspace. Many states utilize cyber tools to achieve their own geopolitical objectives, leading to conflicts and tensions on the global stage.

Another important aspect is technological progress. With the emergence of new technologies such as artificial intelligence, quantum computing, and the Internet of Things, the possibilities for cyberattacks are also increasing. Protecting against these

threats requires constant improvement of cybersecurity systems and enhancing the training of specialists in this field.

Various countries are developing their approaches to cybersecurity, yet common features exist in the formation of strategies. The American cybersecurity strategy focuses on protecting critical infrastructure, developing offensive cyber capabilities, and fostering active international cooperation. The United States is also investing significantly in artificial intelligence and quantum computing technologies to enhance cybersecurity.

Israel is regarded as one of the world leaders in cybersecurity, due to intensive collaboration between the government, private sector, and universities. The Israeli cyber forces are recognized as some of the most effective in the world, and the country actively develops the export of cybersecurity technologies. In 2013, the European Union adopted the Cybersecurity Strategy, aimed at creating an open, reliable, and secure cyberspace. This includes measures in various areas: achieving cybersecurity resilience, significantly reducing cybercrime, developing a cyber defense policy related to the Common Security and Defense Policy, enhancing manufacturing and technological resources for cybersecurity, creating a coordinated international cyber policy for the EU, and promoting the core values of the EU [4].

The analysis of trends in the European Union's cybersecurity policy indicates that the development of digital technologies and information systems has led to new threats to the national security of European countries. Modern information technologies render information systems vulnerable to cyberattacks, necessitating measures to mitigate the negative impacts of these threats [2; 14].

The European Union is actively working to enhance its cybersecurity systems in response to contemporary challenges. This includes streamlining the regulatory framework, developing European principles for Internet resilience, increasing the number of divisions focused on cybersecurity, strengthening control over the national information space, and protecting critical infrastructure. Additionally, pan-European exercises and studies on security incidents in cyberspace are being conducted [3; 5; 8].

The European Union is continually updating its cybersecurity sectors to address modern challenges. This process encompasses the following: organizing the regulatory framework that ensures the integrity of state policy in this area; developing European guidelines to ensure Internet resilience and promoting them internationally; increasing the number of units involved in the cybersecurity system; enhancing oversight of the national information space; strengthening protective mechanisms for the EU's critical information infrastructure; conducting Europe-wide training and research on Internet security incidents; strengthening collaboration between the public and private sectors; establishing a European forum for information exchange among member states; and creating a European early warning system for cyber threats, among others [1].

For Ukraine, it is crucial to become an active participant in these processes, as this will not only enhance its international image but also influence the formation of the organizational and legal foundations of national cybersecurity [10]. In the context of hybrid warfare, cybersecurity issues must be at the center of state policy. Ukraine's foreign policy strategy in the field of cybersecurity should clearly define its goals and methods for achieving them, to foster beneficial partnerships with the EU in safeguarding national interests.

Ukraine requires the establishment of an adequate security system in a transforming world, where national security challenges increasingly exhibit characteristics distinct from traditional threats. The activity of leading states in cyberspace, profound changes in the approach to domestic information policy, and the formation of powerful transnational criminal groups specializing in cybercrimes all underscore the necessity

to develop recommendations for the short- and long-term priorities for transforming the national security sector in light of these trends [7].

Since the onset of Russian aggression in 2014, Ukraine has faced a series of powerful cyberattacks, prompting the government to reassess its approaches to cybersecurity. The world's first documented case of a successful hacker attack on energy infrastructure occurred on December 23, 2015, in Ukraine. As a result, automated control systems for energy substations were incapacitated, leading to power outages lasting from 3 to 8 hours. The incident was reported by Kyivenergo, Prykarpattiaoblenergo, and Chernivtsioblenergo [13]. New structures have been established in the country, such as the National Cybersecurity Coordination Center, and cooperation with international organizations, such as NATO and the EU, has been strengthened.

In the context of cybersecurity, close interaction between the government and the private sector is crucial, as many critical infrastructures, such as banks, telecommunications, and energy, are privately owned. Government agencies must ensure the establishment of regulatory frameworks that allow companies to effectively protect their information resources, as well as promote the sharing of information about potential threats. The private sector plays a key role in developing new protection technologies and in implementing security standards. Investments in cybersecurity enable companies to reduce the risks of cyberattacks, maintain data confidentiality, and protect their reputation.

The implementation of national cybersecurity strategies faces a number of challenges:

- Insufficient funding: In many countries, investments in cybersecurity remain inadequate, hindering the development of the necessary infrastructure and the training of specialists.
- Rapid pace of technological progress: The emergence of new technologies, such as artificial intelligence, quantum computing, and the Internet of Things, creates new threats that states may not be prepared to address.
- The human factor: Even the most advanced protection technologies can be ineffective if users make mistakes. Training and raising awareness among public officials and citizens remain critical aspects of ensuring cybersecurity.
- International law and its absence: Currently, there are no unified international legal frameworks to combat cyberattacks. This complicates cooperation among states and creates loopholes for cybercriminals who can operate from one country without facing prosecution from another.

The Law of Ukraine "On the Fundamentals of Ensuring Cybersecurity in Ukraine" established the overall architecture of the national cybersecurity system and delineated tasks and authorities among the main entities responsible for cybersecurity, including the National Cybersecurity Coordination Center, the Ministry of Defense, the General Staff of the Armed Forces, the State Special Communications and Information Protection Service, the Security Service of Ukraine, the National Police, the National Bank, and the intelligence agencies of Ukraine [11]. In response to cyber threats, Ukraine developed the National Cybersecurity Strategy, which outlines priorities and measures to strengthen cyber protection. The main elements of this strategy include:

- Strengthening the regulatory framework: A significant step was the adoption of the Law "On the Fundamentals of Ensuring Cybersecurity in Ukraine," which defines the primary directions of state activity in the field of cybersecurity. Additionally, the National Cybersecurity Coordination Center was established under the National Security and Defense Council of Ukraine.
- Developing institutional infrastructure: Ukraine is creating specialized cybersecurity units at both military and civilian levels. These bodies are engaged in monitoring cyber

threats, analyzing data, and developing operational response measures to cyberattacks.

- International cooperation: Ukraine actively collaborates with international partners, particularly with the EU and NATO, in the area of information exchange regarding cyberattacks and the development of joint cybersecurity mechanisms. This cooperation allows Ukraine to obtain the necessary technologies and expertise to strengthen its own cyber environment.
- Protection of critical infrastructure: Ukraine is enhancing measures to protect critical infrastructure, such as energy, transportation, and financial systems. This includes both strengthening physical security and implementing modern cybersecurity technologies.
- Educational programs and workforce training: An essential component of the strategy is the training of specialists in the field of cybersecurity. Ukrainian universities are developing specialized educational programs to prepare a new generation of cybersecurity professionals for both the public and private sectors.

4 Conclusion

Cybersecurity is a crucial component of modern international security as cyber threats can have global repercussions. Effectively addressing cybersecurity issues requires international cooperation, harmonization of legislation, the development of new protective technologies, and the continuous improvement of strategies. States and international organizations must intensify their efforts to create a secure and stable cyberspace, which will serve as the foundation for global security. Ukraine's National Security Strategy clearly defines cybersecurity as a priority area for the protection of the state [6]. Cyber threats in Ukraine are not hypothetical—since 2014, the country has been the target of large-scale cyberattacks on key state, military, and energy facilities. Thus, cybersecurity for Ukraine is not only about protecting information infrastructure but also about the security of vital sectors. The Ukrainian government and international partners are actively working to establish a reliable cybersecurity system that will ensure the safety of government institutions, the economy, citizens, and critical infrastructure.

Literature:

1. About ENISA / European Union Agency for Network and Information Security. (n.d.). Retrieved September 10, 2024, from <https://www.enisa.europa.eu/about-enisa>
2. Biriets, K. Y. e. (n.d.). Cybersecurity as an important component of the national security protection system of European countries. Retrieved September 10, 2024, from [15739.pdf \(vntu.edu.ua\)](https://vntu.edu.ua)
3. Cyber Europe / European Union Agency for Network and Information Security. (n.d.). Retrieved September 10, 2024, from <https://www.enisa.europa.eu/topics/cyber-exercises/cyber-europe-programme>
4. Cybersecurity Strategy of the European Union: An open, safe and secure cyberspace. (2017). Retrieved September 10, 2024, from http://eeas.europa.eu/archives/docs/policies/eu-cyber-security/cybsec_comm_en.pdf
5. Cybersecurity Strategy of the European Union: An open, safe and secure cyberspace: Adopted by the European Commission on February 7, 2013 / European Union. (n.d.). Retrieved September 10, 2024, from <https://ec.europa.eu/digital-single-market/en/news/eu-cybersecurity-plan-protect-open-internet-and-online-freedom-and-opportunity-cybersecurity>
6. Decree of the President of Ukraine No. 392/2020 on the decision of the National Security and Defense Council of Ukraine dated September 14, 2020, "On the National Security Strategy of Ukraine." (2020). Retrieved November 26, 2023, from <https://www.president.gov.ua/documents/3922020-35037>
7. Dubov, D. (n.d.). Modern trends in cybersecurity policy: Conclusions for Ukraine. Analytical note. National Institute for Strategic Studies (NISS). Retrieved September 10, 2024, from <https://niss.gov.ua/doslidzhennya/nacionalna-bezpeka/suchasni-trendi-kiberbezpekovo-politiki-visnovki-dlya-ukraini>

8. EU cybersecurity initiatives working towards a more secure online environment / European Union. (n.d.). Retrieved September 10, 2024, from http://ec.europa.eu/information_society/newsroom/image/document/2017-3/factsheet_cybersecurity_update_january_2017_41543.pdf
9. Lipkan, V. A., & Lipkan, O. S. (2018). National and international security in definitions and concepts (2nd ed., revised and expanded). Kyiv: Educational Manual.
10. National Cyber Security Index. NCSI. URL: <https://ncsi.ega.ee/ncsi-index/> (Retrieved November 7, 2023).
11. On the basic principles of ensuring cybersecurity of Ukraine: Law of Ukraine No. 2163-VIII of October 5, 2017. (2017). Bulletin of the Verkhovna Rada (VVR), No. 45, 403 p.
12. Slipchenko, T. (2020). Cybersecurity as a component of the national security protection system: European experience. *Current Issues of Jurisprudence*, 1(21), 128-133.
13. Yemelianov, V. M., & Bondar, H. L. (n.d.). Cybersecurity as a component of national security and cyber protection of Ukraine's critical infrastructure. *Public Administration and Regional Development*, (5), 493-523. Retrieved September 10, 2024, from <https://doi.org/10.34132/pard2019.05.02>
14. Zaporozhets, O. Yu. (2009). The European Union's policy in the field of information security. *Current Issues of International Relations*, 87(II), 36-45.

Primary Paper Section: A

Secondary Paper Section: AD

SOME GENRES AND FORMS OF EARLY MUSIC IN MODERN DOMESTIC PRACTICE

^aOLHA SHADRINA-LYCHAK, ^bNATALIYA FOMENKO,
^cIRYNA DRUZHHA, ^dHANNA IVANIUSHENKO, ^eOLENA
ZHUKOVA

^{a,c,e}Ukrainian National Tchaikovsky Academy of Music, 1-3 / 11,
Architect Gorodetsky Str., 01001, Kyiv, Ukraine

^bMusic Academy of Dnipro, 10, Lyvarna Str., 49044, Dnipro,
Ukraine

^dModern Art Research Institute of the National Academy of Arts
of Ukraine, 18-D, Ye. Konovaltsa St., Kyiv, Ukraine

email: ^aollsha@ukr.net, ^bnatacembalo@gmail.com,

^cminkylytyru0608@gmail.com, ^di_anna@ukr.net,

^eelenapiano3@gmail.com

Abstract: The presented scientific research analyzes the performance activities of contemporary artists specializing in harpsichord art at relevant festivals, among which the powerful annual Bach-fest (Sumy) and the Festival of Early Music in Lviv stand out. Throughout its history, the Bach-fest (Sumy) has brought together Ukrainian performers and leading artists from various countries in Europe, America, and Asia. This festival is practically a peer of the Ukrainian harpsichord school, with many musicians from Kyiv and Lviv honing their skills by performing on its stages and participating in its masterclasses. In turn, the Festival of Early Music in Lviv almost immediately became a creative platform for the establishment and development of historically informed performance in Ukraine. These musical meetings of like-minded individuals have become a point of intersection between the European and Ukrainian harpsichord schools, promoting active professional contacts among early music performers. It should be noted that the scholarly comprehension and artistic exploration of the genre panorama of Baroque keyboard music opens new creative perspectives for Ukrainian musicians.

Keywords: early music, performance, art, unmeasured prelude, toccata, stylus phantasticus, Ukrainian harpsichord school.

1 Introduction

Today, baroque keyboard music genres serve as a gateway to the art world of the 16th-18th centuries, as they tested the artistic and aesthetic ideas of the era, shaped units of Baroque musical vocabulary, and established its norms. A correct understanding of this (and its relevant application in performance practice) is not only important for studying the Baroque legacy itself but also holds great significance for the further development of musical art. Many elements of Baroque music had a noticeable influence on the subsequent development of music and/or evolved into later historical and stylistic periods.

2 Materials and Methods

The material of this article is based on theoretical works by foreign and Ukrainian researchers of ancient musical art, particularly studies dedicated to the historical specificity of Baroque music (M.F. Bukofzer [5], O. Shadrina-Lychak [10], R. Anthony James [1], Apel W.[2], O. Baumont [3], G. Buelow [4], A. Curtis [6], D. Moroney [9], M. Stravaganza [12], C. Stemberge [11]), as well as its reception in the work of Ukrainian musicians O. Zhukova [13], H. Ivaniushenko [7]. The study employs a comprehensive methodological approach, including historical, analytical, descriptive, and cultural methods.

3 Results and Discussion

This study is dedicated to the historical existence of specific keyboard genres of the Baroque era, particularly the toccata and unmeasured prelude, and examines the ways in which they are received in the work of contemporary Ukrainian musicians - both performers and composers. This perspective underscores the relevance of the article.

The unique phenomenon of Baroque music, *stylus phantasticus* or the fantastic style, embodies aspects of its aesthetics with maximum expressiveness, such as changeability, instability, and various artistic excesses. The ideas of fantasy, unpredictability, eccentricity, and contrast, characteristic of the era, were realized in instrumental writing and performance, which fascinate with their virtuosity, dramatic emotional tension, unpredictability, impulsiveness, freedom of expression, and simultaneously -

grandeur and strictness of composition. The fantastic style encompasses a significant body of keyboard music from the late 16th to the 18th century: from the cradle of the style -early Italian toccatas by C. Merulo, G. Frescobaldi, and M. Rossi - to the works of German masters J. J. Froberger, M. Weckmann, and D. Buxtehude, reaching its highest development in the compositions of G. F. Handel and J. S. Bach.

Born during a period of rapid development in instrumental performance and keyboard improvisation, which has its roots in the Renaissance tradition, the fantastic style simultaneously reflects a new logic of musical composition. This logic stems from the desire of the keyboardist to demonstrate the expressive possibilities of the instrument to the fullest. At the same time, being instrumental by its very nature, the fantastic style unfolds under the significant influence of the ideas of the so-called "second practice" within the early Baroque period. For instance, the Italian keyboard toccata, which most vividly embodies *stylus phantasticus*, reflects the creative achievements of madrigalist composers (particularly the *stile concitato* of C. Monteverdi), who revealed previously unexplored realms of rhythmic and harmonic freedom in music to express a wide range of affects, emotional movements, and passions - previously achievable only through human speech. Thanks to the advanced art of intabulation, the vocabulary of Italian keyboard toccatas, already rich in purely instrumental "fantastic formulas" like scale-like virtuosic passages and tiratas, also absorbs the expressiveness of vocal figures, or *affetti*. These figures, later separated from madrigal practice, became the foundation of the pan-European musical lexicon.

The emergence of the fantastic style is associated with the development of the toccata genre in the works of Italian keyboard composers at the turn of the 16th and 17th centuries. The Italian toccata, in contrast to other genres of the era (such as the *ricercar* or *canzona*), distinctly aimed to showcase the possibilities of specifically keyboard-based, fingered technique. It embodied the most significant compositional experiments of the time in rhythm, texture, and harmony. Spontaneous improvisation, rhythmic and harmonic freedom, and the expressiveness of rhetorical figures are the main attributes of the fantastic style, which define the tonal richness of the Baroque keyboard toccata.

The first clear signs of the fantastic style can be found in the toccatas of the Venetian composer Claudio Merulo (1533-1604). A brilliant keyboardist, Merulo was the founder of an improvisational school, the most important element of which was the creation of polyphonic pieces with ornamental "coloring" in the chordal texture of a given text. Another area of compositional exploration in the realm of the fantastic style was the genre of *stravaganze* (literally "strange harmonies"), characterized by bold, extravagant harmonies and a greater figurative coloration compared to *durezze*. Due to the daring harmonic experiments of the Neapolitan school keyboardist Giovanni de Macque (1548-1614), *stravaganze* approaches the madrigals of his contemporary, the Italian composer Gesualdo di Venosa [12].

A new milestone in the development of the fantastic style was reached in the works of the Roman school composer Girolamo Frescobaldi (1583-1643). In his virtuosic toccatas with rhapsodic structures, composed of short, rapidly changing improvisational and contrapuntal episodes, the free play of fantasy and expressiveness achieved perfection [5]. In terms of expressive grandeur, dramatic richness, and excess, as well as the dynamism of forms, Frescobaldi's keyboard style can be compared to the masterpieces of other Italian Baroque masters such as Giovanni Bernini and the vivid representative of Baroque poetry, Giambattista Marino.

The implementation of rhythmic and harmonic freedom is easily recognizable in the characteristic textural solutions of toccatas. Here, irregularity, heterogeneity, and a certain "linearity" are

present: the musical fabric is filled with tirades, long trills, various arpeggios, tied chords, and suspended notes, creating sharp dissonances that even graphically embody the “nervous pulse” of constantly shifting affects.

Another revolutionary innovation by Frescobaldi, which marked a starting point in the understanding of the fantastic style, was his prefaces - essentially, detailed didactic commentaries on his own works. Addressing the reader in these Prefaces, Frescobaldi thoroughly explains the very nature of his musical intentions and defines the degree of interpretive freedom allowed in their execution, explaining how tempo and rhythmic freedom should be “manifested” by the performer interpreting the piece. At the same time, as indicated by Frescobaldi’s instructions for his keyboard works, the performance style, i.e., agogic means, articulation, and the entire expressive system of early Baroque toccatas, follows the madrigal tradition, all serving the sole purpose of expressing the affect.

Considering the fluidity of geographic boundaries for Baroque musicians, the Italian keyboard tradition continued in the German one. The freedom found in Frescobaldi’s toccatas was adopted by German keyboard composers, particularly his student Johann Jakob Froberger (1616-1667), and later by Dieterich Buxtehude (ca. 1627-1707), Matthias Weckmann, Johann Caspar Kerll, and ultimately Johann Sebastian Bach. In their works, rhythmic freedom, virtuosity, and grandeur reached an unprecedented level for that time.

While adopting the achievements of the Italian masters, the German keyboard school increasingly gravitated toward freedom of expression and improvisation. Gradually, the connection with liturgical forms diminished, resulting in the birth of a distinctively German genre of keyboard music - the prelude (Praeludium), which embodies the achievements of the fantastic style most fully and vividly.

This counterpart to the Italian toccata emerged in the works of North German masters and reached its perfected form in the organ compositions of Dieterich Buxtehude. A distinctive feature of this genre (aside from the composition itself - alternating contrasting sections of free material with fugal ones) is its emotional intensity and extreme rhetorical nature. The composer’s organ preludes are dramatic and structurally refined speeches that best reflect the logic of rhetorical disposition. The stylistic uniqueness of the genre is particularly evident in the pedal technique.

North German masters imbued their works with tones of exaltation and heightened expressiveness [2]. The oratorical brilliance and simultaneously personal focus of expression are most clearly embodied in the works of Georg Böhm, Johann Adam Reincken, Matthias Weckmann, and Dieterich Buxtehude. Researchers consider the works of these North German school composers as the most exemplary of the fantastic style, although this primarily concerns the organ repertoire. Harpsichord works, however, can be found in Böhm, Weckmann, and Reincken [4].

A clear manifestation of the desire for the individualization of musical expression is evident in the works of Johann Jakob Froberger, a representative of the South German school. As a student of Frescobaldi, he adopted the metrical-rhythmic freedom (*libero italiano*) and the affective diversity of the madrigal style from the Ferrara master. Froberger’s toccatas are indeed similar to instrumental madrigals. Rhythmic shifts occur every moment: short durations contrast with long, slow ones, and the musical texture is rich with madrigalian (rhetorical) figures, rhythmic extravagances, and syncopations, along with combinations of tirades and leaps. All these techniques add a sense of restlessness and saturation with the most diverse affects, a quality also inherent in Frescobaldi’s toccatas.

However, the compositional model of the teacher’s toccatas is reinterpreted by the composer through the construction of more extended episodes. This new type of toccata, identified by researchers as “novel-improvisational”, later was further developed by Matthias Weckmann. This model also served as a

reference point for the toccatas of Dieterich Buxtehude and Johann Sebastian Bach [2].

An extremely interesting phenomenon and a point of development in the art of keyboard improvisation, and consequently the fantastic style, is the genre of the so-called chordal prelude, in which the texture is written in whole notes (white notes). This type of notation, often with only conditional indications of barlines, was used in the 18th century by J.S. Bach, Handel, Mattheson, Alessandro Scarlatti, Sarti, and other composers.

The purpose of these pieces was partly determined by their prelude function. For instance, some of Handel’s twenty composed chordal preludes are included in suites or small keyboard cycles. The composer wrote out a few of them, providing examples of how to realize this style (such as the Prelude from the A major Suite, HWV 426). The general practice of such pieces likely involved their performance as an introduction to vocal or instrumental works in a related key, intended to set the listener’s mood for the affect of the main piece.

The “realized” preludes probably had a didactic function as well, since they include detailed arpeggios, generously ornamented with embellishments, melodic insertions, imitations, and other “fantastic formulas” - the entire grammar of the improvisational art of the time, which performers needed to master as part of their development of an expressive vocabulary.

At the same time, there existed another mixed type, where certain sections were written in whole notes with the inscription “arpeggio”, while others contained ornaments or melodic inserts. Such compositions evidently captured the sound ideas proposed by the composer for interpretation, which an experienced keyboardist could use and develop (for example, Handel’s preludes HWV 562, 566, 575, 576, etc.). Some toccatas, fantasies, and preludes by J.S. Bach (BWV 921-923, 944) can also be classified under this type, in which the arpeggio sections are similarly written in whole notes. These works could also serve as material for the virtuosity development of the composer-artists themselves.

Thus, keyboard preludes became a genre that fosters a performer’s passion for improvisation and creative experimentation, the embodiment of which can be found in the virtuosic and rhetorical keyboard fantasies and toccatas of J.S. Bach. The improvisational mindset, along with the desire to engage all ten fingers for the fullest sound of the instrument’s range, represents both an uncontrollable attraction to freedom of self-expression and an impulse toward the ordering of material. Moreover, both Handel’s and Bach’s preludes can serve as analogs to the contemporary Italian practice of *partimento* - a method of teaching composition and improvisation. Common to both genres is a simplified notation (in *partimento*, a line of figured bass akin to *basso continuo*), as well as a didactic orientation. Furthermore, in both cases, the notation does not specify either rhythmic or final pitch relationships to the solo melodic line. In the case of *partimento* as a bass line without figures, the performer also has freedom regarding harmonic choices; that is, they can select harmonies according to their own taste, yet certainly based on certain established rules.

Thus, while maintaining a connection with the Italian tradition, the expressive system of the keyboard toccata in the German school underwent further rethinking within the framework of rhetorical doctrine. The defining characteristics of the fantasy style as a musical phenomenon, therefore, are, on one hand, improvisationalness, and on the other, profound rhetorical quality, specifically - extraordinary expressiveness coupled with subordination to the rhetorical disposition in both composition and performance. All of this is reflected in the dynamism, virtuosity, and contrast of keyboard music, while simultaneously existing within a strict logic that defines the compositional foundation of keyboard works by Italian and German masters of the era.

In this sense, fantasy writing embodies the Baroque antithesis of “freedom-order”, in which the apparent improvisational freedom is grounded in affected normativity and the strict rules of the representative canon.

French musicians also remained within the scope of general Baroque artistic trends (with an increased focus on the fantasy, improvisational, and emotional elements). However, their works were marked by distinctly expressed features of this national school, characterized by a certain restraint and a tendency toward rationality, while the music they created was distinguished not only by the application of specific compositional and performative means but also by a characteristic sonic color.

Inspired by the unique sound of the lute and the social demand for this instrument, French artists of the 17th century developed a distinctive musical language known as the *harpsichord lute style* (*harpsichord style luthé*). The comprehensive set of compositional and performative techniques that emerged during this period aimed to achieve desired sound characteristics - softness, volume, and layering - requiring extraordinarily skillful and delicate handling of each note and every textural element. The focus was on working with verticality: various methods of chord spacing were employed, with harmonic notes being articulated and altered sequentially, rather than simultaneously (the so-called *manière brisée*). Such techniques created a cohesive, rich sound filled with complex harmonic structures and overtone layering; this became the standard for French sonic aesthetics. The advancements made by lute players provided a fertile ground for the subsequent creative achievements of French harpsichordists, as the results of their experiments in sound surpassed initial expectations. The transfer of lute playing style to the harpsichord opened up new possibilities and enabled the resolution of intricate artistic challenges, leading to a new quality that transformed it into a representative style of French art from the 17th to the mid-18th century.

The *lute style* (*harpsichord style luthé*) became, to a certain extent, a universal language for French harpsichordists, regardless of the genres they approached [3]. However, its elements were most prominently expressed in the French genre modification of the prelude - the *unmeasured prelude* (*prélude non mesuré*) - as well as in the closely related genre of *tombeau* (a musical epitaph - a meditative work dedicated to the memory of deceased teachers, patrons, or friends). The affinity between the unmeasured prelude, tombeau, and the old Italian toccata is evident: all represent *stylus phantasticus*, characterized by its freedom of expression, bold harmonic experimentation, affectiveness, and sudden emotional shifts. They also share common roots in keyboard improvisations, which often concluded with virtuosic passages. In contrast to the toccata and tombeau, the prelude was *notated using a system without bar lines*.

The vast majority (including the oldest examples) of harpsichord unmeasured preludes are attributed to the work of Louis Couperin (1626-1661) [6; 8; 9]. Other significant contributions to the unmeasured repertoire include the preludes of Nicolas Lebègue (1631-1702), É. G. de la Guerre (1665-1729), and Jean-Antoine d'Anglebert (1628-1691), among others.

The unmeasured prelude represents a notated improvisation based on a specific harmonic sequence; this sequence possesses its own dynamic contour (the logic of rises and falls), which serves as the primary vehicle for the artistic and imagery-laden content of the prelude as well as its structural foundation.

The interpretation of the unmeasured prelude poses a challenge today, as the lack of comprehensive information regarding the metrorhythm can provoke less experienced musicians to interpret arbitrarily. However, a competent performer can approximate the composer's intent by accurately understanding the logic of the harmonic progression of the piece and interpreting the textures chosen by the composer for the realization of the chords. In this context, the performer retains the prerogative to define and apply important interpretive

elements, including the intensity of dynamic development, the placement of harmonic accents, the choice of amplitude for emotional states, tempo, and so forth. These elements serve as factors of freedom and individualization in each interpretive decision when performing the unmeasured prelude as a representative of the *fantasie* style.

The specific genres and forms of musical art from the 17th century that include an improvisational component (such as the unmeasured prelude, *tombeau*, toccata, and the practice of figured bass) exist on the boundary between oral and written traditions. Contextual study of these forms provides extraordinarily valuable information about aspects of performance that were not captured in notation, as they were not meant to be documented but were passed down from master to student over the centuries. Unfortunately, this cultural tradition has been interrupted, and its continuity lost. Today, researchers and performers painstakingly collect historical evidence that would allow for the reconstruction of a comprehensive picture of musical art from the 17th century to the first half of the 18th century. The contribution of the harpsichord unmeasured prelude to this process is particularly significant, as it highlights important nuances of ornamentation, improvisation, and figured bass practices, making the prelude, in a sense, a connecting link between treatises and musical works documented in the conventional manner (with fixed metrorhythm) [10].

Although the unmeasured prelude fell out of active musical practice in the early decades of the 18th century and was replaced by the measured prelude (while its introductory function was preserved in the dance suite or in the pair Prelude – Fugue), the harpsichord lute style born from French artists, with its unique sound ideal, found its reflection in the works of J.S. Bach (for example, in his numerous Allemandes, in works BWV 995-1000, and so on).

It is also important to briefly mention another specifically Baroque genre - the *dance suite* (partita) - which has connections to both Italian and French traditions. Its precursor was a pair of dances: a two-part walking dance (in moderate tempo) and a three-part jumping dance (in a fast tempo), based on a single melody. Over time, the dance forms became more complex, with an increasing number of dances, but the *practical* function of such music remained unchanged, which determined the structure of the suite - an alternation of contrasting dances unified by a common tonality. The genre of the dance suite experienced a new phase of development due to the vibrant growth of the French court ballet (Ballet de Cour) during the reign of Louis XIV (1638-1715) and the works of J.-B. Lully (1632-1687). According to dance practices, the main and optional dances were selected, and their order was established (Allemande – Courante – Sarabande – Gigue).

The term *Partita* is also associated with dances: initially, Italian composers of the late 16th and 17th centuries (such as A. Maione, B. Storace, M. Rossi, G. Frescobaldi, and others) used it to denote variation cycles (mostly on a dance theme). Later (in the late 17th to early 18th centuries) in German territories, Partita became synonymous with Suite; indeed, as with many other genres and phenomena of this era, unparalleled examples of dance suites and partitas belong to the works of J.S. Bach.

The incredible variety of Baroque genres, the absence of clear distinctions between them, and their rapid development within a relatively short period undoubtedly testify to the extraordinarily intense growth of instrumental performance during the studied era. Today, specific genres of keyboard art from the Baroque period (toccata, unmeasured prelude, suite/partita) justifiably attract the attention of performers and researchers, as they not only possess significant artistic value but also reveal an immensely valuable and promising field of research. Moreover, the ability to interpret these works correctly is indicative of musicians' professional level, their competence, and their knowledge of the performance styles of various historical periods and national schools. For this reason, such works are essential in the programs of leading global harpsichord competitions (Festival van Vlaanderen /Bruges, Belgium', J.S.

Bach Competition /Leipzig, Germany/, etc.). Therefore, it is entirely natural that the genres of Baroque keyboard music hold a prominent place in the repertoire of domestic harpsichordists.

The achievements of Ukrainian musicians in the field of *historically informed performance* (HIP) are substantial and recognized. The history of active development in this direction in Ukraine began with the establishment of a harpsichord class by Professor and Honored Artist of Ukraine Svitlana Shabaltyna at the National Music Academy of Ukraine named after P.I. Tchaikovsky in 1995. The founding of the Department of Ancient Music at the National Music Academy was carried out by Nina Oleksandrivna Herasymova-Peridska. Doctor of Arts, Professor, and Academician of the National Academy of Arts of Ukraine in 2000, she became a powerful catalyst for training competitive professional musicians in Ukraine. Today, the National Music Academy is the only higher educational institution in Ukraine providing systematic education in HIP. During this time, a whole generation of harpsichordists has emerged, who are already well-known and respected worldwide. The body of fundamental scientific research on past musical art conducted by Ukrainian specialists is also rapidly expanding, with significant contributions focused on Baroque keyboard genres.

The consistently high interest of musicians and the public in the Baroque heritage has led to the emergence of festivals in Ukraine dedicated to this direction, among which the powerful annual Bach-fest in Sumy and the Festival of Early Music in Lviv stand out.

“Bach-fest” is an international festival dedicated to the music of J.S. Bach and his contemporaries, held annually in Sumy since 1995. The founder and enduring director of the festival is organist and musicologist Orest Koval. Throughout the festival’s history, in addition to Ukrainian performers, leading artists from various countries in Europe, America, and Asia have participated. “Bach-fest” is practically a contemporary of the Ukrainian harpsichord school; many musicians from Kyiv and Lviv have grown professionally alongside it, as they not only performed on its stages but also took part in master classes conducted by invited international guests. Through the efforts of O. Koval and with financial support from the Renaissance Foundation, a two-manual harpsichord of French design, built by Dutch master Fred Bettenhausen, was specially acquired for the festival, marking a significant event in the Ukrainian cultural landscape. A total of 23 festivals have taken place. Unfortunately, since the onset of the COVID-19 pandemic, the Bach-fest has been put on hold.

The “Festival of Early Music in Lviv”, ideologically inspired and artistically directed for many years by musicologist and composer Roman Stelmaszczuk, began its history in 2003 and quickly transformed into a creative platform for the establishment and development of historically informed performance not only in Lviv but throughout Ukraine. The very first festival presented an ambitious program in terms of both participants and repertoire. It also immediately defined a series of elements that influenced both the further development of the festival itself and the formation of the domestic professional environment for performers of early music. On the one hand, the participation of performers from Europe allowed Lviv musicians to practically experience the specifics of historically informed performance, become acquainted with the sounds of historical instrument replicas, and discover a new repertoire.

On the other hand, a tradition was established for conducting scientific conferences and master classes involving Ukrainian and European scholars and performers. This initiative fostered an environment for the study and performance of early music in Lviv, leading to the creation and professional development of new ensembles specializing in early music, as well as the introduction of new academic disciplines and the establishment of a Baroque orchestra and choir at the Lviv National Music Academy named after M.V. Lysenko.

The concerts of the “Festival of Early Music in Lviv” have become a crossroads for European and Ukrainian harpsichord schools, facilitating active professional contacts between Ukrainian and European performers of early music. Throughout its long history, the festival has presented a diverse array of harpsichord music from the 16th to 18th centuries to the public.

An exceptionally interesting perspective on Ukrainian art in its connections to the Baroque tradition is reflected in the harpsichord works of many contemporary national composers, including Y. Ishchenko, S. Krutikov, S. Lunov, V. Polova, Z. Almashe, O. Bezbordko, O. Voitenko, S. Leontiev, and others.

The variety of neobaroque tendencies can be illustrated through several cycles of harpsichord pieces that emerged in the 2000s, notably Partita No. 9 and “Three Gavottes” by Yury Ishchenko (1938-2021), as well as “Five Recollections” for harpsichord and “Little Monkey: Ten Snapshots” by Sviatoslav Krutikov (born 1944). The works of these composers demonstrate fundamentally different approaches to realizing the principles of the Baroque harpsichord cycle. While Y. Ishchenko draws on typical genres of the era, he interprets their characteristics quite freely; in contrast, S. Krutikov, despite the whimsical and imaginative nature of his titles, consistently relies on the structure of Baroque dance forms.

The earliest of these cycles, “Five Recollections” for harpsichord by S. Krutikov, consists of programmatic pieces:

1. *A Dream*
2. *So Far Away Stars*
3. *A Pleasant Meeting*
4. *Such a Wonderful Crimean Night!*
5. *Recalling the Dream.*

In this work, the composer freely employs various stylistic techniques, creating allusions to entirely different intonational spheres. The backbone of the cycle consists of a prelude (A Dream, No. 1), which, in a modified form, concludes the cycle (similar to the aria in J.S. Bach’s “Goldberg Variations”, which serves as a structural “arch” for the cycle) and an easily recognizable jig at the center of the cycle (A Pleasant Meeting, No. 3). The prelude features a large number of ornaments and broken chords, characteristics primarily associated with French examples of the genre, particularly non-metric preludes. The number of movements and their dimensions also correspond well with models of Baroque suites.

Regarding the pieces that alternate with the aforementioned works, they somewhat contrast with the neobaroque odd-numbered movements of the cycle. The second piece, in turn, demonstrates an avant-garde sound, while the fourth imitates improvisation typical of Eastern cultures (in this case, Crimean-Tatar, as the cycle was created in Crimea).

The composer’s second cycle, “Little Monkey Ten Snapshots”, dedicated to the Estonian harpsichordist Imbi Tarum and philologist Yuliya Kulis, is marked by the spirit of the times. This applies to both the contemporary title and the “clip-like” nature of the musical text, as the elements of cyclical construction, the very snapshots, are often indeed microscopic. Specifically, the first, prelude-like snapshot consists of only six measures.

The second snapshot contains hints of a passacaglia or a slow French-style courante. The third, livelier piece resembles a gavotte or a fast air in the French style. The fourth movement is written in the meter of a jig, and the composer, in a note, provides detailed performance recommendations akin to those of his 18th-century colleagues, allowing the tempo of the piece to be altered by nearly one and a half times, depending on the performer’s comfort.

The fifth piece in the cycle is slow and in triple meter, evoking parallels with the genre of the sarabande. However, even within this miniature, the author changes the meter to quadruple, after which follows a jazz-inspired sixth movement. The seventh is

march-like, while the eighth is also march-like but contains elements of polyphony. The ninth is choral, and its textural features somewhat resemble early examples of British variations for keyboard. The cycle concludes with a triple-meter piece, whose rhythmic pattern transforms from dotted rhythm to triplet, reminiscent of Bach's mystifications, such as those distinguishing the Courante from the First Partita, where triplet and dotted rhythms are combined.

It is noteworthy to highlight the composer's sustained interest in the harpsichord and his excellent knowledge of the instrument, as he directly interacted with harpsichordists, owned his own instrument, and referred to it repeatedly in his work, particularly in the concerto for harpsichord and orchestra.

Y. Ishchenko operates quite differently, and the sections of his Partita (written for harpsichordist O. Zhukova, like the "Gavots") bear titles typical of the Baroque keyboard cycle: Allemande, Courante, Sarabande, and Gigue. However, the musical language of these works is entirely avant-garde and often does not fully conform to the established notions of the characteristics inherent to the respective genres.

In the cycle "Three Gavots", all the pieces, despite a common genre foundation, vary in character. Even in such a typical feature as the double anacrusis characteristic of the gavotte, the composer is highly inventive and never repeats himself. Interestingly, knowing the fundamental principles of historical performance allows providing this music with a maximally diverse sound and significantly expanding the palette of possible interpretations. These works are composed in the ancient two-part form, occasionally displaying sonata-like traits.

Moreover, one can observe how the composer employs dynamic means characteristic of Baroque artists, such as thickening the texture and shortening durations in fragments where he requires a dynamic buildup of texture and climax. However, some nuances suggest that the composer did not engage with the harpsichord during the writing process, as in places the notational layout exceeds the typical range for the instrument, presenting the performer with the issue of transposing certain elements down an octave, since the historical harpsichord does not accommodate those notes. The author also exhibits a tendency toward rather radical contrasts between different registers of the instrument, predominantly high and middle.

The harmonic language combines both avant-garde sonorities and diatonic, recognizable elements typical of classical harmony; this most frequently occurs in cadential areas. In this way, the composer cleverly embodies the neoclassical traits characteristic of his work. Y. Ishchenko frequently employs melismatic graphemes; these mainly consist of three types of ornaments - *mordents*, *gruppetti*, and *trills*.

As in original Baroque music, the tempos of these works can be determined not only according to the composer's remarks but also in accordance with the genre and overall presentation, particularly the durations utilized by the composer in his music. As mentioned earlier, in the development of musical material, he often accelerates the motion by subdividing durations, allowing for a general tempo of the work to be inferred from the most virtuosic passages. Through certain metric-rhythmic characteristics, the composer demonstrates what could be described as a multilayered genre foundation. For instance, a piece labeled as a gigue has a waltz-like presentation and creates certain allusions to a ländler, while the sarabande simultaneously functions as a fugue. Therefore, an intriguing task for the performer is to uncover all the genre layers of each piece to fully realize the music in all the nuances of the composer's intellectual concept.

Another approach to the reception of Baroque heritage is represented by the practice of transcribing works from the 16th to the 18th centuries for other instruments. This practice is a significant component of contemporary Ukrainian performers' activities, particularly observed among bandurists, accordionists, and bayan players. Given its constructive features and sound

production technique, the bandura is capable of conveying the specific sound qualities of ancient plucked string instruments (such as lutes and harpsichords) most organically. In turn, the keyboard-wind accordion remarkably recreates organ sound, capturing all the characteristic elements of performance on that instrument (the organ).

By transcribing Baroque music for the bandura, accordion, and bayan, performers gain access to a vast collection of refined and expressive works, enriching their repertoire and expanding the artistic potential of these instruments. However, within the scope of this article, this area of work related to Baroque genres can be only outlined, as a comprehensive exploration of its specifics requires a separate, in-depth study.

4 Conclusion

Thus, the study of European musical art from the 16th to the 18th centuries will always retain a high degree of relevance. Given the temporal distance, the disruption of traditions, and the lack of comprehensive documentation of the musical scores from that era, one can confidently assert that it is unlikely to ever have answers to all questions regarding Baroque music. At the same time, discovering even the smallest detail or fact is incredibly valuable, as it not only serves as another important piece in the overall research puzzle but also leads to further exciting discoveries. For this reason, the scholarly understanding and performance exploration of the genre panorama of Baroque keyboard music opens new creative horizons for Ukrainian musicians.

Literature:

1. Anthony, J. R. (1992). *La musique en France à l'époque baroque (de Beaujoyeux à Rameau)*. Paris: Flammarion.
2. Apel, W. (1972). *The history of keyboard music to 1700*. Bloomington: Indiana University Press.
3. Baumont, O. (2008). Quelques réflexions sur la naissance du style français de clavecin. In J. Duron (Ed.), *La naissance du style français (1650-1673)* (pp. 53-68). Wavre: Editions Mardaga.
4. Buelow, G. J. (2004). *A history of baroque music*. Bloomington: Indiana University Press.
5. Bukofzer, M. F. (1947). *Music in the baroque era (from Monteverdi to Bach)*. New York: W. W. Norton & Company.
6. Curtis, A. (1975). Préface. In L. Couperin, *Pièces de clavecin* (Edition par Alan Curtis, pp. 171). Paris: Éd. Heugel & Cie.
7. Ivaniushenko, G. I. (2023). The International Festival of Ancient Music in Lviv: Stages of formation. *Artistic Culture: Current Issues*, 19(1). [https://doi.org/10.31500/1992-5514.19\(1\).2023.283119](https://doi.org/10.31500/1992-5514.19(1).2023.283119)
8. Moroney, D. (1985). Introduction. In L. Couperin, *Pièces de clavecin (nouvelle révision par Davitt Moroney, p. 222)*. Monaco: Éditions de L'Oiseau-Lyre.
9. Moroney, D. (1980). Prélude non mesuré. In *The New Grove Dictionary of Music and Musicians* (Vol. XV, pp. 212-214). London: Macmillan.
10. Shadrina-Lychak, O. (2011). A-tactless prelude as a representative of the French harpsichord style of the 17th to early 18th century: Aspects of performance interpretation. [Master's dissertation]. National Music Academy of Ukraine named after P. I. Tchaikovsky. Kyiv, Ukraine.
11. Stembridge, C. (1997). Preface. In *CD Consonanze Stravaganti: Neapolitan music for organ, harpsichord and chromatic harpsichord* (6 p.). Freiburg: Ars Musici.
12. Stravaganza. (n.d.). In M. Tilmouth. *Oxford Music Online*, 226. <https://www.oxfordmusiconline.com/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000026923> (Accessed September 13, 2024).
13. Zhukova, O. (2019). Historically informed performance in today's Ukrainian culture. *Kyiv-Mohyla Humanities Journal*, 6, 203-207.

Primary Paper Section: A

Secondary Paper Section: AL

THE IMPACT OF LIABILITIES ON A COMPANY'S FINANCIAL STABILITY

^aNORA ŠTANGOVA, ^bAGNEŠA VIGHOVA

^{a,b}University of Economics and Management in Bratislava,
Department of Small and Medium Business, Furdekova 16, 851
04 Bratislava 5, Slovakia

email: ^anora.stangova@vsemba.sk, ^bagnesa.vighova@vsemba.sk

Abstract: The aim of this article is to examine the impact of liabilities on selected financial indicators, which determine the financial stability of an accounting entity in accordance with the Accounting Act. Based on a theoretical perspective on liabilities, we present factual material drawn from a research project. In conclusion, we outline potential solutions that emerged from the analysis.

Keywords: short-term liabilities, long-term liabilities, liquidity, activity, indebtedness.

1 Introduction

Liabilities are more than simply figures on a balance sheet; they are essential to any company's or government agency's financial reporting and overall health. Investors, analysts, and other stakeholders who depend on financial statements to make choices must comprehend these responsibilities. In financial statements, liabilities play a crucial role in revealing the health of a business and assisting stakeholders in evaluating its liquidity, solvency, and general economic stability. Sustaining openness and confidence in financial reporting depends on accurate reporting and sound management of financial obligations. The Accounting Act defines liabilities as external sources of funding, and they play a significant role in assessing a company's financial health. Naturally, accounting entities are required to report liabilities in their financial statements, specifically in the balance sheet [5; 7; 8; 12]. When an asset or liability is related to more than one layout item, it must be reported under the item it occurs under or in the financial statements' notes, under the Accounting Directive 2013/34/EU. Liabilities differ in terms of their duration and kind. Specifically, as mandated by paragraph 39 of IFRS 7, IFRS Standards demand a maturity analysis that displays the remaining contractual maturities for non-derivative financial obligations. This article highlights the importance of evaluating liabilities in the context of company' financial stability.

2 Method

The methodological basis of the article included the works of scientists and specialists in the field of financial management and accounting, as well as the analysis and generalization of the best practices of a number of companies. The study used provisions of financial and strategic analysis, as well as methods of comparative analysis.

3 Results and discussion

Liabilities from an Accounting Perspective

Every business owner must navigate the complicated world of financial management and confront the difficult task of striking a balance between their company's assets and obligations in order to guarantee long-term stability and development. Comprehending the structure and influence of liabilities on a company's balance sheet is essential, regardless of the urgency of fulfilling immediate commitments or the need for strategic planning to handle long-term loans.

Liabilities are an important consideration when evaluating a company's financial health since they can be a "double-edged sword". On the one hand, they are necessary for capitalizing on opportunities, enabling companies to grow, finance new ventures, or just run their day-to-day operations without exhausting their cash flow. This clever use of debt may result in substantial development and profitability, demonstrating the advantages of responsibly handled obligations. Conversely, large or badly constructed liabilities can cause instability in the financial system, which in turn can cause problems with cash

flow and solvency. Finding the right balance between leveraging liabilities for expansion and making sure they do not jeopardize the company's financial stability is crucial to preserving financial health. Therefore, comprehending the composition and consequences of liabilities is critical for any company hoping to prosper in the current competitive environment, underscoring the need of strategic financial management.

Understanding the structure of a company's balance sheet - especially the liabilities section - is crucial when it comes to corporate finance. This section provides a clear picture of the short- and long-term financial commitments that a business must meet. When evaluating a company's financial health, the two main categories - current liabilities and non-current liabilities - play crucial roles. Accounts payable, short-term loans, and accumulated costs are examples of current obligations that must be paid off within a year and are essential for running a business. However, non-current liabilities - such as bonds due, long-term loans, and deferred tax liabilities - offer information about a company's long-term financial obligations. To sustain financial stability and promote growth, a company's assets and liabilities must be proportionately balanced. A company's leverage and capacity to draw in investment can be greatly impacted by how strategically it manages these responsibilities.

The very term *liabilities* refers to external sources of asset funding for a company. According to the Accounting Act:

- A liability is an existing obligation of the accounting entity arising from past events.
- It is probable that this obligation will reduce the accounting entity's future economic benefits.
- The liability can be reliably measured.
- It is reported on the balance sheet or in the profit and loss statement.

According to International Financial Reporting Standards (IFRS), a liability is recognized in the accounting entity if it is measurable and meets the following three criteria [1-4]:

1. A liability is a current obligation that will likely require a future outflow of economic resources (transfer of cash, goods, or services) or the relinquishment of future income by the entity to settle its obligation at a specified or undetermined future date.
2. The accounting entity cannot avoid settling or discharging the liability.
3. The accounting event resulting in the creation of the liability has already occurred. An economic benefit is defined as the potential to contribute, directly or indirectly, to the flow of cash or cash equivalents.

The basic classification of an accounting entity's liabilities is based on time, dividing them into short-term and long-term ones. If specific liabilities cannot be categorized by time, the intention of the accounting entity at the time the liability arose becomes crucial for classification. For this division, the remaining maturity period is key. The remaining maturity period is the time between the agreed maturity date and the date on which the financial statements are prepared.

Even though they are necessary to finance operations and expansion, liabilities can have a big impact on a company's cash flow and liquidity. A company's liquidity may be strained by a significant amount of liabilities, particularly short-term ones, which can make it difficult for the business to satisfy its immediate financial commitments. This kind of situation frequently results in the need for further funding, which can burden the business even more. On the other hand, by guaranteeing that cash flows are enough for both debt repayment and development investments, efficient liability management may improve a company's financial stability. The secret is to strike a balance that satisfies operational requirements without endangering the company's financial stability.

The following ideas can help to understand how liabilities affect cash flow [11]:

Interest Expenses: Frequent loan interest payments lower the net cash available for other purposes, which may restrict investments in business expansion prospects or shareholder dividend payments.

Debt Covenants: Covenants mandating the corporation to maintain specific financial ratios are a common feature of loans. Cash flow may be further impacted by penalties or the requirement to return loans early if compliance is not maintained.

Refinancing Risk: High debt levels can make it difficult for businesses to refinance their debt, particularly in bad credit markets. Higher interest rates or the requirement to liquidate assets in order to satisfy debts are two outcomes that might have a detrimental impact on cash flow.

Short-term Liabilities

These liabilities are settled by the accounting entity within its operating cycle, typically measured in days [6; 9]. Short-term liabilities are classified by the degree of certainty as follows:

- a) precisely determined liabilities,
- b) provisions - liabilities that are estimated,
- c) contingent liabilities.

The most numerous group of liabilities consists of trade payables. Companies generally encounter trade-related liabilities, which represent obligations to business partners. These arise from activities such as the purchase of goods, materials, or supplies intended for resale, use in production, or service provision. Other liabilities similar to trade payables include obligations for direct and indirect taxes, fees, or penalties. Loans represent financial borrowings provided by banks or financial institutions.

Provisions form a separate group of liabilities that are probable and estimated. Companies create provisions based on the principle of prudence for potential risks, losses, or business-related expenses. Since their exact amount and timing are uncertain, provisions are estimates of existing obligations arising from past events. They may be based on a percentage of a past base or an absolute amount, as defined by law, and they impact the company's economic benefits.

Employee-related liabilities represent wage costs incurred for employees. Employing staff entails a legal obligation to pay contributions and taxes, creating liabilities toward social security institutions such as the Social Insurance Agency, health insurance companies, or the Financial Administration.

Miscellaneous liabilities are understood as transitory items, refer to expenses occurred during a given period but paid later. However, when preparing financial statements, companies must account for and allocate these liabilities over time. Examples include lease payments, unpaid rent, liabilities from complaints, etc. Short-term, precisely determined liabilities also include deferred income, liabilities from declared dividends, advances received, installments of long-term liabilities due the next year, and liabilities related to income tax, VAT, and other taxes.

Long-term Liabilities

Long-term liabilities are obligations with a maturity period or settlement term exceeding one year from the date of the accounting event. Long-term liabilities include:

- bank loans and mortgages;
- financial leases;
- obligations from the social fund;
- issued bonds, and others.

Loans can be classified as either short-term or long-term liabilities, depending on their maturity period. Through loans, a company acquires funds for business activities but incurs a liability in the form of principal which represents the borrowed money, and the interest that it commits to pay back. Loans are considered external sources and are recorded in the liabilities section of the balance sheet. Mortgage loans, often secured by real estate such as company buildings or land, also fall under long-term liabilities.

Leasing is a common method for acquiring assets. In a leasing arrangement, the lessor grants the lessee the right to use an asset for a specified period in exchange for payments, or installments. Leasing can be classified into two types: financial leasing and operational leasing.

Liabilities from the social fund are regulated by Act No. 152/1994 Coll. on the Social Fund, as amended. These are social obligations that can be used in future periods. Employers are legally required to create a social fund, with contributions ranging from 0.6% to 1% of the total gross wages paid to employees for the current year, as regulated by law.

Liabilities as Part of Selected Financial Ratios

To preserve and improve a company's financial position, effective liability management is essential. Businesses may maximize cash flow, lower interest costs, and enhance their debt-to-equity ratio by proactively managing both short- and long-term obligations. Refinancing high-interest debt to a lower interest rate is one practical tactic that may greatly lessen financial pressures. Additionally, businesses may take advantage of growth possibilities while limiting risks by preserving a balanced mix of debt and equity funding. Restructuring debt and extending terms of payment to creditors are two other doable strategies to increase operating flexibility and liquidity. The comparison table that follows shows how various liability management techniques affect a company's financial stability using fictitious data to highlight the possible advantages (see Table 1):

Table 1: The effect of various liability management techniques on the financial health of an organization, with fictitious data used to highlight the possible advantages

Strategy	Interest Rate Reduction (%)	Debt-to-Equity Ratio Before	Debt-to-Equity Ratio After	Impact on Cash Flow
High-Interest Debt Refinancing	3%	1.5	1.3	Positive
Debt Restructuring	N/A	2.0	1.8	Positive
Negotiating Longer Payment Terms	N/A	1.8	1.6	Moderate

Businesses frequently aim to finance their operations in a way that strikes a balance between debt and equity, which makes the debt-to-equity ratio a crucial statistic for analysts and investors. This ratio sheds light on a company's financial leverage and risk profile. It is computed by dividing its total liabilities by its shareholder equity. A greater percentage raises the possibility that a business is taking on excessive debt, which might raise its risk of bankruptcy during recessions. On the other hand, a smaller ratio suggests that a business may be underleveraging and so losing out on prospects for expansion. As an example, let us look at two technological companies: Company A, which has a debt-to-equity ratio of 0.5, and Company B, which has a ratio of 1.5. The lower ratio for Company A implies a cautious approach to leverage and may indicate a more solid financial situation. Company B, on the other hand, appears to be using debt more aggressively, which might raise financial risk but potentially lead to better profits [14].

A thorough examination of corporate finance reveals that a company's lifespan and financial stability are significantly

influenced by its strategic liability management practices. Prominent companies in a range of sectors have shown that competent management of liabilities may greatly improve their financial stability. For example, Apple Inc. has maintained a strong financial sheet to support its aggressive R&D and marketing strategy by managing its long-term debt and operating obligations well. This strategy has increased investor trust while also preserving its financial stability.

Microsoft Corporation is yet another prime example of effective liability management. In order to maximize tax savings and fund its strategic acquisitions, the computer giant carefully arranges its obligations, which supports development and expansion. Important tactics include of [11]:

- Lowering interest rates on corporate bonds to fund acquisitions without reducing shareholder value
- Optimizing the ratio of short-term to long-term obligations in order to preserve cash and financial flexibility
- Utilizing hedging strategies to control the foreign currency and interest rate risks related to its international operations.

By taking these steps, Microsoft has been able to successfully manage risks and sustain a solid financial position, which is in line with its ambitious growth plan.

The effects of strategic liability management on operational effectiveness and market leadership are demonstrated by Amazon.com, Inc. Amazon's growth is unmatched because it uses its liabilities to fund significant investments in technology, logistics, and market development. The business's strategy consists of [14]:

- Allowing for flexibility in its extensive logistical network by utilizing operational leases.
- Obtaining long-term debt on advantageous terms to finance its growth of infrastructure and technical advancements.
- Controlling supplier credit helps maximize cash flow and guarantee the prompt implementation of its ambitious plans.

Amazon's quick expansion and position as a dominant player in the worldwide market may be attributed to its strategic management of liabilities, demonstrating the significant influence that successful liability management can have on a company's success.

Liabilities significantly affect various financial ratios. In this article, we have selected the following ratios that are directly related to liabilities:

a) Liquidity. Liquidity ratios reflect a company's financial position and its ability to meet liabilities, which is assessed through analysis. Two key factors influence the ability to meet liabilities:

- Asset structure
- Regular cash inflow

The asset structure affects liability repayment because different assets have varying levels of liquidity. Liquidity refers to the ease with which assets can be converted into cash or cash equivalents and is determined by the time and cost required for conversion. Liquidity pertains to a company's ability to pay liabilities over the long term, while solvency refers to the immediate ability to settle liabilities. A company that is unable to pay its liabilities is considered permanently illiquid, indicating a breach of financial balance, or insolvency. Liquidity ratios, which are proportional indicators, help quantify a company's liquidity. Liquidity is typically divided into three levels: immediate, current, and total.

The amount of liquidity a company holds determines its ability to pay and cover its liabilities. As we have seen, various factors impact liquidity levels. Addressing low liquidity depends on the specific circumstances and can be challenging. To maintain liquidity, a company must ensure sufficient cash in its financial

accounts, achieved through steady revenue, reduced investment expenditures, and cost-cutting measures. These steps may also result in reduced expenses, including payroll costs. Here is an example from the analyzed organization (see Table 2):

Table 2: Development of Liquidity Ratios from 2020-2022 (in euros)

Ratio	Years			Change	Index
	2020	2021	2022	22-20	22/20
Immediate Liquidity (0.2 – 0.8)	0.36	0.28	0.18	-0.18	0.50
Current Liquidity (1 – 1.5)	0.80	1.27	1.35	0.55	1.69
Total Liquidity (1.5 – 2.5)	0.81	1.27	1.36	0.55	1.68
Immediate Operating Liquidity (0.4 – 1.0)	0.5	0.41	0.23	-0.27	0.46
Current Operating Liquidity (1.2 – 1.7)	1.14	1.84	1.78	0.64	1.56
Total Operating Liquidity (1.7 – 2.7)	1.15	1.85	1.79	0.64	1.56

Source: financial statements; Balance Sheet section, own calculations

b) Activity Ratios

These ratios reflect the capital tied up in various forms of assets and quantify management efficiency, specifically the effectiveness of asset utilization. A key activity ratio is *days payable outstanding*, which measures the average time between the creation of a liability and its payment. This ratio relates liabilities to costs, particularly trade credit extended by suppliers. Higher days payable outstanding values may suggest the company's difficulty in settling its debts.

c) Leverage Ratios

Authors focused on:

- **Total Leverage:** This ratio indicates the extent to which external capital is used relative to total resources.
- **Self-Financing Ratio:** This ratio measures the extent of using own capital relative to the company's total resources.

Leverage ratios are used to assess the structure of financial resources, as the ratio of own to external sources affects financial stability. Proper balance between own and external sources is a result of effective financial management. Higher leverage increases the difficulty of obtaining external resources and raises business risk. The so-called "golden balance rule" for vertical capital structure suggests an approximate 1:1 ratio between own and external resources. Additionally, increasing own resources, often achieved through generating profits, is crucial for financial stability (see Table 3, 4).

Table 3: Development of Leverage Ratios from 2020-2022

Ratio	Years		
	2020	2021	2022
Total Leverage	114.04%	76.26%	72.91 %
Self-financing Ratio	-14.04%	23.74%	23.72 %
Insolvency Ratio	1.58	0.70	0.65
Financial Leverage	-7.12	4.21	4.22
Credit Burden Ratio	31.51%	22.76%	15.64%

Source: financial statements; Balance Sheet section, own calculations

Table 4: Structure of Funding Sources in the Balance Sheet from 2020-2022

Years	2020 / €	%	2021 / €	%	2022 / €	%
Passive accounts						
Total Equity and Liabilities	317 502		403 929		519 877	
Equity	-44 573	100.00%	95 900	100.00%	123 296	100.00%
Share Capital	30 000	-67.31%	30 000	31.28%	30 000	24.33%
Other Capital Funds	19 000	-42.63%	19 000	19.81%	20 500	16.63%
Profit funds	0	0%	0	0%	0	0%
The result of previous years' management	-198 975	446.40%	-93 572	-97.57%	45 400	36.82%
The result of the management of the current accounting period	105 402	-236.47%	140 472	146.48%	27 396	22.22%
Liabilities	362 075	100.00%	308 029	100.00%	379 019	100.00%
Reserves	3 107	0,86%	1 507	0,49%	8 122	2,14%
Long- term Liabilities	8 838	2,44%	9 095	2,95%	9 548	2,52%
Short- term Liabilities	250 072	69,07%	205 504	66,72%	280 030	73,88%
Short- term Financial Assistance	0	0,00%	0	0,00%	0	0,00%
Bank Loans	100 058	27,63%	91 923	29,84%	81 319	21,46%
Time distinction	0	100.00%	0	100.00%	0	100.00%

Source: financial statements; Balance Sheet section, own calculations

Conclusions, Framework Proposals, and Solutions

In analyzing the Balance Sheet and Income Statement for the period 2020-2022, as part of present research, authors observed the impact of liabilities on various financial indicators across many businesses. In most cases, the following conclusions are reached:

1. Higher levels of company indebtedness
2. Insufficient company liquidity
3. Reduced equity value

Framework Proposals and Solutions:

a) Proposal for Addressing Total Indebtedness and Insolvency

The recommended ratio of equity to debt is 50%, and generally, foreign capital should not exceed 70%. During the analyzed period, both companies had total indebtedness exceeding 70%, indicating higher financial risk. Reducing total indebtedness can be achieved by decreasing liabilities, particularly foreign sources. This can be facilitated by repaying bank loans and reducing liabilities, especially short-term ones, which often constitute the largest portion of liabilities. Identifying all liabilities, assessing their amounts and justifications, and subsequently eliminating unnecessary ones is essential.

Another key indicator of indebtedness is the degree of self-financing, which reflects a company's financial independence and is the inverse of total indebtedness. This ratio is calculated by comparing the company's equity to total capital and expressing it as a percentage. A higher degree of self-financing

indicates greater financial stability and less reliance on external financing.

Maintaining a higher proportion of equity to total capital is crucial for any business. The recommended minimum for the share of own resources should not fall below 30%. Companies with a higher proportion of their own resources are considered less risky. Since our analyzed companies have a lower proportion of their own resources, they are more vulnerable, especially during external crises. However, the optimal degree of self-financing may vary among companies and is influenced by the industry in which they operate.

Increasing the value of own resources can be achieved through business profitability. Retained profits and reinvestment can enhance the self-financing ratio, potentially leading to expansion and internal growth. Effective cost management, which impacts cash flow, is also crucial. Reducing costs can improve overall business performance. Regular monitoring and analysis are vital for responding to changes in both internal and external environments. Effective management of own resources requires not only short-term monitoring but also long-term strategic planning. Strategic management and continuous attention are essential for maintaining the degree of self-financing.

Another important indicator of indebtedness is payment insolvency, which measures the extent to which receivables cover short-term liabilities and reflects the company's ability to meet liabilities with immediate repayment. Payment insolvency is calculated by comparing short-term liabilities to short-term receivables.

While payment insolvency provides a partial measure of a company's indebtedness, a high value does not always indicate an inability to pay liabilities - it may reflect a temporary situation [10; 15]. Finding a balance between liabilities and receivables is crucial. Solutions to address payment insolvency include regular monitoring of accounts receivable, tracking due dates, sending reminders for upcoming invoices, and issuing follow-up notices for overdue payments. Larger companies often have dedicated departments or employees managing receivables. To balance liabilities with receivables, companies should align the due dates of liabilities with the due dates of receivables.

b) Proposal for Addressing Credit Indebtedness

Credit indebtedness is not necessarily a negative aspect for businesses. Taking out a loan is a common practice in today's business world, with companies using loans to finance significant investments, development, material purchases, or new equipment. However, it is crucial for a company to assess all risks carefully.

Decisions regarding loan procurement should be well-considered and preceded by strategic planning. The range of credit products offered by banks is broad, so if a company needs to take out a loan, it is advisable to consult with a bank advisor who can collaborate closely with the company's financial department. This approach can lead to securing a loan that best aligns with the company's needs and financial capabilities.

c) Business Liquidity

Liquidity, as a key financial ratio indicator, was also part of the financial analysis for the businesses studied. We observed that liabilities impact this indicator, either independently or as part of external capital. In the analyzed companies, we calculated classic liquidity by comparing financial accounts, short-term receivables, and current assets (numerator) with short-term external capital (denominator). We also calculated operational liquidity using the same items as classic liquidity but with only short-term liabilities in the denominator.

Quick liquidity, which measures a company's ability to cover short-term external capital with cash on hand or in accounts, is another important indicator. Acceptable values for quick liquidity in a market economy typically range from 0.2 to 0.8.

The second liquidity indicator, current liquidity, should range from 1.0 to 1.5. This indicates whether the company can cover short-term external capital not only with financial accounts but also with short-term receivables.

The third calculation, total liquidity, has the highest acceptable range, from 1.5 to 2.5. This measure shows whether the company can cover short-term external capital, which represents a debt, through the monetization of short-term assets.

d) Structure of Liabilities

The evaluation of liabilities is crucial and depends on the type of liability. It may involve:

- Financial liabilities arising from trading,
- Liabilities not related to trading,
- Non-financial liabilities.

Models for valuing these liabilities will be discussed in further contributions.

Literature:

1. Grünwald, R. (2001). *Analysis of the financial credibility of the company* (1st ed.). Ekopress. ISBN 80-86119-47-5.
2. Hellmann, A., & Patel, C. (2021). Translation of International Financial Reporting Standards and implications for judgments and decision-making. *Journal of Behavioral and Experimental Finance*, 30, Article 100479. <https://doi.org/10.1016/j.jbef.2021.100479>
3. Jenčová, S., & Rákoš, J. (2010). *Financial and economic analysis and financial planning*. University of Prešov in Prešov, Faculty of Management. ISBN 978-80-555-0186-4.
4. Kabát, L., & colleagues. (2011). *Possibilities of applying creditworthiness and prediction models in the Slovak business environment*. In *Business in new economic and social conditions*. EUROKÓDEX, s.r.o. ISBN 978-80-89447-51-0.
5. Kotulič, R., Király, P., & Rajčániová, M. (2010). *Financial analysis of the company*. Edition Ekonómia. ISBN 978-80-8078-342-6.
6. Kráľovič, J., & Vlachynský, K. (2011). *Financial management*. Wolters Kluwer. ISBN 80-8078-042-0.
7. Kubičková, D., & Jindřichovská, I. (2015). *Financial analysis and evaluation of company performance* (1st ed.). C. H. Beck. ISBN 978-80-7400-538-1.
8. Mihaliková, E. (2023). *Accounting of budgetary organizations* (1st ed.). ŠafárikPress UPJŠ. <https://unibook.upj.s.sk/img/cms/2023/fvs/uctovnictvo-rozpoctovych-organizaci.pdf>. ISBN 9788057402244.
9. Nita, B., & Oleksyk, P. (2020). On the need for accounting automation in fraud detection and elimination: A pilot study. *Transformations in Business & Economics*, 19(2A), 627-639.
10. Oreský, M., & Reháč, R. (2019). *Financial and economic analysis of a business enterprise*. Wolters Kluwer. ISBN 978-80-571-0174-1.
11. Palea, V. (2013). *Financial reporting under IAS/IFRS: Theoretical background and capital market evidence – a European perspective*. Peter Lang.
12. Růčková, P. (2019). *Financial analysis: Methods, indicators, use in practice* (6th ed.). Grada Publishing. ISBN 978-80-271-2028-4.
13. Vlachynský, K., & colleagues. (2009). *Corporate finance*. Iura Edition, spol. s r. o. ISBN 978-80-8078-258-0.
14. Weygandt, J., Kimmel, P., & Kieso, D. (2018). *Financial accounting with International Financial Reporting Standards*. Wiley.
15. Zalai, K., & colleagues. (2016). *Financial and economic analysis of the company*. Sprint 2 s.r.o. ISBN 978-80-89710-22-5.

Primary Paper Section: A

Secondary Paper Section: AE, AH

SECURITY OF SUSTAINABLE DEVELOPMENT OF THE AGRICULTURAL SECTOR OF THE REGION BASED ON DIGITALIZATION AND CIRCULAR ECONOMY: A CASE STUDY OF UKRAINE

^aMARYNA DIELINI, ^bOLGA KORNELIUK, ^cTETIANA SHMATKOVSKA, ^dNATALIIA NAUMENKO, ^eLILIIA VIRUN, ^fNATALIIA KHOMIUK, ^gROSTYSLAV MARTYNIUK

^aNational University of Life and Environmental Sciences of Ukraine, 11, Heroiv Oborony Str., 0304, Kyiv, Ukraine

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

^cLutsk National Technical University, 75, Lvivska Str., 43018, Lutsk, Ukraine

email: ^amaryna_dielini@nubip.edu.ua,

^bolga.korneliuk@vnu.edu.ua, ^cshmatkovska2016@gmail.com,

^dnaumenko.ns@gmail.com, ^evirun.l0004@lntu.edu.ua,

^fnataljabilous@gmail.com, ^gmartyniuk.rostyslav@vnu.edu.ua

The article examines the features of ensuring the security of sustainable development in the region's agro-industrial complex through digitalization and circular economy principles. It considers contemporary challenges and threats facing the regional agricultural sector, including climate change, resource limitations, and economic instability. The study proposes approaches to increasing resource management efficiency by introducing digital technologies and circular economy models, which help minimize waste, reuse resources, and reduce the negative impact on the environment. The key aspects of ensuring the security of sustainable development in the agricultural industry, such as the digital transformation of management processes, optimization of natural resource use, and enhancement of environmental protection, are identified.

Keywords: agricultural sector, digitalization, digital transformation, environmental safety, circular economy, digital technologies.

1 Introduction

The sustainable development of the regional agro-industrial complex is becoming one of the most critical issues in the modern economy, especially in the context of increasing globalization, climate change, and limited natural resources. Simultaneously, the need to ensure food security and environmental sustainability, while maintaining competitiveness in the agricultural sector, demands new approaches to production organization and resource management. In such conditions, traditional farming methods often prove ineffective given the growing dynamism of the business environment, jeopardizing the stability of both individual enterprises and entire regions.

One of the primary challenges is the scarcity of resources, which requires a rethinking of their practical use. Constant anthropogenic pressure on natural resources from intensive agricultural production leads to soil degradation, depletion of water resources, and increased greenhouse gas emissions. In recent years, climate change has significantly exacerbated these processes, negatively impacting the yield and stability of agricultural production. It is important to note that these effects are especially critical for regional farm producers.

At the same time, digitalization and the adoption of circular economy models offer new solutions to these challenges. However, despite the active development of digital technologies, their implementation in the agricultural sector has yet to reach a significant scale. Infrastructure deficiencies, a lack of awareness, and resistance to change among enterprises are slowing the digital transformation process. Nevertheless, using digital tools, such as big data, the Internet of Things, and automation, can substantially improve the efficiency of agricultural production and resource management, reducing both costs and environmental impact [12].

Additionally, the concept of the circular economy, which emphasizes the efficient use of renewable resources and waste minimization, holds vast potential for the agricultural sector. However, its practical implementation faces several barriers, including regulatory and legal restrictions, limited financial

resources for agricultural producers, and low awareness of new technologies among farmers. Therefore, systemic support at the regional economic policy level is needed to facilitate the transition to a circular production model.

Thus, the security of sustainable development in the agro-industrial sector largely depends on producers' ability to adapt to new conditions through the adoption of innovative technologies and management models. It is crucial to recognize that both the digitalization process and the shift to a circular economy represent technical and managerial challenges. This transition requires new approaches to planning, coordination, and control at all levels of agricultural sector management. Therefore, only a comprehensive approach—combining technological innovation with a shift in the management paradigm—can ensure the long-term sustainability of the regional agro-industrial complex in the face of modern challenges.

2 Literature Review

The study of sustainable development issues in the agro-industrial complex, based on digitalization and the circular economy, reflects the growing attention of researchers to the adoption of innovative technologies and environmentally responsible production models. The primary research focuses on using digital technologies to enhance the efficiency of the agricultural sector and developing circular solutions to reduce the environmental impact of farming systems.

Significant contributions to the study of the digitalization of the agro-industrial complex have been made by M. Dziamulych [1-8], S. Koliadenko [10], and M. Rudenko [14], who analyzed the impact of digital technologies on agricultural production, particularly the role of big data, the Internet of Things, and business process automation in agrarian resource management. These studies highlight that using big data and digital analytics can substantially improve decision-making processes in the agricultural sector, ensuring more efficient resource use. Additionally, the development of precision farming technologies at the regional level is noted for its potential to minimize losses, optimize yields, and increase the resilience of agricultural systems to climate change.

Regarding the circular economy in the agricultural sector, key insights are offered in studies by authors such as N. Horobets [9], V. Kostiuk [11], T. Shmatkovska [15], and others, who examine models of resource reuse in agriculture and their impact on the ecological sustainability of regional agricultural systems. Additionally, closed-loop practices are analyzed, where organic waste is used to produce bioenergy or fertilizers, reducing dependence on chemical inputs and contributing to the restoration of natural ecosystems. Research also indicates that the circular economy has the potential to significantly reduce the negative environmental impact of agricultural enterprises; however, institutional and financial incentives, along with support from state and regional authorities, are essential for its widespread adoption.

Moreover, several researchers, including I. Mazniev [13] and O. Zghurska [18], focus on the integration of digital technologies and the circular economy within the context of sustainable development of the agro-industrial complex. These studies highlight that digital technologies can substantially facilitate the implementation of circular models by enabling more precise and efficient resource management. Furthermore, it is emphasized that the combination of digitalization and the circular economy is crucial to achieving sustainable development in agricultural regions, as it not only improves productivity but also reduces the negative environmental impact.

Thus, the existing body of research indicates that ensuring the sustainable development of the agricultural sector through digitalization and the circular economy is a relevant area of scientific inquiry. However, further study is required to identify the specific strategies for implementing these approaches to enhance agricultural production efficiency and ensure food security at the regional level.

3 Materials and Methods

The research methodology is based on a comprehensive approach, incorporating methods of logical generalization, comparison, analysis and synthesis, and expert evaluation. The selection of these methods is driven by the complexity of the subject, which encompasses not only economic and technological aspects but also environmental, social, and institutional factors related to the agricultural sector.

The primary method used in the research is logical generalization, which enables the formation of a comprehensive understanding of the processes underlying the sustainable development of the region's agro-industrial complex in the context of digitalization and the adoption of the circular economy. Logical generalization involves the systematization and interpretation of theoretical and practical aspects of agricultural security, drawing on existing research and data. The application of this method allowed for the exploration of key concepts such as sustainable development, the digitalization of the agro-industrial complex, and the principles of the circular economy. This, in turn, facilitated the identification of critical factors influencing agricultural production safety and the formulation of general conclusions regarding their interrelationship.

The comparison method was employed to analyze the experiences of different regions in implementing digital technologies and circular economic models within the agricultural sector. This approach made it possible to identify the advantages and disadvantages of each model and determine best practices that can be adapted for specific regions. The comparison was conducted between regions with varying levels of digital infrastructure development, which allowed for the identification of factors that either promote or hinder the advancement of the circular economy and digitalization in the agro-industrial complex.

Analysis and synthesis are key methods in evaluating the security of the agricultural sector and developing recommendations for its improvement. The analysis involved a detailed examination of elements related to the impact of digitalization on production processes, the potential for optimizing resource use through circular approaches, and the assessment of risks associated with environmental safety and socio-economic factors. Special emphasis was placed on analyzing contemporary challenges faced by regional agro-industrial systems, as well as the increasing demands for the environmental sustainability of production.

The synthesis method enabled the integration of individual analytical components into a cohesive understanding. Based on this, comprehensive conclusions were drawn regarding the interaction between digital technologies, the circular economy, and the security of the agro-industrial complex, taking into account the specific characteristics of the region [17]. Synthesis was also employed to develop practical recommendations for improving management processes in the regional agricultural sector, aimed at achieving sustainable development.

The use of the expert evaluation method allowed for a more precise and in-depth understanding of the potential risks and benefits of implementing circular and digital approaches in the agricultural sector. This facilitated not only a theoretical assessment of their impact but also the generation of practical recommendations for minimizing risks and maximizing the positive effects of innovations on the regional agricultural industry.

Overall, the research methodology provided a thorough and comprehensive study of the topic, utilizing various methods of analysis and evaluation to ensure the reliability and applied relevance of the results obtained.

4 Results and Discussion

The modern regional agricultural sector faces numerous challenges and threats resulting from resource limitations and economic instability. Additionally, climate change exacerbates these issues by causing unpredictable weather patterns, which negatively affect farm productivity and soil quality. These factors increase the risks of crop failure and reduce overall agricultural productivity, thereby threatening regional food security. Resource constraints, including the depletion of water and land, further complicate efficient agricultural management, compelling farmers to seek new approaches. Concurrently, economic instability, driven by the devastating impact of the war on Ukraine's agricultural sector, intensifies these threats by restricting access to financing, investment, and the new technologies required to modernize agricultural production. As a result, the economic and ecological stability of rural regions is in decline.

Improving resource management efficiency in the region's agro-industrial complex is crucial to ensuring sustainable development under these modern conditions. The adoption of digital technologies and circular economy models in agricultural production helps minimize waste, reuse resources, and reduce the negative environmental impact of agriculture. This is particularly relevant for farming enterprises that must address the dual challenge of increasing productivity while conserving natural resources. One of the key strategies for enhancing resource management efficiency is the implementation of a circular economy, which promotes closed-loop production cycles. The circular economy is grounded in principles of rational resource use, material reuse, and waste minimization, making it an effective tool for mitigating the environmental impact of the agro-industrial complex. This model shifts away from the traditional linear production approach, in which resources are consumed and waste is discarded, toward a system where resources are reused or transformed into new products, reducing losses and preserving natural resources.

It is important to highlight that among the various aspects of digitization in the agricultural sector, several stand out for their significant impact on improving enterprises' economic security. Prospective areas of digitization and their influence on financial security are outlined in Table 1.

Table 1: The influence of promising directions of digitalization on the economic security of agricultural enterprises

Factors of economic security	Directions of digitization	Impact on the economic security of the enterprise
Productivity growth	precision farming; introduction of drones (spraying; aerial reconnaissance; visual monitoring of resources)	reduction of costs for fertilizers and resources; increasing productivity;
Resistance to external influences	weather and climate change monitoring systems; automated security systems; means of cyber security and information protection	increasing resistance to threats; optimization of security costs
Ensuring stable production	digital platforms for process planning and control; systems of electronic document circulation	increasing planning efficiency; optimization of document flow; reducing the risk of information loss
Financial stability	digital accounting tools; reporting automation; systems of financial forecasting	reduction of financial risks; strengthening of financial stability
Risk management	electronic and hardware monitoring tools; IoT devices and sensors; video surveillance systems	risk reduction and prevention; acceleration of detection and response to economic threats

Source: [10]

One of the primary issues in traditional agriculture is the high consumption of water, land, and energy resources, as well as the significant amount of waste generated throughout the

agricultural production cycle—from the cultivation of raw materials to their processing and transportation. Adopting the principles of the circular economy addresses these problems by transitioning to more closed-loop systems, where the waste from one process becomes resources for another. For instance, utilizing organic waste to produce biofertilizers or bioenergy not only reduces waste but also creates added value by generating resources that can be reintegrated into the production cycle. Such solutions enhance environmental sustainability and improve economic efficiency by lowering waste disposal costs and securing new resources. Moreover, they lessen dependence on external resource supplies, which can be crucial during global economic and political crises. In the context of increasing market instability and resource limitations, circular approaches are becoming increasingly attractive to agricultural enterprises, as they help mitigate risks and bolster resilience to external shocks. Additionally, the adoption of innovative solutions in Ukraine's agricultural sector has been steadily growing in recent years, particularly evidenced by the rising amount of financing for agricultural start-ups (see Fig. 1).

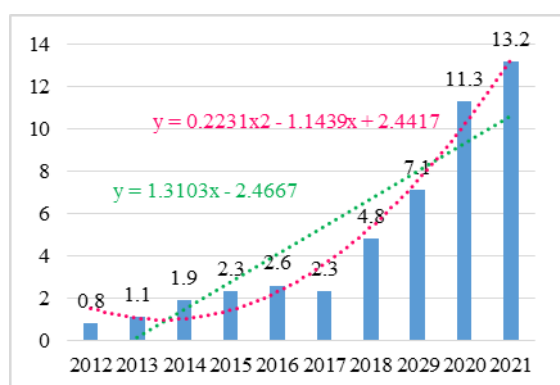


Figure 1. Correlational assessment of the dynamics of start-up financing in Ukraine's agricultural sector (2012-2021), in billion USD.

Source: calculated by the author based on [16]

The results of the correlation evaluation indicate that the linear trend parameters reveal a clear upward trajectory in the financing of start-ups in agriculture over the analyzed period. Specifically, the absolute increase in this indicator was calculated at \$1.3103 billion USD. Conversely, the polynomial trend analysis shows that the actual annual change in financing volume is \$1.4149 billion USD, compared to an initial growth of \$0.2231 billion USD.

In agriculture, it is essential to consider the interactions among various resources such as water, energy, soil, and biodiversity. To enhance resource management efficiency, it is crucial to ensure their rational use and recovery, a fundamental principle of sustainable development. The circular economy provides methods to minimize water use by reusing treated wastewater for irrigation or implementing closed-water supply systems, thereby reducing the strain on natural water resources. Additionally, the circular economy emphasizes optimizing energy use in agro-industrial processes. Traditionally, the agricultural sector consumes substantial amounts of energy, leading to higher costs and increased greenhouse gas emissions. Utilizing renewable energy sources, such as bioenergy, can reduce reliance on conventional energy sources and lessen the environmental impact of agricultural production. For instance, biogas derived from organic waste can serve as an energy source for agricultural enterprises, thus closing the energy production loop within the farm and minimizing emissions.

Another important aspect is the minimization of product and resource losses in the supply chains of the agro-industrial complex. At various stages, including harvesting, processing, storage, and transportation, losses can become significant, increasing the environmental burden and reducing the economic efficiency of production. Employing innovative approaches to

mitigate these losses enables optimized resource use and waste reduction. For instance, improving product storage conditions, modernizing logistics, and employing food waste processing methods can substantially reduce losses—an essential factor in the sustainable development of Ukraine's agro-industrial complex.

One of the main challenges in implementing the circular economy is the need to change management approaches within enterprises. Transitioning to new models necessitates investments in new technologies and processes, as well as the development of infrastructure for recycling and reusing resources. This requires close cooperation between businesses, governments, and communities to create the conditions necessary for implementing circular solutions. Government support, through incentives, financial programs, and regulations, also plays a crucial role in facilitating the transition to sustainable agricultural production. Additionally, investments in digital technologies within the agro-industrial complex are becoming increasingly important (see Fig. 2).

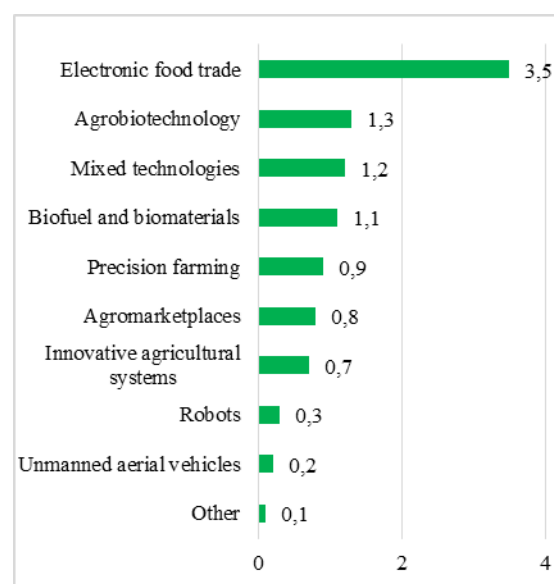


Figure 2. Funding volumes of digital projects in the agricultural sector of Ukraine in 2021, billion USD.

Source: [18]

Therefore, in addition to embracing the circular economy, developing innovative management approaches that enable agro-industrial enterprises to remain flexible and adaptable to changes in external conditions is crucial for enhancing resource management efficiency. In modern agribusiness, the ability to respond quickly to shifts in market conditions, climatic challenges, or fluctuations in demand is essential. This adaptability is facilitated by advanced information systems and management technologies, which improve the planning and control of resource use, thereby minimizing costs and losses.

Integrating sustainable development strategies into the management of agro-industrial enterprises also requires the development of new forms of cooperation and partnerships among agricultural producers, processors, and consumers. Such collaboration enhances coordination at all stages of production and product supply, contributing to reduced losses and increased resource use efficiency. For example, developing short supply chains, where products are delivered directly from producers to consumers, can reduce transportation and storage costs while minimizing the environmental impact by decreasing greenhouse gas emissions.

In this context, the role of state policy and regulation in ensuring the sustainable development of the agro-industrial complex is vital. There must be state-level mechanisms to support farmers and agribusinesses in adopting the latest technologies and

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).

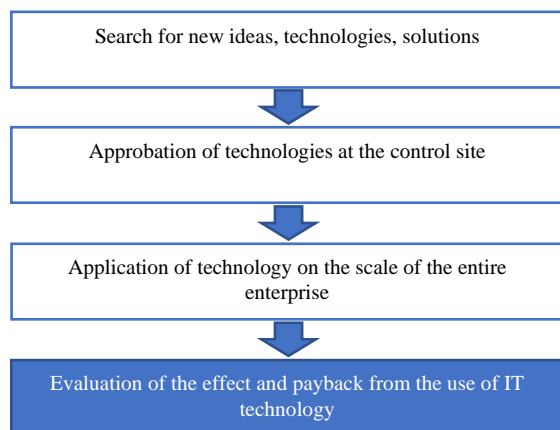


Figure 3. The algorithm for introducing digital technologies to the production strategy of agricultural enterprises
Source: [9]

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.

Primary Paper Section: A

Secondary Paper Section: AE, AH

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).

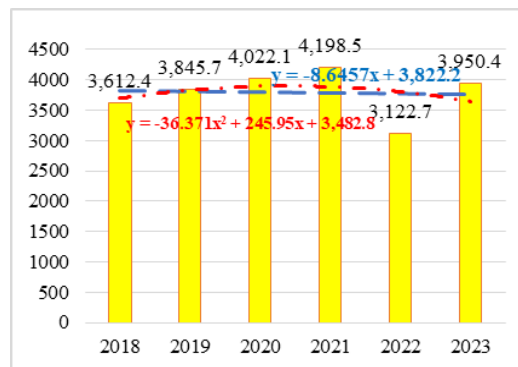


Figure 1. Correlative assessment of the dynamics of investments in logistics infrastructure in Ukraine for 2018-2021, UAH million.

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).

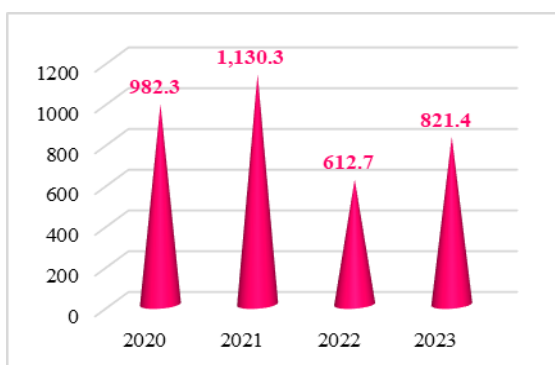


Figure 2. Volumes of investments in digital software solutions by logistics companies of Ukraine for 2020-2023, in million UAH.

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,
^caleftinaandrievskaya@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.

Primary Paper Section: A

Secondary Paper Section: AG

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

^aIRINA MOSIAKOVA, ^bVALENTYN ROGOZA, ^cYAROSLAV SMOLYN, ^dVIKTORIA BAIKALA, ^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).

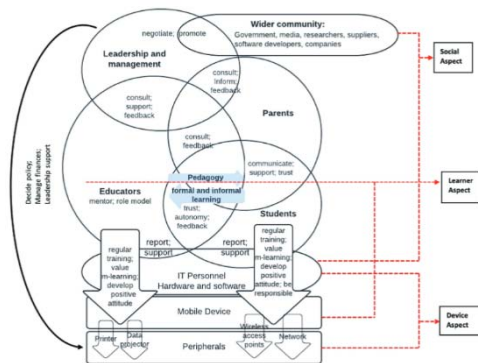


Figure 1. M-learning conceptual framework [34]

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.

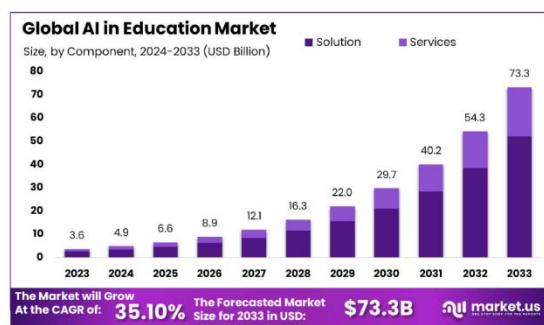


Figure 2. Global market of AI in education [2]

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:

- 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>
- AI in Education Market (2024, February). *Market.us*. <https://market.us/report/ai-in-education-market/>
- 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>
- Artificial Intelligence in Education. Survey Insights (2023, February 27). *HolonIQ*. <https://www.holoniq.com/notes/artificial-intelligence-in-education-2023-survey-insights>
- 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>
- 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>
- 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>
- 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>
- 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>
- Cope, B., Kalantzis, M., & Searsmith, D. (2021). Artificial intelligence for education: Knowledge and its assessment in AI-enabled learning ecologies. *Educational Philosophy and Theory*, 53(12), 1229-1245.
- Fadel, Ch., Holmes, W., & Bialik, M. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. GRIN Verlag.
- Firat, M. (2023). Integrating AI Applications into learning management systems to enhance e-learning. *Instructional Technology and Lifelong Learning*, 4(1), 1-14.
- 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>
- 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>
- Giró-Gracia, X., & Sancho-Gil, J. M. (2022). La Inteligencia Artificial en la educación: Big data, cajas negras y solucionismo tecnológico. *Revista Latinoamericana De Tecnología Educativa - RELATEC*, 21(1), 129-145.
- 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>
- 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>
- 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>
- 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>
- 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>
- 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., Dzhandha, 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: ^atatianadzuba@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].

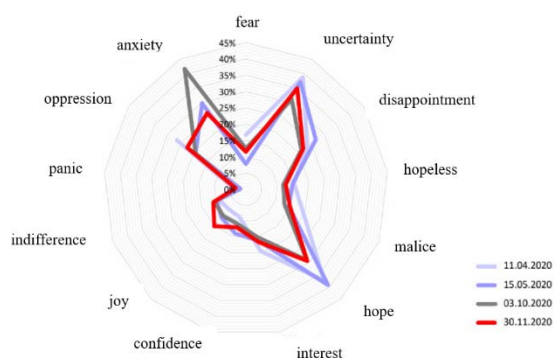


Figure 1. Dynamics of the emotional state of the urban population of Ukraine

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.

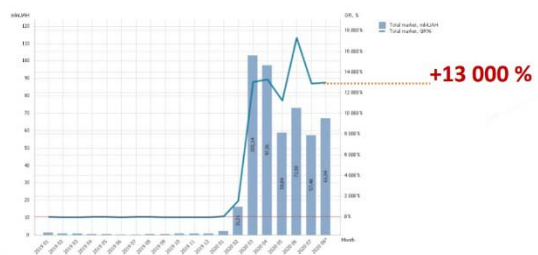


Figure 3. Distortion of mask consumption due to quarantine restrictions [39]

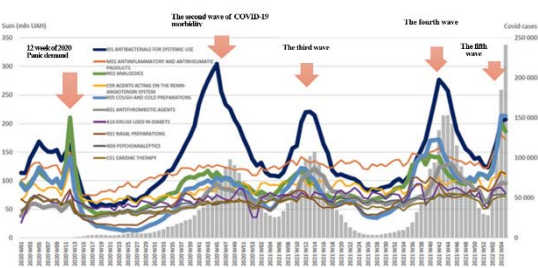


Figure 4. Dynamics of demand for various classes of pharmaceuticals since the start of the pandemic

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.

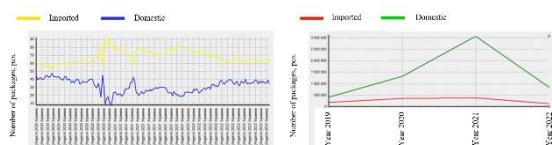


Figure 5. Fluctuations in retail sales of imported and domestic enoxaparin (MS% and Quantity)

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.

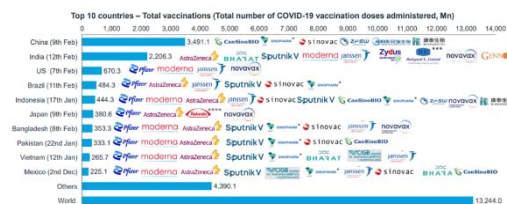


Figure 6. Top 10 countries by total number of vaccine doses administered as of February 2023.

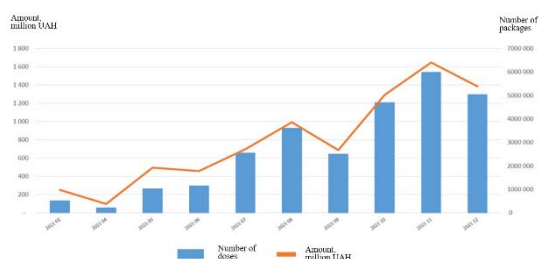


Figure 7. Dynamics of COVID-19 vaccine supplies to Ukraine [35]

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/fcaptop.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/IJCSNS.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: 10.33543/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/ilt.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/fcaptop.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/fcaptop.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/fcaptop.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? *Filozofija-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

Primary Paper Section: F**Secondary Paper Section: FQ**



PAPERS PUBLISHED IN THE JOURNAL EXPRESS THE VIEWPOINTS OF INDEPENDENT AUTHORS.

