ISSN 3083-6018 (online)

СОЦІАЛЬНИЙ РОЗВИТОК: ЕКОНОМІКО-ПРАВОВІ ПРОБЛЕМИ

SOCIAL DEVELOPMENT: ECONOMIC AND LEGAL ISSUES

№ 10 / No. 10
2025

ISSN 3083-6018 (online)

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SOCIAL DEVELOPMENT: ECONOMIC AND LEGAL ISSUES

№ 10/No. 10

2025

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Рік заснування: 2024
Мови видання: українська, англійська
Періодичність: 1 раз на місяць
ISSN 3083-6018 (online)
УДК [1+351/.354](051)

Адреса редакції: Україна, 79000, місто Львів, вул. Угорська, буд. 12, кв. 108
Телефон: +380981627500
E-mail: spilkanaukovtsiv@gmail.com
Web: https://www.eu-scientists.com/index.php/sdel

Реєстрація суб'єкта у сфері онлайн-медіа:
Рішення Національної ради України з питань телебачення і радіомовлення № 228 від 23.01.2025 р.
Ідентифікатор медіа – R40-05798.
Видання публікує статті з таких спеціальностей:
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Рекомендовано до публікації рішенням науково-технічної ради ГО «Східно-Європейська спілка науковців» *(протокол № 19 від 27.10.2025)*

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Year of foundation: 2024
Languages of publication: Ukrainian, English
Frequency: monthly
ISSN 3083-6018 (online)
UDC [1+351/.354](051)
Editorial address: 12, Ugorska St., Lviv, 79000, Ukraine, apartment 108
Tel.: +380981627500
E-mail: spilkanaukovtsiv@gmail.com
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Registration: Decision of the National Council of Television and Radio Broadcasting of Ukraine No. 228 of 23.01.2025.
The media identifier is **R40-05798.**
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Recommended for publication by the decision of the Scientific and Technical Council of the NGO "Eastern European Union of Scientists"
(protocol No. 19 of 27.10.2025)

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Monitoring the Quality of Drinking Water in Ukraine during Martial Law

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.01

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ABSTRACT

The article analyzes the state of drinking water quality monitoring in Ukraine under martial law, taking into account environmental, sanitary-hygienic, regulatory, legal, and administrative factors. It has been established that military actions have caused a significant deterioration in the sanitary and epidemiological situation due to the destruction of critical infrastructure, environmental pollution, and instability of water supply systems. It has been established that control over the quality of drinking water in the current conditions is becoming a sanitary, hygienic, and strategic instrument of state security. It was emphasized that in 2025, the State Service of Ukraine for Food Safety and Consumer Protection carried out a large-scale monitoring program, the results of which revealed violations of sanitary requirements at more than 69% of water supply facilities. It was determined that the systematic deterioration of water quality requires the modernization of purification processes and stricter control over compliance with standards. It was noted that improving the effectiveness of control is only possible with interagency coordination and the implementation of a unified information and analytical monitoring system. A positive trend in reducing the level of microbiological contamination in centralized systems was established, which indicates the effectiveness of the modernization of treatment facilities. It was noted that the situation in the field of decentralized water supply remains critical due to limited technical resources and difficult control conditions. It was emphasized that sanitary-chemical and radiation indicators show a trend towards gradual stabilization. The importance of regulatory and legal regulation is revealed, in particular, in Resolution of the Cabinet of Ministers of Ukraine No. 61 of January 21, 2025, which defines the procedure for state monitoring of water supply. It is emphasized that the implementation of these documents provides the legal basis for the transition to a modern model of water security management. It is determined that bringing the quality of drinking water into line with EU standards remains an important task in the context of Ukraine's European integration. It is emphasized that achieving the target indicators requires a combination of technical, digital, and regulatory solutions aimed at ensuring a stable supply of safe water to the population even in crisis conditions.

KEYWORDS

drinking water quality monitoring, martial law, water supply, regulatory and legal regulation.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Моніторинг якості питної води в Україні під час воєнного стану

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.01

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АНОТАЦІЯ

У статті проаналізовано стан моніторингу якості питної води в Україні в умовах воєнного стану з урахуванням екологічних, санітарно-гігієнічних, нормативно-правових і управлінських чинників. Встановлено, що воєнні дії спричинили істотне погіршення санітарно-епідемічної ситуації, зумовлене руйнуванням об'єктів критичної інфраструктури, забрудненням довкілля та нестабільністю систем водопостачання. З'ясовано, що контроль за якістю питної води в сучасних умовах набуває статусу санітарно-гігієнічного та стратегічного інструмента безпеки держави. Наголошено, що у 2025 році Держпродспоживслужбою здійснено масштабну програму моніторингу, результати якої засвідчили порушення санітарних вимог на понад 69 % об'єктів водопостачання. Визначено, що системне погіршення якості води потребує модернізації технологічних процесів очищення та посилення контролю за дотриманням нормативів. Зауважено, що підвищення ефективності контролю можливе лише за умови міжвідомчої координації та впровадження єдиної інформаційно-аналітичної системи моніторингу. Встановлено позитивну динаміку зниження рівня мікробіологічного забруднення у централізованих системах, що свідчить про результативність модернізації очисних споруд. Констатовано, що ситуація у сфері нецентралізованого водопостачання залишається критичною через обмеженість технічних ресурсів і складні умови контролю. Підкреслено, що санітарно-хімічні та радіаційні показники демонструють тенденцію до поступової стабілізації. Розкрито значення нормативно-правового врегулювання, зокрема Постанови Кабінету Міністрів України № 61 від 21 січня 2025 року, яка визначає порядок державного моніторингу водопостачання. Наголошено, що реалізація зазначених документів забезпечує правову основу переходу до сучасної моделі управління водною безпекою. Визначено, що відповідність якості питної води стандартам ЄС залишається важливим завданням у контексті євроінтеграції України. Підкреслено, що досягнення цільових показників потребує поєднання технічних, цифрових і нормативних рішень, спрямованих на забезпечення стабільного постачання безпечної води населенню навіть у кризових умовах.

КЛЮЧОВІ СЛОВА

моніторинг якості питної води, воєнний стан, водопостачання, нормативно-правове регулювання.

1. Introduction

Under martial law in Ukraine, providing the population with high-quality drinking water is one of the defining tasks in the field of environmental and sanitary safety of the state. The destruction of elements of water supply infrastructure, an increase in the likelihood of contamination of water supply sources and the complication of monitoring their condition create critical challenges that require an integrated approach to overcoming them. That is why it is of particular importance to create and operate an effective monitoring system capable of ensuring continuous monitoring of drinking water quality indicators, timely detection of deviations from established norms and making effective management decisions. Therefore, the relevance of this issue is due to the need to guarantee the water security of the population as a component of the national resilience of the state in the face of military threats.

2. Literature Review

The analysis of recent studies and publications shows that the issue of monitoring the quality of drinking water in Ukraine during martial law has become especially relevant due to the increased risks to water resources, water supply systems and public health. In particular, I. Taraimovych, S.Sovhira and N. Dushechkina study the impact of hostilities on the state of aquatic ecosystems and the quality of drinking water [19]. On the other hand, U. Lototska-Dudyk and V. Laboiko analyze the state of water supply to the population of Ukraine, emphasizing the need to improve the system of control over sanitary and hygienic indicators of water under martial law [10]. At the same time, I. Andrusyshyna and O. Lampeka draw attention to the regulatory and legal aspects of ensuring the safety of drinking water, comparing Ukrainian control standards with European approaches and highlighting gaps in the current legislation [2]. Scientific developments under the leadership of O. V. Shestopalova reveal modern aspects of the analysis of water quality indicators, in particular, the use of the latest monitoring methods and the need to adapt them to crisis conditions [17]. At the same time, O. Hafurova, T. Novak and S. Holub focus on the right of citizens to access information on the quality of drinking water, emphasizing that the transparency of environmental data is an important factor in effective water resources management [5].

3. Problem Statement

The article is aimed at analyzing the monitoring of drinking water quality in Ukraine under martial law, taking into account environmental, sanitary, hygienic, regulatory and managerial aspects.

4. Methods and Materials

The study of the state of monitoring the quality of drinking water in Ukraine under martial law is based on a comprehensive scientific and methodological approach that combines general scientific and special methods of analysis. The object of study is the system for monitoring the quality of drinking water as an element of sanitary and epidemiological safety, and the subject is its functioning in the conditions of hostilities. To collect primary data, the method of system analysis was used, which made it possible to assess the relationships between the destruction of infrastructure, pollution of water sources and epidemic risks. The comparative method was used to compare pre- and post-war indicators of water quality. Logical and semantic analysis helped to clarify the concept of “water quality monitoring” as a tool for the strategic security of the state. The study is based on empirical data from 2020–2024, providing practical guidance for the authorities.

5. Results and Discussion

Military operations significantly change the sanitary and epidemiological situation in Ukraine, which leads to an increase in risks for the population’s life support systems. Destruction of critical infrastructure facilities, environmental pollution, disruption of water supply stability and restriction of

access to safe water sources form the prerequisites for systemic changes in the field of public health. strategic security of the state, especially under martial law [1].

Taking into account these challenges, in the first half of 2025, specialists of the State Food and Consumer Service implemented a large-scale program to monitor the safety and quality of drinking water. It covered centralized water supply systems and local sources, which made it possible to get an objective picture of the state of water supply in different regions of the country. The studies were carried out as part of interdepartmental commissions, as well as during scheduled and unscheduled inspections. As a result of this activity, 7715 water supply facilities were examined, of which 5,328 (69%) were found to violate the requirements of sanitary legislation. The largest number of such cases was recorded at non-centralized sources – 3,195 facilities, among which wells, catchments and wells predominate, which remain the main source of water for the rural population [3].

Laboratory observations confirm the presence of abnormalities in chemical and microbiological indicators. Within the framework of centralized water supply, 682,884 laboratory tests were carried out, among which 22,611 samples demonstrated non-compliance with sanitary and chemical standards. In non-centralized sources, more than 800 cases of exceeding the permissible indicators were recorded. These data reflect a trend towards deterioration of water quality, which emphasizes the need to update the technological processes of water intake and strengthen control over compliance with regulatory requirements. Additional evidence of the aggravation of the problem are the results regarding the microbiological state of the water. Of the 163 samples examined, 15 showed microbiological abnormalities, which signal an increased epidemic danger, especially in the frontline and affected regions. In Poltava and Kyiv regions, two cases of nitrate poisoning of children were recorded, and methemoglobinemia was diagnosed – a pathological condition caused by drinking water with an excessive content of nitrates [3]. These examples confirm the need to improve the monitoring system at the level of laboratory tests, as well as within the framework of preventive measures of territorial communities aimed at preventing risks to public health.

It is important to note that increasing the efficiency of water quality control is impossible without a well-established interaction between various public administration structures. Within the framework of the state water security policy, interagency cooperation is being intensified to ensure coordination of actions and a comprehensive response to identified threats. In particular, the State Food and Consumer Service conducted more than 690 thousand laboratory tests of water samples, prepared more than 3000 recommendations to the authorities and organized 255 meetings of commissions on technogenic and environmental safety and emergencies. In addition, the programs of production control of water quality have been checked and agreed, which testifies to the strengthening of the systematization of public administration in this area [3; 9].

In this context, these results demonstrate an increase in the level of coordination between public administration bodies, which makes it possible to ensure coordination of actions in the field of control over the quality of drinking water during martial law. The strengthening of the coordination role of the state is confirmed by the expansion of administrative, technological and analytical management tools aimed at increasing the effectiveness of response to identified threats [20].

In order to clearly reflect the current state of drinking water quality monitoring, it is advisable to refer to statistical data illustrating the compliance of water samples with state sanitary standards (Table 1).

Comparison of indicators in time perspective indicates a gradual decrease in the level of microbiological contamination in centralized systems. In particular, in urban water supply systems, the share of non-standard samples decreased from 4.7% in 2020 to 2.3% in 2024, and in rural water supply systems, from 13.8% to 10.2%. Such results indicate an increase in the efficiency of water disinfection and modernization of treatment facilities, especially in communities supported by state and international programs.

At the same time, the situation in the field of non-centralized water supply remains problematic. More than 25% of samples taken in 2024 did not meet sanitary standards for microbiological indicators. The main reasons for this are the lack of constant monitoring, the use of individual wells and wells, as well as difficult conditions for ensuring sanitary requirements in areas close to hostilities. Improving monitoring in this sector involves the introduction of bioindication and remote-control systems for water parameters, which will allow for the rapid detection of potential deviations.

Table 1. Drinking water that meets state sanitary norms and rules by types of indicators, percentages of non-standard samples

Indicators	2020	2021	2022	2023	2024
Drinking water that meets state sanitary norms and rules by types of indicators, percentages of non-standard samples:					
For microbiological indicators:					
City water pipes	4.7	5.1	2.1	2.7	2.3
Rural water pipes	13.8	11.9	11.4	11.0	10.2
Non-centralized water supply	22.6	22.9	28.3	25.1	25.4
For sanitary-chemical indicators:					
City water pipes	16.8	18.2	12.1	11.3	11.7
Rural water pipes	26.9	28.9	25.4	28.9	27.7
Non-centralized water supply	32.6	33.5	39.9	35.0	32.9
For radiation indicators:					
City water pipes	0.8	2.0	0.5	0.6	1.0
Rural water pipes	6.5	2.8	12.2	2.9	1.7
Non-centralized water supply	8.8	7.1	4.9	6.3	2.7
Drinking water that meets state sanitary norms and rules by types of indicators, percentages of non-standard samples:					
For microbiological indicators:					
By type of water supply					
Rural water pipes	4.7	5.1	2.1	2.7	2.3
City water pipes	13.8	11.9	11.4	11.0	10.2
By type of water supply source					
Centralized	7.6	7.5	3.5	4.3	3.8
Non-centralized	22.6	22.9	28.3	25.1	25.4
For sanitary-chemical indicators:					
By type of water supply					
Rural water pipes	16.8	18.2	12.1	11.3	11.7
City water pipes	26.9	28.9	25.4	28.9	27.7
By type of water supply source					
Centralized	21.7	21.2	14.3	14.3	15.0
Non-centralized	32.6	33.5	39.9	35.0	32.9
For radiation indicators:					
By type of water supply					
Rural water pipes	0.8	2.0	0.5	0.6	1.0
City water pipes	6.5	2.8	12.2	2.9	1.7
By type of water supply source					
Centralized	4.7	1.9	1.2	0.8	1.1
non-centralized	8.8	7.1	4.9	6.3	2.7

Note: Target values of the indicator for 2030: for microbiological indicators: urban water pipelines – 1.5, rural water pipelines – 2.5, non-centralized water supply – 15.5; for sanitary-chemical indicators: urban water pipelines – 6.5, rural water pipelines – 14.5, non-centralized water supply – 29.5; for radiation indicators: urban water pipelines – 0.5, rural water pipelines – 1.5, non-centralized water supply – 3

Source: Compiled based on [18].

Comparison of indicators in time perspective indicates a gradual decrease in the level of microbiological contamination in centralized systems. In particular, in urban water supply systems, the share of non-standard samples decreased from 4.7% in 2020 to 2.3% in 2024, and in rural water supply systems, from 13.8% to 10.2%. Such results indicate an increase in the efficiency of water disinfection and modernization of treatment facilities, especially in communities supported by state and international programs.

At the same time, the situation in the field of non-centralized water supply remains problematic. More than 25% of samples taken in 2024 did not meet sanitary standards for microbiological indicators. The main reasons for this are the lack of constant monitoring, the use of individual wells and wells, as well as difficult conditions for ensuring sanitary requirements in areas close to hostilities. Improving monitoring in this sector involves the introduction of bioindication and remote-control systems for water parameters, which will allow for the rapid detection of potential deviations.

Sanitary-chemical indicators show a certain stability with a tendency to gradually improve. In urban water supply systems, the share of non-standard samples decreased from 16.8% in 2020 to 11.7% in 2024, while in rural water supply systems, from 26.9% to 27.7%, which indicates the preservation of a relatively high level of chemical load. The worst results are observed in non-centralized systems, where 32.9% of non-standard samples were recorded in 2024. This is due to the low quality of sources, a lack of reagents for treatment, and limited technical capabilities at the local level [7].

Considering the state of radiation indicators, it is worth noting that they demonstrate the most favorable trend. In urban water supply systems, the level of non-standard samples decreased to 1.0%, in rural water supply systems, to 1.7%, and in non-centralized water supply systems, to 2.7% in 2024. Positive changes are explained by the stable functioning of regional control laboratories, preventive measures and proper compliance with the requirements to prevent radionuclides from entering water supply sources.

The correlation of the results obtained with the targets for 2030 shows that urban systems are already approaching the established standards (1.5% for microbiological, 6.5% for sanitary-chemical, and 0.5% for radiation indicators). For rural areas, there is a moderate lag, while in the non-centralized sector, it is necessary to achieve a reduction in the deviation rate of at least 10–15% in the coming years. This requires comprehensive technical, organizational and financial solutions aimed at improving the efficiency of the water control system [8].

Summing up the results, it is worth emphasizing a clear relationship between the level of organization of water resources management and the quality of drinking water. Centralized systems demonstrate stable parameters – 3.8% of non-standard samples for microbiological indicators in 2024, compared to 25.4% for non-centralized ones. This indicates the important role of institutional management in ensuring water security and forming a sustainable infrastructure for water quality control under martial law. In this context, it is advisable to emphasize the need to integrate the state monitoring system with local laboratories and digital platforms, which will ensure the continuity of control even in areas with limited access. Such an improvement will contribute to the timely detection of deviations, as well as create a database for predicting potential risks, which is especially important in wartime [6].

At the same time, it should be borne in mind that during the war, the structure of water supply sources has changed significantly: some centralized systems were damaged or destroyed, which led to an increase in the share of non-centralized consumption. This increases the importance of introducing simplified field-testing methods and mobile laboratories that will provide monitoring even in temporarily uncontrolled areas.

Summing up the above results, it can be stated that the drinking water quality monitoring system in Ukraine demonstrates gradual stabilization, but remains uneven by type of sources. This indicates the need to strengthen controls, especially in rural and non-centralized water supply systems, where the level of non-standard samples remains the highest. Achieving the targets until 2030 requires concerted actions of state institutions, local governments and business entities in the field of water supply. To do this, it is important to ensure a combination of infrastructure investments, digital control technologies, information and education programs for the population and strengthening regulatory responsibility for compliance with water quality standards [11].

In the context of the fulfillment of international obligations, this issue becomes even more important because Ukraine, within the framework of the European integration process, must bring its legislation in line with the European Union standards on the safety of water intended for human consumption. In this regard, Directive (EU) 2020/2184 [4] defines the basic standards and principles that states must adhere to to guarantee high-quality drinking water. Its provisions are aimed at forming a water resources management system based on risk assessment and providing for control at all stages – from the source of water intake to the end consumer.

Under martial law, compliance with such requirements becomes critical, as the risks of damage to water infrastructure, surface water pollution and limited laboratory monitoring capabilities increase. The situation is complicated by the fact that Ukraine's water supply has historically been focused mainly on the use of surface sources. This provides a significant potential for water resources, but at the same time increases the vulnerability of the system to environmental, man-made and military threats. Therefore, there is now a need to update national standards for water quality control, taking into account wartime conditions and practices of the European Union.

According to the provisions of the Directive [4], ensuring the safety of drinking water requires compliance with certain bacteriological, chemical and microbiological parameters, as well as the introduction of effective risk management at all stages of the water supply system. This involves identifying potential threats, assessing their level of danger, establishing control points, and implementing preventive measures to minimize negative consequences. In this process, a special place is occupied by the control of materials in contact with water, since their unsatisfactory technical condition can become a source of secondary contamination even if standard cleaning procedures are followed.

In this regard, the need to create a holistic control system that combines laboratory, analytical and management components is increasing. This is the basis of the modern model of state monitoring of drinking water quality, which is gradually being formed in Ukraine. An important stage of its development was the adoption of the Resolution of the Cabinet of Ministers of Ukraine dated January 21, 2025, No. 61 "On Approval of the Procedure for State Monitoring in the Fields of Drinking Water and Drinking Water Supply, Sanitation" [16]. The document outlines the main tasks of the monitoring system – from assessing the state of water bodies in places of water intake by chemical, bacteriological, microbiological and radiological indicators to monitoring the technical condition of centralized water supply systems and wastewater reuse processes.

Such a regulatory framework creates preconditions for the transition to a more structured model of water security management. The Resolution forms a legal framework that is consistent with European requirements and contributes to the introduction of modern information and analytical monitoring mechanisms. Its implementation provides for increasing the efficiency of response to detected deviations and ensuring constant updating of data on the quality of drinking water in different regions of the country.

As part of the practical implementation of the requirements of these regulatory documents, tap drinking water, as well as water from bottling points, must comply with state sanitary standards and rules that guarantee epidemic and radiation safety. State sanitary norms and rules "Hygienic Requirements for Drinking Water Intended for Human Consumption", approved by the Order of the Ministry of Health of Ukraine dated May 12, 2010 No. 400 [15], determine the maximum permissible concentrations of chemical, microbiological, parasitological and radiological indicators. In order to comply with these requirements, water is disinfected and residual concentrations of reagents used during purification are controlled.

Given the modern challenges of the war period, ensuring that drinking water meets sanitary standards is of particular importance. Damage to infrastructure, limited access to laboratory facilities and disruption of technological processes can cause a significant deterioration in water quality. This increases the risk of pathogenic microorganisms, heavy metals, radionuclides and other toxic compounds entering the water supply network. Therefore, systematic control of compliance with sanitary standards is considered a component of the state security policy aimed at preventing threats to public health.

In addition, increasing the efficiency of water quality monitoring under martial law provides for the expansion of methodological monitoring tools, which should include the technical and organizational dimensions of control. In this context, it is important to ensure the improvement of laboratory diagnostics, the increase in the accuracy of the determination of residual reagents and the introduction of adaptive evaluation protocols. Such protocols should take into account the variability of the state of water supply sources, seasonal fluctuations in the level of pollution and the specifics of individual territories. The use of these approaches contributes to obtaining reliable results and ensures a stable supply of high-quality drinking water to the population, even in the case of resource shortage and increased risks.

Further attention should be focused on ensuring the balance of disinfection processes, since the sanitary safety of the water supply directly depends on this. Effective disinfection requires constant monitoring of the ratio of the concentration of reagents and the level of their residual effect. Insufficient dosage creates prerequisites for microbial contamination, while excess reagents can cause chemical overload of water. Therefore, control of residual concentrations of disinfectants is a necessary component of the monitoring system, which guarantees environmental safety and prevents secondary pollution.

Taking into account the existing risks, the development of a drinking water quality control system should be based on the digitalization of monitoring and automation of reporting detected deviations. The combination of remote data collection technologies, analytical platforms and forecasting modules will allow for rapid response to violations, improve decision-making mechanisms and form a sustainable model of water security that can function even in crisis conditions.

At the same time, strengthening the technical component of control requires a regulatory framework that will determine the permissible limits for the content of hazardous substances in drinking water. In this aspect, an important document is the State Sanitary Norms and Rules "Safety Indicators and Certain Indicators of Drinking Water Quality under Martial Law and Other Emergencies", approved by the Order of the Ministry of Health of Ukraine dated May 25, 2022, No. 564/37900 [14]. The document specifies the list of sanitary and toxicological parameters by which the safety of water for consumption is determined, which makes it possible to provide uniform standards for assessing its quality in conditions of increased risks.

The parameters determined by the standards [14] cover a wide range of inorganic and organic compounds that can enter the water due to natural processes or man-made influence. Inorganic components include aluminum, boron, cadmium, arsenic, sodium, nickel, nitrates, nitrites, mercury, lead, selenium, antimony, fluorides, chlorates, chlorites, chromium and cyanides, the concentrations of which must remain within the established standards. Compliance with these indicators is an important condition for preventing toxic effects on the human body and maintaining the stability of the water supply system.

In addition to inorganic elements, within the monitoring system, considerable attention is paid to organic components that pose a potential danger due to their ability to accumulate in the body and cause long-term health effects. In this context, benzo(a)pyrene, benzene, 1,2-dichloroethane, pesticides, trihalomethanes, trichloroethylene and tetrachloroethylene are considered especially dangerous. For each of these compounds, maximum permissible concentrations have been established, the excess of which signals a threat to human health and requires an immediate response from regulatory authorities.

Considering individual categories of pollutants, the regulation of the content of pesticides in water is especially indicative. The regulatory framework provides not only for specific values for individual substances, but also for limiting their total content. This makes it possible to assess the combined impact of several components, which is extremely important for areas with developed agricultural production. It is in such regions that the risk of agrochemical residues entering water supply sources remains elevated, so the control system must ensure constant monitoring of their fluctuations in the aquatic environment.

Under martial law, the problem of controlling the content of hazardous substances is complicated by objective circumstances, in particular, limited access to reagents, technical means and laboratory equipment. In this regard, the current regulations allow for temporary deviations from standard requirements, for example, regarding concentrations of trihalomethanes, when it is impossible to ensure their complete removal. This regulatory flexibility allows maintaining the minimum required safety standards even in unstable infrastructure conditions, while creating preconditions for a gradual return to normal controls.

Of additional importance is the organization of systemic monitoring, which should cover chemical, microbiological and toxicological indicators. The integration of these areas with the use of geographic information technologies contributes to the timely identification of sources of pollution, the determination of ways of their spread and the increase in the efficiency of managerial decisions. Due to this complexity, water supply systems are more resistant to environmental, man-made and military threats, which is especially important for the affected areas.

It is worth noting that in 2024, important government decisions were made aimed at strengthening the water policy of the state, among which an important place is occupied by the State Target Program for Integrated Water Supply of Territories Affected by Hostilities for the Period up to 2030 [13]. Its implementation is aimed at stabilizing water supply systems and ensuring the proper quality of drinking water during martial law and during the recovery period. Particular attention is paid to the modernization of water intake facilities, in particular those based on underground sources, as well as the introduction of the latest technologies for water purification and disinfection, which ensure compliance with sanitary and hygienic standards.

A separate task of the Program is to create a system for continuous monitoring of water quality using digital tools for data collection and analysis. The implementation of this direction is designed to increase the efficiency of response to changes in the state of water resources and to timely identify potential deviations from the established standards. The use of digital technologies makes it possible to ensure continuity of control even in crisis conditions, which is especially important during hostilities, when the risk of contamination of drinking water sources due to damage to infrastructure or restrictions on laboratory tests increases. The use of remote monitoring systems creates the basis for the formation of a model of preventive water resources management, focused on reducing environmental risks and increasing the level of public safety.

At the same time, the improvement of technological control mechanisms requires proper legal support, which determines the procedure for access to information on the state of water supply. According to Article 9 of the Law of Ukraine "On Drinking Water and Drinking Water Supply" dated 10.01.2002, No. 2918-III [12], every consumer has the right guaranteed by the state to receive reliable data on the quality of drinking water. To exercise this right, the central executive body responsible for housing and communal policy annually forms and publishes the National Report on the quality of drinking water and the state of drinking water supply in Ukraine. This contributes to the formation of an open system of environmental management, within the framework of which citizens can exercise public control over compliance with safety standards.

An important component of this mechanism is the activities of local self-government bodies, which are obliged to timely inform citizens through the media about cases of non-compliance of water indicators with established standards. Ensuring the publicity of such data increases the transparency of the monitoring system, as well as forms public confidence in the actions of state and municipal structures in the field of water supply. The openness of the information space creates favorable conditions for the development of environmentally responsible consumer behavior, which in turn strengthens the principles of sustainable water resources management even in emergency circumstances of martial law.

6. Conclusions

The summarized results of the study show that the system for monitoring the quality of drinking water in Ukraine under martial law is at the stage of gradual stabilization, but is still characterized by significant unevenness between centralized and non-centralized water supply systems. One of the determining factors for the effectiveness of control is the level of institutional organization of water resources management, the quality of interagency coordination and the degree of technological support for laboratory analysis. A feature of the current situation is that centralized systems demonstrate positive dynamics in reducing microbiological and sanitary-chemical pollution, while non-centralized sources remain problematic due to insufficient control, deterioration of infrastructure and limited response capabilities in frontline regions.

An important direction of state policy in this area is the implementation of regulatory legal acts, in particular, the Resolution of the Cabinet of Ministers of Ukraine No. 61 and updated state sanitary rules, which create the basis for a gradual transition to European standards for water security management. In this context, the integration of state, regional and local levels of control, as well as the use of digital monitoring technologies and automated surveillance systems, without which the achievement of water quality targets by 2030 is unlikely, is of particular importance.

Further effectiveness of the monitoring system should be based on the principles of risk-based management, modernization of the laboratory base, control of residual reagents and strengthening the regulatory responsibility of water supply entities. In view of the above, the systematic renewal of mechanisms for controlling the quality of drinking water is an important prerequisite for the formation of a sustainable model of water security of the state, capable of functioning in the face of military challenges and meeting European environmental standards.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



The Impact of Military Operations on the Accounting and Taxation System in Ukraine

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.02

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ABSTRACT

The article is devoted to the study of the impact of military operations on the accounting and taxation system in Ukraine. Particular attention is paid to assessing the effectiveness of legislative changes introduced to support business, identifying the main problems and risks that arise in the field of accounting and taxation during the war, as well as finding possible ways to improve these systems in the process of military and post-war economic recovery. The purpose of the study is to comprehensively analyze the impact of military operations on the accounting and taxation system in Ukraine, identify key problems and risks that arise during their functioning under martial law, and develop scientifically based recommendations for improving accounting and tax practices to ensure the financial stability of enterprises and the state. In the process of scientific research, general scientific methods of cognition were used, in particular analysis and synthesis, induction and deduction, comparison, a systematic approach, and a graphical approach. Changes in the legislation of Ukraine on accounting and taxation adopted during martial law were analyzed. The features of tax administration in the context of military operations (moratoria, tax audits, suspension of deadlines, etc.) were studied. To determine how military events affected accounting by enterprises of various forms of ownership and scales of activity. An assessment of the consequences of the introduced tax benefits and simplifications for business and the state budget was given. The main risks and challenges for the accounting and tax system of Ukraine during martial law were identified. Directions for improving the accounting and taxation system of Ukraine were formed, taking into account military challenges and prospects for post-war recovery. Future research should focus on studying the long-term consequences of military operations on the accounting and taxation system in Ukraine, in particular, on the effectiveness of digitalization of accounting processes, integration of electronic services into tax administration, assessment of the impact of tax benefits on budget revenues and financial stability of enterprises, as well as on the development of anti-crisis management mechanisms and increasing cybersecurity of information systems in the field of accounting and taxation.

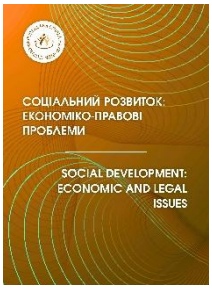
KEYWORDS

accounting, tax system, risks, military operations, relocation, financial burden, tax benefits.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Вплив воєнних дій на систему обліку та оподаткування в Україні

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.02

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АНОТАЦІЯ

Стаття присвячена дослідженню впливу воєнних дій на систему бухгалтерського обліку та оподаткування в Україні. Особлива увага приділяється оцінці ефективності законодавчих змін, запроваджених з метою підтримки бізнесу, виявленню основних проблем та ризиків, що виникають у сфері обліку та оподаткування під час війни, а також пошуку можливих шляхів удосконалення цих систем у процесі воєнного та післявоєнного відновлення економіки. Мета дослідження полягає у комплексному аналізі впливу воєнних дій на систему бухгалтерського обліку та оподаткування в Україні, виявленні ключових проблем і ризиків, що виникають у процесі їх функціонування в умовах воєнного стану, а також у розробці науково обґрунтованих рекомендацій щодо удосконалення облікових і податкових практик для забезпечення фінансової стабільності підприємств та держави. У процесі наукового дослідження використовувалися загальнонаукові способи пізнання, зокрема аналіз і синтез, індукція та дедукція, порівняння, системний підхід, графічний. Проаналізовано зміни у законодавстві України щодо бухгалтерського обліку та оподаткування, ухвалені у період воєнного стану. Досліджено особливості податкового адміністрування в умовах воєнних дій (мораторії, податкові перевірки, зупинення строків тощо). Визначити, як воєнні події вплинули на ведення бухгалтерського обліку підприємствами різних форм власності та масштабів діяльності. Дана оцінка наслідків запроваджених податкових пільг і спрощень для бізнесу та державного бюджету. Виявлено основні ризики та виклики для облікової й податкової системи України у період воєнного стану. Сформовано напрями удосконалення системи обліку та оподаткування України з урахуванням воєнних викликів і перспектив повоєнного відновлення. Майбутні дослідження повинні зосередитися на вивченні довгострокових наслідків воєнних дій на систему бухгалтерського обліку та оподаткування в Україні, зокрема на ефективності цифровізації облікових процесів, інтеграції електронних сервісів у податкове адміністрування, оцінці впливу податкових пільг на бюджетні надходження та фінансову стійкість підприємств, а також на розробці механізмів антикризового управління та підвищення кібербезпеки інформаційних систем у сфері обліку та оподаткування.

КЛЮЧОВІ СЛОВА

облік, податкова система, ризики, воєнні дії, релокація, фінансове навантаження, податкові пільги.

1. Introduction

The full-scale war has become not only a military test for Ukraine, but also a financial blow. The destruction of infrastructure is estimated at hundreds of billions of dollars, and the outflow of capital and the forced shutdown of production facilities led to a sharp decrease in business activity. Thousands of companies were forced to move offices and production to the west of Ukraine or even close their activities. At the same time, there is a migration of millions of workers, a decrease in domestic demand and the loss of traditional markets. All this creates an extremely difficult background for the operation of the financial system.

In such conditions, the functioning of the accounting and taxation system turned out to be not adaptive enough to work in a state of emergency. On the one hand, the state had to introduce tax benefits, simplified administration processes to support business; On the other hand, these steps have created additional risks to the stability of the budget system. As a result, accounting and taxation have come into the spotlight as key tools for ensuring transparency in financial transactions, controlling resources, and creating conditions for the country's future economic recovery.

The tax base has significantly narrowed, the budget deficit has become chronic, and the state is increasingly dependent on international loans and grants. This situation creates a double tension in the accounting and fiscal sphere: on the one hand, it is necessary to ensure the stability of revenues to finance the army and social programs; on the other hand, to support opportunities for the development of business, which itself is in a difficult state. Financial accounting, which was usually perceived as a technical procedure, acquires strategic importance. It is transparency and flexibility in the field of accounting that allow states to manage resources more efficiently in crises.

Therefore, the study of this problem opens up an opportunity not only to record the current state of affairs but also to outline development scenarios for the next decade.

2. Literature Review

The issue of the impact of hostilities on the accounting and taxation system in Ukraine is sufficiently researched in the domestic literature. A significant contribution to the study of this topic was made by A. Halaburda and S. Shevchenko [1, p. 123], who revealed the essence of tax policy under martial law; analyzed the changes to the legislation and the tax mechanism that have been adopted since the introduction of martial law. N. Tataryn and A. Kholast [2, p. 34], based on the analysis of tax revenues for the period 2021–2024, provided advice on improving the tax system after the end of the war.

V. Horyn, P. Bula, V. Chornous, [3, p. 23] in their work highlighted the features and practical aspects of the formation of the tax policy of Ukraine under martial law. The emphasis is on tax innovations of the first stage of the full-scale war, aimed at maintaining economic activity and adapting businesses to work in the face of security risks and uncertainty. H. Balashov, O. Fedorchak [4, p. 96] determined the foundations of accounting and taxation under martial law. A. Voitenko, N. Svichkar [5, p. 48] studied the impact of the war on the organization of accounting. The authors consider the problems of implementing the principle of continuity in wartime; The main factors influencing the assessment of the principle of continuity are given.

O. Shulhan and N. Svichkar [6, p. 140] investigated the organizational and legislative and regulatory aspects of accounting and taxation in local self-government bodies under martial law. A. Dub and T. Medynska [7, p. 214] studied the impact of tax policy on income formation during the war. Yu. Radionov [8] focused on the formation and implementation of state and local budgets, as well as the management of financial resources under martial law. B. Pshyk and A. Stasyshyn [9, p. 23] outlined the main directions of ensuring the effectiveness of tax policy in Ukraine, which are based on monitoring tax legislation under martial law, timely fulfillment of tax obligations.

Given the considerable number of works covering the impact of hostilities on the accounting and taxation system in Ukraine, there is a lack of systematic studies that take into account ways to improve the accounting and taxation system of Ukraine, taking into account military challenges and prospects for post-war recovery, which has become a need for research.

3. Problem Statement

The purpose of this study is to comprehensively study the impact of hostilities on the accounting and taxation system in Ukraine, identify key problems and challenges faced by businesses and the state, as well as develop proposals for improving accounting and tax mechanisms, taking into account war realities and prospects for post-war economic recovery.

4. Methods and Materials

The research methodology is based on a combination of general scientific and specific methods of cognition, which provide a comprehensive analysis of the impact of hostilities on the accounting and taxation system. The research materials were used as regulations of Ukraine regulating accounting and taxation under martial law, statistical data of the State Tax Service and the Ministry of Finance, analytical reviews of economic processes, reports of enterprises on accounting and tax revenues, as well as the results of international studies of crisis tax systems.

The research methods included: analysis and synthesis – for the systematic study of legislative changes and practical consequences; comparison – to compare pre-war and military approaches in tax accounting and administration; induction and deduction – to form generalizations and conclusions; a systematic approach – for a comprehensive consideration of the relationship between hostilities, economic processes and the tax system; Graphic.

5. Results and Discussion

Ukraine is currently going through a period when the economic system is being tested for strength in exceptionally harsh conditions. Military events crossed out the usual logic of economic life. Where, until recently, there were proven market schemes, today we see shut down enterprises, dismantled workshops and relocated production sites. Some businesses lost the ability to function, others, moving equipment, sharply reduced production volumes and reduced staff.

The impact of hostilities on accounting and the tax system of Ukraine is manifested in a complex of profound transformations that cover both the legislative field and the practice of economic activity. Martial law led to the temporary suspension of certain tax terms, the introduction of preferential tax regimes, and a moratorium on inspections, which was aimed at reducing the pressure on business and maintaining its viability. At the same time, there were problems with ensuring the principle of continuity of accounting, reliability of reporting and preservation of primary documentation, because many enterprises suffered loss of assets, evacuation or relocation. The structure of budget revenues has changed significantly: tax benefits have helped enterprises, but at the same time, reduced the amount of financial resources of the state. Along with this, the digitalization of accounting processes and the use of electronic services have intensified, which has become a key tool for maintaining the transparency and stability of the financial system.

Another important trend can be noticed: the higher the level of financial discipline, the more enterprises can maintain partnerships and receive support from international institutions. Accounting in Ukraine is the basis of financial control, a tool for making managerial decisions and ensuring transparency of economic relations. Its theoretical basis is based on the provisions of the National Accounting Standards (NASS), the Law of Ukraine "On Accounting and Financial Reporting in Ukraine", as well as the principles of double entry, objectivity, systematic, continuity and truthfulness of reflection of economic transactions. functions of information support, control over the use of resources, planning and evaluation of the effectiveness of enterprises and state institutions [8].

The tax system of Ukraine is formed on the basis of the Constitution, the Tax Code of Ukraine and other normative legal acts that regulate the administration of taxes, fees and mandatory payments. In theory, it is based on the principles of legality, equality, justice, economic feasibility and efficiency. The main functions of the tax system are the formation of budget resources, the regulation of economic processes, the encouragement of socially important industries and ensuring the financial stability of the state.

The stability of the economy is impossible without a clear interaction of two key elements – the tax system and accounting. Accounting procedures guarantee the reliability of financial data on the basis

of which tax liabilities are calculated, and tax policy, in turn, motivates businesses to report openly and correctly [6, p. 140].

Among the innovations, it is worth noting the mandatory disclosure of non-financial reporting in the field of sustainable development for certain categories of business, the correction of tax rates and military tax, as well as the introduction of preferential regimes aimed at reducing the burden of entrepreneurs [7, p.214].

During martial law in Ukraine, a number of legislative changes were adopted aimed at simplifying accounting procedures and reducing the tax burden in order to support business and ensure the functioning of the economy. The systematization of the main changes in the legislation of Ukraine on accounting and taxation, adopted during martial law, is presented in Table 1.

Table 1. Main changes in the legislation of Ukraine on accounting and taxation during martial law

Scope of change	Until martial law	During martial law
Reporting and Paying Taxes	Clear deadlines for filing declarations and paying taxes; application of penalties for delay	It is possible to submit reports without imposing a fine in case of emergency circumstances.
Tax audits	Scheduled and unscheduled business inspections	Moratorium on most inspections; only critical inspections (VAT, excisable goods, high-risk transactions) are allowed.
Taxation system for business	The simplified system was limited to an income of up to UAH 7 million for sole proprietors	Temporary increase in the income threshold to UAH 10 billion; introduction of group 3 of the single tax with a rate of 2% of income (in 2025, the marginal income is UAH 9.3 million)
VAT and customs payments	Standard import taxation	Exemption from VAT and duties for single taxpayers of groups 1–3; Release of humanitarian aid
Accounting and reporting	Mandatory storage of paper documents; Standard Financial Reporting Requirements	Electronic document management is allowed; the rules for storing documents have been simplified; Reporting takes into account force majeure circumstances

Source: Systematized by the authors based on [10–13].

Under martial law in Ukraine, significant transformations of the accounting and tax systems have taken place aimed at maintaining the functioning of business, ensuring the financial stability of the state and adapting enterprises to crisis conditions (Table 2).

Table 2. Changes in the accounting and tax system of Ukraine during the war

Criterion	Characteristic
Legislative initiatives	
Law No. 2120-IX (15.03.2022)	Suspension of tax terms; Moratorium on inspections
Law No. 2118	Postponement of reporting deadlines; deferral of taxes without penalties
Features of taxation	
VAT and other taxes	Simplified VAT administration; VAT exemption for certain categories of enterprises and humanitarian aid
Tax administration and reporting	Moratorium on inspections; electronic submission of documents; the ability to take into account force majeure circumstances in financial statements
Business support	
Small and medium-sized businesses	Tax benefits, simplification of payment and reporting procedures, and deferral of taxes
Microenterprises	Adaptation to new conditions: simplified taxation system, flexible document flow

Source: Systematized by the authors on the basis of [10; 14].

Martial law in Ukraine necessitated the adaptation of tax administration to new crisis conditions, which provided for both mitigating the tax burden on business and ensuring the stability of budget revenues.

In these conditions, there was a need for rapid adaptation of the regulatory framework, the introduction of tax benefits, moratoriums on inspections and simplified tax administration procedures. At the same time, the armed conflict has complicated the reliability of financial statements, ensuring the continuity of accounting processes and the preservation of primary documentation, especially in small and micro enterprises.

Hostilities in Ukraine since 2022 have significantly affected the organization of accounting and financial reporting at enterprises of various forms of ownership and size. The main aspects of this influence are presented in Table 3.

Large enterprises have experienced significant difficulties in accounting due to the loss of some assets, interruptions in the operation of IT systems and disruption of logistics chains. Some of the

primary documents could be missing or damaged, which made it difficult to prepare financial statements and ensure the reliability of accounting data. To compensate for these problems, enterprises were forced to accelerate the implementation of digitalization of accounting processes and automation of reporting, which made it possible to ensure the continuity of accounting even in crisis conditions.

Table 3. The Impact of Military Events on Accounting by Enterprises of Various Forms of Ownership and Scale of Activity

Type of enterprise	Main problems	Adaptation measures
Large enterprises	Loss of assets, disruption of logistics, partial absence of primary documents	Digitalization of accounting, automation of reporting, and ensuring continuity of processes
Small and medium-sized enterprises	Difficulties with timely reporting and payment of taxes, limited resources	Use of simplified taxation system and tax benefits, flexible accounting, and remote work
Microenterprises and sole proprietorships	Limited access to financial resources, high risk of breaches of accounting reliability	Simplified taxation, electronic document management, and deferral of tax payments.

Source: Formed by the authors based on [7, p. 214; 15, p. 38].

Small and medium-sized enterprises faced difficulties in timely reporting and compliance with tax obligations due to limited resources. Microenterprises and individual entrepreneurs (FOPs) were in the most vulnerable position, as limited resources and the volume of primary documentation made it difficult to maintain reliable accounting.

For enterprises, especially small and medium-sized businesses, these events have become a key support tool. A simplified taxation system, tax deferrals, and a moratorium on inspections allowed entrepreneurs to maintain liquidity, avoid fines and administrative pressure, and adapt to crisis conditions. Small and micro enterprises were able to continue operating even in conditions of limited access to resources and logistical difficulties, which significantly reduced the risk of mass bankruptcy and job security.

On the other hand, a positive consequence of the introduction of benefits is the maintenance of economic activity and the ability of enterprises to exist, which in the future makes it possible to compensate for temporary budget losses due to the reconstruction of business after the stabilization of the economic situation. These measures also led to the transition of enterprises to electronic services and digital accounting systems, which increases the efficiency of administration and transparency of financial transactions in the future (Table 4).

Table 4. Assessment of the consequences of the introduced tax benefits and simplifications for business and the state budget

Criterion	Impact on business	Impact on the state budget
Simplified taxation system	Maintaining liquidity, the ability to continue operations, and reducing administrative pressure	Decrease in tax revenues in the short term
Deferral of tax payments	Opportunity to avoid fines and improve the financial condition of enterprises	Temporary reduction of budget revenues and the need for additional financial planning
Moratorium on tax audits	Reducing the risk of fines and administrative pressure, maintaining business stability	Reduced control over tax liabilities, risk of tax evasion
Tax exemptions for certain categories	Additional financial support for small businesses and individual entrepreneurs, stimulation of economic activity	A short-term drop in budget revenues, the need for compensation mechanisms
Digitalization and electronic document management	Improving the efficiency of accounting and reporting, adaptation to crisis conditions	Improving transparency and control over financial flows in the medium and long term

Source: Formed by the authors based on [16–18]

At the same time, state bodies face difficulties in control: limited access to taxpayers, constant changes in legislation and mass relocation of enterprises complicate the verification of the correctness of accruals and the timeliness of tax payment. In a number of cases, it is observed that even when using remote services, some payments are received with a delay, and shortcomings in the internal accounting of individual companies create risks for the overall stability of budget revenues.

Martial law in Ukraine has created significant challenges for accounting and tax administration. The main problems are related to the instability of the economic environment, limited access to resources and risks to information security (Table 5).

Table 5. The main problems of accounting and tax administration during the war

Category	Main problems	Consequences for enterprises and the state
Accounting	Loss and destruction of assets	Inability to accurately account for property and stocks
	Limited access to information	Complications of collecting primary documents and maintaining registers
	Increased risk of errors	Unreliable financial statements, increased risk of fines
	The need for prompt adaptation	Use of lightweight accounting schemes, possible collisions with standards
Tax administration	Reduction of the tax base	Decrease in tax revenues, budget deficit
	Uncertainty in legislation	Complicated calculation and payment of taxes, risk of miscalculations
	Control complications	Difficulties in controlling taxpayers, increasing the risk of evasion
	Administrative restrictions	Problems of reporting and performing calculations
Additional factors	Risks of cybercrime	Threat to data security and digital accounting systems
	Instability of financial flows	Complications of valuation of assets and liabilities
	Need for qualified personnel	The need to automate and improve the competence of accountants

Source: Systematized by the authors based on [5, p.48; 19; 20, p. 38; 22].

Martial law has caused multifaceted risks for the functioning of the accounting and tax systems.

Tax breaks and moratoriums on audits, although necessary to support business, have led to a decrease in budget revenues, making it difficult to finance government programs and forecast revenues. Administrative and organizational challenges include the need to adapt tax authorities to remote work, e-administration, and staff retraining [21, p. 53].

Taken together, these factors create a complex dynamics of tax revenues, which requires the state to implement adapted control and forecasting mechanisms, and from business – flexible strategies of financial management and accounting. The combination of these factors resulted in a significant increase in the budget deficit and an increased need to attract external financial resources, in particular loans from international organizations and grant support.

Martial law in Ukraine has caused significant changes in the structure of tax revenues and public expenditures. The economic activity of enterprises and the population decreased due to the destruction of infrastructure, the mass relocation of businesses and the displacement of the population. As a result, the state faced a reduction in tax revenues and an increase in the need to finance defense and social programs. Looking at Fig. 1, you can see how various tax revenues to the state budget of Ukraine have changed.

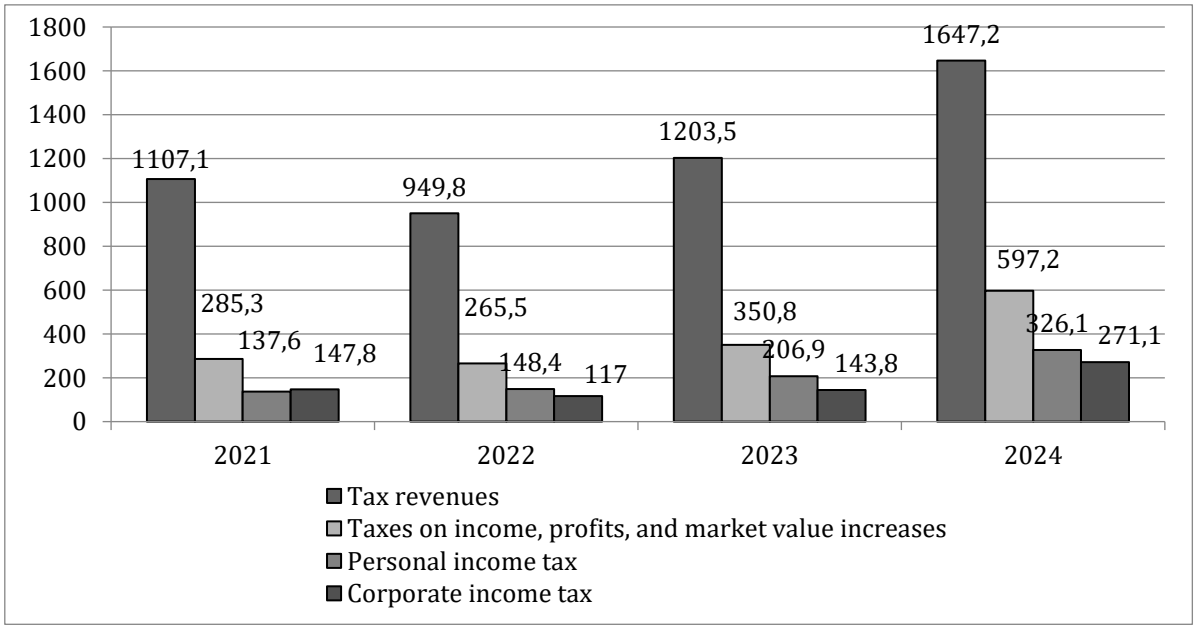


Fig.1. Dynamics of tax revenues, billion UAH

Source: Built by the authors based on [23].

The reduction in corporate income tax reflects business losses due to the destruction and evacuation of enterprises. further growth (UAH 271.1 billion in 2024) indicates the resumption of business operations and the adaptation of the tax system to new conditions.

The growth of the personal income tax indicates: stabilization of the labor market and the recovery of some enterprises, the introduction of automatic tax calculation mechanisms, possibly a partial increase in tax rates or expansion of the tax base.

Ways to improve the accounting and taxation system of Ukraine, taking into account military challenges and prospects for post-war recovery, are shown in Fig. 2.

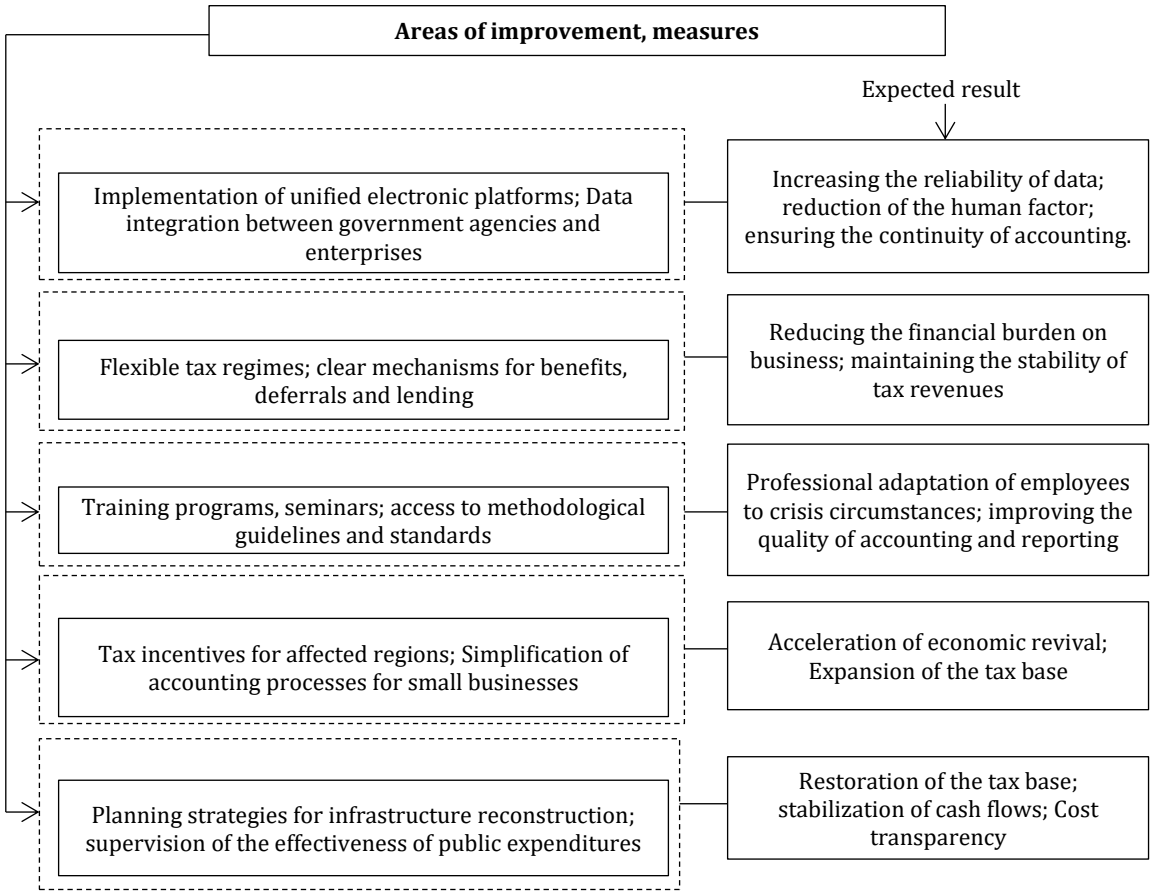


Fig. 2. Ways to improve the accounting and taxation system of Ukraine, taking into account military challenges and prospects for post-war recovery

Source: Developed by the authors.

The combination of various digital tools in accounting and tax administration opens up a new paradigm of financial management, where the system becomes not only more flexible but also resilient to external shocks. The experience of countries that have successfully implemented comprehensive digitalization shows that after economic crises, recovery is faster compared to states where processes remain fragmented or paper-based.

In the context of armed conflicts or financial shocks, this approach allows you to ensure the continuity of the system, promptly reconfiguring financial mechanisms for new challenges. Comprehensive digitalization does not just improve existing processes but creates a foundation for economic sustainability and more efficient use of public resources, creating an environment where management decisions are based on data rather than intuition or scattered reports.

Summing up, the comprehensive application of these measures allows for ensuring the stability and continuity of accounting, increasing the efficiency of tax administration, reducing risks for business and the state budget, and adapting the system to functioning in crisis conditions.

6. Conclusions

During the war, government agencies were forced to quickly implement adaptive financial mechanisms that could reduce the impact on the economy and business. There are tax benefits and deferred payments, simplified administration procedures, as well as intensive digitalization of accounting processes – from automated platforms to online reporting. In practice, this is manifested in

the fact that even during periods of peak loads, the state budget remained stable, and enterprises received the necessary flexibility to support operational activities. In a number of cases, it is observed that the rapid adaptation of financial systems allowed businesses to avoid critical failures, reduce the risks of accounting errors and ensure the continuity of management processes, creating conditions for a gradual recovery of the economy even in regions with a high level of destabilization.

It has been determined that the main consequences of hostilities for the accounting system are the violation of the continuity of accounting processes, the partial loss of primary documentation, the complication of digitalization and automation of accounting, and for the tax system – a decrease in budget revenues, the need to simplify procedures and the introduction of temporary tax benefits.

The main risks and challenges are identified, including: a decrease in the reliability of financial information, limited resources for accounting in small and micro enterprises, an increase in cyber threats, socio-economic factors affecting the tax base, and the need for rapid adaptation of tax authorities to remote administration.

It is recommended to increase the stability of the accounting and taxation system: large-scale digitalization of accounting and tax processes; introduction of electronic document management; flexible tax administration with risk-based control; increasing transparency and reliability of accounting; training of personnel; development of crisis scenarios and action plans; ensuring cybersecurity and data protection.

In the future, this creates the basis for strong economic development: transparency and standardization of accounting contribute to increasing investor confidence and capital attraction, which could potentially increase investment in the medium term.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Institutional-Economic and Transport-Logistics Features of Ukraine's Integration into the EU

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.03

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ABSTRACT

The article is devoted to a comprehensive study of the institutional, economic, and transport and logistics aspects of Ukraine's integration into the European Union. The impact of economic asymmetry, structural differences in economies, and institutional barriers on the pace of Ukraine's rapprochement with the EU is analyzed, as well as the importance of state policy and legislative reforms in the implementation of European integration processes. Particular attention is paid to the development of transport infrastructure, the integration of logistics routes into the European TEN-T network, and the effectiveness of multimodal and intermodal transportation in ensuring exports and economic stability, especially in conditions of war and limited access to seaports. The research methodology is based on an interdisciplinary approach that combines systemic, institutional, and structural-functional analyses, as well as statistical, comparative, and historical-logical methods, which allow us to identify key stages of Ukraine's European integration and assess their economic and infrastructural consequences. The article examines Ukraine's European integration since 1991 through the lens of economic asymmetry, institutional transformation and external factors. It is established that over three decades, GDP per capita in Ukraine grew, but in 2024 amounted to only USD 4,800 compared to over USD 30,000 in the EU-27, confirming a significant gap. Internal obstacles (1990s transformational recession, inflation) are combined with external ones ("integration without membership" until 2014). Scientific significance lies in systematizing integration stages: from the Partnership Agreement (1994) to the Association (2014) and transport laws of 2021–2022. It has been argued that deep deregulation, modernization of grain export logistics, and harmonization of standards are necessary to accelerate convergence. Priority areas are proposed: transit simplification, customs digitalization, and multimodal transport development. The results are of practical importance for shaping the EU integration strategy during wartime and post-war periods.

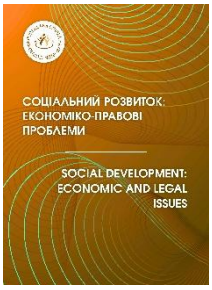
KEYWORDS

European integration, economic asymmetry, macroeconomic stabilization, institutional barriers, transport and logistics infrastructure, multimodal transportation, national security.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Інституційно-економічні та транспортно-логістичні особливості інтеграції України до ЄС

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.03

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АНОТАЦІЯ

Статтю присвячено комплексному дослідженню інституційно-економічних та транспортно-логістичних аспектів інтеграції України до Європейського Союзу. Проаналізовано вплив економічної асиметрії, структурних відмінностей економік та інституційних бар'єрів на темпи зближення України з ЄС, а також значення державної політики та законодавчих реформ у реалізації євроінтеграційних процесів. Особливу увагу зосереджено на розвитку транспортної інфраструктури, інтеграції логістичних маршрутів до європейської мережі TEN-T та ефективності мультимодальних і інтермодальних перевезень у забезпеченні експорту й економічної стійкості, особливо в умовах війни та обмеженого доступу до морських портів. Методика дослідження ґрунтується на міждисциплінарному підході, що поєднує системний, інституційний та структурно-функціональний аналізи, а також статистичний, порівняльний та історико-логічний методи, що дають змогу виокремити ключові етапи євроінтеграції України та оцінити їхні економічні та інфраструктурні наслідки. У статті проаналізовано процес європейської інтеграції України з 1991 року через призму економічної асиметрії, інституційних трансформацій та зовнішніх факторів. Встановлено, що за три десятиліття ВВП на душу населення в Україні зріс, але у 2024 році становив лише 4 800 дол. США проти понад 30 тис. дол. США у ЄС-27, що підтверджує збереження значного розриву. Виявлено, що внутрішні перешкоди (трансформаційна рецесія 1990-х, інфляція) поєднуються з зовнішніми (формат «інтеграція без членства» до 2014 р.). Наукова значущість полягає у систематизації етапів інтеграції: від Угоди про партнерство (1994) до Асоціації (2014) та транспортних законів 2021–2022 рр. Обґрунтовано, що прискорення конвергенції потребує глибока дерегуляція, модернізація логістики зернового експорту та гармонізація стандартів. Запропоновано пріоритетні напрямки: спрощення транзиту, цифровізація митних процедур, розвиток мультимодальних перевезень. Результати мають практичне значення для формування стратегії євроінтеграції у воєнний та повоєнний періоди.

КЛЮЧОВІ СЛОВА

європейська інтеграція, економічна асиметрія, макроекономічна стабілізація, інституційні бар'єри, транспортно-логістична інфраструктура, мультимодальні перевезення, національна безпека.

1. Introduction

The need for European integration of Ukraine arose immediately after the restoration of independence in 1991 and remains central to the political and economic discourse of the state. It combines strategic interests of national security, the need for macroeconomic stabilization and the desire to modernize institutions in accordance with European standards. For more than three decades, European integration has been identified as a priority in state strategies and program documents, in particular in the Partnership and Cooperation Agreement with the European Union (1994) [20], the Association Agreement (2014) [16] and several legislative acts regulating the transport and logistics sector [14]; [15].

The complexity of the problem is explained by a combination of internal and external factors. Internal obstacles are primarily related to the fact that in the first years of independence, Ukraine experienced the difficulties of a transitional economy, which was characterized by a deep transformational recession of the 1990s. Between 1991 and 1999, Ukraine's real GDP more than halved, and inflation reached thousands of percent per year [18]. These trends contrasted sharply with the economic stability of the EU countries, which were at the same time completing the creation of the Single Internal Market (Single Market) and moving towards the introduction of the euro.

External factors further complicated the process of Ukraine's European integration. The EU traditionally viewed Ukraine as a neighboring state without a clear prospect of membership, as evidenced by the nature of the Partnership and Cooperation Agreement (1994), which focused on political dialogue and economic cooperation rather than association or future accession [21]. Thus, Ukraine's initial relations with the EU were shaped in the format of "integration without membership," which left considerable uncertainty.

One of the key problems on the path to Ukraine's integration into the EU is economic asymmetry. Thus, as of the early 2000s, GDP per capita in Ukraine was 6–7 times lower than the EU average [6]. And in 2024, despite some growth over the last two decades, this gap remained significant: about 4,800 US dollars compared to over 30 thousand dollars in the EU-27 [6]; [18]. This situation corresponds to the conditions described in the convergence theory of the neoclassical model of economic growth, where countries with lower starting indicators can develop faster, but only if there is institutional stability, openness and access to investment [9]; [13].

No less important challenge is the structural differences between economies. Ukraine has traditionally remained an exporter of raw materials and products with low added value (metallurgy, agricultural sector), while the EU economy is characterized by high diversification, dominance of service sectors and innovative technologies [1]; [11]. This means that integration occurs not only between economies with different income levels, but also between economies of different types.

A separate dimension is institutional constraints. According to the studies of Rabinovych (2022) [17] and Dimitrova and Dragneva (2023) [4], the weakness of the administrative system, corruption and insufficient efficiency of public administration in Ukraine slow down the implementation of the acquis Communautaire ("community asset"). This forms an "institutional gap" between Ukraine and the EU, which is as important as the macroeconomic one.

Of particular importance in process integration is transport and logistics. Ukraine has historically acted as a transit country, but weak infrastructure and inefficient governance have limited the realization of this potential [2]; [19]. Only after the signing of the Association Agreement (2014), and especially after 2022, when the agreement on "transport visa-free travel" was concluded and accession to the Convention on Common Transit was made, transport integration became a strategic factor in maintaining exports and foreign exchange earnings [7]; [22].

Thus, the problem of Ukraine's European integration lies in the need to overcome economic and institutional asymmetry, harmonize the structure of the economy, ensure effective implementation of legal norms and at the same time develop transport and logistics infrastructure, which is the basis for the practical implementation of integration processes. Not only the pace of convergence with the EU, but also the stability of the Ukrainian economy in modern conditions, depends on the solution of these tasks.

2. Literature Review

Ukraine's European integration is a topic that has received extensive coverage in the works of both Ukrainian and foreign researchers. The scientific discussion of this issue has formed around several key areas: macroeconomic analysis, empirical studies of the impact of the Association Agreement and the Deep and Comprehensive Free Trade Area (hereinafter referred to as the DCFTA), institutional analysis, and the transport and logistics dimension.

Macroeconomic approaches are covered in textbooks and monographs on macroeconomics, in which integration is often viewed through the prism of theories of economic growth. Neoclassical models, in particular the Solow model, show that countries with a lower level of development have the potential for faster economic growth if they have access to capital and technologies from developed partners [9]; [13]. In this regard, domestic economic literature emphasizes that integration with the EU can become a catalyst for convergence between Ukraine and more developed countries [12]. And openness and development of international trade in macroeconomics is interpreted as an important factor in accelerating economic growth [10], which is also empirically confirmed.

Empirical studies of the impact of international integration, in particular DCFTAs, have been the subject of detailed quantitative assessments in the works of Ukrainian researchers. In particular, Movchan [11] used a general equilibrium (CGE) model to assess the distributional effects of DCFTAs and concluded that the benefits of integration outweigh the possible losses, but the social consequences are uneven. Adarov and al. [1] showed that the creation of a free trade zone contributed to the growth of Ukraine's GDP, increased investment attractiveness and export diversification. Frey [8], in turn, using a microsimulation model, proved that trade liberalization deepens income inequality, since its benefits are concentrated in certain population groups.

The institutional dimension of research on the issues of European integration focuses on the fact that the Association Agreement is not only a trade instrument, but also a legal and administrative instrument. Van der Loo [21] sees it as an example of "integration without membership", which involves the implementation of a large part of the acquis Communautaire without guaranteeing membership. Dimitrova and Dragneva [4] argues that the process of Europeanization of Ukrainian institutions has a long-term effect, but its effectiveness is limited by the weakness of the administrative system. Rabinovych [17] adds that the institutional capacity of the state is a determining factor in the speed and efficiency of the implementation of EU norms. In the same context, Buzogány and Varga [3] emphasize the importance of coalition actions of business and civil society organizations, which create additional pressure on the government to accelerate the implementation of reforms.

The transport and logistics dimension are a separate research area of European integration. Ukrainian researchers emphasize the importance of the development of multimodal and intermodal transportation. N. Stepanenko and V. Stepanenko [19] emphasize the importance of Ukraine's integration into the European transport network TEN-T as a condition for increasing competitiveness. Bielova et al. [2] analyze the barriers to the development of multimodal transportation, including imperfect legislation and a lack of investment. After 2022, a new body of research appeared, emphasizing the importance of transport integration in wartime. Fernandes et al. [7] analyze how the war in Ukraine has changed European transport chains, and Yanovska et al. [22] focus on grain export logistics, which have become critical for global food security.

Thus, the analysis of modern scientific publications demonstrates that the integration of Ukraine into the EU is considered by modern researchers in a multifaceted way, namely: through macroeconomic theories of convergence, quantitative models of the impact of the DCFTA, research on institutional capacity and practical transport and logistics dimensions. Accordingly, the scientific problem lies not only in measuring economic benefits and losses, but also in understanding how integration transforms institutions and infrastructure, which, in turn, determine the real possibilities of economic rapprochement of Ukraine with the European Union.

3. Problem Statement

The aim of the article is a comprehensive scientific understanding of the institutional, economic, and transport and logistics features of Ukraine's integration into the European Union, in particular, identifying the patterns and stages of this process, assessing the impact of institutional transformations

and transport and logistics changes on economic convergence with the EU, as well as identifying key factors that contribute to or limit the effectiveness of European integration in the face of modern challenges.

4. Methods and Materials

The research methodology is based on an interdisciplinary approach that combines economic, institutional and logistical aspects of Ukraine's European integration. For a comprehensive analysis, systemic, structural-functional and institutional approaches were used, which allow us to consider the integration process as an interconnected set of economic, legal and infrastructural transformations.

Methods of analysis, synthesis, induction, deduction and generalization made it possible to identify the regularities of the formation of European integration processes and assess their impact on economic dynamics and the development of transport and logistics infrastructure. Comparative and statistical analysis was used to compare the indicators of economic development of Ukraine and the EU countries and determine the level of integration. The key stages of European integration were identified using the historical-logical method, which allowed us to systematize the process based on changes in the political, economic and transport and logistics spheres.

The information basis of the study is official data from Eurostat, the State Statistics Service of Ukraine, the World Bank, the IMF, as well as analytical materials from leading national and international research centers.

5. Results and Discussion

The starting point for studying the trends of Ukraine's economic integration with the EU is the analysis of foreign trade statistics, which clearly demonstrate the gradual deepening of economic cooperation with the European Union (Figures 1–4).

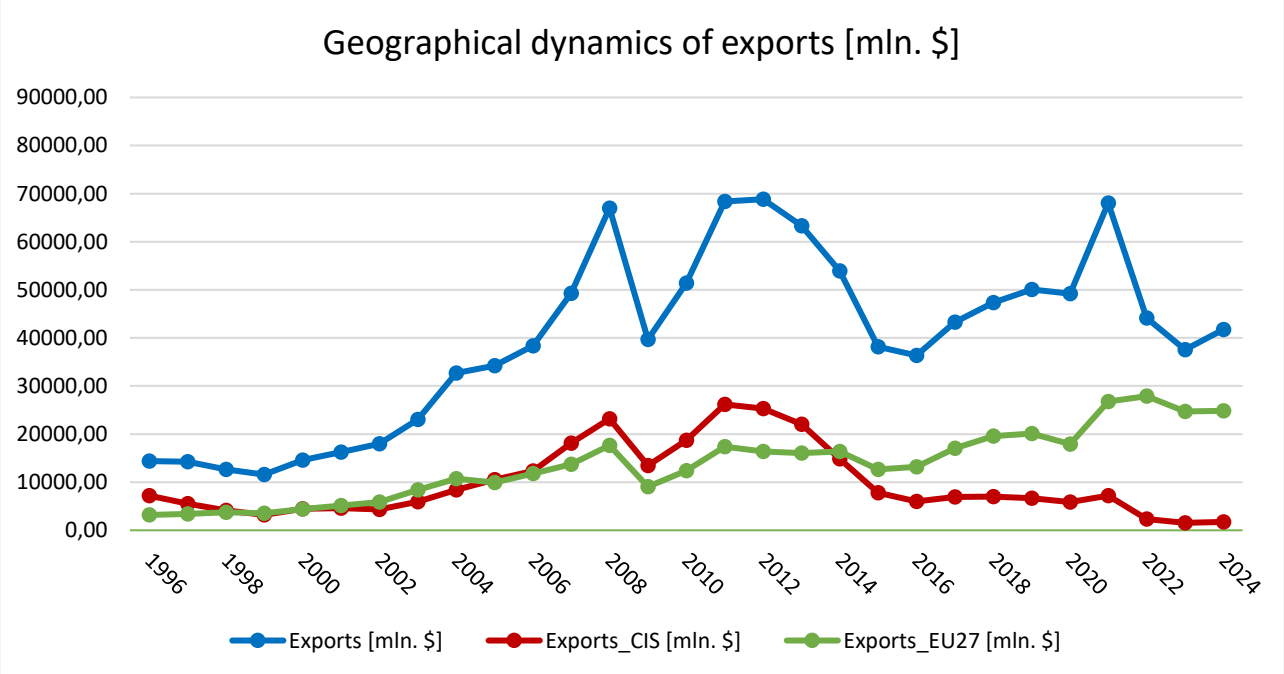


Fig. 1. Geographical dynamics of exports, million USD

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

Fig. 1 shows the dynamics of Ukraine's exports for 1991–2025 in terms of geographical structure. It can be seen that in the 1990s the CIS market remained dominant, but since 2004 the EU's share has been steadily growing. After signing the Association Agreement and introducing the DCFTA, the EU consolidated its position as Ukraine's main trading partner, which was especially evident in 2014–2024.

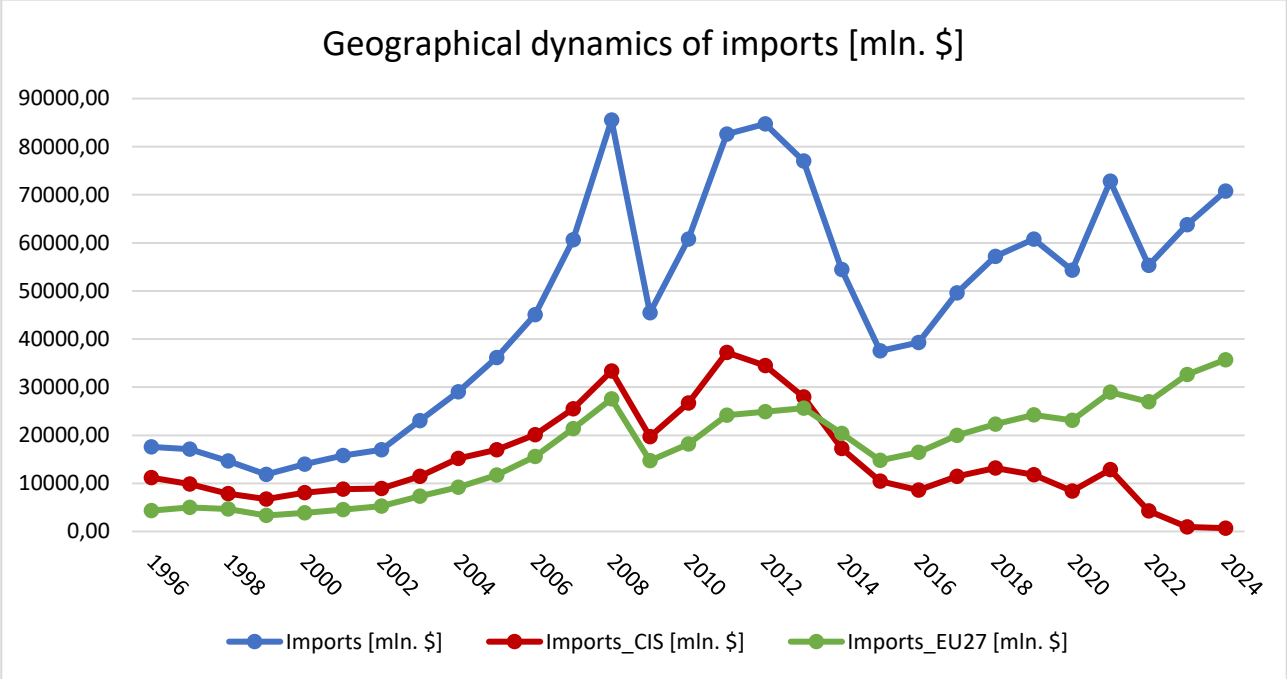


Fig. 2. Geographical dynamics of exports, million USD

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

A similar trend is observed in Fig. 2, which reflects the dynamics of imports. While in the 1990s, supplies from Russia and other post-Soviet states prevailed, Ukraine gradually reoriented itself to the European market. This is due to both trade liberalization and the desire of businesses to adapt production to EU standards.

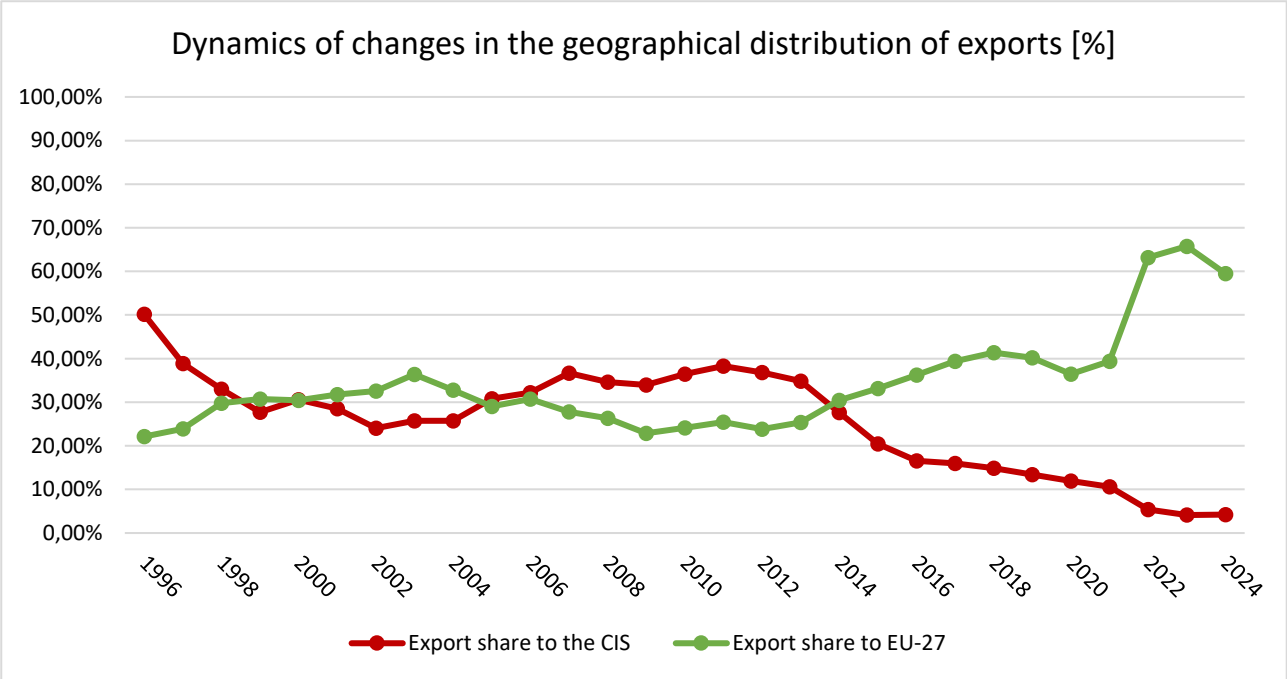


Fig. 3. Dynamics of changes in the geographical distribution of exports, %

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

Fig. 3 illustrates the share of Ukrainian exports to the EU and the CIS in percentage terms. The data confirm a structural shift: if in the mid-1990s the CIS share exceeded the EU share by several times, then after 2014 the situation changed to the diametrically opposite one – more than 40% of Ukrainian exports are steadily directed to the European Union.

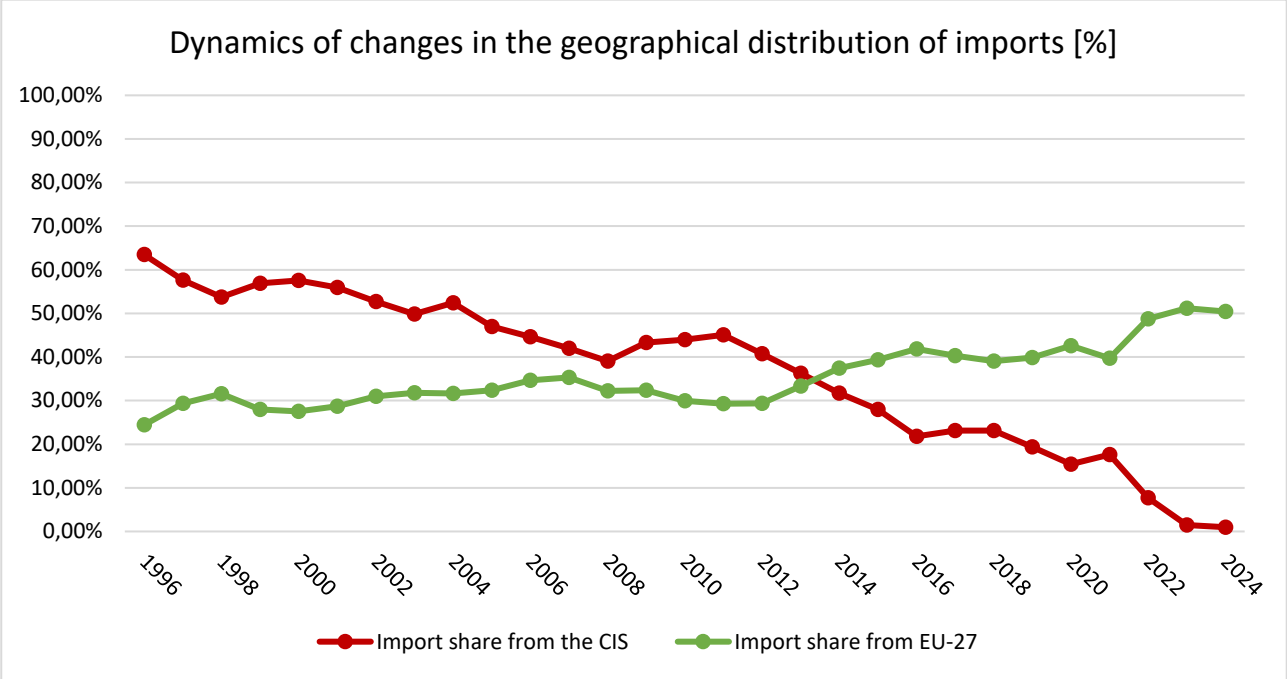


Fig. 4. Dynamics changes geographical distribution import, %

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

No less revealing is Fig. 4, which shows the change in the share of imports. The gradual diversification of supply sources and the reduction of dependence on the Russian market indicate a purposeful policy of economic integration and Ukraine's desire to ensure energy and technological security through cooperation with the EU.

Overall, the above reflects a key trend: within three decades of the restoration of independence, a radical reorientation of Ukraine's foreign economic relations from the post-Soviet space to the European Union took place. This process became the material basis of Ukraine's political and economic integration into the EU, which is further examined by distinguishing four stages of Ukraine's integration into the EU, each of which had its own political and economic characteristics and reflected Ukraine's gradual rapprochement with the European Union.

The first stage – 1991-2003 – the first steps of integration and economic transformation. What is decisive for this period is that since the declaration of independence, Ukraine has identified the European direction of development as a strategic priority, although in the 1990s, this course was often declarative. In 1994, the Partnership and Cooperation Agreement with the EU was signed, which entered into force in 1998 and created the basis for political dialogue, trade and economic cooperation, but did not yet foresee the prospects of membership [21].

The economy of Ukraine during this period was in a deep transformation crisis. During 1991–1999, GDP more than halved, industrial production fell by 48%, and inflation in 1993 exceeded 10,000% [18]. In such conditions, foreign trade with the EU was of limited importance, although the share of exports, which arrived in the European and market.

It is obvious that the transport sector of the Ukrainian economy felt the consequences of the general economic crisis. The volume of freight transportation decreased by 2.5 times compared to 1990, and the infrastructure suffered from chronic underfunding [19]. Ukraine retained its transit potential, but did not use it fully, which did not contribute to accelerating the overcoming of crisis processes in the economy.

The second stage – 2004–2013 – political changes and rapprochement with the EU. The defining event in this period was the "Orange Revolution" of 2004, which became a turning point in the political history of Ukraine. It clearly fixed the pro-European course of the state. During this period, Ukraine joined the "Eastern Partnership", and in 2007 began negotiations on an Association Agreement with the EU.

The macroeconomic situation in 2000–2008 was characterized by high rates of economic growth: the average annual GDP growth was about 7%, which corresponded to the laws of "catch-up development" [9]. However, the global financial and economic crisis of 2008–2009 led to a 15% drop in

GDP and demonstrated the vulnerability of the domestic economy. economy dependent on the export of metals and chemical products [1].

There were gradual changes in the field of logistics and transport. Freight transport by rail remained key for the export of metallurgical products, but the volume of road transport began to grow due to gradual integration with European markets [2]. The lack of modern infrastructure and complex customs procedures were still serious barriers to the development of the freight transportation and transport logistics market.

The third stage – 2014–2021 – the Revolution of Dignity, association and conclusion of the Deep and Comprehensive Free Trade Agreement. During this period, it was the Revolution of Dignity in 2014 that radically changed the political and economic course of Ukraine. The refusal of the Yanukovych government to sign the Association Agreement with the EU caused mass protests, which ended with a change of power and the final choice of the European vector. In June 2014, the Association Agreement with the EU was signed, and the DCFTA began to operate in 2016.

At this time, the EU became Ukraine's main trading partner, accounting for over 40% of exports [5]. The structure of exports changed, with a decline in supplies of metals and chemicals and an increase in the share of agricultural products. This reflected, on the one hand, Ukraine's loss of industrial potential, and, on the other, a reorientation towards more competitive segments.

The transport and logistics sector of Ukraine has received a new impetus for development at this time. The Law of Ukraine No. 1887-IX "On Multimodal Transportation" [14] established the legal framework for integration into the European transport system. The role of road transport has increased: the volume of cross-border road transport to EU countries doubled in 2014–2020 [19]. Ukraine has gradually adapted its standards to European requirements in the field of transport and logistics.

The fourth period – 2022 – until now – war and accelerated integration. At this time, the full-scale Russian invasion in February 2022 became an unprecedented challenge for the economy and society of Ukraine. The GDP drop in 2022 was about 29% [18]. The loss of access to seaports on the Black Sea has sharply reduced export opportunities, especially for grains and metals.

In these conditions, transport integration with the EU has become critically important. An agreement on "transport visa-free travel" was concluded, which allowed Ukrainian carriers to carry out cargo transportation to the EU without the need to obtain separate permits. Ukraine joined the Convention on Common Transit (NCTS) [15], which significantly simplified customs procedures. In 2022, the EU also included Ukrainian transport routes in the TEN-T network [13].

Therefore, the importance of road transport in transportation has increased significantly: in 2021, about 35% of agricultural exports were transported by road, while in 2023 this figure exceeded 65% [22]. At the same time, the sharp increase in the load on the infrastructure revealed bottlenecks: insufficient throughput capacity of checkpoints, a lack of modern logistics centers, and a shortage of rolling stock.

Ukraine's economy became even more dependent on the agricultural sector during this period. According to the European Commission [5], in 2022–2023, more than half of exports were agricultural products. This made the functioning of transport corridors critical not only for the Ukrainian economy but also for world food security.

Summarizing the features of the above stages, it should be noted that each stage of integration was accompanied by important macroeconomic changes. In the 1990s, it was about stabilization after a deep recession. transformational recession, in the 2000s – about rapid growth with high dependence on raw material exports, in the 2010s – about reorientation towards the EU and adaptation to the DCFTA conditions, and in the 2020s – about the survival of the economy in war conditions, which is largely due to accelerated transport integration with the EU.

In the difficult conditions of war, the transport sector, especially freight transportation, has become one of the key elements of Ukraine's integration with the EU. If at the initial stages it only reflected the infrastructure features and general trends of the economy, then in 2022–2024 it was its ability to ensure exports that determined the economic stability of the state. As Fernandes et al. emphasize [16] and Yanovska [22], transport and logistics integration has become a practical dimension of Ukraine's economic rapprochement with the EU, without which macroeconomic and political declarations would remain unrealized.

6. Conclusions

Ukraine's European integration is a complex and multifaceted process that combines political decisions, economic transformations and institutional changes. European integration processes in Ukraine are taking place gradually, in several stages, each of which has its own characteristics and consequences for the development of the state.

Summarizing the European integration processes in Ukraine, the following key conclusions should be highlighted:

- European integration has become a determining factor in the transformation of Ukraine's economy, changing its structure, sales markets, and institutional foundations;
- All stages of integration confirm the provisions of the convergence theory: a country with a lower level of development can benefit from access to more developed and capacious markets and technologies, but the speed and quality of this process depend on overcoming institutional barriers, in particular corruption and weak public administration, which remain the main obstacle to integration;
- Integration is accompanied by an uneven distribution of benefits: the agricultural sector benefits the most, while industry and mechanical engineering often lose competitive positions [1]; [11];
- Logistically – the transport sector, especially freight transport, has become crucial after 2022. Its integration into EU systems (NCTS, TEN-T, visa-free travel) has become not only a condition for trade, but also a guarantee of economic stability.

The prospects for Ukraine's further integration into the EU depend on its ability to combine macroeconomic stabilization, structural reforms, and infrastructure modernization. If institutional barriers are overcome and the transport and logistics system is integrated into the European network, Ukraine will be able to fully realize the potential of convergence and gradually noticeably to reduce the gap in development levels with EU countries.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Assessment of Environmental Risks and Their Impact on the Sustainable Socio-Economic Development of Territorial Communities

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.11

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ABSTRACT

The relevance of this study stems from the growing impact of environmental risks on the socio-economic resilience of territorial communities in Ukraine amid wartime destruction, climate change, and the ongoing transformation of the public governance system. The deterioration of environmental quality, depletion of natural resources, and increasing technogenic pressures directly affect population well-being, territorial investment attractiveness, and overall quality of life. This necessitates the development of a new system of local environmental governance focused on risk prevention, the integration of environmental indicators into strategic development planning, and the enhancement of decision-making efficiency at the local level. The purpose of the article is to assess environmental risks and determine their impact on the sustainable socio-economic development of territorial communities amid wartime and post-war transformations and the growing environmental responsibility of local self-government bodies. The study employs general scientific methods – analysis, synthesis, induction, and deduction – to systematize approaches to environmental risk assessment and to determine their influence on community development. The comparative method is used to analyze national and international practices of environmental risk management, while the generalization method serves to formulate practical recommendations. Statistical and logical-analytical approaches made it possible to identify interrelations between environmental conditions, economic indicators, and the quality of life of the population. The study identifies the structure and scale of environmental risks arising from air pollution, land and water degradation, ecological imbalance, and the technogenic consequences of Russia's aggression against Ukraine. It has been established that such risks reduce the level of economic activity of territorial communities, negatively affect public health, and slow down local development. The main barriers to effective environmental risk management have been identified as the fragmentation of environmental monitoring systems, insufficient funding for environmental programs, a shortage of qualified personnel in environmental management, and the lack of integrated governance mechanisms for environmental security. It has been proven that environmental risks have a multidimensional impact on the financial, social, and demographic stability of territorial communities. The study substantiates the need to establish a unified digital environmental monitoring platform, strengthen the human and institutional capacity of local authorities, diversify sources of environmental financing, and transition to preventive, data-driven environmental management based on open data and multi-sectoral partnerships among state, municipal, private, and civil society actors. Future studies should focus on developing an integrated index of community environmental sustainability, improving spatial planning mechanisms that account for environmental risks, and assessing the effectiveness of environmental policy during the post-war recovery of Ukrainian territories.

KEYWORDS

environmental security, community resilience, environmental monitoring, risk management, socio-economic stability, territorial recovery.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Оцінка екологічних ризиків та їх вплив на сталий соціально-економічний розвиток територіальних громад

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СТАТТЯ

Дослідницька

DOI:
10.70651/3083-6018/2025.10.11

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АНОТАЦІЯ

Актуальність дослідження зумовлено зростанням впливу екологічних ризиків на соціально-економічну стійкість територіальних громад України в умовах воєнних руйнувань, кліматичних змін та трансформації системи публічного управління. Погіршення якості довкілля, деградація природних ресурсів і зростання техногенного навантаження безпосередньо впливають на добробут населення, інвестиційну привабливість територій і загальну якість життя. Це вимагає формування нової системи локального екологічного управління, орієнтованої на запобігання ризикам, інтеграцію екологічних індикаторів у стратегічне планування розвитку громад і підвищення ефективності управлінських рішень на місцевому рівні. Метою статті є оцінка екологічних ризиків і визначення їхнього впливу на сталий соціально-економічний розвиток територіальних громад в умовах воєнних та післявоєнних трансформацій і зростання екологічної відповідальності органів місцевого самоврядування. У роботі застосовано загальнонаукові методи – аналіз, синтез, індукцію та дедукцію – для систематизації підходів до оцінювання екологічних ризиків і визначення їхнього впливу на розвиток громад. Порівняльний метод використано для зіставлення національної та міжнародної практики управління ризиками довкілля, а метод узагальнення – для формування практичних рекомендацій. Статистичний аналіз і логіко-аналітичний підхід дали змогу встановити взаємозв'язки між станом природного середовища, економічними показниками та якістю життя населення. Досліджено структуру та масштаби екологічних ризиків, що формуються внаслідок забруднення атмосферного повітря, деградації земельних і водних ресурсів, порушення екологічної рівноваги та військово-техногенних наслідків російської агресії. Встановлено, що такі ризики знижують рівень економічної активності територіальних громад, негативно впливають на здоров'я населення та уповільнюють темпи місцевого розвитку. Виявлено основні бар'єри ефективного управління екологічними ризиками: фрагментарність системи моніторингу довкілля, нестачу фінансування природоохоронних програм, кадровий дефіцит у сфері екологічного менеджменту та відсутність інтегрованих управлінських механізмів екологічної безпеки. Доведено, що екологічні ризики мають багатовимірний вплив на фінансову, соціальну та демографічну стабільність територіальних громад. Обґрунтовано потребу у створенні єдиної цифрової платформи моніторингу стану довкілля, підвищенні кадрового потенціалу місцевих органів влади, розширенні джерел екологічного фінансування та переході до превентивного управління природоохоронною діяльністю на основі відкритих даних і партнерської взаємодії між державними, муніципальними, приватними та громадськими структурами.

КЛЮЧОВІ СЛОВА

екологічна безпека, стійкість громад, моніторинг довкілля, управління ризиками, соціально-економічна стабільність, відновлення територій.

1. Introduction

Modern socio-economic development of territorial communities is increasingly dependent on environmental factors. The environmental impact no longer seems to be just a background – it shapes the living space, determines how attractive the community is to the investor, or even, viable in the long term. Problems that until recently were perceived as local – soil pollution, depletion of water resources, changes in the microclimate – are now intertwined into a broader system of risks affecting the economy, social processes, and public health. Sometimes the consequences of these risks do not appear immediately: they accumulate, reducing productivity, increasing health care costs, and creating a feeling of gradual degradation of natural capital.

Decentralization, which was supposed to provide communities with greater autonomy, at the same time opened up several new management tasks. When powers are transferred to the local level, the responsibility of local self-government bodies, in particular for the state of the environment, also increases. However, the monitoring system remains fragmented. Environmental indicators are often left out of strategic development documents, as if they were an appendix, not a basic element. Often, communities do not have reliable data to realistically assess the scale of environmental threats and potential losses. Added to this is the lack of financial resources for the implementation of environmental programs, the lack of trained specialists and the heterogeneity of information sources. Because of this, management decisions are made based on partial or incomplete data, without proper analytical validity.

In a scientific and practical sense, the issue of assessing environmental risks for the sustainable development of territorial communities is becoming more and more important. It is not only about the creation of individual methods – it is important to learn to see the relationship between the natural, social and economic environments. The formation of integrated approaches here is not so much a technical as a conceptual task: how to combine environmental policy with local development programs, how to avoid duplication of functions, how to create real decision-making mechanisms based on verified data. It is obvious that the effectiveness of such systems is still far from desirable, and therefore, the issue of finding a balance between the environmental and socio-economic interests of communities remains open.

2. Literature Review

The study of the assessment of environmental risks and their impact on the sustainable socio-economic development of territorial communities is carried out in four interrelated areas, covering institutional-economic, analytical-environmental, socio-financial and security-recovery aspects of sustainability.

Within the first direction – institutional and economic – attention is focused on management mechanisms for the sustainable development of communities and the transformation of their economic models under the influence of environmental factors. N. Petrukha and V. Brych proved that institutional consistency and regulatory support are the basic prerequisites for reducing environmental risks in the activities of agricultural enterprises, as well as for the formation of financial sustainability of territorial communities [1]. V. V. Faifura et al. determined that environmental modernization of territorial communities is an effective tool for the transition to a "green" economy, as it contributes to the harmonization of economic and environmental goals [2]. T. Nazarova and V. Lynnyk showed that the effectiveness of local self-government reforms largely depends on the integration of environmental risks into the system of strategic planning of community development [3].

The second direction – analytical and environmental – is related to the development of systems of indicators, indicators and methods for assessing the balance of territorial development. O. V. Mykhailovska and M. S. Tatarchuk determined that the ecological balance of community development should be assessed through integrated indicators that combine the state of natural resources with socio-economic parameters [4]. A. Vysochyn et al. proved that environmental risks significantly affect the financial stability of territorial communities, causing the redistribution of budget resources to eliminate the consequences of natural and man-made threats [5]. H. V. Mudrak proposed a multi-level system of environmental, social and economic indicators for assessing the sustainable development of the communities of Eastern Podillia [6]. O. Hrynkevych et al. emphasized the importance

of environmental indicators for strategic diagnostics of territorial development and emphasized the need to introduce digital tools to monitor the dynamics of environmental risks [7].

The third direction – socio-financial – is devoted to assessing the socio-economic potential of territorial communities in the context of environmental safety and sustainable development. L. P. Horbata substantiated that information and digital transformations of society create new risks for the environmental sustainability of communities, in particular those related to limited access to environmental information and digital inequality [8]. O. Uhodnikova et al. have developed a model for assessing the socio-economic potential of territorial communities, in which environmental safety is a systemic factor of regional competitiveness [9]. O. Marukhlenko et al. showed that the development of community potential as a factor of socio-ecological progress requires the integration of managerial, economic and environmental approaches [10]. N. Tkalenko et al. proved that the environmental component of sustainable development is a determining element of the financial stability of communities, and its underestimation leads to an increase in environmental and social risks [11].

The fourth direction – security and recovery – includes the study of the impact of hostilities and global threats on the environmental sustainability of territorial systems. I. Irtyshcheva et al. showed that Russian aggression has led to an increase in environmental risks due to the destruction of industrial and municipal infrastructure, pollution of soil, water and air resources, as well as the loss of biodiversity, which creates long-term threats to the sustainability of communities [12]. N. Bielikova and O. Levanda found that hostilities have a cumulative negative effect on the environment, emphasizing the need for an international mechanism for assessing environmental damage and implementing strategies for environmental restoration of the territories of Ukraine [13].

3. Problem Statement

Despite the available research in the field of environmental management, there is no systematic classification of environmental risks in communities and effective methods of their assessment and inclusion in socio-economic planning. The relationship between environmental threats, the well-being of the population and the investment attractiveness of territorial communities has not been sufficiently clarified. The limited empirical data and fragmentary monitoring reduce the accuracy of previous results. The authors' study aims to create an integrated approach to the classification and assessment of environmental risks, improve the analysis of their impact on community development using statistical, comparative and spatial-analytical methods, as well as propose practical mechanisms of integrated management to increase the environmental sustainability of territorial systems.

4. Methods and Materials

The article is aimed at assessing environmental risks and determining their impact on the sustainable socio-economic development of territorial communities and strengthening the environmental responsibility of local self-government bodies.

To achieve this goal, the following tasks are provided:

1. To determine the essence, typology and key determinants of environmental risks of territorial communities and their connection with the parameters of sustainable development.
2. To analyze scientific approaches to assessing environmental risks and establish their impact on socio-economic indicators of community development.
3. To substantiate the directions for improving the system of management, monitoring and minimization of environmental risks to strengthen the sustainability of local development.

5. Results and Discussion

Environmental risks are a determining factor in the sustainable development of territorial communities, as they reflect a set of threats arising under the influence of natural, man-made and socio-economic factors. Their content covers the probability of occurrence of environmental events, the scale of possible losses and the ability of the management system to respond to them. Within communities, such risks manifest themselves in land degradation, water pollution, loss of biodiversity, deterioration of air quality, increased waste and reduced ecosystem resilience. Their classification by sources, scale,

duration and predictability allows streamlining the assessment of threats and creating the basis for the formation of effective mechanisms for managing the sustainable development of territories (Table 1).

Table 1. Classification of environmental risks of territorial communities

Classification criterion	Risk groups	Characteristics of manifestations
By source of occurrence	Natural, man-made, socio-economic	Natural disasters, accidents, pollution as a result of the economic activity of enterprises, irrational land use
By the scale of action	Local, regional, cross-border	From minor local disturbances of ecosystems to global climate change
By duration of exposure	Short-term, medium-term, long-term	Temporary consequences of accidents or persistent processes of environmental degradation
According to the possibility of forecasting	Predictable, unpredictable	Evaluated by environmental monitoring models or sudden events without preliminary indicators
According to the degree of controllability	Managed, partially managed, unmanaged	Possibility of influence of public authorities on the sources and consequences of risk through regulatory, technological, or organizational measures

Source: Formed by the authors based on [4; 6; 7; 10; 12; 13].

In modern conditions, the practical application of the classification of environmental risks makes it possible to identify the systemic nature of threats that combine natural, man-made and anthropogenic factors. One of the largest examples in recent years was the explosion of the Kakhovka hydroelectric power plant dam in June 2023. According to a report by the United Nations Environment Program (UNEP), the flooding area exceeded 600 km^2, and water losses amounted to about 14 km^3, which caused degradation of coastal ecosystems, soil erosion, fish deaths and large-scale pollution with residues of petroleum products and heavy metals. More than 30 zones of potential environmental pollution have been identified, where the level of lead and copper content exceeds the permissible concentrations by 3–6 times [14]. This case illustrates long-term, regional, and partially manageable risks that go beyond the boundaries of a single community and require many years of environmental monitoring, soil restoration, and floodplain reclamation.

At the same time, for many Ukrainian communities, local man-made risks associated with air quality are becoming more and more relevant. Data from the SaveEcoBot open ecological network show that in September 2025, the average daily concentrations of fine particles $PM_{2.5}$ in industrial centers, in particular in Dnipro, Kryvyi Rih, and Zaporizhzhia, consistently exceeded the level of 50 μg/m^3, i.e. 3–4 times higher than the WHO recommendations [15]. This situation forms chronic risks of medium duration, which directly affect the morbidity of the population, reduce working capacity and increase social costs for health care. In addition, against the backdrop of the ongoing war, the number of combined environmental risks has increased sharply. According to the Ministry of Environmental Protection and Natural Resources of Ukraine, as of mid-2025, more than 9 thousand cases of environmental damage were recorded, and the amount of environmental damage exceeded €108 billion [16]. These losses include land contamination with explosives, destruction of industrial facilities, loss of forest resources, and large-scale fires in communities. According to the classification, such risks are mixed, long-term and partially unmanageable, because they combine military, industrial and natural consequences that require international monitoring, comprehensive environmental audits and infrastructure restoration. Thus, the application of the environmental risk classification system in modern Ukrainian realities makes it possible to scientifically determine the priorities of environmental policy, form hazard maps for communities and ensure the integration of environmental measures into sustainable development strategies. This confirms that environmental risk management has become not only an environmental but also a socio-economic task on a national scale.

Environmental risk assessment is based on a systematic analysis that combines quantitative measurements of natural and man-made threats with a qualitative study of their socio-economic consequences. Quantitative methods cover the parameters of pollutant concentration, toxicity, degradation areas, waste volumes and the probability of accidents. Qualitative – reflect the perception of risk, the effectiveness of institutional response mechanisms, the level of community resilience. The most effective are integrated approaches that combine these indicators in a single risk matrix. Such a combination allows taking into account not only natural and technical, but also socio-behavioral factors, increasing the accuracy of determining the priorities of environmental policy at the local level (Table 2).

Table 2. Basic scientific approaches to quantitative and qualitative assessment of environmental risks

Approach	Methodological framework	Advantages	Restriction	Examples of practical use
Quantitative	Probabilistic and statistical models, GIS mapping, loss calculation	Objectivity, comparability of indicators, and forecasting of consequences	Need for reliable data, high cost of monitoring	Calculation of damage from air pollution, mapping of environmental hazard zones
Quality	Expert assessments, vulnerability analysis, DPSIR and SWOT models	Flexibility, taking into account local specifics, community involvement	Subjectivity, complexity of formalization	Identification of socio-environmental priorities of the territorial community, adaptation of local development strategies to environmental risks, and formation of response plans
Integrated	A combination of quantitative and qualitative indicators, construction of integral risk indices	Consistency, adaptability, and the possibility of integration into planning	The need for cross-sectoral coordination	Formation of environmental passports of communities, risk assessment in river basin management plans

Source: Formed by the authors based on [1; 5; 6; 7; 9; 11].

In modern ones, it is territorial communities that have become the basic level of implementation of quantitative and qualitative approaches to environmental risk assessment. This is due to the fact that environmental processes – air pollution, land degradation, changes in the hydrological regime – manifest themselves locally, and therefore risk assessment and management should be carried out where the primary threat is formed. In practice, quantitative methods are used by communities in the form of official calculations of losses according to state methods. For example, according to the Order of the Ministry of Energy and Environmental Protection No. 277 of 28.04.2020, communities have the right to record the facts of excess emissions and file claims for damages. In 2024, such lawsuits were filed by Ivano-Frankivsk and Kryvyi Rih communities against industrial enterprises, which made it possible to direct the received compensation funds (more than UAH 40 million) to local budgets for environmental programs [17]. This is an example of a quantitative approach that directly strengthens the financial capacity of communities to manage risk. Integrated approaches are manifested in planning based on environmental indicators. Thus, in accordance with the Order of the Cabinet of Ministers of Ukraine No. 1077-r of 1.11.2024 "On Approval of Management Plans for the River Basins of the Dnipro and Don for 2025–2030", communities located within sub-basins must conduct a self-assessment of water management risks and determine the priorities of investments in treatment facilities, floodplain reclamation and wastewater control. Within the framework of this approach, communities act not as objects, but as subjects of spatial risk management, coordinating their actions with basin structures and state water policy [18]. On the example of the Desnyansky Basin Department of Water Resources, which in 2024 presented the Dnipro Basin Management Plan 2025–2030, a cartographic model of risks for local councils of Chernihiv, Kyiv and Poltava regions has already been formed. It includes layers of spatial data on the state of water bodies, sources of pollution and predicted scenarios of flood threats. This allows communities to scientifically choose sites for the reconstruction of reclamation systems and determine the territories where new construction is prohibited [19].

The impact of environmental risks on the socio-economic development of territorial communities is multidimensional and mutually reinforcing. Natural and man-made threats affect the well-being of the population, the state of the environment, the level of employment, the value of real estate and the dynamics of investments in the local economy. Water and air pollution, soil degradation and depletion of natural resources cause a decrease in the environmental sustainability of territories and an increase in social costs of communities: the morbidity of the population increases, and the recreational functions of natural areas are lost. For local governments, this means reducing tax revenues to local budgets, reducing the cost of land plots, increasing spending on the health care system and eliminating the consequences of environmental emergencies. A low level of environmental safety reduces the investment attractiveness of communities, forming a closed cycle: degradation of the natural

environment leads to economic recession, and the lack of financial and human resources leads to the impossibility of implementing environmental protection measures (Table 3).

Table 3. Relationship of environmental risks with socio-economic indicators of the development of territorial communities

Risk category	Socio-economic manifestation	Typical indicator	Economic consequence	Social consequence
Air pollution	Increase in morbidity of the population, decrease in working capacity	Number of days with excess MPC $PM_{2.5}$	Decrease in the level of labor productivity, increase in the budget, and household expenditures on health care	Deterioration in the quality of life, shortening of life expectancy
Land and water degradation	Reduced yield, loss of agricultural potential	Heavy metal content in the soil and the salinity level	Decrease in agricultural sector incomes, rising unemployment	Migration of the population from rural areas
Military-man-made environmental consequences	Destruction of infrastructure, pollution of territories	Area of contaminated or flooded land	Decrease in investment attractiveness, increase in the budget burden	Social destabilization, deterioration of public health, and living conditions
Disturbance of the ecological balance in urbanized areas	Overloading of engineering infrastructure, reducing living comfort	Urban Pollution Index (AQI)	Increase in housing and communal services, decrease in the market value of housing	Deterioration of the psycho-emotional state of the population

Source: Formed by the authors based on [2; 3; 5; 10; 11; 12].

In modern conditions, environmental risks are increasingly determining the socio-economic dynamics of territorial communities of Ukraine. Their impact is manifested both through direct economic losses and through long-term social consequences – deterioration of public health, migration processes, and a decrease in investment attractiveness. health care costs by 10–15% compared to areas with better environmental performance [20]. High concentrations of particulate matter $PM_{2.5}$ and NO_2 in industrial cities of Ukraine, according to the NGO "SaveDnipro", in 2023–2024. exceeded the WHO norms by 3–6 times, which, according to environmentalists, led to the loss of more than UAH 5 billion of economic potential due to a decrease in labor productivity [21]. The military-man-made consequences of Russian aggression significantly increase the negative impact of environmental risks on the natural environment and the socio-economic sustainability of territorial communities. According to the report of the United Nations Environment Programme (UNEP) and the UNECE (UNECE), as of the end of 2023, more than 30% of the territories of the southern and eastern regions of Ukraine suffered environmental damage – soil pollution with heavy metals, destruction of hydraulic structures, secondary flooding and fires at industrial facilities [22]. The scale of these destructions directly affects the dynamics of the recovery of the local economy: the level of investment in infrastructure reconstruction remains 40–50% lower than before the war, while unemployment in the agro-industrial complex and logistics sectors increased by 20–25%.

In the south of Ukraine, in particular in the Odesa region, the total environmental damage for 2022–2025. are estimated at more than UAH 39 billion, and the losses of the recreational potential of coastal areas exceed 15% of the pre-war level [23]. In parallel with economic losses, a tendency of socio-ecological depletion of the population is formed. According to the scientists of KPI. I. Sikorsky, long-term air pollution in industrial agglomerations causes an increase in respiratory morbidity by 18–22%, which directly correlates with a decrease in the Human Development Index (HDI) of territorial communities [24].

As a result, environmental risks turn into a system-forming determinant of the quality of life of the population. They not only worsen the state of the environment, but also modify the economic behavior of households, the structure of the labor market, the volume of medical expenses and demographic dynamics. Empirical studies and regional assessments by UNEP and SaveDnipro show that in communities with high levels of air pollution, health care costs account for up to 12% of local budgets, and the average life expectancy decreases by 2–3 years compared to areas with better environmental

conditions [4]. Thus, environmental risks are an integral factor in the socio-economic stability of the community, determining its financial stability, competitiveness and investment potential. The inclusion of environmental safety indicators in the system of socio-economic planning for the development of territories should become a necessary condition for achieving real sustainable development.

The environmental risk management system in Ukrainian communities remains fragmented. In some communities, there are laboratories for monitoring the state of air, water and soil, while in others there are not even basic observation posts. The state network of environmental monitoring is concentrated mainly in regional centers, so more than 60% of territories remain "blank spots" in the system of state control [11]. Data on the state of the natural environment are collected by various institutions – the State Environmental Inspectorate, the State Food and Consumer Service, water management departments – according to different methods, which leads to statistical inconsistency of indicators and makes it impossible to build an integrated database. As a result, the creation of risk maps acquires the character of reconstruction, rather than system analytical modeling.

The financial aspect is another critical link in environmental management. In most communities, environmental protection funds do not exceed 1% of local budgets, which provides funding only for current activities – cleaning of territories, local eco-actions, or information campaigns [8]. Reconstruction of sewage treatment plants, land reclamation, and investments in green infrastructure are postponed indefinitely. Grant initiatives are implemented sporadically, without the formation of stable mechanisms for attracting private capital.

Staffing also remains insufficient: in small communities, ecologist positions are often nominal or combined with other administrative functions, which reduces the professional quality of decision-making. The lack of trained specialists in the field of environmental management and the system of advanced training at the local level exacerbates the management gap between communities. The regulatory framework does not provide a clear vertical of responsibility: the separation of powers between state and local bodies remains unclear, and the control mechanisms are declarative.

The information component of the problem acquires security significance. The population practically does not have access to operational environmental information: there is a lack of open digital monitoring panels, local notification systems and reliable communication channels. This reduces the level of trust in environmental policy and inhibits citizens' participation in environmental initiatives. During the war, the situation was complicated by damage to solid waste landfills, destruction of sewage treatment plants and water supply systems. Environmental risks have ceased to be purely man-made, transforming into a factor of humanitarian security.

In modern conditions, environmental management in territorial communities of Ukraine is mostly reactive and functions not as an integral system, but as a set of individual actions aimed at eliminating existing consequences. Management decisions are mostly made situationally, without taking into account long-term environmental, economic and social consequences. Gaps persist between management sectors, and insufficient coordination between levels of government, which reduces the effectiveness of environmental policy. In 2022–2025, the defensive logic of response dominated in most communities, when actions were aimed not at preventing risks, but at eliminating their consequences, which is contrary to the principles of sustainable development [3].

Improving the effectiveness of environmental risk management requires a transition to an analytically oriented model based on the integration of monitoring, forecasting and response within a single management cycle. It is possible to implement such a model through the creation of a national digital environmental platform that will combine state databases (State Environmental Inspectorate, Ukrhydrometeorological Center), the results of public monitoring ("SaveDnipro", "SaveEcoBot"), satellite observations of the Copernicus program and open geographic information resources [6]. Within such a platform, risk maps should be generated in real time as an analytical forecasting tool, and not as post-factum reporting. Pilot elements of such a system are already being implemented in the Dnipro and Kyiv water basins in accordance with the River Basin Management Plans for 2025–2030 [7].

Along with digitalization, environmental governance needs institutional strengthening. In communities, it is necessary to create permanent units for environmental risk assessment and sustainable development planning, which should include analysts, environmentalists, crisis managers and GIS specialists. The effectiveness of such structures is determined not by the number of personnel, but by the quality of competencies – the ability to integrate environmental indicators into financial, spatial and investment decisions. Empirical studies confirm that the presence of a specialized analytical

unit in the structure of the community increases the efficiency of the use of the environmental fund by an average of 25% [8].

The financial basis of environmental policy needs to be shifted from the residual principle to the investment approach. Relying solely on local budgets is ineffective: in 2024, the average volume of environmental protection funds was only 0.9% of community revenues. The development of public-private partnerships and grant funding (European Investment Bank, Green Climate Fund, LIFE Program) opens up opportunities for the modernization of wastewater treatment plants, water treatment systems, landfill reclamation and the creation of green infrastructure. According to UNECE, communities participating in international environmental programs demonstrate an increase in the environmental capacity index by 30–35% [22].

The integration of environmental indicators into the system of socio-economic planning is not a formality, but a mechanism for harmonizing development policy with environmental priorities. The inclusion of indices of the state of the environment, pollution level and number of emergencies in community passports provides a link between budgetary, spatial and strategic planning. Municipalities that have introduced a system of integrated environmental passports have achieved a 12% reduction in the share of accidental emissions and a 20% increase in the transparency of financial reporting.

An important direction is the development of early warning systems and local environmental communication. The practice of public eco-monitoring shows that notifying the population through open online panels and mobile applications reduces the number of environmental incidents by an average of 15% [11]. Such decisions not only increase the level of trust in the authorities, but also form a culture of co-responsibility for the environment.

Therefore, in the future (from 2025), the construction of an effective system for assessing and minimizing environmental risks should be based on preventive, integrated and digitally supported management logic that combines open data, cross-sectoral coordination and institutional interaction. This approach allows us to consider environmental safety not as an auxiliary direction of environmental protection, but as a key element in restoring the socio-economic stability of territorial communities in the war and post-war periods.

6. Conclusions

In the course of the study, it was found that environmental risks are a key factor that determines the socio-economic sustainability of territorial communities in the current conditions of war and post-war transformations. It has been revealed that the main problems of effective environmental risk management are fragmentation of monitoring, limited funding of environmental measures, lack of an integrated analytical management system, insufficient institutional capacity of communities and low level of environmental awareness of the population. It has been determined that the consequences of environmental threats directly affect the well-being of the population, investment attractiveness, employment and environmental quality, creating a multiplier effect of economic losses and social destabilization. It is recommended to form a unified digital system of environmental monitoring, integrate environmental indicators into strategies for the socio-economic development of communities, develop professional units for environmental risk management and diversify sources of funding through international environmental programs. The need to transition to a preventive, data-oriented management model based on open data, intersectoral coordination and partnership of communities with scientific and business structures was emphasized. Prospects for further research are to develop a methodology for an integrated index of environmental sustainability of communities, model the impact of risks on indicators of human development, and create scenario forecasts of ecosystem transformation in the process of post-war restoration of territories.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



E-Commerce 3.0: Integrating Mobile, Social and Omnichannel Trade into Digital Entrepreneurship

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.14

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ABSTRACT

The relevance of the study lies in the fact that E-commerce 3.0 represents a new phase in the digital transformation of trade and entrepreneurship, driven by the integration of mobile, social, and omnichannel commerce into a unified customer interaction platform. Over recent years, the growing importance of digital channels and shifts in consumer preferences have necessitated the adaptation of modern enterprises to new market demands, where traditional approaches to customer management and interaction are no longer effective. In Ukraine, where the development of e-commerce is gaining new momentum, the integration of modern digital solutions is particularly important for ensuring the competitiveness of enterprises in a global environment. The study aims to substantiate an integrated E-commerce 3.0 model, incorporating mobile, social, and omnichannel solutions for managing customer experience and data analytics. The paper proposes an enterprise readiness assessment system for digital integration. Using analytical, comparative, and structural–logical methods, the study synthesizes academic and industry sources from 2024–2025 and develops a digital maturity matrix of E-commerce 3.0 (dimensions: mobile, social, omni). The results reveal a clear relationship between the level of omnichannel coherence, the sophistication of customer data analytics (CDP/DWH, AI models), and key business indicators: increased conversion rates, repeat-purchase frequency, improved unit economics, reduced service costs, and faster response times. Practical priorities for digital investment are outlined, including mobile interaction, social-commerce tools, and a unified data layer supporting assortment management, pricing, and last-mile logistics. The conclusion is that the integrated E-commerce 3.0 architecture creates a client-centric decision-making system and can serve as a methodological basis for further quantitative studies on the relationship between channel integration and the financial performance of trade and distribution enterprises.

KEYWORDS

e-commerce 3.0, digital entrepreneurship, mobile commerce, social commerce, omnichannel strategy, trade organization, customer-data analytics, digital transformation.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

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Електронна комерція (e-commerce) 3.0: інтеграція мобільної, соціальної та омніканальної торгівлі у цифрове підприємництво

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.14

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АНОТАЦІЯ

Актуальність дослідження полягає в тому, що E-commerce 3.0 є новим етапом розвитку електронної комерції, який зумовлений інтеграцією мобільної, соціальної та омніканальної торгівлі в єдину платформу для взаємодії з клієнтами. За останні роки, зростання значення цифрових каналів і зміни у споживчих перевагах вимагають адаптації сучасних підприємств до нових вимог ринку, де традиційні підходи до управління та взаємодії з клієнтами вже не є ефективними. В Україні, де розвиток електронної комерції набуває нових темпів, інтеграція сучасних цифрових рішень стає особливо важливою для забезпечення конкурентоспроможності підприємств у глобальному середовищі. Метою дослідження є розробка інтегрованої моделі E-commerce 3.0, яка включає мобільні, соціальні та омніканальні рішення для управління клієнтським досвідом і аналізу даних. У роботі пропонується система оцінки цифрової зрілості підприємств, яка допомагає зрозуміти, як впровадження нових технологій може покращити не лише внутрішні процеси, але й взаємодію з кінцевим споживачем. У процесі дослідження проведено аналіз існуючих моделей цифрової торгівлі, розроблено матрицю цифрової зрілості E-commerce 3.0 і оцінено роль різних технологій, зокрема, Customer Data Platforms (CDP), Data Warehouses (DWH) та інструментів штучного інтелекту для прогнозування споживчих запитів і зниження витрат. Досліджено вплив мобільних додатків, соціальних мереж та омніканальних платформ на підвищення лояльності клієнтів, збільшення частоти покупок і поліпшення ефективності операцій. Висновки свідчать про те, що цифрова інтеграція E-commerce 3.0 дозволяє підприємствам не лише автоматизувати взаємодію з клієнтами, а й створювати нові можливості для персоналізації обслуговування. Водночас, для досягнення успіху необхідно забезпечити ефективну синергію між технологіями та організаційними процесами. Українські підприємства вже активно впроваджують окремі елементи цієї моделі, проте для успішної реалізації в повному обсязі потрібно подолати ряд бар'єрів, серед яких – недостатній рівень цифрової зрілості, відсутність узгоджених стандартів і кадрові проблеми.

КЛЮЧОВІ СЛОВА

електронна комерція 3.0, цифрове підприємництво, мобільна торгівля, соціальна комерція, омніканальна стратегія, організація торгівлі, аналітика клієнтських даних, цифрова трансформація.

1. Introduction

The global economy is entering a phase when e-commerce is no longer just a sales channel – it becomes a medium for the formation of a new business logic. What was called "online commerce" a decade ago is now transforming into a complex network of digital platforms integrated between mobile apps, social media, and physical touchpoints. It is this integration that forms the phenomenon that is increasingly referred to as E-commerce 3.0 – a stage where the digital presence of a business not only reflects its activities, but determines the ways of creating value.

The relevance of the topic is due not only to the speed of technological changes but also to the deep behavioral shifts of consumers. The generation of users who were born with a phone in their hands expects instant communication, personal experience and continuity of service – whether they buy in a mobile application or visit the sales floor. For enterprises, this means the need not just to "be online", but to create a unified digital commerce architecture where customer data analytics, mobile interaction, and omnichannel experiences become the core of competitive advantage.

Scientific interest in the problems of E-commerce 3.0 is due to the fact that this stage of development does not have an established theoretical model. If previous waves of e-commerce described technological progress (E-commerce 1.0 – online stores, E-commerce 2.0 – marketplaces), now the digital integration of entrepreneurship comes to the fore: the ability of businesses to synchronize digital channels with logistics, marketing and customer analytics. This shifts the focus from technical solutions to managerial competencies and strategic models that ensure resilience in a changing environment.

The problem is that the majority of domestic enterprises perceive e-commerce mainly as an "additional sales channel", not realizing its systemic potential in creating value. At the same time, the experience of international companies proves that mobile, social and omnichannel integration allows not only to increase sales, but also to form a new logic of relations between the enterprise and the consumer – based on data, trust and quick adaptation.

2. Literature Review

In the modern scientific discussion, the integration of mobile, social and omnichannel commerce is considered a key factor in the formation of the E-commerce 3.0 stage. In the works of B. Alexander and R. Varley, it is show that the combination of physical and digital consumer experience forms new "territories" of interaction with the buyer and rethinks the role of trade formats [2]. The study of H. Mehrabi et al. emphasizes the need to develop the analytical capacity of enterprises – the ability to work with customer data to make managerial decisions in the digital environment [15]. A similar conclusion is confirmed by M. A. Hossain et al., who propose a toolkit for evaluating "customer analytics" as a bridge between platform logic and the operational activities of the enterprise [11].

Behavioral differences between users of mobile devices and desktop computers are analyzed in detail in the work of A. Goldstein and Ch. Hajaj. It is shown that the difference in conversion paths requires a specific interaction design and measurement of channel performance [9]. In the field of social commerce (sales through social networks), an extended model of technology adoption for consumers is presented in the work of P. Sarker and colleagues [22]. The risks and limits of omnichannel are substantiated by S. M. Rahman and co-authors: without proper synchronization of sales, service and logistics processes, operating costs increase, and consequently, the economics of channel integration deteriorate [19]. A case study in the fashion segment (B. Khalid) confirms that customer satisfaction is formed due to the consistency of all points of contact, and not individual channels [13].

Analytical reports from leading organizations and companies complement the academic base. According to an analytical report by Deloitte, the key drivers of retail growth in 2025 are related to mobile transactions, social interaction, and personalization of offers [7; 8]. The Organization for Economic Co-operation and Development (OECD) outlines regulatory trends in digital trade – from cross-border data flow to transparency and security requirements – that define the framework for business models in different jurisdictions [17; 18]. McKinsey shows how AI-powered personalization is transforming marketing approaches, increasing the effectiveness of real-time offers [14], while industry

reviews of Shopify and GS1 US record an acceleration of the transition to mobile and omnichannel interaction scenarios [23; 10].

In the Ukrainian context, several publications note the role of C2C marketplaces in sustainable development and describe the mechanisms of digital innovations that reduce costs and strengthen the competitive advantages of enterprises; These conclusions are presented as applied guidelines for the transformation of trade practices [4; 5]. A separate co-author's work devoted to the influence of macroeconomic factors (in particular, inflation) on economic dynamics emphasizes the indirect influence of the external environment on consumer behavior and the structure of electronic demand [12].

Summing up, the available sources convincingly prove the importance of each of the components – mobile, social and omnichannel – for the effectiveness of e-commerce. At the same time, there is a lack of a comprehensive model that connects these three areas with the organizational and economic mechanisms of entrepreneurship, logistics and data management. It is this gap that determines the research niche that the E-commerce 3.0 concept proposed in our article is designed to fill.

3. Problem Statement

Based on the results of the literature analysis, we can conclude that modern e-commerce is at the stage of transition from a multi-channel presence to a true digital integration of business processes. Despite a significant number of studies that reveal certain aspects of mobile commerce, social interaction and omnichannel, there is still a lack of a comprehensive approach to defining the organizational and economic mechanisms of E-commerce 3.0 in the scientific plane.

The main problem is the lack of a holistic vision of how the combination of mobile, social and omnichannel tools transforms entrepreneurial activity and creates added value in the digital environment. For trade and distribution enterprises, this issue is of particular importance, since competitiveness, speed of customer service and financial results depend on the effectiveness of such integration.

The article is aimed at scientific substantiation of the concept of E-commerce 3.0 as an integrated model of digital entrepreneurship that combines mobile, social and omnichannel channels of interaction with customers, as well as the development of analytical guidelines for assessing the level of readiness of enterprises to implement this model.

To achieve the goal, it is necessary to solve the following tasks:

1. To clarify the essence and structure of the concept of "E-commerce 3.0" in the context of the evolution of e-commerce.
2. To identify the key economic and organizational factors that ensure the successful integration of mobile, social and omnichannel trade.
3. To develop a generalized model of digital integration in the field of entrepreneurship.

To offer practical directions for the implementation of this model for trade and distribution enterprises, taking into account modern technological trends.

4. Methods and Materials

The methodological approach of this article is based on an interdisciplinary combination of economic theory, digital technologies and management practices. The focus is not on individual tools of e-commerce, but on its systematic integration into the architecture of entrepreneurship. This led to the use of several methods that allow describing, interpreting and explaining the processes of transformation of business models under the influence of digitalization.

Firstly, a conceptual and analytical method was applied, which provided a rethinking of the concept of E-commerce 3.0 in the context of modern economic dynamics. Through the synthesis of approaches of different schools – from the classical theory of entrepreneurship to the digital data economy – a framework vision of this stage has been formed as a logical continuation of the previous phases of the evolution of e-commerce.

Secondly, structural and logical modeling is used to build a generalized scheme of integration of mobile, social and omnichannel trade into entrepreneurial processes. The model allows you to trace the

connection between interaction channels, data flows and the results of the enterprise, as well as to identify critical points of digital maturity.

Thirdly, the work uses a comparative and analytical method, which makes it possible to compare international practices of digital commerce with national conditions for trade development. At the same time, materials from Deloitte, OECD, McKinsey, Shopify and other analytical sources were used, reflecting the real processes of integrating digital technologies into retail and distribution activities.

An important part of the methodology was the system analysis of managerial decisions in the digital environment. It made it possible to determine how mobile applications, social platforms, and customer data analytics are shaping new decision-making logic – from strategic planning to daily operational interaction with consumers.

The information base of the study was academic publications in professional journals (Journal of Retailing, Technological Forecasting & Social Change, Journal of Business Research), analytical reports of international organizations (OECD, WTO), industry research of leading consulting companies (Deloitte, McKinsey, Amperity) and the results of the author's analysis of open data on the dynamics of the e-commerce market in 2023–2025. Industry reviews of CDP Institute customer data [3] and Adobe digital retail trends [1] were used to confirm the dynamics. An overview of US legislative initiatives on digital trade is also summarized in a study by the Congressional Research Service [6].

The combination of theoretical and applied methods made it possible to provide not only a descriptive, but also a diagnostic and analytical nature of the study, aimed at identifying patterns that determine the success of integrating digital channels into entrepreneurial models.

5. Results and Discussion

In the works of modern scientists, theoretical and methodological approaches to defining the essence of e-commerce as a component of the digital economy have been formed [2; 7; 11; 17]. Based on these developments, we will consider the evolution of its stages – from the initial models of E-commerce 1.0, which were based on one-way interaction between the seller and the buyer, to the modern stage of E-commerce 3.0, where an integrated digital ecosystem of entrepreneurship is being formed. This approach allows us to realize how changes in technological, socio-economic and behavioral factors determined a new logic for the organization of trade processes.

E-commerce in its first forms (1.0) was characterized mainly by the automation of transactions and the emergence of online stores as a new distribution channel. The main technological drivers were the development of websites, electronic payment systems, and the first CRM solutions. However, this model remained one-sided: the consumer played the role of a passive user, and marketing communications were predominantly massive.

The E-commerce 2.0 stage was associated with the emergence of social networks, the growing role of the mobile Internet and personalized advertising. Business models began to shift from transactional to relational, which involved establishing long-term relationships with customers. According to research by Deloitte and Statista, it was during this period (2010–2018) that the largest increase in the share of online shoppers was observed, due to the spread of mobile technologies and social commerce.

The current stage of E-commerce 3.0 is formed under the influence of the intellectualization of business processes, the merger of mobile, social and omnichannel commerce. Its essence is to create a comprehensive environment where customer experience is a central element of the enterprise's digital ecosystem. Enterprises are implementing integrated CDP platforms (Customer Data Platform), analytics based on artificial intelligence, as well as automated logistics solutions that allow achieving a high level of personalization. Some surveys of frontline staff confirm an increase in customer expectations for seamless service [16]. This trend is confirmed by publications of leading media, which record an increase in the share of real-time purchases [26].

The generalized characteristics of the main stages of e-commerce development are presented in Table 1.

Table 1. Evolution of the stages of development of e-commerce

Development stage	Formation period*	Main characteristics	Key Technologies	Dominant business model
E-commerce 1.0	1995–2005	The beginning of online trading, the creation of web stores, and the emergence of the first payment systems	HTML sites, email, payment gateways, basic CRM	Transactional (sale of goods through the site)
E-commerce 2.0	2006–2018	Socialization of trade, development of marketplaces, and use of mobile platforms	Social networks, mobile applications, Big Data, targeting	Relational (building relationships with the client, personalization)
E-commerce 3.0	≈2019–present	Integration of mobile, social, and omnichannel commerce; Focus on customer experience	Artificial Intelligence, Customer Data Platform, Automated Logistics	Integrated (digital entrepreneurship, customer value management)

Source: Stage periods are an analytical interpretation based on sources [2; 7; 8; 10; 14; 17; 18; 23] and reflect the dominant technological and organizational characteristics of the relevant phases of e-commerce development.

At the same time, E-commerce 3.0 is not just about technological updates. This is a qualitatively new phase of digital transformation of entrepreneurship, where analytical, logistics, marketing and management processes are integrated. Such integration creates prerequisites for the emergence of "smart" business models, in which information flows are interconnected with operational decisions, and the client becomes an active co-creator of value.

As shown in Table 1, the development of e-commerce is progressive. The first stages focused on automating sales and transactions, while the modern phase of E-commerce 3.0 is characterized by integrating data, analytics, mobile, and social channels into a single ecosystem of digital entrepreneurship.

In particular, unlike the previous stages, where the main goal was to optimize transactions, E-commerce 3.0 is aimed at building long-term digital loyalty based on an analytical understanding of consumer behavior and seamless interaction between all channels – online and offline. This involves the use of single customer ID systems, automated personalization scripts, and multi-channel dashboards.

Thus, modern e-commerce is transforming from a purely commercial form of activity into a multi-level customer experience management system, which combines technology, marketing, analytics and logistics. This process marks the transition from simple "network trading" to the concept of digital entrepreneurship, in which data acts as a strategic asset and a source of competitive advantage.

The development of e-commerce to stage 3.0 is accompanied by a change not only in technological means, but also in the logic of building entrepreneurial systems. If the previous phases were focused mainly on improving sales channels, then the modern model is based on the creation of a single digital architecture, which combines communication channels, analytics tools, and customer experience management processes. According to an analytical review by SmartCommerce, more than half of shoppers believe that the lack of a single user profile makes it difficult to interact with a brand [24].

Studies of leading analytical companies confirm that the integration of three areas – mobile, social and omnichannel trade – has become a basic condition for business competitiveness in the digital age [7; 8; 14]. Within E-commerce 3.0, these components form an interconnected system of value creation, where customer data circulates in a closed cycle "collection – analytics – personalization – interaction – loyalty".

Mobile commerce has become a key point of contact between the enterprise and the consumer. It provides instant access to the product, personalized recommendations, and a flexible communication system. McKinsey analytics show that more than 70% of e-purchases in 2025 are made through mobile devices, and the conversion rate in mobile applications is on average 30% higher than in browser versions [14].

Social commerce is becoming not only a sales tool, but also a space for forming communities. As noted by S. M. Rahman et al. and P. Sarker et al., social platforms have turned into full-fledged marketplaces, where interaction between users creates trust, which previously required significant branding costs [19; 22]. The introduction of elements of gamification, streaming sales, and content

integration changes the traditional marketing model, focusing it on the active participation of the consumer in the process of creating value.

Omnichannel commerce is the third key element of the E-commerce 3.0 model. It ensures the continuity of interaction between online and offline channels: the buyer can start the process in the mobile application, continue on the social network, and complete the purchase in the physical store. Research by B. Khalid and M. Weippert shows that effective omnichannel is directly correlated with customer satisfaction and long-term profitability [13; 28].

Thus, the integrated E-commerce 3.0 model can be presented as a system of three interconnected blocks – mobile, social and omnichannel commerce – united by a single information loop and platform solutions for customer data management (Customer Data Platform, CDP). On their basis, coordinated analytics, personalization of offers, automated logistics, and synchronization of pricing policies are formed.

As shown in Table 2, the key elements of E-commerce 3.0 form a complete integrated system.

Table 2. Key components of E-commerce 3.0 integration

System Component	Content and functional role	Technologies used	Expected implementation results
Mobile Trading	Provides instant access to products and services, personalized offers, and fast payments via mobile apps	Mobile platforms, apps, push notifications, mobile analytics	Increase in the frequency of purchases, increase in conversion rates and user loyalty
Social Trading	Realization of sales through social networks, content integration and interaction between users	Social Media Platforms, Marketplace Integration, Gamification, Content Marketing	Increase trust, increase audience reach, form brand communities
Omnichannel Trading	Ensures continuity of customer experience between all channels of interaction - online and offline	CDP platforms, ERP systems, automated logistics, consumer behavior analytics	Reduction of losses in the purchase process, synchronization of pricing policy, increase in profitability
Intelligent analytics and personalization	Formation of predictive customer behavior, customer life cycle management	Artificial Intelligence, Machine Learning, Big Data, Predictive Analytics	Optimization of marketing costs, increasing the accuracy of offers, increasing the average check

As can be seen from the content of Table 2, the effectiveness of modern e-commerce is determined by the complexity of integration, when mobile, social and omnichannel trade do not function in isolation, but as complementary components of a single digital ecosystem. As a result, e-commerce is becoming not only a sales channel but a platform for the development of digital entrepreneurship.

The architecture of the integrated E-commerce 3.0 model (Figure 1) covers five agreed levels: channels of interaction with the consumer; customer experience orchestration (coordinated management of customer journey crossings across channels); data and analytics (CDP/DWH, artificial intelligence models); operating core (OMS/ERP/WMS/TMS); and management and control. Bidirectional flows between the data layers, orchestration, and operations provide real-time personalization and "training" of the system based on the results of order fulfillment.

The presented model (Figure 1) reflects five interconnected levels of digital architecture: interaction channels; Orchestration of customer experience (i.e., alignment of all user touchpoints), data and analytics (CDP/DWH, AI models); operating core (OMS/ERP/WMS/TMS); and management and control. Bidirectional flows between the data, orchestration, and operations layers provide real-time personalization and system training based on the results of completed orders, which directly increase key performance metrics such as responsiveness, demand accuracy, and customer retention.

Research by Deloitte and OECD shows that in the digital economy, the degree of integration of analytical and operational processes directly correlates with business productivity indicators [7; 18]. Businesses with high levels of digital maturity demonstrate more flexible logistics, faster responsiveness to changes in demand, and reduced transaction costs. In this context, E-commerce 3.0 can be considered as the highest phase of the evolution of digital entrepreneurship, where the level of technological integration determines not only competitive advantages, but also the ability to innovative self-development.

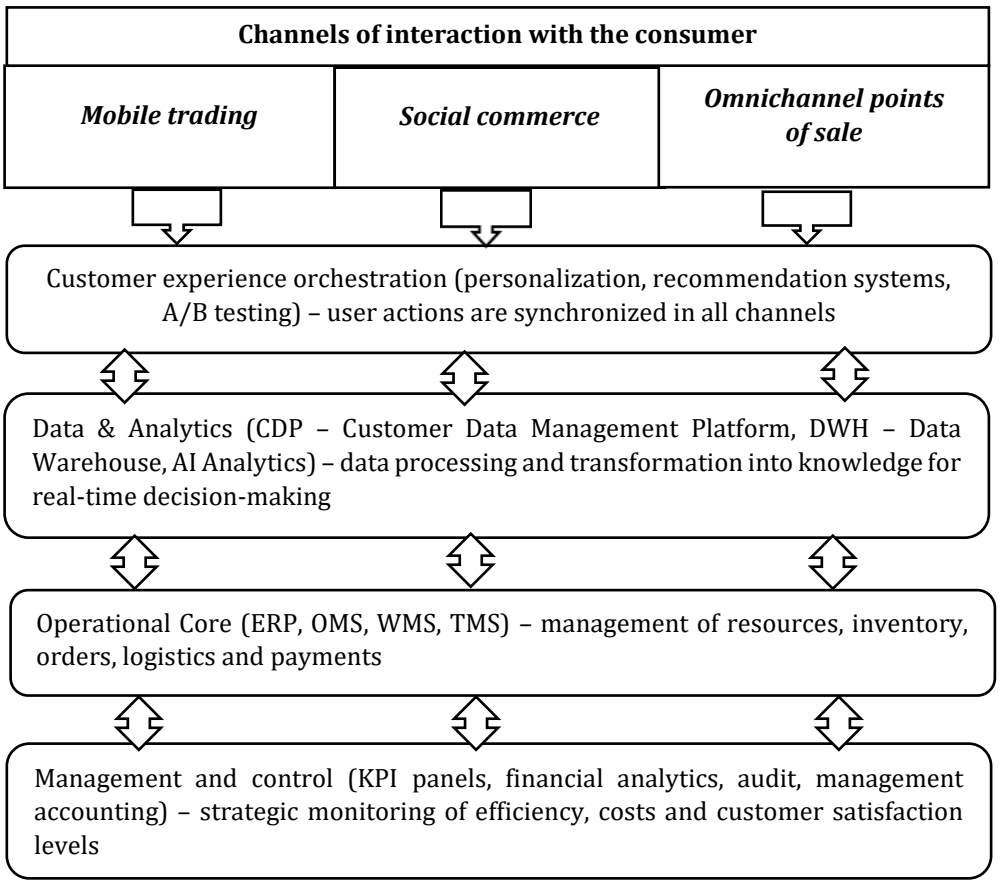


Figure 1. Architecture of the integrated E-commerce 3.0 model

To assess the digital maturity of enterprises, a model is proposed that takes into account five levels of development, from basic digital presence to full integration of data, processes and analytics. It is shown in Figure 2, where the interdependence between the degree of digital maturity and the effectiveness of the enterprise can be traced.

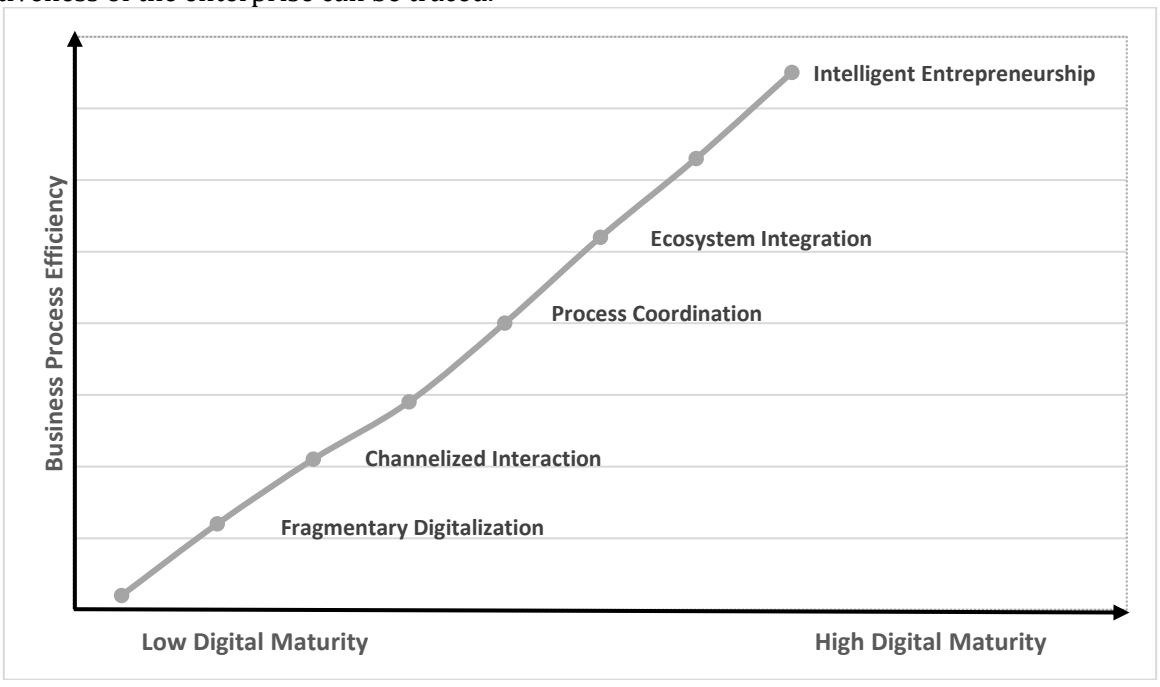


Figure 2. Interdependence of the level of digital maturity of the enterprise and the efficiency of its business model

Figure 2 demonstrates that the growth of the level of digital integration directly correlates with an increase in productivity indicators, in particular, the effectiveness of acquisition channels and the reduction of customer service costs (cost-to-serve)

The above diagram shows five successive levels of maturity:

1. Fragmented digitalization, when the company only implements basic tools of online presence (website, electronic payments).
2. Channeled interaction, which involves the use of several digital channels without intersystem integration.
3. Coordination of processes, CRM systems, customer data analytics, synchronization of part of the processes appear at this level.
4. Integration into a single ecosystem where mobile, social, and omnichannel commerce are connected by a common data platform (CDP) and common analytical logic.
5. Intelligent entrepreneurship, where the system becomes self-organized: AI (Artificial Intelligence) algorithms predict demand, automatically optimize supply chains, and personalize communications with customers.

The transition between levels is accompanied not only by technological changes, but also by the transformation of management approaches. According to McKinsey and Turki research, only enterprises that combine technological modernization with restructuring of business processes demonstrate a significant increase in efficiency indicators [14; 25]. This suggests that digital maturity is not a final state, but a continuous process of adaptation to market dynamics and consumer behavior.

For a visual display of the criteria for assessing digital maturity, Table 3 provides a generalized maturity matrix of E-commerce 3.0. In it, enterprises are classified according to the main areas – technological infrastructure, channel integration, analytical capacity, customer experience management and organizational adaptability.

According to Table 3, the transition of the enterprise from fragmented digitalization to integrated customer experience management is accompanied by a steady increase in metrics such as the consumer loyalty index (NPS – Net Promoter Score), customer retention rate and gross sales of goods through the platform (GMV – Gross Merchandise Value), which indicates an increase in organizational maturity and the effectiveness of the business model.

Table 3. Digital Maturity Matrix of Enterprises in the Context of E-commerce 3.0

Digital maturity level	Level characteristics	Technological infra-structure	Channel integration	Analytical capacity	Customer Experience Management
1. Fragmented digitalization	Using basic digital tools without system integration	Separate websites, electronic payments, basic CRM	Separate online channels without coordination	Analytics are missing or performed manually	Passive interaction with the consumer through standard messages
2. Channeled interaction	Using multiple channels without collaborative data management	Mobile site, separate marketing platforms	The channels operate autonomously, data exchange is minimal	Fragmented customer analytics	Interaction is episodic, without personalization
3. Coordination of processes	Application of integrated CRM and campaign management systems	Unified CRM/ERP base, automation of operations	Partial integration of channels, synchronization of orders	Getting started with BI (Business Intelligence)	Personalization of content for major customer segments
4. Integration into the eco-system	Formation of a common information space with a single client profile	CDP platform, automated logistics, integrated systems	Full synchronization of online and offline channels	Advanced analytics, demand forecasting	Focus on long-term customer loyalty
5. Intellectual entre-preneurship	Automated business management based on data and AI	Artificial Intelligence, Machine Learning, Predictive Analytics	Dynamic adaptation of channels in real time	Self-learning analytical models, full automation	Proactive real-time customer experience management

The digital maturity of enterprises is evolving from the fragmented use of technology to the full integration of analytics, channels, and processes. The transition to the level of intellectual entrepreneurship provides an increase in efficiency, accuracy of managerial decisions and forms new competitive advantages.

The analysis of the proposed model makes it possible to establish that enterprises with a high level of digital maturity demonstrate not only greater profitability, but also higher resistance to external shocks. In such companies, data becomes a strategic asset, and analytics becomes the basis for managerial decision-making. Accordingly, the transition to E-commerce 3.0 should be considered as a process of forming an intellectual-analytical economic system, where value is created due to the speed of data exchange, transparency of processes and the ability of the enterprise to self-update [8; 17; 27].

The results of the study allow us to in-depth assess the transformation of e-commerce in the direction of the E-commerce 3.0 model. It has been revealed that the key factor in the transition to this level is not just the digitalization of individual functions of the enterprise, but the integration of mobile, social and omnichannel solutions into the common architecture of customer experience management. This is in line with current trends recorded in reports from Deloitte [7; 8] and McKinsey [14], which highlight the growing importance of data analytics, personalization, and real-time channel synchronization. The main barriers to digital integration of trade enterprises in Ukraine are summarized in Table 4.

Table 4. Main barriers to digital integration in Ukraine

Barrier category	The essence of the problem
Technological Organizing Personnel	Fragmentation of the IT infrastructure, lack of integrated data management systems, weak compatibility between channels.
	Lack of a strategic vision of digital transformation, disunity of marketing, logistics and financial subsystems.
	There is a shortage of specialists with competencies in data analytics, digital marketing, and omnichannel processes.
Regulatory Financial Barrier category	Instability of the legal field, lack of clear rules for e-commerce and data circulation.
	Limited opportunities for financing digital projects, high costs for infrastructure implementation and cyber defense.
	The essence of the problem
Technological	Fragmentation of the IT infrastructure, lack of integrated data management systems, weak compatibility between channels.

Source: systematized by [4; 5; 12; 18; 20; 21].

As can be seen from Table 4, the main obstacles remain the fragmentation of digital infrastructure, the low level of analytical maturity of enterprises and the shortage of personnel with competencies in the field of omnichannel coordination. At the same time, even under these conditions, Ukrainian companies are demonstrating their readiness to implement E-commerce 3.0 elements, primarily in the segments of mobile commerce, marketplaces, and logistics services. This indicates the gradual formation of prerequisites for the transition from situational digitalization to systemic transformation of business models.

The developed architecture (Figure 1) demonstrates that it is the orchestration of customer experience that is the central element of a new stage in trade development. Enterprises that move to high digital maturity levels (Table 3) not only increase service speed and demand accuracy, but also form new customer retention mechanisms. This is in line with the findings of OECD research [17; 18], which states that the future of digital commerce is determined by the ability of businesses to combine technological and behavioral data in a single management system.

A comparison of the results obtained with previous e-commerce models shows that E-commerce 1.0 and 2.0 were limited to transactional logic – selling goods through a website or mobile application. In model 3.0, there is a transition from "sales channels" to "interaction ecosystems", where the consumer becomes an active participant in value creation [2; 9; 22]. Thus, digital entrepreneurship goes beyond technical tools and turns into a comprehensive management concept that covers marketing, logistics, finance and communications.

From the point of view of practical implementation, an important condition for the effectiveness of E-commerce 3.0 is the development of analytical competencies of personnel and the availability of flexible data management platforms (CDP – Customer Data Platform, DWH – Data Warehouse). They

allow you to synchronize marketing and operational processes, which, according to H. Turki [25] and M. A. Hossain et al. [11], provides an increase in profitability and a shortening of the customer service cycle.

In general, the results of the study confirm that the effective integration of mobile, social and omnichannel commerce creates conditions for the formation of a new quality of entrepreneurship – intellectual, adaptive and customer-centric. This approach not only optimizes costs, but also strengthens the position of enterprises in the global market, which is consistent with the conclusions of the OECD [18] and GS1 US [10] on new standards for sustainable digital development.

The results of the study show that the transition to the E-commerce 3.0 model is not only a technological update, but forms a new paradigm of digital entrepreneurship. The integration of mobile, social, and omnichannel tools creates a synergistic effect when customer experience management, logistics processes, and data analytics are combined into a single decision-making system [7; 11; 15; 19; 25; 27].

For Ukrainian enterprises, the key conclusion is that the effectiveness of digital transformation is determined not by the number of technologies used, but by the level of their consistency. The development of CDP (Customer Data Platform) systems, end-to-end analytics and ERP integration helps to increase the accuracy of demand forecasting, reduce customer service costs, and increase the profitability of operations. This is confirmed by both OECD industry research [18] and the results of Deloitte analytics [7; 8].

At the same time, it is the human factor and managerial culture that remain decisive in the implementation of the new architecture. Organizations that combine technological maturity with agile management and staff training demonstrate the highest performance and customer loyalty rates. Such interaction of technical and socio-economic elements forms the basis of the "digital synergy" of entrepreneurship, which becomes the core of competitiveness in the modern global economy.

6. Conclusions

The study made it possible to systematically reveal the essence and structural logic of the E-commerce 3.0 model as a new stage in the development of digital entrepreneurship. It has been established that the main factor of transformation is the integration of mobile, social and omnichannel commerce into a single customer-centric space, where data analytics and artificial intelligence technologies provide personalization of interaction with the consumer and increase the operational efficiency of the business.

As a result of the theoretical and applied analysis, three key directions of the evolution of e-commerce have been identified: the transition from a transactional model to an integration model; growing the role of analytics platforms (CDP, DWH) as the basis for customer experience management; increasing the interdependence between technological maturity and financial results of the enterprise. The developed architecture (Figure 1) and the digital maturity matrix (Table 3) prove that the complex integration of channels and data creates a synergistic effect in the form of an increase in the speed of service, the accuracy of demand forecasts and the level of customer loyalty.

A practical generalization of the experience of Ukrainian companies shows the presence of structural barriers to digital integration – technological, personnel, regulatory and financial. At the same time, there is a positive trend in the introduction of mobile and social commerce tools, in particular in the field of marketplaces, which confirms the ability of national enterprises to adapt global trends to their own environment.

The scientific novelty of the work lies in the formation of an integrated concept of E-commerce 3.0, which coordinates architectural, analytical and organizational aspects of the development of e-commerce and offers an approach to assessing the digital maturity of enterprises. The practical value is in the possibility of using the proposed model as a methodological basis for developing strategies for digital transformation in the field of trade and distribution.

Further research should be directed to empirical verification of the relationship between the level of integration of channels and economic indicators of enterprises, as well as to the analysis of mechanisms for the sustainable development of digital trade in Ukraine in the context of global technological changes.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Improving the system of indicators of digital transformation of the agricultural sector in the context of Ukraine's European integration

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.16

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ABSTRACT

The article is devoted to improving the system of indicators of digital transformation of the agricultural sector in the context of Ukraine's European integration. Particular attention is paid to the implementation of digital innovations in the agricultural sector, increasing competitiveness and efficiency, and reducing the resource intensity of production. The purpose of the study is to substantiate the theoretical foundations and develop methodological approaches to improving the system of indicators of digital transformation of the agricultural sector of Ukraine, taking into account the requirements of European integration and adaptation to European standards for assessing digital development. In the course of the scientific study, general scientific methods of cognition were used, in particular: methods of theoretical generalization, analysis and synthesis, comparative analysis, statistical methods, expert and analytical method. Data collection covered the database of the State Statistics Service of Ukraine, the Global Innovation Index (WIPO), the European Commission (JRC, Eurostat), as well as the results of our own analytical processing of data from national and international reports on the digital economy and agriculture. The relationship between the indicators of the EU Common Agricultural Policy and the digital transformation of the agricultural sector of Ukraine has been established in accordance with the main areas of the CAP: sustainable development and "green" practices; innovation and knowledge; competitiveness and efficiency; social cohesion and development of rural areas; climate neutrality. The relationship between the indicators of the Global Innovation Index (GII) and the digitalization of the agricultural sector has been determined in accordance with the main groups of the GII: infrastructure (Infrastructure); human capital and research (Human capital & research); business development (Business sophistication); market development (Market sophistication); institutional environment (Institutions); knowledge and technological outputs (Knowledge & technology outputs); creative outputs (Creative outputs). A system of indicators of the digital transformation of the agricultural sector in the context of Ukraine's European integration (ADI EU) has been generalized and proposed in terms of target groups: infrastructure and access to technologies; digital skills and education; innovation and technology implementation; policy and institutional support; economic and environmental effect.

KEYWORDS

agricultural sector, digitalization, European integration, common agricultural policy, Global Innovation Index

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Удосконалення системи індикаторів цифрової трансформації агросектору в умовах євроінтеграції України

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.16

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АНОТАЦІЯ

Стаття присвячена удосконаленню системи індикаторів цифрової трансформації агросектору в умовах євроінтеграції України. Особлива увага приділяється впровадженню цифрових інновацій в агросекторі, підвищенню конкурентоспроможності і ефективності, зменшенню ресурсоємності виробництва. Мета дослідження полягає у обґрунтуванні теоретичних засад та розробленні методичних підходів до удосконалення системи індикаторів цифрової трансформації аграрного сектору України з урахуванням вимог євроінтеграції та адаптації до європейських стандартів оцінювання цифрового розвитку. У ході наукового дослідження використовувалися загальнонаукові методи пізнання, зокрема: методи теоретичного узагальнення, аналізу та синтезу, порівняльний аналіз, статистичні методи, експертно-аналітичний метод. Збір даних охоплював базу Державної служби статистики України, Global Innovation Index (WIPO), Європейської комісії (JRC, Eurostat), а також результати власного аналітичного опрацювання даних національних і міжнародних звітів щодо цифрової економіки та сільського господарства. Встановлено взаємозв'язок індикаторів Спільної аграрної політики ЄС та цифрової трансформації агросектору України відповідно до основних напрямів САП: сталий розвиток і "зелені" практики; інновації та знання; конкурентоспроможність і ефективність; соціальна згуртованість і розвиток сільських територій; кліматична нейтральність. Визначено взаємозв'язок показників Global Innovation Index (GII) та цифровізації агросектору відповідно до основних груп GII: інфраструктура (Infrastructure); людський капітал і дослідження (Human capital & research); розвиток бізнесу (Business sophistication); розвиток ринку (Market sophistication); інституційне середовище (Institutions); знання та технологічні результати (Knowledge & technology outputs); творчі результати (Creative outputs). Узагальнено та запропоновано систему індикаторів цифрової трансформації агросектору в умовах Євроінтеграції України (ADI EU) в розрізі цільових груп: інфраструктура та доступ до технологій; цифрові навички та освіта; інновації та впровадження технологій; політика та інституційна підтримка; економічний та екологічний ефект.

КЛЮЧОВІ СЛОВА

агросектор, цифровізація, євроінтеграція, спільна аграрна політика, Global Innovation Index

1. Introduction

The current stage of development of the agricultural sector of Ukraine is characterized by the active introduction of digital technologies, which is a key factor in increasing its competitiveness, efficiency and sustainability in the context of globalization [15]. In the context of European integration processes, Ukraine undertakes to adapt management, monitoring and reporting systems to the standards of the European Union, in particular in the field of digitalization of agriculture. This involves the creation of an effective system of indicators capable of comprehensively assessing the level, dynamics and results of the digital transformation of the agricultural sector.

At the same time, the current scorecard used in Ukraine remains fragmented, does not provide a complete reflection of digitalization processes, and is not consistent with European approaches to assessing the digital maturity of agricultural sectors (for example, with the Digital Economy and Society Index – DESI or EU Agricultural Digitalisation Index methodologies). The lack of a unified measurement methodology prevents the comparison of Ukrainian indicators with European ones, complicates the assessment of the effectiveness of state policy and reduces the investment attractiveness of the agricultural sector.

Improving the system of indicators of digital transformation will allow not only to create an objective analytical base for managerial decision-making, but also to integrate Ukrainian statistics into pan-European information and analytical platforms, to ensure monitoring of the implementation of the UN Sustainable Development Goals and the policy of the EU Green Deal [5; 6]. This will increase the efficiency of agricultural production, develop human capital, expand the digital services market, and foster an innovative agricultural ecosystem in Ukraine.

Thus, the study aimed at improving the system of indicators of digital transformation of the agricultural sector in the context of European integration is timely and of great scientific and practical importance for the formation of an effective state policy for digital development, harmonization of national statistical approaches with European standards and ensuring sustainable development of the agricultural sector.

2. Literature Review

The issue of improving the system of indicators of digital transformation of the agricultural sector in the context of Ukraine's European integration is insufficiently researched in the domestic literature, since the direction is relatively new. Digital transformation acts not only as a technical stage of modernization, but also as a profound institutional change that transforms the principles of functioning of agricultural enterprises, increasing their flexibility, openness and ability to quickly adapt to new conditions [20]. Comprehensive digitalization means a large-scale transition of agro-economic systems to the use of digital technologies in all areas of activity, as well as their deep integration into digital ecosystems based on unified digital platforms and standards of interaction [18]. Building a digital economy in Ukraine requires the formation of a long-term strategy and a holistic state policy in the field of digitalization, which should be based on taking into account the European digital course and based on the experience of the EU. The state policy of digital development of Ukraine should cover the main directions defined in the digital policy of the European Union [11]. According to the research of many scientists, institutions and the institutional environment play an important role in the issue of innovation support, including European integration processes, in Ukraine [2; 16; 22]. An important role in this is played by the objects that will act as indicators, as well as the methods of their generalization and display [14; 24; 28].

Several foreign authors who have studied indicators of sustainable development in other sectors [3; 14], i.e., regional analysis is also possible in the agricultural sector regarding indicators of sustainability and agricultural policy [26]. Other authors focus on sustainable development indicators and their impact on European agricultural policy [8; 17]. A significant part of the authors investigates the impact of innovation and digitalization on sustainable development and agricultural policy, including the development of farming [9; 10–13; 27].

Despite the presence of a significant number of scientific papers on strategies and mechanisms of digital transformation of the agricultural sector, there is still a lack of generalized studies that take into account regional specifics and the context of European integration. Therefore, information materials

from various sources were analyzed, summarized and systematized in accordance with the subject of this study.

3. Problem Statement

The purpose of the study is to substantiate the theoretical foundations and develop methodological approaches to improving the system of indicators of digital transformation of the agricultural sector of Ukraine, taking into account the requirements of European integration and adaptation to European standards for assessing digital development. To achieve this goal, the following tasks will be performed: to explore European approaches to digitalization monitoring; to develop a structure and a list of improved indicators of digital transformation of the agricultural sector, harmonized with European requirements.

4. Methods and Materials

The methodological basis of the study is systemic, process and institutional approaches to the analysis of the digital transformation of the agricultural sector of the economy. To achieve this goal, a complex of general scientific and special research methods was used: methods of theoretical generalization, analysis and synthesis, comparative analysis, statistical methods, and expert-analytical method. The empirical basis of the study is made up of statistical materials of the State Statistics Service of Ukraine, Global Innovation Index (WIPO), the European Commission (JRC, Eurostat), as well as the results of its own analytical processing of data from national and international reports on the digital economy and agriculture.

5. Results and Discussion

The digitalization of agriculture and rural areas in the EU supports the modernization, competitiveness and sustainable development of agriculture. It promotes the integration of digital technologies and data-driven approaches, while improving the well-being of rural communities. The Common Agricultural Policy (CAP) is an EU strategic policy aimed at supporting farmers, rural development, food security and environmental sustainability.

The main goals of the Common Agrarian Policy are [25]:

1. Ensuring a fair income for farmers;
2. Increasing the competitiveness of agriculture;
3. Strengthening the position of farmers in the supply chain;
4. Protection of the environment, biodiversity and climate;
5. Support for sustainable rural development;
6. Attracting innovation, digitalization and knowledge.

Digital technologies can act as tools to facilitate the achievement of all specific objectives of the Common Agricultural Policy (CAP), in particular economic, environmental, climate and rural objectives.

By creating a conducive environment, the European Union is working on human-centered digitalization. This will reduce the digital divide between urban and rural areas and allow farmers and rural communities to adopt and use digital technologies effectively. The key objective of SAP 2023-27 is to modernize agriculture and rural areas by promoting and sharing knowledge, innovation and digitalization.

The SAP promotes an integrated approach to the digitalization of agriculture and rural areas, not only at the farm level, but also for the modernization of administration. EU countries have developed digitalization strategies for the first time as part of their SAP Strategic Plans, contributing to the promotion of digitalization in agriculture and rural areas. These strategies are adapted to the unique situation of each country [23]. They explore the potential of digital technologies to align with SAP-specific and cross-sectoral goals, and identify requirements to promote the adoption and sustainable use of digital technologies.

EU countries are also working to find mutual benefits with other policy instruments and actions, ensuring a holistic approach to digitalization. Building on the portfolio of SAP activities at their disposal, EU countries are strategically promoting digitalization, focusing on critical areas such as infrastructure,

training, skills development and the implementation of advanced technologies, including precision farming. To monitor the effectiveness of the Common Agricultural Policy (CAP), the Common Monitoring and Evaluation Framework (CMEF) system is used (Table 1).

Table 1. Relationship between the indicators of the EU Common Agricultural Policy and the digital transformation of the agricultural sector of Ukraine

CAP direction	How digitalization manifests itself	Key digital indicators
Sustainable development and green practices	Use of precision farming systems, monitoring of fertilizers and pesticides using sensors and satellites	Proportion of farms using digital technologies to monitor soil/yield
Innovation and knowledge	Support for projects within the framework of EIP-AGRI (European Partnership for Innovation), digital hubs	Number of projects with digital solutions that received CAP funding
Competitiveness and efficiency	Use of big data, IoT, and automated resource accounting systems	Labor productivity in digitally active farms vs traditional ones
Social cohesion and rural development	Online platforms for rural businesses, digital advisory services	Share of farmers with access to high-speed Internet
Climate neutrality	Use of satellite monitoring (Copernicus), GIS systems for land management	Digital Monitoring Level in Emission Assessment Systems

Source: Systematized by the authors according to the data given in [21; 25].

One of the important systems of indicators of the EU Common Agricultural Policy is the Global Innovation Index (GII). GII and the level of digitalization of the agricultural sector do have interrelated indicators that can be used for benchmarking or building correlation models. GII is often an integral indicator of innovation potential, while the level of digitalization of the agricultural sector is one of the effective indicators of its implementation (Table 2).

Table 2. Global Innovation Index (GII) and digitalization of the agricultural sector: interconnection of indicators

GII indicator group	Examples of GII indicators	Similar or tangential indicators of digitalization in the agricultural sector	Scope of interconnection
Infrastructure	- ICT access - ICT use - E-government (E-gov) - Energy infrastructure	- Level of digital coverage of rural areas (4G/5G) - Share of households with Internet - Use of GPS, IoT, and drones	Technological base of digitalization: digital solutions in agriculture are not possible without infrastructure
Human capital and research (Human capital & research)	- Quality of education - Number of scientists (R&D personnel) - Education costs (%)	- Digital literacy of farmers - AgriTech training programs - Number of specialists in the field of smart farming	Preparing Human Capital for the Use of Digital Technologies in Agriculture
Business sophistication	- Companies' investments in R&D - Cooperation between business and science - Number of knowledge-intensive employees	- Joint projects of agricultural companies and IT startups - R&D centers of agricultural technologies - Venture investments in AgriTech	An innovation ecosystem that drives digital solutions in the agricultural sector
Market development (Market sophistication)	- Access to loans and venture capital - Development of the financial market	- Investing in digital farms - Financing of agricultural innovations and startups	Access to finance is the key to introducing new digital technologies
Institutional environment (Institutions)	- Government efficiency - Quality of the regulatory environment - Protection of property rights	- Availability of state programs for the digitalization of agriculture - Legislative framework for the use of data (data governance)	State support for digitalization in the agricultural sector
Knowledge & technology outputs	- Number of patents - High-tech exports - Scientific publications	- Patents for agricultural technologies - Developments in the field of precision agriculture - Number of AgriTech startups	Effectiveness of digital innovations in the agricultural sector
Creative outputs	- ICT and creative industries	- Use of digital platforms for agrimarketing	Innovative application of digitalization for market differentiation

GII indicator group	Examples of GII indicators	Similar or tangential indicators of digitalization in the agricultural sector	Scope of interconnection
	- The impact of innovation in business	- Smart products, traceability systems	

Source: Systematized by the authors according to the data given in [4].

Objectives of the system of indicators of digital transformation of the agricultural sector in the context of Ukraine's European integration (what should be measured):

1. The level of penetration of digital technologies in agriculture (infrastructure + equipment);
2. Data availability and data quality/data exchange (interoperability, platforms);
3. The level of use of digital solutions (Precision Farming, drones, IoT, ERP, electronic services);
4. Human capital – digital skills of agricultural producers and consultants;
5. Economic impact – productivity, costs, profitability, labor market;
6. Environmental and sustainable effect (saving water/fertilizers, reducing emissions);
7. Regulatory/policy compliance – implementation of EU requirements (CAP, digital standards);
8. Risks – cybersecurity, data privacy, digital stratification between regions.

Based on the above data, it is proposed to improve the system of indicators of digital transformation of the agricultural sector in the context of European integration of Ukraine (ADI EU) (Table 3).

Table 3. System of Indicators of Digital Transformation of the Agricultural Sector in the Context of European Integration of Ukraine (ADI EU)

Indicator	SubIndicator
1. Infrastructure and access to technology	1.1 Internet access in rural areas
	1.2 Mobile and 4G/5G coverage
	1.3 Accessibility of digital devices
2. Digital skills and education	2.1 Farmers' Digital Literacy Rate
	2.2 Availability of educational programs in agricultural technologies
	2.3 Institutions that support AgriTech training
3. Innovation and technology adoption	3.1. Use of "smart" farming
	3.2 Applications of Artificial Intelligence, Big Data, Satellite Monitoring
	3.3 Startups and innovative solutions in the field of agriculture
4. Policy and institutional support	4.1 State programs for the digitalization of the agricultural sector
	4.2 support for startups, R&D, agrotech clusters
	4.3 National strategies for the development of digital agriculture
5. Economic and environmental effects	5.1 Performance Enhancement
	5.2 Cost reduction
	5.3 Sustainability of production (efficient use of resources, reduction of emissions)

Source: Systematized by the authors according to the data given in [4; 19; 21; 25].

6. Conclusions

Thus, the EU Common Agricultural Policy contains indicators that can be used to determine the degree of compliance of countries with generally accepted strategies, including in the agricultural sector. The digitalization of all sectors of the economy necessitates the allocation of new indicators. This also applies to agriculture and rural areas. In general, digitalization indicators without taking into account the industry direction are partially components of the Global Innovation Index (GII) indicators.

The indicators of digital transformation of the agricultural sector can be considered a sectoral sub-index that focuses on digital innovations in agriculture. Taking into account the European integration direction of the development of the Ukrainian economy, including in agriculture, the System of Indicators of Digital Transformation of the Agricultural Sector in the Context of European Integration of Ukraine (ADI EU) has been proposed. This system will allow for a better assessment of the state of digital European integration of the agricultural sector of Ukraine.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

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Adaptive-Selective Type of Financing of Higher Education Institutions in Overcoming Sustainable Development Disparities

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.17

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ABSTRACT

Modern socio-economic transformations in Ukraine have led to radical changes in higher education, serving as a basis for generating new knowledge and training highly qualified personnel. At the same time, market economic conditions significantly affect the processes of formation and use of financial resources of higher education institutions. The purpose of this study is to deepen the theoretical foundations and develop practical recommendations regarding the adaptive-selective type of financing of higher education institutions in overcoming sustainable development disparities. It is argued that financing is the process of providing the subjects of all institutional sectors of the economy, including types of economic activity (in particular education) and their institutions, with the necessary monetary resources. The work systematizes the sources of formation of financial resources of higher education institutions in overcoming sustainable development disparities, and also defines external (economic and political state of the country; scientific, technical and informational environment; external economic environment; natural and ecological environment) and internal influencing factors (material and the technical base of institutions of higher education; the volume of state orders for the training of specialists; fees for educational and other services) for the formation of financial resources in institutions of higher education. Conceptual approaches to improving the financing mechanism of higher education in Ukraine to overcome sustainable development disparities are justified, which will take into account the need to rethink the theoretical and methodological foundations of the influence of higher education on the development of the national economy. The implementation of the proposed recommendations will contribute to strengthening the influence of the adaptive-selective type of financing of higher education institutions in overcoming disparities in development on the activation of educational activities in Ukraine.

KEYWORDS

education, educational services, financing, higher education institutions, state budget, sources of financing, public-private partnership, sustainable development.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

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Адаптивно-селективний тип фінансування вищих навчальних закладів у подоланні диспропорцій у сфері сталого розвитку

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.17

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АНОТАЦІЯ

Сучасні соціально-економічні перетворення в Україні спричинили радикальні зміни у сфері вищої освіти як основи для генерування нових знань та підготовки висококваліфікованих кадрів. Водночас ринкові економічні умови суттєво впливають на процеси формування та використання фінансових ресурсів вищих навчальних закладів. Метою даного дослідження є поглиблення теоретичних засад та розробка практичних рекомендацій щодо адаптивно-селективного типу фінансування вищих навчальних закладів у подоланні диспропорцій сталого розвитку. Стверджується, що фінансування являє собою процес забезпечення суб'єктів усіх інституційних секторів економіки, видів господарської діяльності, зокрема освіти та їхніх установ, необхідними грошовими ресурсами. У роботі систематизовано джерела формування фінансових ресурсів вищих навчальних закладів у подоланні диспропорцій сталого розвитку, а також визначено зовнішні (економічний і політичний стан країни; науково-технічне та інформаційне середовище; зовнішнє економічне середовище; природне та екологічне середовище) та внутрішні чинники впливу (матеріально-технічна база вищих навчальних закладів; обсяг державних замовлень на підготовку фахівців; плата за освітні та інші послуги) на формування фінансових ресурсів у вищих навчальних закладах. Обґрунтовано концептуальні підходи до вдосконалення механізму фінансування вищої освіти в Україні з метою подолання диспропорцій сталого розвитку, які враховуватимуть необхідність переосмислення теоретичних і методологічних засад впливу вищої освіти на розвиток національної економіки. Реалізація запропонованих рекомендацій сприятиме посиленню впливу адаптивно-селективного типу фінансування вищих навчальних закладів на подолання диспропорцій розвитку, активізацію освітньої діяльності в Україні.

КЛЮЧОВІ СЛОВА

освіта, освітні послуги, фінансування, вищі заклади освіти, державний бюджет, джерела фінансування, державно-приватне партнерство, сталий розвиток.

1. Introduction

Modern socio-economic transformations in Ukraine have caused radical changes in the field of higher education as a base for generating new knowledge and training highly qualified personnel. At the same time, market economic conditions significantly affect the processes of formation and use of financial resources of higher education institutions (hereinafter referred to as HEIs). There is disproportionality in the financing of various specialties and levels of education, the unreasonableness of the amounts of allocated funds in terms of higher education. Under such circumstances, the issues of carrying out reforms in this area become a priority, which requires the formation of new types of funding for higher education.

Increasing the effectiveness of the adaptive-selective type of financing of higher education in overcoming sustainable development disparities can be achieved by mobilizing new sources of financial resources for the implementation of competitive educational activities and the production of quality educational services. The urgent need to solve problems related to the improvement of the adaptive-selective type of financing of HEIs requires the search for new methods and approaches for diversification and rational use of their financial resources.

The purpose of this study is to deepen the theoretical foundations and develop practical recommendations regarding the adaptive-selective type of financing of higher education institutions in overcoming sustainable development disparities.

The research hypothesis is as follows: One of the most effective means of successful implementation of educational transformation is the proper use of modern tools of adaptive-selective type of financing of all components of the educational system. Expenditures on education should ensure the development of the education system, its transition to a new qualitative level, which would provide the future socio-economic development of the country as a whole. However, in the face of today, effective funding for higher education in Ukraine is complicated by a serious crisis in the national economy, related not only to internal but also primarily to external factors, such as war, resolved by the Russian Federation and a large-scale pandemic of COVID-19. This causes additional challenges to the educational field, forcing additional sources of financing to overcome development disproportions.

In addition to the above problems, according to the results of the analysis of the peculiarities of financing HEIs in Ukraine, the following problems should be distinguished: (1) low level of internationalization of domestic institutions of higher education; (2) inconsistency of the positions of scientists and politicians on the development of education; (3) moral and physical depreciation of fixed assets and intangible assets in HEIs; (4) relative slowness of the development of education compared to the rapid modernization of modern society; (5) lag in the quality of education compared to the educational systems of developed countries of the world; (6) low level of training of graduates of HEIs; (7) imbalance of sources of higher education funding (significant transfer of the state share); (8) oversaturation of the labor market by graduates of HEIs; detachment of training from practice; (9) insufficient financing of innovative needs of HEIs and development of scientific and pedagogical potential; (10) lack of a clear strategy for financing HEIs; (11) inconsistency of the status of HEIs "Budget Institution" as subjects of economic activity, the principles of a market economy; (12) competition of domestic institutions of higher education with foreign educational institutions.

In view of the isolated groups of threats, it is necessary to develop appropriate mechanisms and tools for their neutralization, in particular: the transition from the principle of maintenance at the expense of the state budget to state support of higher educational institutions in the amounts actually possible; ensuring effective distribution of financial resources from the state and local budgets with appropriate control; development of financing regulations taking into account minimum social standards; increasing the prestige of intellectual work; development of the educational lending system; stimulation of solvent demand for quality educational services; formation of educational and scientific clusters, creation of attractive conditions for the receipt of sponsorship funds; assistance in attracting funds under investment programs in the form of grants; provision of tax benefits for HEIs on income from independent profitable activities, etc.

2. Literature Review

An analytical review of scientific literature gives reasons to claim that there is no single universal financing mechanism for HEIs. Therefore, in order to comprehensively evaluate the effectiveness of financing of HEIs, it is necessary to measure it by various methods and methods. This issue is extremely significant for both scientists and practitioners. Economic science, especially foreign science, is rich in theoretical paradigms and methodological and practical approaches to the adaptive-selective type of financing of HEIs. But we believe that due to various reasons, most of them cannot be used in our country. In academic research models, it is proposed to use the public-private partnership mechanism in the field of financing HEIs [25].

The study of higher education in the context of its financing is based on research: the concept of human capital; methods of organizing economic cooperation; analysis of the conceptual model of financing HEIs; models of financing higher education in Ukraine, its lending mechanisms; effectiveness of the system of education financing and management; strategies and formation of the basis for investing in higher education and science and effective economic policy in this field [14]; determinants of management efficiency in the system of higher education, which involves an increase in budget funding, expansion of state lending for higher education, formation and support of research universities [23; 24]; formula distribution, which contributes to the formation of a competitive environment among HEIs [27]; inflows of private investments into the higher education system [1]; modern world rankings (The Global Competitiveness Index); the process of forming an educational cluster as a mechanism of interaction between HEIs and business structures within the framework of public-private partnership with appropriate financial support [9–11; 25].

The issue of ensuring the higher education competitiveness in the current conditions of educational area globalization and the development of digital economy was revealed in the articles of H. Futao [3], O. Hart [4]; H. Horta [5], V. Kovtunets, S. Londar [12], M. Krupka, O. Hrynkevych, S. Sas [14], Yu. Petrova [17], N. Ugur [22], Z. Varnalii [23; 24], O. Krasilnik, L. Khmelevskaya [24], Yu. Vitrenko [26], D. Zagirniak, O. Kratt, M. Zagirnyak [28], T. Zatonatska, O. Rozhko, I. Lyutyy, N. Tkachenko, O. Anisimova [29]. These researchers analyzed the essence and prospects of using modern information and communication technologies as an effective strategy tool to ensure the adaptability of the higher education system to the challenges of the digital economy.

3. Problem Statement

One of the central ideas of modern financing is the implementation of public-private partnership (hereinafter referred to as PPP) in the financing of HEIs in Ukraine, where ministries, including the Ministry of Education and Science of Ukraine, state services, central executive authorities will act as a state partner (Fig. 1).

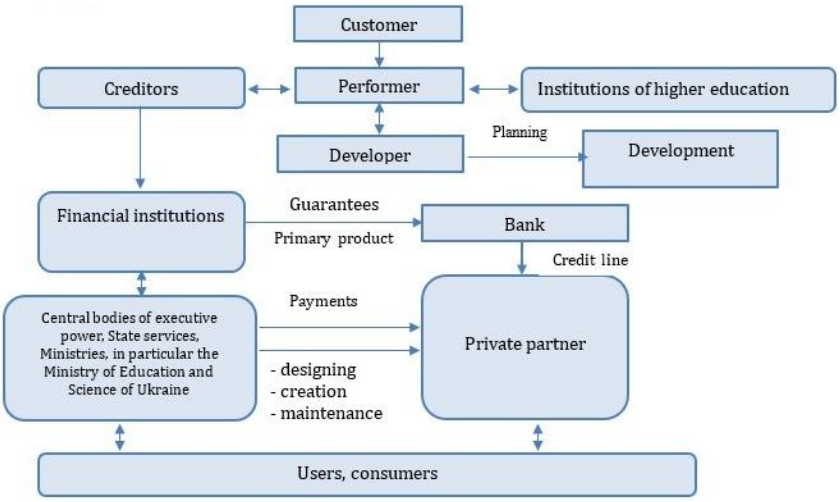


Figure 1. Algorithm for PPP implementation in the financing of higher education institutions in Ukraine

Source: Developed by the authors.

Within the framework of public-private partnership, it is considered necessary to form educational-scientific clusters with appropriate funding, which will contribute to the activation of educational-scientific activities, diversification of funding sources for educational programs and scientific research.

The advantages of PPP implementation in the financing of HEIs in Ukraine can be considered: stimulating the development of entrepreneurial thinking and promoting the implementation of advanced management methods; promoting the development of innovative forms of project financing; improving the quality of public services to consumers (higher education students); increasing the efficiency and effectiveness of financing, taking into account the interests of various groups of stakeholders.

Some authors continuing this theme, claim that the development of partnership relations between the state, science and the private sector will enable HEIs to increase the efficiency of property management, contribute to the attraction of extrabudgetary funds for the implementation of projects, increase the level of teaching and conducting scientific research, and in will generally contribute to the active development of the higher education system of Ukraine.

The beginning of an active increase in the attention of scientists to PPP problems dates back to 2005. The tendency to increase the attention of scientists is determined by the approval in 2004 of the "Green Book" of the European Commission on PPP and the Communication on PPP and Community legislation on public procurement and concessions.

Therefore, the use of the PPP mechanism will allow HEIs to overcome the sustainable development disparities that have persisted in recent years and activate partnership relations between HEIs, business and the state, thereby restoring the link "science – education – business". In addition, the application of the PPP mechanism will allow HEIs to effectively manage their own property, attract additional financial resources for conducting scientific activities, improve the quality of teaching and generally increase the level of competitiveness of HEIs of Ukraine in the world educational and scientific space.

4. Methods and Materials

The financing mechanism of higher education institutions and its components

The formation of new approaches to the financing of HEIs continues throughout the years of Ukraine's independence. This process was carried out in parallel with reforms and structural shifts in the country's political, social, and economic systems. Among the most important, it should be noted the spread of the market mechanism in the field of education, the emergence of private property, the creation of private educational institutions, fundamental changes in the budget and tax legislation, the transition to the use of the toolkit of the program-targeted method of financing, the formation of a formulaic approach to the distribution of budget funds, etc. It should be noted that these transformations were carried out against the background of the development of general globalization processes, which at the current stage of development cover the entire European educational space, they led to the appearance of many new financing tools in the field of education. In this context, we propose to ensure an adaptive and selective type of financing of HEIs in overcoming sustainable development disparities, to establish cooperation with foreign subjects of educational activity. We believe that the adaptive-selective type of higher education financing is the choice of the best financing mechanism that can be adapted to HEIs in overcoming the disproportions of development in today's conditions. That is, Ukraine needs to develop a financing mechanism for higher education, where clear procedures will be specified, how and from which sources will receive funding. Unlike the foreign experience, the domestic one does not correspond to the desired. The country is already trying to implement an investment policy regarding the financing of HEIs, and is looking for investment methods, since the budget does not effectively plan the financing of this area. However, this is only the initial stage of reforming the financing of higher education, it is necessary to continue to study foreign experience and adapt it to Ukrainian realities.

Thus, financing is the process of providing the subjects of all institutional sectors of the economy, types of economic activity, in particular education and their institutions, with the necessary monetary resources. The theoretical generalization of the existing views on the essence of the financing mechanism of higher educational institutions made it possible to define it as a financial relationship

with an appropriate set of elements (mission, goals, principles, subjects, methods, forms, sources, factors of provision and analytical tools), on the basis of which the appropriate level of funding is achieved, functioning and development of these institutions (Fig. 2).

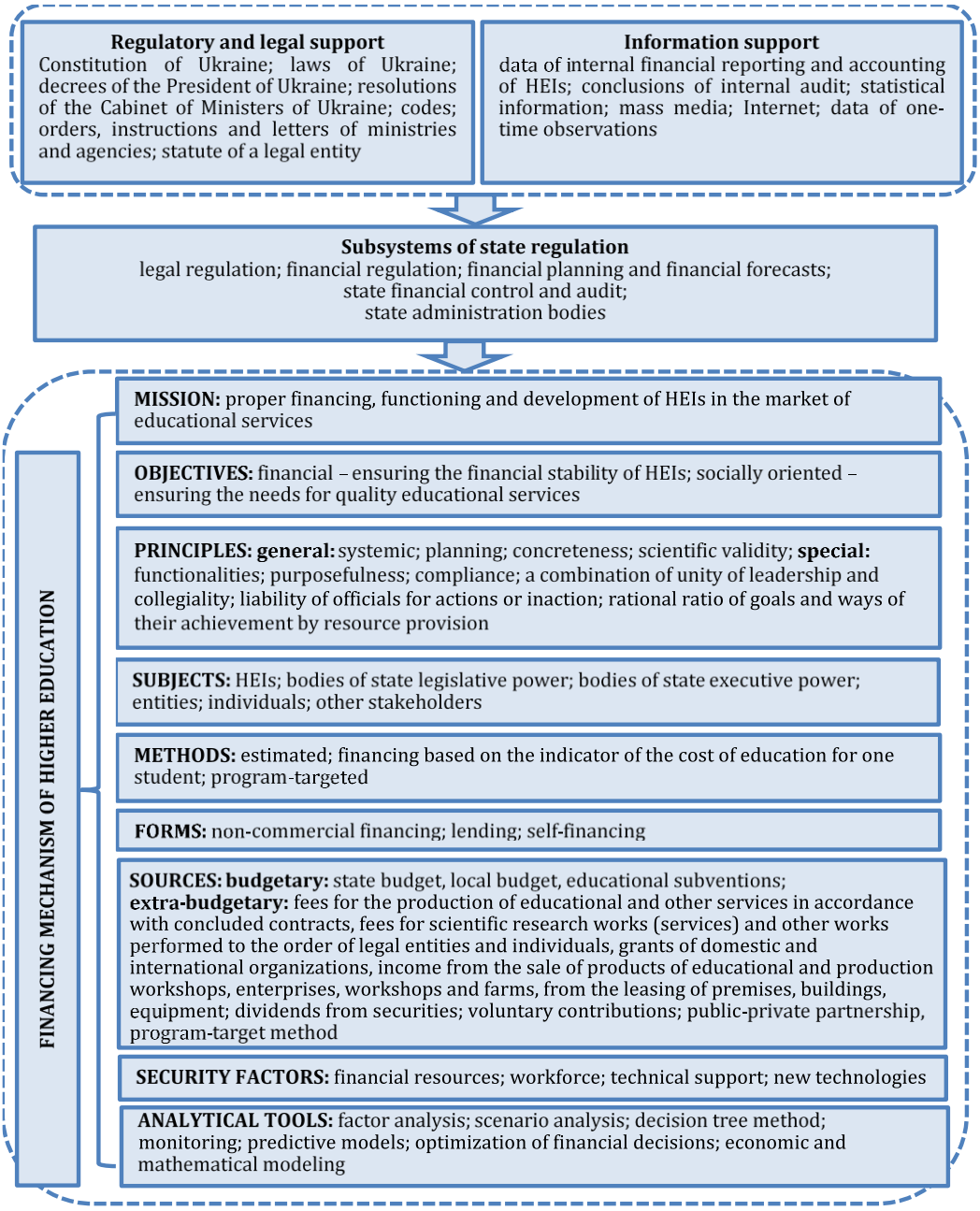


Figure 2. The financing mechanism of higher education institutions and its components
Source: Developed by the authors.

In Ukraine, HEIs are financed mainly from the state budget. Also in paragraph 61 of the Federal Law "About Education" dated September 5, 2017 No. 2145-VIII, it is determined that additional sources of funding for educational institutions are allowed in Ukraine, in particular the following: funds received for training, training, advanced training and retraining of personnel in accordance with concluded contracts; fee for providing additional educational services; funds received for research works (services) and other works performed by the educational institution on the order of enterprises, institutions, organizations and citizens; income from the sale of products of educational and production workshops, enterprises, workshops and farms, from the leasing of premises, buildings, equipment; subsidies from local budgets; dividends from securities; currency receipts; voluntary monetary contributions, material values, received from enterprises, institutions, organizations, individual citizens; other funds.

Identification of threats to the effective financing of higher education institutions

We believe that it is important to carry out threat modeling and to build an economic and mathematical model that will cover different parameters and identify the problematic aspects of educational institutions' financing. Timely identified threats that can have a negative impact on the functioning of educational institutions, as well as prompt measures taken to eliminate or minimize the negative impact, contribute to the effective and stable development not only of individual higher education institutions, but also in the whole educational field. Using the method of analyzing the hierarchy of threats to the effective functioning of these establishments, they can be ordered by the importance of influencing the process, and the Saati method will identify the components to strengthen or weaken the effect of the causative factor.

Suppose that the set Z = {z_1, z_2, ... z_m} contains threats to the functioning of higher education institutions in today's economic, social and political realities. Therefore, it is necessary to identify the key threats by which the set Z1 = {z_1, z_2,... z_n} of the set Z ($Z_1 \subset Z$) is given. We form a table showing the list of factors (threats) and their mathematical designation (Table 1).

Table 1. List of factors and their mathematical notation

Mathematical notation	Factor name	Mnemonic name
Z_1	low level of internationalization of domestic higher education institutions	LLI
Z_2	inconsistency of the positions of scientists and politicians on the development of education	IPSP
Z_3	moral and physical deterioration of fixed assets and intangible assets in higher education institutions	MPDFA
Z_4	the relative slowdown of the rates of development of education in comparison with the rapid modernization of modern society	RSRDE
Z_5	the gap in the quality of education in comparison with the educational systems of the developed countries of the world	GQE
Z_6	low level of training of graduates of higher education institutions	LLTG
Z_7	imbalance of higher education funding sources (significant over-balancing of the state share)	IHE
Z_8	oversaturation of the labor market by graduates of higher education institutions	OLMG
Z_9	separation of training from practice	ST
Z_{10}	insufficient financing of innovative needs of higher education institutions and the development of scientific and pedagogical potential	IFIN
Z_{11}	lack of clear strategy of financing higher education institutions	LCSF
Z_{12}	Status inconsistency of higher education institutions "budgetary institution" as subjects of economic activity to the principles of market economy	SI
Z_{13}	competition of domestic higher education institutions with foreign educational institutions	CDI

Source: Developed by the authors.

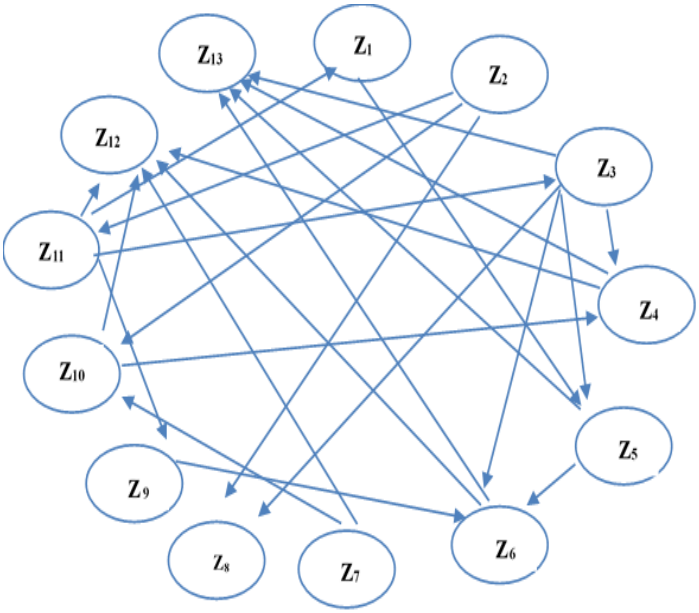


Figure 3. Graph the causal link between the major threats of effective HEIs financing
Source: Developed by the authors.

We show a subset of factors Z_1 and possible causal relationships between them by means of an oriented graph (Fig. 3) consisting of 13 points where the edges connect adjacent pairs of vertices (z_i, z_j). The arrow is pointing from factor z_1 that depends on the factor z_j (end of arrow). For example, the low level of training of graduates of the HEI is caused by insufficient financing of innovative needs of these institutions and the development of scientific and pedagogical potential.

Using the data of Fig. 3, it is possible to construct a binary dependence matrix $B = \left(b_{ij}, \quad i,j = \overline{1,13}\right)$, where each of the elements of the matrix

$$b_{ij} = \begin{cases} 1, \ if \ vertex \ i \ dependson \ the \ vertex \ j \\ 0, if \ vertex \ i \ doesn`t \ depend \ on \ vertex \ j \end{cases} \quad (1)$$

According to the results of the binary relation "depends on," all the elements in the matrix can take two values of 0 and 1.

Table 2 shows a binary dependency matrix, where the first column and the first row of the table indicate the threat number and the second row and the second column indicate its name. The created matrix satisfies the condition of transitivity.

We construct a reach matrix I + B, where I is a single matrix of order 13. The obtained matrix corresponds to the condition:

$$(I + B)^{k-1} \leq (I + B)^k = (I + B)^{k+1}, \quad (2)$$

where k is an integer.

From the set Z_1 we have previously defined, for each of the thirteen factors, there are two subsets: R (z_i) is the reach set, and A (z_i) is the previous set (the set of previous vertices). The achievable vertex can be considered provided that the vertex z_j can be reached from the vertex z_i in the graph (Fig. 3), there will be a path leading from the vertex z_i to the vertex z_j. The vertex z_i is the vertex z_j, the precursor if it can reach its vertex.

Formed sets R (z_i), A (z_i), as well as their cross-section, are presented in Table 2. From those vertices of the graph for which the condition is satisfied

$$A(z_i) = R(z_i) \cap A(z_i), \quad (3)$$

the first (lower) level of the hierarchy is formed. These vertices can be considered as out of reach of all other vertices of the graph.

Table 2. A binary matrix of the relationship of causal relationships between the major threats to the effective functioning of higher education institutions

Mnemonic Factor name	1 LLI	2 IPSP	3 MPDFA	4 RSRDE	5 GQE	6 LLTG	7 IHE	8 OLMG	9 ST	10 IFIN	11 LCSF	12 SI	13 CDI
1. LLI	0	0	0	0	1	0	0	0	0	0	0	0	0
2. IPSP	0	0	0	0	0	0	0	1	0	1	1	0	0
3. MPDFA	0	0	0	1	1	1	0	1	0	0	0	0	1
4. RSRDE	0	0	0	0	0	0	0	0	0	0	0	1	1
5. GQE	0	0	0	0	0	1	0	0	0	1	0	0	1
6. LLTG	0	0	0	0	0	0	0	0	0	0	0	1	1
7. IHE	0	0	0	0	0	0	0	0	0	1	0	1	0
8. OLMG	0	0	0	0	0	0	0	0	0	0	0	0	0
9. ST	0	0	0	0	0	1	0	0	0	0	0	0	0
10.IFIN	0	0	0	1	0	0	0	0	0	0	0	1	0
11.LCSF	1	0	1	0	0	0	0	0	1	0	0	1	0
12.SI	0	0	0	0	0	0	0	0	0	0	0	0	0
13.CDI	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Developed by the authors.

It is necessary to determine the first level in the threat hierarchy (the lowest in terms of the greatest impact on the object under study). For this, we construct the table (Table 3) according to the above algorithm.

Table 3. The first iteration of the causal link between the major threats to the effective functioning of higher education institutions

Z_i	$R(z_i)$	$A(z_i)$	$R(z_i) \cap A(z_i)$
Z_1	Z_1, Z_5	Z_1, Z_{11}	Z_1
Z_2	Z_2, Z_8, Z_{10}, Z_{11}	Z_2	Z_2
Z_3	$Z_3, Z_4, Z_5, Z_6, Z_8, Z_{13}$	Z_3, Z_{11}	Z_3
Z_4	Z_4, Z_{12}, Z_{13}	Z_3, Z_4, Z_{10}	Z_4
Z_5	Z_5, Z_6, Z_{10}, Z_{13}	Z_1, Z_3, Z_5	Z_5
Z_6	Z_6, Z_{12}, Z_{13}	Z_3, Z_5, Z_6, Z_9	Z_6
Z_7	Z_7, Z_{10}, Z_{12}	Z_7	Z_7
Z_8	Z_8	Z_2, Z_3, Z_8	Z_8
Z_9	Z_6, Z_9	Z_9, Z_{11}	Z_9
Z_{10}	Z_4, Z_{10}, Z_{12}	Z_2, Z_5, Z_7, Z_{10}	Z_{10}
Z_{11}	$Z_1, Z_3, Z_9, Z_{11}, Z_{12}$	Z_2, Z_{11}	Z_{11}
Z_{12}	Z_{12}	$Z_4, Z_6, Z_7, Z_{10}, Z_{11}, Z_{12}$	Z_{12}
Z_{13}	Z_{13}	$Z_3, Z_4, Z_5, Z_6, Z_{13}$	Z_{13}

Source: Developed by the authors.

The fulfillment of condition (3) is clearly presented for the threats: Z_2 – inconsistency of the positions of scientists and politicians in the development of education; Z_7 – imbalance of higher education funding sources (significant over-governmental share). The next step is to remove from the table the rows that correspond to the selected vertices (Z_2, Z_7), as well as to remove the numbers 2, 7 from the entire table. According to the Oriented column, all vertices that meet the identified threats are removed.

We have got results in seven levels of hierarchy (from smallest to largest) thanks toc computer-aided modeling: (1) imbalance of financing sources (significant prevalence of government share); the inconsistency of the positions of scientists and politicians on the further development of higher education; (2) lack of a clear financing strategy of HEIs; (3) separation of training from practice; moral and physical deterioration of fixed assets and intangible assets; low level of internationalization and academic mobility; (4) oversaturation of the labor market by graduates of HEIs; the gap between the quality of education and the educational systems of developed countries; (5) insufficient financing of innovative needs and development of scientific and pedagogical potential; low level of preparation of graduates of HEIs; (6) the relative slowdown in the development rate of education in comparison with rapid modernization of society; (7) inconsistency of the status of "budgetary institution" as a subject of economic activity with the principles of market economy; competition with foreign HEIs in attracting entrants. HEIs are constantly forced to seek additional sources of financing for their own needs for sustainable development, which is a decisive factor in ensuring their competitiveness.

5. Results and Discussion

Priority Tasks of the Modernization of Financing of Higher Education Institutions

The current state of development of the world community creates conditions under which the adaptive-selective type of funding of higher education becomes important in overcoming sustainable development disparities in Ukraine. HEIs are forced to constantly search for additional sources of funding for their own needs for sustainable development, which is a defining element of a high level of competitiveness.

Striving to increase the level of competitiveness of Ukrainian institutions of higher education, it is necessary to pay attention to solving the following priority tasks:

– to abandon financing of HEIs mainly from the state budget, instead increase the share of attracting financial resources from the corporate sector, and provide state support in the actually necessary amounts.

– to improve and deepen the autonomy of educational institutions, primarily in the field of

financing. It should be noted that there are a large number of private institutions of higher education abroad and their financing mainly depends on tuition fees and other fees.

– to include research institutions in the composition of leading universities. Completion of this task will improve the state of the material and technical base of educational institutions and post-graduate education institutions, raise the professional level of teachers, allow more effective use of the complex of material, financial and labor resources of HEIs;

– to expand the independence of HEIs in the field of resource management, including funds from the budget;

– to allow educational institutions to independently distribute budget revenues in accordance with the articles of the budget classification. Accordingly, institutions of higher education must submit reports on the spending of funds received from the budget, which can be the starting point for calculating statistical indicators in the field of education;

– to stimulate the implementation of various types of income-generating activities. Today, there is a natural need to optimize the distribution of the available resources of HEIs, which will make it possible to allocate funds for investment costs. In view of this, when self-financing, educational institutions should direct their activities to gain profit. In addition to the receipt of funds from tuition fees, the main sources of extrabudgetary funds should include income from independent activities, in particular sponsorship funds, donations, endowments, cooperation with business structures and lending. Another source of additional funds is the production of non-educational services that generate income. These include: rental of premises for holding conferences, rental of dormitories, provision of food, provision of information and consulting services, commercial use of the results of scientific research, use of the Internet; putting vehicles into operation; organization of paid museum and exhibition activities; opening of exhibitions and sales of scientific and creative products; sale of training materials; organization of paid webinars; theater performances and concerts; establishment of a subscription fee for the use of library assets;

– to conduct preparatory courses; income from the activities of scientific research units and scientific publishing activities, etc.;

– to motivate institutions of higher education to participate in the formation of the national innovation system by granting institutions of higher education the status of research. A “national HEIs that has significant scientific achievements, conducts research and innovation activities, ensures the integration of education and science with production, participates in the implementation of international projects and programs” can apply for this responsible status. The status is granted to the specified institution for the purpose of increasing the role of the university as a center of education and science, training highly qualified scientific and scientific-pedagogical personnel, putting into practice scientific achievements, technical and technological developments, implementing joint programs in priority areas together with other higher educational institutions and scientific institutions fundamental and applied scientific research to solve important socio-economic problems in various fields and regions;

– to ensure the effective distribution of financial resources for the expenditure of educational services from the state and local budgets in amounts sufficient for the development of educational institutions, taking into account the state of the material and technical and laboratory base, the possibility of reproducing the potential of scientific and pedagogical personnel and the development of science;

– to improve the methods of determining the amount of education funding and develop funding standards taking into account minimum social standards, which will allow establishing the lower limit of mandatory financial support for the development of education;

– to improve the mechanism of financing education in Ukraine, taking into account international experience, transition to multi-channel financing, take decisive measures to increase and diversify sources of financing higher education and optimize their structure;

– to create conditions for the use of intellectual work, increasing its prestige and demand for it, bringing the volume of training of specialists with higher education to the needs of the modern labor market;

– to develop the system of educational lending, which will contribute to: increasing the interest of citizens in using credit resources to pay for educational services;

– to create a new model of financing HEIs, which is based on the joint participation of the state,

business circles and citizens.

By implementing the proposed measures, educational institutions will have the opportunity to take the initiative and expand their independence in the economic sphere of HEIs.

One of the most important tasks for improving the financing of HEIs is the growth of the role of extra-budgetary funds, including obtaining funds for providing educational services, performing other non-educational services, receiving sponsorship, donations, loans, income from cooperation with business structures, etc. As Panych emphasizes, investment in higher education is a matter of social responsibility and security. However, the problem of financing covers not only the issue of the amount of funds, but also financing mechanisms, as well as the accompanying regulation that affects the distribution of these funds. Incentives for the development of HEIs depend on the general economic policy of the state.

Thus, a sufficient level of provision of HEIs with financial resources exerts its influence on the sustainable development of higher education, as well as on the quality of training of competitive highly qualified specialists. In this context, we believe that the government of Ukraine should develop not only a program of effective investment of funds in the development of national education and science, but also take priority measures to reorganize this sphere of life and society's attitude towards it. Possible measures to correct the situation in this area are: a significant increase in the status of a scientist and the role of science in society through the normalization of wages; increase in financing of the scientific sphere from the state budget in order to update the material and technical base of science; strengthening of the institutional and financial foundations of competitive (grant) funding of scientific research; creation of conditions for the return of highly qualified scientists who gained experience in universities and scientific institutions of the world; strengthening the ties of the scientific sphere with business, industrial and entrepreneurial structures; expansion of international cooperation and integration of the scientific sphere of Ukraine into the world system, in particular into the European scientific space.

In Fig. 4, we will highlight the main areas of further improvement of the financing mechanism of HEIs.

World experience in financing higher education allows us to conclude that in the practice of the leading countries of the world, state funding is reduced to a minimum and occupies a meager share, HEIs have greater autonomy, and also have the rights and broad opportunities to attract and use various forms of funding. In Ukraine, the funding of HEIs is predominantly provided by budgetary resources; their number does not give opportunities to fully develop, to implement innovative projects, which is why the Ukrainian HEIs need to develop new, more effective funding systems for HEIs and approach the standards of advanced countries of the world.

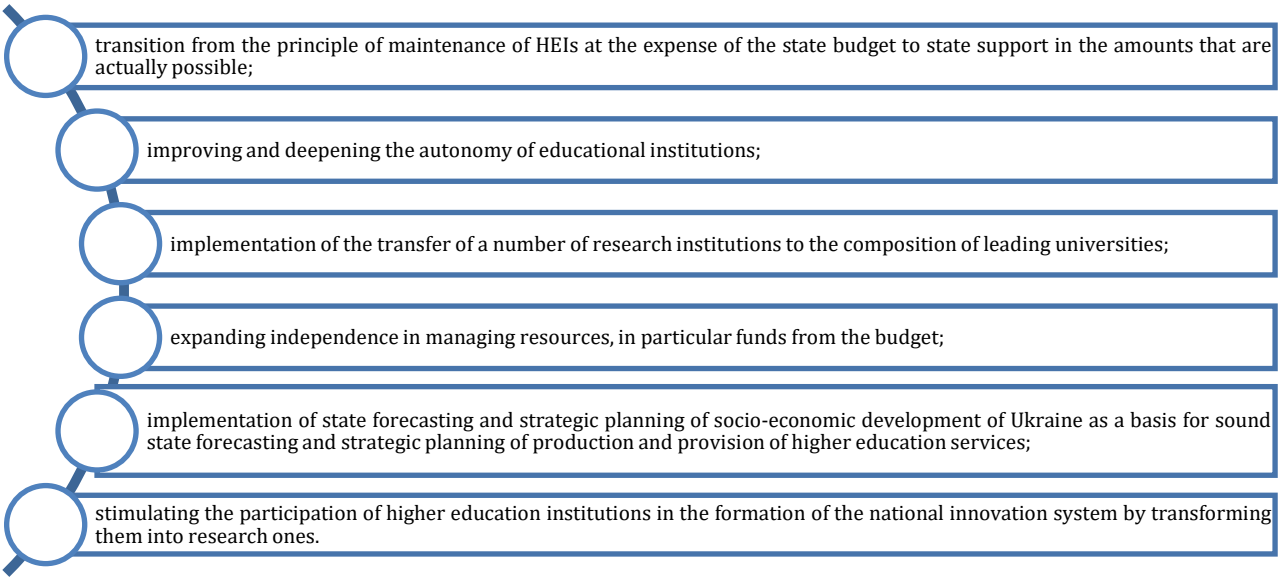


Figure 4. The main areas of improvement of the financing mechanism of higher education institutions

Source: Developed by the authors.

Subjects and contours of the effective structure of higher education in Ukraine

In the process of functioning, Ukrainian state institutions of higher education interact with various entities (Table 4).

Table 4. Financial, economic and social relations of state institutions of higher education with stakeholders

Institutions of higher education	**State**	The state acts as a guarantor of the rights of every citizen to receive higher education on equal terms, and the state also creates and ensures all necessary conditions for HEIs to carry out their activities. At the same time, state institutions of higher education are an instrument of the state's social policy in providing citizens of the country with higher education.
	Employers	Employers are both customers and consumers of the HEI's product at the same time. In the case of financing state institutions of higher education, employers (both public and private sectors) place orders for the training of the necessary specialists for certain sectors of the economy and thus form their offer of certain educational services. And while receiving highly qualified specialists, they consume the same educational services.
	Subjects of economic activity	State institutions of higher education attract possible alternative sources of financing and carry out capitalization of the implementation of certain types of their own activities in order to increase the level of training of highly qualified and innovatively developed specialists.
	Society	State institutions of higher education are obliged to train modern individuals who will step confidently "in step" with modern progress, feel comfortable in society and contribute to its progressive development in the future.
	Market of educational services	State institutions of higher education interact with all segments of the educational services market, interact with other educational institutions. And the market of educational services contributes to ensuring all the rights and opportunities of students.
	Households	State institutions of higher education act as investors in personal development, thereby providing the labor market with qualified specialists.

Source: Developed by the authors.

Such relationships affect: (1) the effectiveness of the financing process of state HEIs and the results of their activities; (2) social development and development of the individual as a whole. Financial resources of the state, households, economic entities and own funds of state HEIs act as material carriers of financial relations between all participants of the educational services market. That is why there is a need to study all aspects of these relationships between state institutions of higher education and all stakeholders in order to carry out an in-depth analysis of the processes of existing financing of domestic educational institutions and to determine development prospects based on the experience of foreign countries.

In view of the global reduction of public financial resources in Ukraine and the countries of the world, the "DEFINE" project was introduced. His main tasks were:

- determination of state financing mechanisms and their development during the last decade;
- monitoring trends in state funding of universities;
- identification of key problems in the field of higher education financing;
- development of measures to increase the efficiency of financing universities, etc.

That is, the main activity of the "DEFINE" project is the study of financing in higher education, the provision of recommendations that will contribute to the development of strategies for increasing the efficiency of financing higher education.

Studies emphasize that in most cases, the state distributes the appropriate funding for higher education through so-called block grants (Table 5).

Table 5. The mechanism of distribution of state funding

Grants			
Funding based on activity results		**Other financing methods**	
Performance contracts	Funding based on a formula		Based on the negotiation process
	According to performance criteria "at the exit"	According to performance criteria "at the entrance"	Based on a historically determined distribution
Project financing			
Financing under programs of "excellence"			
Other methods of direct financing, including targeted			

Source: Developed by the authors.

The distribution of block grants according to the formula is the main method of distribution of state funding by state institutions of higher education and is used in the vast majority of countries included, for example, in the University Autonomy in Europe study. Negotiated block grant funding is used in some countries such as Austria, Germany and Spain. In practice, however, a country will use a combination of methods to determine the size of the grant allocation. This experience can also serve Ukrainian HEIs as an additional source of attracting financial resources, while contributing to increasing the quality of educational products.

Implementation of the reform of domestic higher education should be a "companion" of the implemented economic reforms in the country, which are aimed at increasing the volume of innovative potential and significantly raising living standards in Ukraine. The contours of the effective structure of the development of higher education in Ukraine are highlighted in Fig. 5.

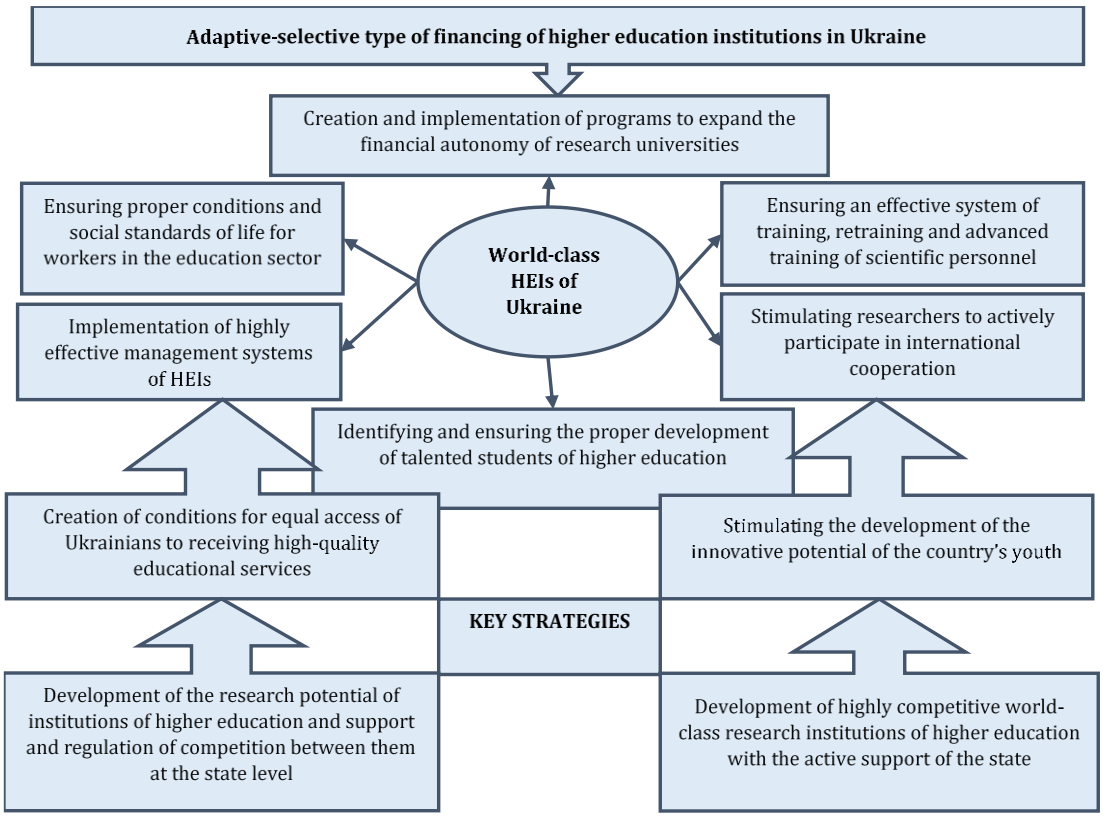


Figure 5. Contours of the effective structure of the development of higher education in Ukraine

Source: Compiled by the authors.

As already mentioned, financing of the educational sphere in Ukraine is carried out in insufficient amounts; the majority of financing is carried out by the state from the country's budgets and requires research and the attention of scientists and practitioners regarding the search for new sources and opportunities for attracting financial resources for the development of world-class educational institutions. World experience contains several strategies for the development of the educational sphere, the research of which can help domestic legislative and executive authorities to set an effective vector of development in the educational sphere:

1. The "broad" strategy (from high-quality mass higher education to the creation of world-class universities) provides for the country's achievement of the highest standards of higher education in the field of learning and teaching, expansion of general access of the population to high-quality educational services, increasing the research potential of universities, gradual evolutionary separation of university institutions capable of competing on the global market. This strategy is used mainly in the countries of Western Europe.

2. The "in-depth" strategy (from pioneering research in breakthrough fields of knowledge to the creation of world-class universities) consists of the development (with the active participation and financial support of the state) of world-class universities based on a small number of existing university institutions capable of carrying out serious and significant scientific research. This strategy was used by

the countries of East Asia during the second half of the 20th century. Currently, this model is being implemented in Saudi Arabia, Brazil, etc.

3. The combined strategy of "broad" and "deep" is a certain combination of the two previous strategies and is used today in the USA and China, and is also gaining popularity in the countries of Western Europe.

In world practice, endowment funds (trust funds) are widely used, which are trust funds intended for non-commercial use. The endowment differs from charitable financing by the targeted nature of the activity and the focus on obtaining income through the investment of funds. The endowment fund, as evidenced by the practice of countries that use this type of financing in the field of education, is an effective tool for the financial support of intellectual activity. As for the size of the endowment, it depends on the ability of the institution of higher education to effectively engage in fundraising, that is, to create certain projects aimed at attracting financial resources for non-commercial purposes. In the domestic practice of HEIs, there were attempts to introduce the first endowment funds. However, they develop slowly, which is caused by the unstable situation in the state. When creating and developing such a direction of financing as an endowment in Ukraine, it is necessary to study and be guided by the leading experience of the advanced countries of the world. Only in this way can success be achieved in the introduction and effective functioning of endowment funds in Ukraine, which will contribute to ensuring the necessary level of financing of domestic institutions of higher education and will contribute to the activation of the development of international programs, the participation of scientists in international programs.

In modern conditions, the use of charitable resources to finance education and science in Ukraine is not yet widely popular, but it is actively used in foreign practice. Its appearance is caused by the development of several non-profit organizations to alienate from the state some of the functions in the field of social policy. At the initial stages of the formation of such organizations, their resources were used only for social needs in the field of social protection, and now they are widely used in the field of education and science for the accumulation and development of human capital.

6. Conclusions

In Ukraine, limited financing of HEIs negatively affects the quality of educational services. Insufficient amounts of budget allocations require the search for additional sources of funding, and therefore the study of the best global experience of highly developed countries and its implementation in the activities of public HEIs of Ukraine indicates the following promising directions: co-financing of education by business and the state; creation of an appropriate legal framework for stimulating patronage and sponsorship; development and implementation of the higher education lending mechanism; search for promising areas of activation of research and innovation activities of HEIs; introduction of transfers of scientific developments into the activities of the real sector of the economy. Creating appropriate conditions for the development of the educational sphere, increasing funding for education and science, is a guarantee of effective development of the state as a whole.

It was found that financing is a process of providing necessary monetary resources to subjects of all institutional sectors of the economy, types of economic activity, in particular, education and its institutions. The main sources of higher education funding include funds from local and state budgets, the receipt of resources to higher education from educational, scientific, and industrial activities, property rental fees, proceeds from the sale of property, preferential state loans for obtaining higher education, payment of students' training at the expense of firms and enterprises, charitable contributions, grants and gifts, funds received for the fulfillment of specific assignments from legal entities and individuals.

To develop a universal approach to evaluating the effectiveness of the allocation of state budget funds, in particular to higher education, a methodology for calculating its comparative coefficient has been developed according to the proposed formula, which includes the main indicators of the educational and scientific activity of HEIs, and provides an opportunity to identify positive and negative trends in their development, avoid or react to problematic aspects promptly, as well as make balanced decisions.

It has been proven that when developing a financing mechanism for the activities of HEIs, it is necessary to take into account the impact of threats to their sustainable development. The main threats

to the effective functioning of the HEIs are the problems of general development, as well as financial problems. On the basis of the method of analysis of hierarchies, threats were constructed according to the degree of risk, which made it possible to propose appropriate mechanisms and tools for overcoming them for the sustainable financial development of HEIs.

The implementation of the reform in the sphere of financing of HEIs must be carried out based on the needs of Ukraine, but taking into account global trends, the vector of the development of the country's economy, society and competitiveness not only in the domestic but also in the world markets. It is necessary to focus on the needs of increasing modernization and innovation potential in the country, raising the living standards of the population. This can be done only with state support for the introduction and stimulation of the implementation of foreign experience in the field of higher education financing, creation of appropriate conditions for the development of higher education. Currently, in the modern world, it should be increasingly realized that without the implementation of paradigmatic changes in education, as well as sufficient funding of educational institutions, higher education will not be able to fulfill its mission of training young people in the competitive conditions of the development of the knowledge economy.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

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Digital Transformation of Human Resource Policies: Integrating AI and Data Analytics in Strategic Workforce Management

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.21

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ABSTRACT

The purpose of this study is to conduct a comprehensive analysis of digital transformation processes in human resource management policies through the strategic integration of artificial intelligence and data analytics technologies, to identify implementation mechanisms, determine success factors and barriers, and develop a scientifically grounded conceptual framework for effective digitalization of workforce management in contemporary organizations. The study employs systematic literature review methods with elements of conceptual modeling. The empirical base comprises 47 scientific publications and 14 industry reports for the period 2019–2025. Content analysis was used to identify thematic categories, empirical data were analyzed using the constant comparative method, statistical verification was conducted through triangulation across multiple sources, and conceptual synthesis was employed to construct an integrated theoretical model. Four groups of digital transformation drivers in HR management were identified and systematized: technological (with efficiency indicators of 87–95.8%), organizational (leadership correlation with readiness 0.92), external (regulatory, competitive), and social (ESG principles, human-centricity). Five categories of critical implementation barriers were revealed: technical limitations (44% of organizations), organizational obstacles (67% implementations without process changes), ethical-legal challenges (36% algorithmic bias), financial constraints (51% inability to measure ROI), and security threats (projected losses of $10.5 trillion). Digital technology's impact on HR management effectiveness was established across four key areas: recruitment (92.3% NLP screening accuracy), personnel development (218% increase in revenue per employee), workforce planning (95.8% turnover prediction accuracy), and engagement and retention (18–43% reduction in turnover). An integrated conceptual framework was developed comprising a four-phase process model, a three-level coordination system, five critical success factors with corresponding KPIs, and adaptive mechanisms for different organizational contexts. A comprehensive conceptual framework has been constructed, bringing together four distinct implementation phases, three organizational coordination levels, five critical success factors with measurable KPIs, and flexible mechanisms tailored to diverse organizational contexts. The framework synthesizes technological capabilities, organizational dynamics, ethical considerations, and human-centered elements into a unified theoretical model operating within the HR 5.0 paradigm. Analysis revealed a striking paradox: despite 65% of organizations having adopted AI tools, merely 1% have achieved full implementation maturity. This disparity between technological uptake and organizational readiness explains why 70% of digital transformation projects fail to meet their objectives. The framework equips HR practitioners with a structured methodology for AI implementation, incorporating concrete performance metrics and strategies tailored to organizations of different sizes, industries, and digital maturity levels.

KEYWORDS

digital transformation, human resource management, artificial intelligence, data analytics, HR policy, organizational change, HR 5.0.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

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Цифрова трансформація політики управління людськими ресурсами: інтеграція штучного інтелекту та аналітики даних у стратегічне управління робочою силою

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.21

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АНОТАЦІЯ

Метою дослідження є комплексний аналіз процесів цифрової трансформації політики управління людськими ресурсами в контексті стратегічної інтеграції технологій штучного інтелекту та аналітики даних, ідентифікація механізмів впровадження, визначення факторів успіху та бар'єрів реалізації, розробка науково обґрунтованої концептуальної рамки ефективної цифровізації управління робочою силою в сучасних організаціях. У дослідженні застосовано методи систематичного огляду наукової літератури з елементами концептуального моделювання. Емпіричну базу складають 47 наукових публікацій та 14 галузевих звітів за період 2019–2025 років. Використано контент-аналіз для ідентифікації тематичних категорій, тематичний аналіз емпіричних даних через метод постійного порівняльного аналізу, статистичну верифікацію шляхом тріангуляції даних з множинних джерел, концептуальний синтез для побудови інтегрованої теоретичної моделі. Ідентифіковано та систематизовано чотири групи драйверів цифрової трансформації управління персоналом: технологічні (з показниками ефективності 87–95,8%), організаційні (кореляція лідерства з готовністю 0,92), зовнішні (регуляторні, конкурентні) та соціальні (ESG-принципи, людиноцентричність). Виявлено п'ять категорій критичних бар'єрів впровадження: технічні обмеження (44% організацій), організаційні перешкоди (67% впроваджень без процесних змін), етично-правові виклики (36% алгоритмічної упередженості), фінансові обмеження (51% неможливості вимірювання ROI), безпекові загрози (прогнозовані втрати $10,5 трлн). Встановлено механізми впливу цифрових технологій на ефективність управління персоналом у чотирьох ключових сферах: рекрутинг (92,3% точність NLP-скринінгу), розвиток персоналу (218% збільшення доходу на співробітника), планування робочої сили (95,8% точність прогнозування плинності), залученість та утримання (зниження плинності на 18–43%). Розроблено інтегровану концептуальну рамку, що містить чотирифазну процесну модель, трирівневу систему координації, п'ять критичних факторів успіху з відповідними KPI та адаптивні механізми для різних організаційних контекстів. Сформовано цілісну теоретичну модель цифрової трансформації управління людськими ресурсами, що інтегрує технологічні, організаційні, етичні та людські виміри в рамках парадигми HR 5.0. Виявлено системну суперечність між технологічним потенціалом (65% впровадження інструментів ШІ) та організаційною зрілістю (1% повної зрілості), що пояснює 70% невдач проектів цифрової трансформації. Розроблено структурований підхід до впровадження технологій штучного інтелекту в кадрові політики з конкретними метриками ефективності та адаптивними стратегіями для організацій різного розміру, галузевої приналежності та рівня цифрової зрілості. Запропонована система може бути використана HR-практиками для планування та реалізації ініціатив цифрової трансформації.

КЛЮЧОВІ СЛОВА:

цифрова трансформація, управління людськими ресурсами, штучний інтелект, аналітика даних, кадрова політика, організаційні зміни, HR 5.0.

1. Introduction

Today's organizational landscape is undergoing a fundamental reshaping driven by the convergence of artificial intelligence (hereinafter, AI), data analytics, and digital technologies, which are radically altering human resource management practices across diverse industries and sectors [23; 49]. This digital revolution transcends simple technological upgrades, marking a paradigmatic shift toward evidence-based strategic workforce management that challenges long-established personnel management paradigms while unlocking new frontiers in organizational efficiency [4; 51].

Digital transformation dynamics have intensified markedly during the post-pandemic era, compelling organizations to rapidly reconceptualize their personnel management approaches and pivot from intuitive decision-making toward sophisticated analytical systems [5; 18]. Between June 2023 and January 2025, the proportion of HR leaders actively planning or implementing generative AI surged from 19% to 61%, signaling swift recognition of these technologies' transformational capabilities [13]. This transformation spans multiple dimensions: AI-powered recruiting systems, predictive talent management analytics, digital productivity monitoring, and automated learning and development platforms [16; 32]. Evidence demonstrates that HR automation delivers administrative cost reductions of 30% for HR professionals and 49% for employers [30]. Currently, 38% of organizations deploy AI for HR functions, while 62% intend implementation within three years [43]. Concurrently, emerging sustainable innovation leadership capabilities illustrate how digital transformation intersects with both organizational environmental efficiency and strategic competitiveness [21].

Contemporary empirical research reveals that achieving successful digital transformation in human resource management requires a multidimensional approach that integrates technological infrastructure, organizational culture, and human capital development [9; 14]. HR leaders forecast that generative AI will impact 37% of the workforce within the next two to five years [13], requiring fundamental reconceptualization of traditional HR functions. Organizations adopting comprehensive digital HR strategies document substantial gains in decision-making efficiency, employee engagement, and operational performance, whereas those failing to adapt confront mounting competitive disadvantages [8;12]. Nevertheless, this transformation generates considerable challenges: digital competency gaps, data privacy concerns, cybersecurity risks, with projected cybercrime costs reaching $10.5 trillion by 2025, and employee data breaches rising 41% in 2023, and the imperative to balance technological advancement with human-centered workforce management approaches [1; 30; 40].

AI and data analytics integration into personnel management policy reaches beyond operational efficiency to encompass strategic workforce planning, talent acquisition, performance management, and employee development [22; 44]. Significantly, 44% of HR leaders indicated in May 2025 that they plan to deploy semi-autonomous agentic AI capabilities within twelve months [13], signaling a shift from basic automation toward sophisticated intelligent decision-making systems. This evolution necessitates that organizations cultivate new competencies, restructure traditional HR functions, and establish governance frameworks ensuring ethical and effective digital technology deployment while preserving employee trust and organizational integrity [26; 50].

Despite expanding scholarly literature on digital transformation, substantial gaps persist in understanding how AI and data analytics can be successfully integrated into HR policy while navigating the intricate interplay of technological, ethical, and organizational challenges. A critical concern arises from evidence that 67% of organizations implement technologies without modifying work processes [25], resulting in suboptimal transformation outcomes. The research gains added relevance from emerging regulatory frameworks, notably the EU AI Act – the first comprehensive legal instrument governing artificial intelligence [27] – which establishes new standards for ethical AI deployment in personnel management. This investigation addresses a critical knowledge gap by examining factors that either facilitate or impede digital HR technology adoption, analyzing mechanisms through which digital transformation influences workforce management outcomes, and proposing a comprehensive strategic implementation framework.

The central research question guiding this investigation is: how can organizations successfully implement digital transformation in HR policy through strategic integration of AI and data analytics while simultaneously addressing technological infrastructure requirements, organizational change management challenges, and the ethical considerations inherent in workforce digitalization?

This research aims to conduct a comprehensive analysis of digital transformation in personnel management policy through the strategic integration of AI and data analytics, to examine implementation mechanisms, to identify pivotal success factors and barriers, and to develop an evidence-based framework for effective workforce digitalization in contemporary organizations.

The study pursues five specific objectives: (1) systematic analysis of current personnel digital transformation trends and practices across diverse organizational contexts and industries, accounting for emerging realities of agentic AI and generative technologies; (2) identification and assessment of key technological, organizational, and human factors influencing successful AI and data analytics implementation in HR policy, including analysis of barriers preventing work process changes during technological upgrades; (3) examination of mechanisms through which digital transformation impacts workforce management outcomes, particularly decision-making processes, employee engagement, and operational efficiency; (4) evaluation of challenges and barriers confronting organizations when integrating digital technologies into HR practices, including infrastructure limitations, skill gaps, ethical considerations, and regulatory compliance issues; and (5) development of a comprehensive strategic framework for successful personnel digital transformation, accounting for implementation pathways, governance structures, formation of T-shaped competencies for HR professionals, and sustainability considerations.

The object of this research is the digital transformation of human resource management policy and practice within contemporary organizations, specifically in the context of the rapid adoption of generative and agentic artificial intelligence.

The research subject focuses on the strategic integration of AI technologies and data analysis into personnel management policy, the mechanisms by which these technologies affect organizational workforce management effectiveness, and the development of ethical and regulatory frameworks governing their deployment.

2. Literature Review

2.1. Theoretical Foundations of Digital Transformation in Human Resource Management

Theoretical foundations underpinning digital transformation in human resource management have evolved considerably, spawning multiple conceptual frameworks that illuminate the intricate interplay among technology, organizational structures, and human capital management. Through comprehensive bibliometric analysis of 2,743 publications, O'Brien et al. documented that HRM 4.0 research exhibits accelerated growth post-2020, with AI-driven human resource management, digital talent management, and automation emerging as dominant scholarly themes [29]. Current data indicates that 65% of HR departments globally have adopted at least one AI-based tool [41], underscoring the worldwide scope of this transformation.

The Technology-Organization-Environment (TOE) framework has emerged as particularly influential in elucidating patterns of digital HR technology adoption. Prymyska et al. constructed a conceptual model for AI integration in production environments featuring three distinct levels: a sensory level for data collection, an analytical level for processing, and a managerial level for decision-making [31]. Their model identifies technological infrastructure, organizational readiness, and environmental factors as pivotal challenges confronting successful implementation.

Examining Industry 4.0 readiness across 506 Malaysian SMEs through the Industry4WRD assessment framework, Techanamurthy et al. analyzed critical digital transformation factors [42]. Their findings revealed that leadership and strategic alignment achieved the highest scores (mean value 0.81), whereas workforce competence registered as the weakest element (0.35). Notably, leadership demonstrated the most robust positive correlation (0.92) with overall digital transformation readiness, underscoring its pivotal role in successful technology implementation.

Resource-Based View (RBV) theory offers a complementary perspective on how digital technologies evolve into strategic assets within personnel management. RBV posits that digital HR technologies can deliver sustainable competitive advantages when they satisfy VRIN criteria: Valuable, Rare, Inimitable, and Non-substitutable. Digital HR systems attain strategic resource status through organic integration with organizational culture, processes, and competencies, thereby generating synergistic effects that competitors find difficult to replicate.

2.2. AI Applications in Human Resource Management

AI integration into HR practices represents a defining dimension of personnel management's digital evolution. Rajeev et al. explored AI's multifaceted role in talent management, highlighting advances in recruitment precision, personalized learning pathways, predictive analytics, and employee satisfaction [33]. Empirical evidence supports this effectiveness: AI-selected candidates have a 14% higher probability of interview success and an 18% higher likelihood of accepting job offers [11].

Chao et al. developed a comprehensive AI-driven human resource management strategy that integrates machine learning algorithms, natural language processing, and reinforcement learning with conventional HR practices [10]. Their empirical findings revealed that NLP techniques applied to resume evaluation attained 92.3% accuracy, surpassing human screening performance. In comparison, XGBoost-based predictive analysis for candidate-position matching reached 89.6% accuracy in assessing organization-candidate compatibility. Current adoption patterns show that 60% of organizations deploy AI for talent management, with 65% of recruiters actively utilizing AI-powered tools [11]. Through a systematic review of AI's role in human resource management, Hourani analyzed 10 peer-reviewed studies using advanced statistical methods [19]. The review documents substantial benefits from AI implementation: heightened efficiency, improved employee satisfaction, and strategic workforce optimization. Additionally, AI-powered tools reduce recruitment costs per hire by 30% and increase average revenue per employee by 4% [11].

2.3. Data Analytics and Workforce Intelligence

The evolution of data analytics in personnel management has fundamentally reshaped decision-making processes, shifting them from intuitive approaches to evidence-based strategic planning. Sharma et al. investigated how big data and AI enhance HR decision-making by delivering insights into workforce demographics, productivity patterns, and employee behavior [37]. Predictive analytics now achieves notable outcomes: turnover forecasting reaches 87% accuracy [17], while underperforming employee identification occurs 27% faster than manual review processes [41].

Through social network analysis of AI-based human resource management research, Maghsoudi et al. examined 102,296 authors and 287,799 collaborative relationships, identifying four principal research streams: AI for system identification and control, HR analytics and performance management, machine learning for classification and prediction, and AI-based HR decision-making [24].

Vaiyapuri and Sbai demonstrated the practical application of advanced analytics to address employee attrition using Bayesian-optimized boosting ensemble models, achieving 95.8% accuracy in turnover prediction [46]. AI-powered workforce analytics platforms enhanced employee risk assessment accuracy by 44%, whereas AI-driven 360-degree feedback tools improved user satisfaction by 33% [41].

2.4. Challenges and Barriers to Digital Transformation

Notwithstanding potential benefits, organizations encounter substantial challenges when pursuing digital HR transformation initiatives. Through interviews with oil and gas industry executives, Dua pinpointed critical barriers: high initial investment costs, workforce skill deficiencies, cybersecurity vulnerabilities, complexity in integrating new technologies with legacy systems, and the risk of excessive dependence on technology [12]. Personnel readiness constitutes a particularly acute concern: 67% of respondents reported that their organizations had not proactively pursued training and upskilling initiatives to prepare employees for AI technology deployment [38].

Algorithmic bias is a critical challenge in AI-based HR systems. O'Brien et al. underscored the necessity for transparent and explainable AI models to counteract algorithmic discrimination, particularly in recruitment and performance evaluation contexts [29]. Available evidence reveals algorithmic bias in 36% of hiring algorithms [17], with 41% of HR professionals identifying it as their principal AI implementation concern. During 2025, 29% of companies suspended or restructured AI-based recruitment tools following bias detection. Responding to these concerns, 36% of organizations now conduct regular audits of their AI models to verify fairness and transparency [41]

Ethical and legal dimensions have gained heightened significance. The U.S. Equal Employment Opportunity Commission (EEOC) achieved a landmark settlement in 2023 for AI-based employment discrimination, compelling a company to pay $325,000 after its system automatically rejected older candidates [20]. Subsequently, in February 2024, a class-action lawsuit was filed against Workday

alleging systematic discrimination based on race, age, and disability [20]. These legal precedents establish that employers – not third-party vendors – bear primary liability for unintentional discrimination arising from the deployment of AI tools.

2.5. Industry Applications and Sectoral Variations

Digital HR transformation exhibits distinct sectoral variations in adoption patterns and implementation challenges. North America leads in AI adoption for HR, with 68% of departments deploying AI-based tools, compared to 54% in Europe and 45% in Asia [47]. Within the United States, 37% of organizations have adopted AI-based platforms to automate talent acquisition processes [41].

Investigating AI and automation integration within the tourism and hospitality industry, Chao et al. highlighted the sector's pronounced dependence on human capital and service excellence [10]. Their analysis demonstrates that although AI enhances operational efficiency through automation and predictive analytics, it also introduces challenges related to data privacy and cultural resistance to technological adoption. Within the manufacturing sector, Satyro et al. determined that successful AI integration necessitates robust technological infrastructure, strong management commitment, articulated strategic vision, and comprehensive workforce upskilling programs [35]. Al-Ballam and Ziyab documented Kuwait's Heavy North Oil Digital Transformation Initiative, which incorporates AI-based predictive maintenance, IoT-powered asset management, and real-time data integration platforms [2].

2.6. Future Trends and Emerging Technologies

The transition toward Industry 5.0 and HR 5.0 marks the subsequent phase of digital transformation, foregrounding human-centric approaches alongside technological advancement. Whereas Industry 4.0 prioritized technological efficiency and productivity, Industry 5.0 embeds societal value and wellbeing within core production objectives [39]. Saxena et al. characterized HR 5.0 as a holistic framework leveraging technology, data, and analytics to cultivate a more focused and adaptive workforce grounded in "people first" principles [36].

Central to HR 5.0 is the transition from rigid job roles to skills-based models that emphasize adaptability and continuous development [6; 39]. Evidence indicates that the most effective leaders in 2025 will possess emotional intelligence – capabilities AI cannot replicate, including empathy, creative thinking, and communication [48]. World Economic Forum research projects that complex problem-solving will emerge as the most sought-after skill across all industries by 2025 [48].

Through a systematic review, Samuels and Pelser traced the transition from Industry 4.0 to 5.0, underscoring how AI, big data analytics, and blockchain technologies converge to enhance supply chain efficiency and resilience [34]. Nam and Park analyzed revolutionary developments in total laboratory automation, emphasizing the integration of AI, machine learning, robotics, and the Internet of Things [28].

2.7. Sustainable and Green HR Practices

Embedding sustainability principles within digital HR practices has gained growing prominence. Aljohani introduced an innovative framework for ESG strategy assessment that employs fuzzy multi-criteria decision-making tools, focusing on seven pivotal strategies: AI-based predictive analytics, renewable energy integration, and AI-enhanced workforce and community development [3].

Zervas and Stiakakis investigated human resource management strategies for bridging the digital divide, foregrounding HRM's function in mitigating digital inequality while enhancing employee productivity [51]. Their findings reveal that HRM strategies substantially reduce the digital divide by fostering digital adaptability and cultivating inclusive work environments.

2.8. Industry 4.0 and 5.0 Technologies in HR Context

Transitioning toward Industry 5.0 necessitates reconceptualizing the function of human resources within technology-saturated environments. Gupta et al. provide a comprehensive exploration of the spectrum of human capital management in Industry 5.0, foregrounding the transformational role of human capital analytics in shaping workforce management, talent development, and HR strategies [15].

Yu et al. constructed a competency education framework for marine superintendents within the context of eco-digital maritime transformation through an integrated DACUM approach [50]. Their

investigation identified convergent competencies-digital technology literacy and capacity to interpret global maritime regulations – as critical for the successful career transformation of marine superintendents navigating digital technology implementation alongside environmental requirements in the maritime sector.

The AI in HR market is experiencing exponential growth: from $661.56 million in 2023 to a projected $1.12 billion by 2030, representing a CAGR of 6.78%. Alternative projections suggest the market will reach $1.35 billion by 2025 [45]. The AI-based HR software market is forecast to reach $2.3 billion by 2025 [47], while other projections indicate growth from $6.05 billion in 2024 to $14.08 billion by 2029 [41].

Literature analysis exposes a complex digital HR transformation landscape marked by substantial opportunities coexisting with persistent challenges. Although technological capabilities continue advancing, successful implementation hinges critically on organizational readiness, leadership commitment, and comprehensive change management strategies.

Geographic disparities in research production and implementation underscore the necessity for more inclusive digital HR transformation approaches. O'Brien et al. observed that although China, the U.S., and India dominate research production, European countries exhibit stronger international collaboration [29]. Current data reveal that only 1% of companies consider their AI implementation fully mature, while 47% of C-suite executives perceive their organizations as implementing AI too gradually [17].

The literature review also exposes gaps in longitudinal research on the long-term impacts of digital HR transformation on organizational outcomes and employee well-being. Existing research predominantly addresses implementation challenges and short-term benefits, devoting limited attention to sustainability and evolutionary adaptation of digital HR systems over extended timeframes. Ethical AI deployment warrants further investigation, particularly given that 47% of employees report discomfort with AI use for performance evaluation [41] and 78% expect transparency in AI-assisted HR decisions [17].

3. Problem Statement

Analysis of digital transformation's current state in human resource management exposes a fundamental contradiction between AI and data analytics' theoretical potential and their practical implementation outcomes. Despite 65% of HR departments globally deploying AI-based tools [41], only 1% of companies characterize their AI-based tool implementations as fully mature, with 70% of digital transformation projects falling short of their objectives [17].

3.1. The gap between Strategy and operational capabilities

The initial challenge stems from insufficient comprehensive theoretical foundations for the successful integration of AI into HR policies. Although Maghsoudi et al. delineated four principal AI research domains in HR, a substantial gap persists between theoretical models and practical implementation frameworks [24]. Techanamurthy et al. uncovered a systemic disconnect: despite high leadership scores (correlation of 0.92), workforce competence remains critically deficient (0.35) [42].

This challenge intensifies given that 67% of organizations deploy technologies without modifying work processes [25], while an equivalent 67% neglect employee training for AI systems [38]. Simultaneously, the average employee navigates 12+ organizational changes annually, yet 47% of managers perceive AI implementation as proceeding too gradually [17]. Sectoral and regional disparities compound the challenge: 68% implementation in North America contrasts sharply with 45% in Asia [47].

3.2. Ethical challenges and crisis of trust

The second challenge concerns the ethical dimensions of AI deployment. Notwithstanding high technical accuracy – 92.3% in NLP screening and 89.6% in compatibility prediction according to Chao et al. [10] – algorithmic bias pervades 36% of hiring algorithms [17], which 41% of HR professionals identify as their principal concern [41]. Bias detection has prompted 29% of companies to suspend AI recruiting initiatives [41].

Legal ramifications are materializing: in 2023, the EEOC ordered a company to pay $325,000 for AI-driven age discrimination [20], while in 2024, a class action lawsuit was filed against Workday [20]. Paradoxically, although bias in human decision-making is acknowledged, AI garners limited trust: according to DemandSage, 48% of managers express willingness to trust AI fully, whereas merely 31% of recruiters express willingness to trust AI fully [11], whereas 47% of employees report discomfort with AI-based assessment [41].

A critical discrepancy emerges: 78% of employees anticipate transparency in AI-assisted HR decisions [17], yet only 36% of organizations perform regular model audits [41]. Most systems operate as "black boxes", fundamentally contradicting HR 5.0's "people first" principles [36].

3.3. Fragmentation of implementation and lack of long-term data

The third challenge manifests as a disconnect between technical efficiency and organizational outcomes. Despite impressive accuracy rates – 87% in turnover prediction according to HireBee [17] – systemic improvements remain elusive due to fragmented implementation patterns: AI achieves full implementation in merely 37% of organizations for record management, 34% for performance management, and 27% for onboarding [11]. Most research concentrates on short-term effects while neglecting data on transformation sustainability over extended timeframes. Investment pressures – $3.3 trillion by 2025 – compel the pursuit of "quick wins" at the expense of strategic transformation [48]. Geographical asymmetry in research production further complicates knowledge transfer processes [29].

3.4. Insufficient integration of sustainable development and human-centeredness

The fourth challenge arises from the disparity between ESG declarations and the integration of sustainability principles into digital HR processes. Despite the escalating importance of ESG criteria [3], practical integration remains fragmented. Zervas and Stiakakis identified inclusivity as mediating between HRM and productivity, underscoring the necessity for comprehensive approaches [51]. Critically, the pursuit of automation often eclipses human-centeredness [48]. Over 50% of remote workers experience difficulty establishing connections with colleagues [30], while emotional intelligence is a pivotal leadership competency [48]. Nevertheless, investment flows predominantly toward technology rather than toward cultivating human competence.

3.5. Security threats and methodological fragmentation

The fifth challenge addresses cybersecurity threats: cybercrime costs are projected to reach $10.5 trillion in 2025, accompanied by a 41% surge in employee data breaches [30]. Concurrently, 55% of HR professionals harbor concerns regarding AI data privacy, while 48% of employees express unease about activity monitoring [17]. A methodological challenge compounds these concerns: the absence of standardized approaches to evaluate the effectiveness of digital HR initiatives. Metric diversity generates methodological fragmentation, impeding the comparison of results and the formation of generalizable conclusions.

In synthesis, the central scientific challenge is the absence of a comprehensive conceptual framework for integrating strategic AI and data analytics into HR policies – one that balances technological efficiency, ethical imperatives, sustainable development principles, and long-term organizational adaptability.

This challenge manifests across three critical dimensions:

1. Strategic dimension. Technological capabilities (92,3% accuracy) remain inconsistent with organizational outcomes (1% mature implementation).
2. Operational dimension. Fragmented implementation (27–37% full integration) prevails over coherent digital ecosystem development, compounded by the absence of process change (67% of organizations).
3. Ethical dimension. Employee expectations for fairness and transparency (78%) confront algorithmic bias (36%) and limited trust among recruiters (31%).

Addressing this challenge requires developing an integrated approach that synthesizes technological innovation, organizational transformation, and ethical principles to ensure a sustainable and effective digital evolution of human resource management in dynamic business environments.

4. Methods and Materials

This investigation employed a systematic literature review methodology incorporating conceptual modeling elements. The methodological foundation rests on a systematic approach to analyzing digital transformation in human resource management, aiming to construct an integrated theoretical framework for artificial intelligence and data analytics implementation in HR policies.

Systematic literature searches were executed across international databases – Web of Science, Scopus, and Google Scholar – spanning 2019–2025, with particular emphasis on 2023–2025 publications. Search strategies employed the following key term combinations: "digital transformation", "human resources", "AI in HR", "HR analytics", "workforce management", "people analytics", "algorithmic bias HR", "HR 5.0", "Industry 5.0". Inclusion criteria encompassed: peer-reviewed journal publications, availability of empirical data (quantitative or qualitative), theoretical justification of conceptual models, full-text availability, and research topic relevance. Exclusion criteria eliminated: unreviewed conference materials, duplicate publications, articles lacking empirical support, and publications outside HR contexts.

The empirical foundation comprised 47 scientific publications and 14 industry reports containing relevant statistical data as of 2025. Industry reports and statistical data furnished pertinent quantitative indicators regarding digital HR technology implementation.

Data analysis proceeded through four sequential stages. The initial stage employed content analysis of scientific publications to identify five pivotal thematic categories: digital HR transformation drivers, implementation barriers and challenges, AI and analytics impact mechanisms on HR processes, performance, and effectiveness indicators, and ethical aspects alongside regulatory dimensions. The second stage used a continuous comparative thematic analysis of empirical data to identify recurring patterns in successful transformations, typical errors and obstacles, and industry-specific and regional implementation characteristics. The third stage conducted statistical verification by triangulating quantitative indicators across multiple sources to establish data reliability, with each key indicator verified in at least three independent sources. The fourth stage performed conceptual synthesis, integrating the preceding stage results into a unified theoretical model by identifying key elements based on mention frequency and theoretical significance, structuring relationships through causal analysis, generalizing implementation best practices, and developing adaptive mechanisms that account for specific organizational context. The integrated conceptual framework emerged through the systematic construction of individual components into a coherent system. Initially, key elements were identified based on theoretical significance and empirical confirmation across multiple sources, and interrelationships among technological, organizational, ethical, and human factors were structured through detailed cause-and-effect analysis. The implementation process model crystallized through systematic generalization of successful organizational cases, enabling identification of critical success factors at each transformation stage. Adaptive mechanisms were devised to ensure the applicability of the conceptual framework across varied organizational contexts, accommodating differences in organizational size, industry characteristics, technological maturity levels, and organizational culture. The investigation acknowledges certain methodological limitations that require consideration when interpreting the results. Reliance on secondary sources precludes primary empirical research, constraining the capacity for data verification and in-depth analysis of specific organizational contexts. The rapid pace of technological development, particularly regarding generative and agentic AI, suggests that some data may become outdated shortly after publication. The predominance of English-language publications may introduce geographical biases, limiting comprehension of the regional characteristics of digital HR transformation in non-English-speaking nations. Most studies' focus on large organizations limits the generalizability of their conclusions to small and medium-sized enterprises, which comprise a substantial segment of the global economy. The study's temporal scope – 2019–2025 – may be inadequate to capture long-term trends and evolutionary changes that require longitudinal observation. Notwithstanding these constraints, the employed approach provided a robust theoretical foundation for understanding digital transformation processes in human resource management and for constructing a practical conceptual framework integrating the most current scientific data and industry insights as of 2025.

5. Results and Discussion

5.1. Key drivers of digital transformation in HR policies

An analysis of empirical studies and organizations' practical experience reveals a complex system of interrelated factors that drive the digital transformation of HR policies. Based on a synthesis of research results, five main groups of drivers can be identified that form a multi-level model for stimulating digital change in human resource management.

Technological factors as catalysts for transformation. Technological progress is the most evident and powerful driver of digital HR transformation. As of 2025, 65% of HR departments worldwide have implemented at least one AI-based tool [41], with 60% of organizations using AI for talent management and 65% of recruiters actively using AI tools [11]. This trend reflects a global process of rapid technology adoption that gained momentum after 2020. It was then that HRM 4.0 research documented a sharp increase in interest toward HR digitalization [29]. The advancement of artificial intelligence, machine learning, cloud computing, and big data analytics has opened up possibilities for HR professionals that did not exist before: automating routine operations and reaching a qualitatively new level of strategic workforce planning.

The impact of generative AI has been particularly striking. According to Gartner, the share of HR leaders actively planning or already implementing GenAI grew from 19% in June 2023 to 61% in January 2025 [13]. This confirms predictions about the pivotal role of generative technologies in creating autonomous HR systems. The research findings are compelling: natural language processing technologies demonstrate 92.3% accuracy in resume screening and 89.6% accuracy in predicting candidate-organization compatibility, significantly outperforming traditional selection methods [10]. Even more impressive results were achieved by, who reached 95.8% accuracy in predicting employee turnover using Bayesian-optimized models [46].

Such performance metrics have become a powerful incentive for investments in digital HR solutions. DemandSage reports that AI-selected candidates are 14% more likely to be invited for interviews and 18% more likely to accept job offers [11]. Not surprisingly, the AI market in HR is experiencing exponential growth: from $661.56 million in 2023 to a projected $1.12 billion by 2030, representing a CAGR of 6.78% according to [45]. Alternative forecasts from SQ Magazine appear even more optimistic, projecting $14.08 billion by 2029 [41].

Meanwhile, cloud technologies provide scalability and accessibility for HR systems, enabling organizations to adapt quickly to changing business needs. The integration of IoT devices into work environments opens up opportunities for real-time performance monitoring and personalizing employee experiences.

Organizational factors and internal drivers. Internal factors play a decisive role in stimulating digital HR transformation. Research by Techanamurthy et al. revealed a strong correlation (0.92) between leadership quality and an organization's overall readiness for digital transformation [42]. This underscores how critical management support is for successfully implementing digital initiatives. However, a critical problem has also been identified: workforce competencies remain low (0.35), creating a gap between strategic vision and operational capabilities.

The digital expectations of internal HR service clients are becoming increasingly demanding. Employees, particularly millennials and Gen Z, expect HR processes to be as convenient and fast as the consumer digital services they use daily. This shift in expectations creates internal pressure on HR departments, forcing them to modernize their processes and tools. Tellingly, 78% of employees expect transparency in HR decisions made with AI assistance, which requires not just technological upgrades but cultural changes within organizations [17].

An organization's strategic objectives also serve as a powerful driver of digitalization. Companies seeking competitive advantage through innovation and operational efficiency view digital HR technologies as critical investments. However, a significant obstacle emerges here: 67% of organizations implement technologies without changing their work processes [25], leading to suboptimal outcomes. In contrast, organizations with clear strategic goals and a willingness to transform processes demonstrate substantially better results in implementing HR technologies.

A culture of continuous learning and adaptability also stimulates digital change. Organizations that cultivate innovative thinking and openness to experimentation adopt new HR technologies faster and adapt them more successfully to their specific needs. What remains problematic is that 67% of

organizations fail to be proactive in training employees to work with AI, creating a substantial barrier to successful transformation [38].

External stimuli and market factors. External forces exert powerful pressure on organizations, accelerating digital HR transformation. The COVID-19 pandemic proved to be an unprecedented catalyst for digitalization, forcing organizations to rethink their approaches to human resource management rapidly. The necessity of enabling remote work, digital hiring, and virtual learning accelerated the adoption of technologies that would typically take years to implement. More than half of remote workers report difficulty connecting with colleagues in remote settings, driving adoption of digital collaboration tools [30].

The competitive environment creates additional incentives for HR digitalization. Organizations that observe competitors successfully implementing digital HR solutions feel pressure to modernize to avoid losing their competitive position in the battle for talent. However, 47% of senior executives believe their organizations are implementing AI too slowly, creating a gap between awareness of the need for change and the speed of its implementation. Industry innovation also drives digital transformation, as best practices spread rapidly among organizations within the same sector [17]. The regulatory landscape and legal developments are pushing the need for HR process digitalization. The emergence of the EU AI Act as the first comprehensive AI legislation [27] sets new standards for ethical AI use in human resource management. Legal precedents, such as the EEOC's $325,000 settlement for age discrimination by AI and the class action lawsuit against Workday, are prompting organizations to implement more transparent and fair automated systems [20]. New requirements for reporting, personal data protection, and equal opportunity are encouraging organizations to implement automated systems to ensure compliance and transparency.

Labor market demographic shifts are also driving digitalization. An aging workforce in developed countries and the growing share of digitally literate workers create a need for new approaches to managing multi-generational teams and meeting diverse expectations regarding work experience. External drivers have varied impacts depending on the industry context. O'Brien et al. found that the technology and financial sectors adapt more quickly to external challenges, while healthcare and the public sector respond more slowly due to regulatory constraints [29]. Regional data confirms geographical disparities: 68% adoption in North America, 54% in Europe, and 45% in Asia [47].

Digital age needs and social factors. The digital age is shaping new social norms and expectations that directly impact HR practices. Growing attention to employability and lifelong learning encourages organizations to implement digital platforms for employee development and career management. The transition to HR 5.0 and Industry 5.0 emphasizes integrating social value and well-being into core organizational objectives [39], with emotional intelligence becoming a key leadership competency [48].

ESG principles are becoming important drivers of digital HR transformation. Research by Aljohani shows that integrating AI into ESG strategies, including enhancing workforce and community development, is becoming critical for organizations pursuing sustainable development [3]. Zervas and Stiakakis found that inclusivity mediates the relationship between HRM and employee performance, highlighting the importance of social factors in digital transformation [51].

Social networks and digital platforms are changing how people search for jobs and build professional networks, prompting HR departments to adapt their recruitment and employer branding strategies to the digital environment. Social and cultural factors have the most significant impact in sectors with high customer interaction and a strong dependence on human capital. Research indicates that in professional services and education, social drivers often outweigh technological ones in spurring digital change.

Synergistic effects and contextual variability. Empirical analysis reveals that the impact of different drivers varies across organizational contexts and industry-specific conditions. Technological drivers demonstrate the most universal impact, manifesting across all types of organizations regardless of size or sector. However, their practical implementation largely depends on organizational factors, especially leadership quality and innovation culture. What is critical is that only 1% of companies consider their AI implementation fully mature, despite widespread technological adoption, indicating the complexity of transforming organizational processes and culture [17].

To systematize the identified drivers of digital transformation of HR policies, a summary of the main influencing factors is presented (Table 1).

Table 1. Characteristics of the main drivers of digital transformation in HR policies

Driver type	Key components	Empirical indicators	Examples of impact	Level of impact
Technological factors	AI, machine learning, cloud technologies, data analytics, IoT	65% of HR departments have implemented AI; 61% GenAI; 92.3% NLP accuracy; 87% turnover prediction accuracy	Recruitment automation, predictive attrition analytics, personalized training, 14% higher probability of success for AI candidates	High (universal)
Organizational factors	Leadership, corporate culture, strategic goals, internal customer needs	Correlation between leadership and readiness: 0.92; 67% without process change; 67% without AI training	Management support, innovative culture, digital expectations of employees (78% expect transparency)	High (context-dependent)
External drivers	Pandemic, competition, regulatory changes, demographic shifts	Accelerated by COVID-19; 47% of executives consider implementation to be slow; EU AI Act $325K EEOC settlement	Remote work (50%+ communication difficulties), digital recruiting, compliance automation, geographic differences (68%/54%/45%)	Medium-High (variable)
Social factors	ESG principles, Generation Z/millennials, social networks, the concept of employability	HR 5.0 human-centeredness; emotional intelligence of leaders; inclusiveness as a mediator	ESG integration in HR, digital employer branding, development platforms, human-centered approach Industry 5.0	Medium (specific)

Source: Compiled by the authors based on the data from: [3; 10; 11; 13; 17; 20; 25; 27; 29; 30; 38; 39; 41; 42; 45–48; 51].

Table 1 demonstrates that technological factors have the greatest and most universal impact on the digital transformation of HR policies, as supported by specific empirical performance indicators, with accuracy ranges of 87–95.8% across various AI applications. Organizational factors, although demonstrating a high level of influence, with a correlation of 0.92 between leadership and readiness, are characterized by significant contextual dependence and critical barriers, including insufficient staff training and the lack of process changes during implementation.

External stimuli have a variable impact depending on industry specifics and geography, with regulatory changes and legal precedents becoming increasingly important factors. Social factors have a more specific and targeted impact on certain aspects of HR practices, while gaining increasing importance in the context of the transition to HR 5.0 and the human-centered paradigm of Industry 5.0.

For a detailed analysis of the variability in the impact of drivers across organizational characteristics, a comparative table is presented (Table 2).

When examining the data presented in Table 2, distinct patterns emerge in how different organizational contexts respond to various drivers. Technology and financial firms stand out as exceptionally responsive to all driver categories. This makes intuitive sense given their inherent orientation toward technological innovation and the intense competitive pressures they face in their markets. The public sector presents an interesting contrast. Bureaucratic structures and regulatory requirements tend to dampen responsiveness to technological and external drivers, yet these organizations exhibit notable sensitivity to social factors.

Organization size introduces another layer of complexity to this picture. Large corporations, with their 65% AI adoption rate, prove most responsive to technological and external drivers [41]. Medium-sized enterprises tell a different story – with 32% adoption rates, they appear to rely more heavily on organizational factors as their primary drivers [41]. Small businesses face the most significant challenges and show the lowest responsiveness across all driver types, with only 30% of SMEs having adopted AI [47]. Resource constraints appear to be the limiting factor here, restricting their ability to respond effectively to any driver category.

Geography matters considerably in this picture as well. North America leads across all driver categories with a 68% adoption rate. Europe, at 54%, presents an interesting case – there is a notable balance between organizational and regulatory factors here, particularly shaped by the EU AI Act [27]. Asia, with 45% adoption, falls somewhere in the middle, showing moderate receptivity that tends to emphasize organizational and external incentives more heavily [47]. What emerges most clearly from

this analysis is that multiple drivers working together create the strongest impetus for successful digital transformation.

Table 2. Comparing driver effects across organizational characteristics

Organizational characteristics	Technological drivers	Organizational drivers	External drivers	Social drivers	Dominant factors
By industry:					
Technology/Finance	Very high	High	Very high	High	Technological + External
Health care	Medium	High	Medium	High	Organizational + Social
Public sector	Low	Medium	Low	High	Social + Regulatory
Production	High	High	High	Medium	Technological + Organizational
By size:					
Large corporations (65% AI)	Very high	High	High	High	Technological + External
Medium-sized enterprises (32% AI)	High	Very high	Medium	Medium	Organizational + Technological
Small businesses (30% AI)	Medium	High	Low	Low	Organizational
By geography:					
North America (68%)	Very high	High	High	Very high	Comprehensive impact
Europe (54%)	High	High	High	Very high	Organizational + Regulatory
Asia (45%)	Medium	High	Medium	Medium	Organizational + External
By degree of maturity:					
Mature implementation (1%)	Maximum	Maximum	Maximum	Maximum	Synergy of all factors
Active implementation (65%)	Very high	High	High	High	Technological + Organizational
Initial implementation (34%)	High	Medium	Medium	Medium	External + Technological
Synergistic effect	★★★★★	★★★★☆	★★★☆☆	★★★☆☆	Multiple drivers

Note: The level of impact is assessed on a five-point scale, with ★★★★★ being the maximum synergistic effect.

Source: Compiled by the authors based on the data from: [12; 13; 17; 29; 41; 47].

Organizations experiencing simultaneous pressure from technological, organizational, and external factors do not just adopt digital HR solutions more readily – they also achieve significantly better implementation outcomes and realize the most tremendous gains in operational efficiency. This synergistic effect appears far more powerful than any single driver operating in isolation. At the same time, 70% of digital transformation projects fail to achieve their goals (Boston Consulting Group, cited by 365Talents [52]), indicating the critical importance of a comprehensive approach that integrates all types of drivers while overcoming organizational barriers such as lack of process change (67% of organizations according to Mercer [25]) and insufficient staff training (67% of organizations according to SHRM [38]).

5.2. Barriers and challenges to the implementation of digital HR technologies

An analysis of the current state of digital technology implementation in human resource management reveals a complex system of interrelated obstacles that hinder the successful implementation of AI and data analytics in HR policies. Empirical research demonstrates a paradoxical situation: even though 65% of HR departments worldwide have implemented at least one AI-based tool [41], only 1% of organizations consider their implementations fully mature [17], and 70% of digital transformation projects fail to achieve their goals [52]. Organizations face systemic challenges that significantly limit the effectiveness of digital transformation.

To systematize the identified obstacles, a summary of the main categories of barriers to the implementation of digital HR technologies is presented (Table 3).

Technical limitations have proven to be a critical category of obstacles to the successful implementation of digital HR technologies. A study by Flexential shows that 44% of organizations identify IT infrastructure limitations as the main barrier to expanding AI initiatives. This problem is particularly acute in the context of growing computing power requirements – global spending on AI

infrastructure reached $47.4 billion in the first half of 2024, up 97% from the same period last year. System integration poses particularly thorny challenges for organizations saddled with legacy HR systems. When Gartner surveyed HR leaders in 2024, 55% considered their current technology solutions inadequate for evolving business needs. Perhaps even more troubling, 46% reported that existing HR technologies were actually hindering rather than improving the employee experience. This creates something of a paradox – investments meant to drive improvement are instead making things worse. The scale of integration difficulties becomes clearer when we consider that 47% of organizations struggle with integrating digital tools.

Table 3. Systematizing barriers and challenges to the implementation of digital HR technologies

Category of barriers	Key components	Statistical indicators	Impact on implementation	Level of criticality
Technical limitations	Infrastructure limitations, system integration, data quality, and technological maturity	44% IT infrastructure as a barrier; 55% unsatisfactory technologies; 46% negative impact on experience; 47% integration difficulties	Blocks AI scaling, creates technological gaps, limits functionality, and fragmentation (37%/34%/27% by process)	Critical
Organizational barriers	Resistance to change, skill gaps, cultural barriers, and leadership	67% without process change; 67% without AI training; 52% resistance to change; 27% lack of experts; 86% talent shortage; 12+ changes/year per employee	Slows adaptation, reduces efficiency, creates internal resistance, and workforce competencies 0.35	Critical
Ethical and legal challenges	Data privacy, algorithmic bias, regulatory compliance, transparency	36% of algorithms contain bias; 41% of HR professionals are concerned about bias; 29% have suspended AI recruiting; 33% lack security protocols; 48% have policy gaps; $325K EEOC settlement; 31% trust recruiters; 47% employee discomfort	Reputational risks, regulatory threats, ethical dilemmas, trust crisis, and legal implications of the EU AI Act	Critical
Financial constraints	High initial investment, uncertainty of ROI, budget constraints, and cost of support	26% cite high costs as a barrier; 51% cannot measure ROI; 50% find it difficult to demonstrate ROI; $3.3 trillion investment by 2025; $40–50 billion per 1 GW of GPU	Limits investment opportunities, complicates project justification, and puts pressure for quick returns instead of a strategy	High
Security threats	Cyber threats, data breaches, privacy, and personal data protection	$10.5 trillion in cybercrime by 2025; 41% increase in employee data breaches; 55% of HR professionals concerned about privacy; 48% of employees concerned about tracking; 24% view cyber threats as a challenge	Creates risks of data leaks, reputational damage, regulatory fines, and loss of employee trust	High

Source: Compiled by the authors based on the data from: [11; 13; 17; 20; 25; 27; 30; 38; 41; 42]

The piecemeal nature of AI implementation only compounds these technical headaches. As of 2025, full AI implementation exists in just 37% of organizations for employee record management, 34% for performance management, and a mere 27% for onboarding [11]. This fragmentation creates what might be called "islands of automation" scattered throughout a sea of traditional processes, making it impossible to realize the synergistic benefits that an integrated digital ecosystem could provide. Data quality and accessibility present yet another critical technical hurdle. Research from Harvard Business Review (2017) found that 21% of 783 respondents cited the sensitive nature of data in digital business as a significant barrier to transformation. When data quality is poor, it not only limits how well AI algorithms can perform – it also creates real risks of making inaccurate decisions based on faulty information.

Organizational barriers cut particularly deep because they directly affect whether employees and management actually adopt new technologies. The most glaring problem? Fully 67% of organizations implement technologies without bothering to change their work processes [25]. This creates what we might call "digital shells" wrapped around outdated practices. It explains why technology alone fails to transform organizations. As Mercer aptly puts it: “technology is not the same as transformation, and

digitalization is not the same as technology [25]. Digitalization is a mindset, transformation is an ability, and technology is a means of scaling and measuring value".

The training gap exacerbates organizational challenges. A striking 67% of organizations have not been proactive about training and upskilling employees to work with AI technologies [38]. This sets up a vicious cycle where technologies roll out faster than organizations can develop the competencies needed to use them effectively. Techanamurthy et al. found that workforce competencies remain critically low (0.35), even when leadership scores are high (0.92 correlation with readiness) [42].

Resistance to change remains a fundamental obstacle – 52% of respondents in the HBR study (2017) reported this challenge. Veeam's research confirms this, with 14% of IT leaders citing internal resistance as a factor blocking successful digital transformation. Consider this: the average employee navigates more than 12 significant changes per year, many of which meet resistance stemming from employee mindset or insufficient motivation to adapt.

The shortage of qualified personnel has become a critical bottleneck for AI development in HR [7]. TEKsystems found that 27% of executives point to a lack of technical expertise as the main barrier to achieving transformation goals. This becomes especially acute with AI technologies, where 86% of organizations worry about acquiring or developing specialized talent to meet AI objectives. The skills gap in specialized IT infrastructure management is actually widening: 61% of organizations reported such gaps in 2024, up from 53% the previous year.

Cultural barriers manifest through risk-averse cultures found in 36% of organizations (KPMG, 2023), which naturally slows digital transformation progress. Another 32% of leaders see complex work environments as the primary obstacle to successful digital transformation. Meanwhile, 47% of senior executives believe their organizations are implementing AI too slowly, creating an awkward internal tension between cautious cultures and the urgent need for change [17].

Ethical and legal challenges have become critically important as AI increasingly drives hiring decisions. Algorithmic bias has been detected in 36% of hiring algorithms [17], and 41% of HR professionals cite it as the main problem with AI implementation [41]. The severity of this issue becomes clear when we learn that 29% of companies have been forced to suspend or restructure AI-based recruiting tools after discovering biases [41].

Flexential's study (2025) uncovered critical gaps in how organizations approach ethical AI governance: 33% lack security protocols, and nearly half (48%) have policy gaps in detecting algorithmic bias. Only 36% of organizations regularly audit their AI models for fairness and transparency [41].

The legal consequences of algorithmic discrimination are becoming impossible to ignore. In 2023, the US Equal Employment Opportunity Commission (EEOC) reached its first-ever settlement in an AI discrimination case, requiring a company to pay $325,000 for automatically rejecting older candidates [20]. In February 2024, a class action lawsuit was filed against Workday alleging systematic discrimination based on race, age, and disability [20]. This case highlights an important point: employers, not third-party providers, bear the primary risk for unintentional discrimination.

O'Brien et al. emphasize the need for transparent and explainable AI models to mitigate algorithmic discrimination, particularly in recruitment and performance evaluation [29]. Yet trust remains elusive: only 31% of recruiters are willing to trust AI for hiring decisions [11] fully, and 47% of employees feel uncomfortable with AI-driven performance evaluation [41]. At the same time, 78% of employees expect transparency in AI-assisted HR decisions, but most organizational AI systems function as "black boxes" [17].

Personal data protection regulations add another layer of complexity. The EU AI Act, as the first comprehensive AI legislation, establishes new standards for ethical AI use in human resource management that organizations must navigate when developing and implementing HR systems [27]. The question of transparency in algorithmic decision-making becomes particularly pressing in light of this and similar regulatory initiatives emerging in other jurisdictions. Organizations face a delicate balancing act between leveraging advanced AI technologies and maintaining compliance with ethical principles and legal requirements.

Security threats represent a growing challenge category for digital HR transformation. Cybercrime costs are projected to reach $10.5 trillion by 2025, and employee data breaches jumped 41% in 2023 [30]. When even institutions like the European Parliament fall victim to data breaches in their online

recruitment systems, it underscores just how vulnerable HR systems are – systems that process highly sensitive personal information about employees [30].

Data security concerns are widespread: 55% of HR professionals worry about data privacy when using AI, while 48% of employees are concerned about AI tracking their activity [17]. Veeam's study found that 24% of IT leaders identify cyber threats as the main challenge in digital transformation efforts, underscoring the importance of data security in HR systems.

Financial barriers present complex dynamics that shape HR technology decisions. TEKsystems found that 26% of executives view high costs as the main obstacle to digital transformation – a finding confirmed by Veeam (2023), which found that 22% of IT leaders cited economic uncertainty as a significant challenge. Yet expected investments in digital transformation amount to $3.3 trillion by 2025 [52], putting intense pressure on HR departments to demonstrate quick returns on investment.

The core problem remains the inability to measure ROI from HR technologies accurately. Gartner discovered that 51% of organizations cannot measure the ROI of their technology investments. The Workforce Trends Report (2024) found that half of HR leaders struggle to demonstrate ROI, and 60% find it challenging to prepare HR business cases. ROI uncertainty is compounded by the long-term nature of HR investments and the difficulty of quantifying benefits like improved employee engagement, reduced turnover, or enhanced organizational culture. Research shows that HR technology solutions have been "completely unsuccessful" (26%) or "only somewhat successful" (32%) in reducing HR operating costs [13]. High upfront investments in AI infrastructure create additional financial hurdles. Analysts estimate that installing 1 GW of modern Nvidia GB300 GPU power could cost €40–50 billion, putting such investments within the reach only of the largest corporations. This risks widening the gap between organizations that can afford digital transformation and those that cannot, particularly among SMEs, where only 30% have implemented AI-based HR tools [47].

The synergistic nature of these challenges. What is crucial to understand is that these barriers do not operate in isolation – they create synergistic effects that compound the difficulty of implementing digital HR technologies. Technical limitations amplify organizational barriers when a lack of technical expertise among employees (27% of organizations per TEKsystems) combines with infrastructure problems (44% of organizations per Flexential) and failure to change processes (67% of organizations per Mercer [25]). Ethical challenges are magnified by financial constraints, since implementing appropriate safeguards requires additional investment that 51% of organizations cannot justify because they cannot measure ROI [13]. The research reveals a paradoxical situation: nearly all companies are investing in AI (65% have implemented tools, according to SQ Magazine [41]), yet only 1% consider themselves mature in this area [17], and 70% of projects fail to achieve their goals [52]. The most significant barrier to scaling turns out to be not employees who are ready for change, but management that is unable to ensure sufficiently rapid transformation while overcoming organizational barriers such as the absence of process changes and staff training.

Geographical disparities in AI technology development pose yet another challenge for organizations across regions. Europe controls only 4% of global AI computing power, limiting European organizations' ability to compete in HR digital transformation. Regional implementation differences (68% North America, 54% Europe, 45% Asia per WeCreateProblems [47]) reflect not just varying investment levels but also different regulatory environments, cultural contexts, and availability of technological infrastructure.

Addressing these identified barriers and developing appropriate strategies to overcome them is essential for successfully integrating AI and data analytics into modern organizational HR policies. It is particularly critical to overcome organizational barriers to adopting technology without changing processes or training staff, to address ethical challenges posed by algorithmic bias and the trust crisis, and to ensure the financial soundness of investments through demonstrated ROI.

5.3. Mechanisms of influence of digital HR technologies on the effectiveness of personnel management

The digital transformation of HR policies is shaping a system of interconnected mechanisms that influence key aspects of personnel management. At the same time, empirical data shows a significant gap between the technical potential of these mechanisms and their practical implementation in organizations: even though 65% of HR departments have implemented AI-based tools [41], only 1% of organizations have achieved mature implementation [17], and 70% of digital transformation projects

fail to achieve their goals [52]. To systematize the mechanisms of influence, a summary of the key transformation processes is presented (Table 4).

Table 4. Mechanisms of influence of digital HR technologies on the effectiveness of personnel management

Potential impact	Key mechanisms	Statistical indicators of effectiveness	Technological solutions	Level of impact	Level of implementation
Recruiting and talent selection	Automated screening, AI-powered interviews, predictive compliance analytics	92.3% NLP screening accuracy; 89.6% compatibility prediction accuracy; 30% cost reduction; 14% higher interview probability; 18% higher acceptance probability; 40% reduction in hiring time	NLP for resume analysis (92.3% accuracy), ML algorithms, conversational AI, video analytics	Revolutionary (technically)	60% talent management; 65% recruiters
Performance evaluation and development	Continuous monitoring, personalized development paths, and AI-driven KPIs	218% increase in income when learning; 15% increase in engagement when developing a career; 70% higher engagement when learning; 23% improvement in recognition	Performance analytics systems, AI tutors, adaptive learning platforms, and 360-degree assessment	High (potentially)	34% full implementation
Workforce planning and analytics	Forecast demand planning, dynamic resource optimization, scenario modeling.	95.8% accuracy of turnover forecast; 87% accuracy of outflow forecast; 82% higher profitability in analytics; 15% increase in productivity from big data	Predictive models (95.8% accuracy), HR dashboards, workforce analytics systems, scenario tools	Strategic (high potential)	Low maturity level (1% of organizations)
Staff engagement and retention	Personalized employee experience, real-time surveys, AI-driven ER strategy	18–43% reduction in turnover due to engagement; 52% of resignations can be prevented; 51% are actively looking for work; 65% use workforce analytics; $8.8 trillion lost due to low engagement	Interaction platforms, sentiment analysis, personalized preferences, and gamification systems	Critically important	65% engagement analytics

Source: Compiled by the author based on the data from: [10; 11; 17; 25; 38; 41; 46; 52].

Recruiting and talent selection: revolutionary potential meets limited implementation. Empirical evidence shows that strategically integrating AI and data analytics into HR processes creates a cascade of improvements rippling across the entire spectrum of human resource management. By 2025, 65% of HR departments had implemented at least one AI-based tool [41], with 60% of organizations using AI for talent management and 65% of recruiters actively working with AI tools [11]. When we look at technical indicators, digitized recruiting stands out as the process that shows the most significant efficiency gains among all HR processes.

Automated screening and intelligent candidate matching are genuinely revolutionizing the early stages of recruiting, and the technical efficiency numbers are impressive. Chao et al. found that NLP technologies achieve 92.3% accuracy in resume screening and 89.6% accuracy in predicting organization-candidate fit – substantially outperforming traditional human selection methods [10]. The World Economic Forum documented that conversational AI in hiring leads to an 87.64% reduction in financial costs compared to traditional approaches. The mechanism is straightforward: AI handles initial screenings, reduces the manual workload, and allows recruiters to focus on the most qualified candidates. Under optimal conditions, AI technologies show a clear advantage over human recruiters in selection accuracy. Candidates selected by AI are 14% more likely to pass interviews and 18% more likely to accept job offers [11].

Process acceleration and cost reduction represent key benefits of recruiting digitization. SHRM found that AI recruitment systems can reduce hiring time by an average of 40%, demonstrating

substantial potential to improve hiring process efficiency [38]. AI also reduces hiring costs by up to 30% while allowing recruiters to consider more candidates [11].

However, these impressive technical efficiency metrics come with critical ethical challenges and practical implementation constraints. Algorithmic bias has turned up in 36% of hiring algorithms [17], prompting 29% of companies to suspend or restructure their AI recruiting efforts [41]. The legal consequences are real: a $325,000 EEOC settlement for age discrimination by AI and a class-action lawsuit against Workday for systemic discrimination [20]. Trust remains problematic, too. Only 31% of recruiters are willing to fully trust AI for hiring decisions, even as 48% of managers carry their own biases [11].

Performance evaluation and development: high potential with fragmented implementation. Digital technologies are fundamentally reshaping traditional approaches to performance evaluation, moving away from periodic annual reviews toward continuous monitoring and personalized development. Continuous performance evaluation through AI monitoring is replacing traditional annual reviews with dynamic tracking systems. Companies running comprehensive training programs show 218% higher revenue per employee, highlighting the return on investment in personnel development. This statistic reveals a direct link between systematic employee development and organizational financial outcomes.

Personalized development paths based on AI recommendations significantly boost employee engagement. Employees with access to career development programs are 15% more engaged, and 70% report higher engagement levels with on-the-job training. Comprehensive feedback and recognition systems integrated with digital platforms demonstrate substantial productivity impacts. Employees receiving recognition at least weekly show 23% higher engagement, and digital recognition platforms increase engagement by 30%.

However, fragmented adoption limits the practical implementation of these mechanisms. As of 2025, AI is fully implemented in performance management in only 34% of organizations [11]. This creates a situation where the potential benefits of continuous evaluation systems and personalized development remain unrealized due to insufficient integration with other HR processes. What makes matters worse is that 67% of organizations implement technologies without changing processes [25], meaning new tools often get layered onto outdated performance management practices without any fundamental transformation of approaches.

Workforce planning and analytics: strategic potential with low maturity. Digital technologies are transforming workforce planning from reactive management into proactive, data-driven strategic planning. Organizations using people analytics achieve 82% higher profitability compared to other companies through optimized business and management decisions.

Predictive analytics for employee turnover has become a critically important strategic planning tool with impressive technical accuracy. Vaiyapuri and Sbai achieved 95.8% accuracy in predicting employee turnover using Bayesian-optimized boosting ensemble models [46]. AI systems achieve up to 87–95% accuracy in predicting which employees plan to leave [17], providing HR departments with essential analytical data to implement preventive retention strategies. A dynamic workforce needs planning through AI systems, enabling organizations to optimize resource allocation and forecast future talent requirements. Scenario modeling and people analytics support strategic planning under uncertainty. Organizations using big data and analytics expect a 15% productivity increase through improved decision-making based on employee turnover metrics, engagement levels, and training effectiveness.

Nevertheless, these impressive technical capabilities face a critical maturity gap in implementation: only 1% of companies consider their AI implementation fully mature [17]. This means that despite having access to powerful forecasting tools with 95.8% accuracy, most organizations lack the organizational capacity to use them effectively. A critical barrier is that 67% of organizations have not been proactive about training employees to work with AI [38], which limits HR professionals' ability to interpret and apply complex predictive models. Additionally, 51% of organizations cannot measure the ROI of their technology investments [13], complicating the justification for investing in advanced analytical systems.

Employee engagement and retention: critical importance with growing challenges. Digital transformation of employee retention is shifting away from one-size-fits-all approaches toward hyper-personalized strategies based on real-time analytics of employee behavior and sentiment. The statistics underscore how critical this direction is: 51% of employees are actively seeking new job opportunities,

signaling high potential turnover. Personalized rewards and recognition programs with AI support demonstrate significant impacts on retention. Employee engagement reduces turnover by 18–43%, and 52% of departures could be prevented by better managerial intervention. Sentiment analysis and real-time surveys allow organizations to respond proactively to shifts in employee sentiment. Over 65% of organizations use workforce analytics solutions to improve employee engagement, productivity, and decision-making. This becomes especially important considering that low engagement costs the global economy $8.8 trillion, or 9% of global GDP. Personalized career and skills development have become critically important for retaining talent. Only 29% of employees are "delighted" with available career development opportunities, though 41% consider these opportunities "very important" for job satisfaction, engagement, and motivation. Employees in mentorship programs are 45% more engaged, and continuous skills development increases engagement by 32%.

Human-centric digitalization challenges complicate the implementation of these mechanisms. More than half of remote workers report difficulty connecting with colleagues in remote environments, highlighting the risk of dehumanizing work relationships [30]. What is critical is maintaining a balance between automating engagement processes and preserving the human element. The transition to HR 5.0 emphasizes that emotional intelligence is becoming a key leadership competency – one that AI cannot replace [48]. Moreover, 47% of employees feel uncomfortable with AI being used for performance evaluation, which can negatively impact engagement if organizations do not ensure proper transparency and human involvement in processes [41].

Integrated transformation: synergy of mechanisms with systemic limitations. The most significant transformational impact comes from integrating all mechanisms into a cohesive digital people management ecosystem. Integrated HR ecosystems demonstrate exponential advantages compared to fragmented solutions. However, implementing this integration faces systemic limitations. The fragmented nature of implementation – with only 27–37% full implementation across various processes – creates “automation islands” rather than a holistic ecosystem [11]. Cultural transformation through digital technologies establishes new standards for employee experience. Inclusive workplaces demonstrate 12% higher engagement rates, and teams with high levels of managerial communication report 34% higher engagement. Zervas and Stiakakis found that inclusiveness mediates the relationship between HRM and employee productivity, emphasizing the importance of a human-centric approach even when implementing advanced technologies [51].

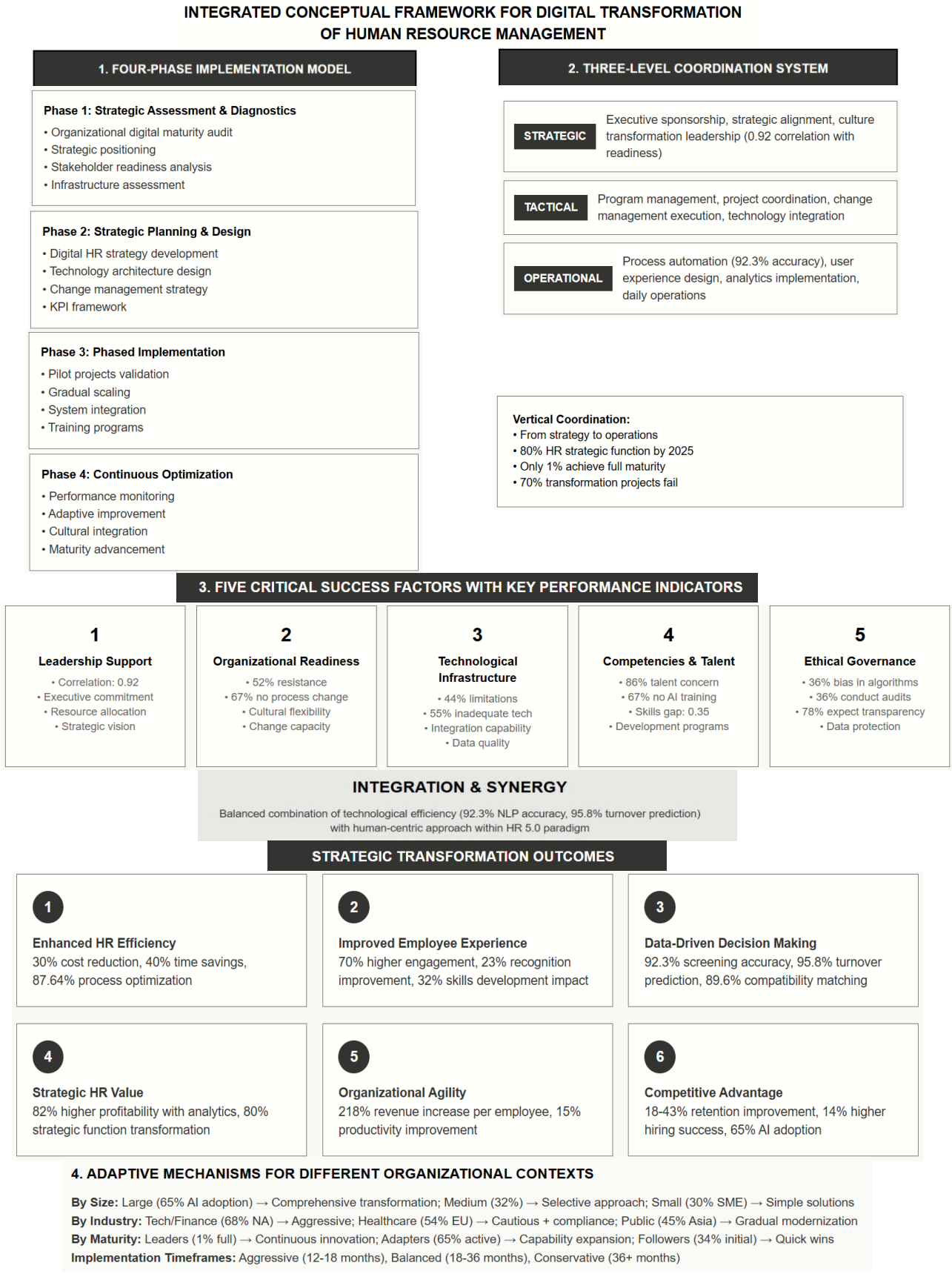
5.4. Integrated conceptual framework for digital transformation of human resource management

The results of a systematic analysis of the impact of digital technologies on human resource management allow us to form an integrated conceptual framework for the strategic implementation of AI and data analytics in HR policies (Fig. 1). The conceptual framework developed is a multidimensional model that integrates four interrelated components: (1) a four-phase implementation model that structures the temporal sequence of transformation; (2) a multi-level approach that ensures vertical coordination from strategy to operations; (3) a system of critical success factors with specific metrics; (4) adaptive mechanisms for different organizational contexts. The framework rests on a central principle: balancing technological efficiency – such as the 92.3% accuracy of NLP screening demonstrated by Chao et al. – with a human-centered approach that enables sustainable transformation without eroding organizational culture [10]. The digital transformation process unfolds through four interrelated phases, each with its own specific goals and success criteria.

Phase 1: Strategic assessment and diagnostics begin with a comprehensive audit of the organization's current state. This audit has three key components that need careful attention. First, the organizational digital maturity audit examines existing technologies, staff digital competencies, and automation levels.

This deserves particular scrutiny, given that 44% of organizations cite IT infrastructure limitations as a significant obstacle. The audit needs to realistically assess technological readiness rather than making overly optimistic assumptions.

Phase 2: Strategic Planning and Design transforms diagnostic results into a concrete strategy with a roadmap. HR digital strategy development should consider key impact mechanisms: a 50% reduction in time-to-hire [38], a 218% increase in revenue with comprehensive training, and an 18–43% reduction in turnover.



Figɜky 1. Integrated conceptual framework for digital transformation of human resource management

Source: Compiled by the authors based on the data from [13; 17; 38; 42; 46], taking into account the analysis of sections 5.1–5.3.

Technology architecture defines technical solutions, considering that 55% of HR leaders consider current technologies inadequate to business needs [13].

Change management strategy addresses 52% resistance to change and 27% lack of technical expertise through comprehensive training and communication programs.

Phase 3: Phased implementation begins with pilot projects in a controlled environment to validate technical solutions. These pilots need to demonstrate concrete benefits – for instance, the 30% reduction in recruitment costs documented by DemandSage [11]. Once pilots prove successful, phased scaling expands these initiatives more broadly. This scaling requires careful planning, particularly since 86% of organizations worry about acquiring the specialized talent needed to support these systems. System integration becomes essential at this stage to ensure new tools operate seamlessly within the existing HR ecosystem rather than creating disconnected silos.

Phase 4: Continuous optimization shifts focus to long-term sustainability. This involves systematic monitoring of performance indicators – tracking metrics such as the 95.8% accuracy in predicting turnover achieved by Vaiyapuri and Sbai [46] or the 23% engagement improvement through recognition programs documented by PeopleBox (2025). However, monitoring alone is not enough. The phase also requires adaptive improvement as needs change and cultural integration to ensure these changes actually stick rather than fading away once initial enthusiasm wanes.

The KPI system supporting this framework is organized around four categories that correspond to the impact mechanisms described earlier (Table 5).

Table 5. Key performance indicators system for HR digital transformation

Category	Key metrics	Target indicators	Data sources
Recruiting excellence	Time to hire	50% reduction	[38]
	Hiring costs	30% reduction	[11]
	Hiring quality	14% improvement	Boterview (2025)
	Diversity	35% improvement	[17]
Productivity and development	Engagement	>70% highly engaged	PeopleBox (2025)
	Completion of training	>85%	Author's recommendation
	Internal mobility	>20% positions	Author's recommendation
	Revenue per employee	+218% with training	PeopleBox (2025)
Workforce analytics	Forecast accuracy	>95% turnover	[46]
	Data quality	>90%	Author's recommendation
	Analytics adoption	>80% of managers	Author's recommendation
	ROI of analytics	+82% profitability	NetSuite (2025)
Employee experience	Retention	+18–43% improvement	Paycor (2025)
	Employee NPS	>50	HR Cloud (2025)
	Technology adoption	>90%	Author's recommendation
	Request resolution time	<24 hours	Author's recommendation

Note: Target indicators are developed based on a synthesis of empirical data 5.1–5.3.
Source: Compiled by the authors.

Effective transformation requires coordination of three levels of organizational activity:

The *Strategic level* provides overall management through executive sponsorship, strategic alignment, and leadership in culture transformation. Critically, the biggest obstacle is not employees, but management that fails to provide sufficiently rapid governance. By 2025, 80% of organizations will transform HR into a strategic function through AI [17].

The *Tactical level* implements program management and project coordination, executes change management strategies through specific training programs (67% of organizations do not conduct AI training according to SHRM, 2025), and coordinates technology integration (46% of technologies negatively impact employee experience according to Gartner [13]).

The *Operational level* ensures process automation (99% of organizations use AI in hiring according to Insight Global, 2025; 87.64% cost reduction through conversational AI according to WEF, 2025), user experience design (69% of employees face obstacles in interacting with HR technologies according to Gartner [13]), and analytics implementation (82% higher profitability with workforce analytics according to NetSuite, 2025).

The systematization of success factors and the development of a metrics system are based on empirical data from sections 5.1–5.3. Five critical factors determine transformation success:

1. *Leadership support* (correlation 0.92 with readiness according to Techanamurthy et al. [42]) includes active top management support, allocation of sufficient resources, and implementation consistency.

2. *Organizational readiness* encompasses readiness for change, digital competencies, and cultural flexibility (52% resistance to change according to HBR, 2017).

3. *Technology infrastructure* includes IT systems readiness, data quality, and integration capabilities (44% infrastructure limitations according to Flexential, 2025).

4. *Competencies and talent* cover availability of skills, development programs, and the ability to attract digital talent (86% concern about talent according to Flexential, 2025).

5. *Ethical governance* includes mechanisms for ethical AI use, data protection, and transparency (33% without AI security protocols according to Flexential, 2025).

The flexibility of the conceptual framework is ensured by a system of adaptive mechanisms that account for the specifics of organizational contexts (Table 6).

Table 6. Adaptive mechanisms of the conceptual framework

Segmentation parameter	Context characteristics	Approach adaptations	Critical factors
Organization size	Extensive (>1,000 employees, 65% AI adoption)	Comprehensive transformation, focus on integration	Coordination between departments
	Medium (100–1,000, 32% adoption)	Selective approach, initiatives with the most significant impact	Resource optimization
	Small (<100, 30% SME implementation)	Simple economic solutions, minimal requirements	Limited resources
Industry	Technology/Finance (68% North America)	Aggressive transformation, full integration	Rapid change
	Healthcare (54% Europe)	Cautious approach, focus on compliance	Regulatory restrictions
	Public sector (45% Asia)	Gradual modernization, emphasis on transparency	Bureaucracy
Digital maturity	Leaders (1% full maturity)	Continuous innovation, ecosystem integration	Maintaining position
	Adopters (65% active implementation)	Capability expansion, scaling	Overcoming fragmentation
	Followers (34% initial)	Basic automation, quick wins	Demonstrating values

Source: Compiled by the authors based on the data from [17; 41; 47].

Phased implementation strategies adapt the pace of transformation:

Aggressive transformation (12–18 months): for digitally mature organizations with strong management support and ready infrastructure.

Balanced approach (18–36 months): for most organizations with average maturity that need time to develop competencies.

Conservative evolution (36+ months): for organizations with significant infrastructure, cultural, or resource constraints.

Risk mitigation strategies need to address the specific challenges identified earlier. Technological risks loom large, with 44% of organizations facing IT infrastructure constraints. Addressing these requires robust testing protocols and backup systems that can prevent catastrophic failures during implementation. Organizational risks present a different kind of challenge – 52% of organizations encounter resistance to change, which calls for dedicated change management programs and intensive communication to bring skeptical employees and managers on board.

Ethical risks demand meticulous attention. With algorithmic bias detected in 36% of systems, organizations need strong governance frameworks and regular audits to catch problems before they cause harm. Financial risks, cited by 26% of organizations as a barrier due to high costs, can be managed through phased investments that spread costs over time and rigorous ROI tracking to justify continued spending.

The integrated conceptual framework we have outlined here represents a holistic approach to digital HR transformation. It combines the structure of a process-based methodology with the flexibility needed to adapt to different organizational contexts. What is essential to understand is that successful implementation is not about cherry-picking individual components – it requires careful consideration of all elements and how they interact with each other. The goal throughout is to maintain that crucial

balance between technological efficiency and human-centeredness, ensuring that transformation enhances rather than diminishes the human dimension of work.

6. Conclusions

This research into digital transformation of human resource management through AI and data analytics integration has revealed a striking disconnect between technological potential and organizational reality. While 65% of HR departments have implemented at least one AI-based tool, only 1% of organizations have reached full implementation maturity, and 70% of digital transformation projects fall short of their objectives. This points to a systemic problem that has little to do with technological limitations and everything to do with organizations' inability to integrate digital solutions effectively into existing personnel management processes.

The research identified four interconnected groups of drivers pushing HR policy toward digital transformation. Technological factors exhibit the broadest universal impact, with impressive performance indicators, including 92.3% NLP screening accuracy and 95.8% turnover prediction accuracy. Yet realizing this potential depends critically on organizational factors, particularly leadership quality, which correlates with transformation readiness at 0.92. External stimuli and social factors add further pressure, though with significant geographical variation in adoption rates (68% in North America versus 45% in Asia). What emerges most clearly is that multiple drivers working together create the most potent catalyst for successful transformation.

When we systematize the barriers, five categories of critical obstacles emerge. Technical limitations affect 44% of organizations, which cite infrastructure issues as a significant concern. Organizational obstacles run even deeper – 67% of organizations implement technologies without changing processes, and another 67% do so without training staff. These form the main structural challenges. Ethical and legal issues add another layer of complexity, with algorithmic bias appearing in 36% of hiring systems and creating both reputational and regulatory risks. Financial constraints also hamper progress, as 51% of organizations cannot measure ROI from their technology investments. Security threats loom large as well, with cybercrime projected to cost $10.5 trillion by 2025. What makes this especially challenging is that these barriers do not operate independently – they amplify each other's negative impacts synergistically.

The impact mechanisms of digital HR technologies on personnel management effectiveness show significant transformational potential when properly implemented. Recruitment sees 30% cost reductions and 40% decreases in time-to-hire. Personnel development systems with comprehensive training generate 218% increases in revenue per employee. Predictive analytics enables accurate forecasting of staff turnover with 95.8% accuracy. Engagement programs cut turnover by 18–43%. However, the fragmented implementation pattern – with only 27–37% full integration across processes – prevents organizations from realizing the synergies that an integrated digital ecosystem could provide.

The integrated conceptual framework developed here offers a structured approach to overcoming these challenges. It works through a four-phase implementation model spanning strategic assessment, planning, implementation, and optimization. Multi-level coordination operates across strategic, tactical, and operational levels. A system of critical success factors provides concrete metrics for tracking progress. Adaptive mechanisms allow customization for different organizational contexts. Throughout, the framework's central principle maintains balance between technological efficiency and a human-centric approach, aligning with the HR 5.0 paradigm.

This research makes its theoretical contribution by creating a holistic conceptual model that integrates the technological, organizational, ethical, and human dimensions of HR digital transformation. Its practical significance lies in providing concrete implementation tools, including a KPI system and adaptive mechanisms tailored to different organizational contexts.

Several limitations deserve acknowledgment. The research relies on secondary sources without conducting primary empirical research. The rapid pace of technological development means some data may quickly become obsolete. English-language publications dominate the sources, potentially introducing geographical biases. The focus centers on large organizations, limiting generalizability to SMEs. Longitudinal data on long-term transformation effects remain absent.

Future research should pursue several directions. The proposed conceptual framework requires empirical validation across different organizational contexts. Longitudinal studies could track the long-

term effects of HR digital transformation. Specific strategies tailored for SMEs and resource-constrained organizations require development. Research into mechanisms to overcome algorithmic bias and ensure ethical AI use remains critical. The impact of agentic AI on the future of personnel management deserves dedicated investigation.

Returning to the central research question: successful implementation of digital transformation in HR policy requires far more than technological investments. It demands fundamental transformation of organizational culture, processes, and competencies. The key success factor is whether organizations can bridge the gap between technological capabilities and organizational capacities through a comprehensive approach integrating strategic vision, phased implementation, competency development, and ethical governance.

The future of human resource management will be determined not by technologies themselves, but by organizations' ability to create synergy between artificial intelligence and human potential within the HR 5.0 paradigm. In this future, technology serves as a tool to enhance, not replace, human-centric management.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Contemporary Geopolitical Transformations and Their Impact on the Dynamics of International Tourist Flows

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.07

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ABSTRACT

Tourism is an extremely vulnerable sector to external and internal crises. The current state of international tourism development is determined by the influence of dynamic geopolitical transformations that significantly change the structure, directions, and intensity of the tourism industry. Geopolitical processes determine the spatial structure of international tourist flows, their dynamics, and the direction of development of the global travel market. The purpose of this article is to analyze the impact of geopolitical challenges on international tourist flows and to identify the main trends in the world. As a result, geopolitical challenges are defined as a multifaceted set of factors, including political conflicts, military actions, economic sanctions, migration crises, the threat of terrorism, and a number of transformations in the system of international relations between different states. These factors lead to a reduction in tourist flows to the affected regions and a redistribution of tourists to more stable countries. The increase in international tourist flows is ensured by stable regions where favorable conditions for the development of tourism have been created and are maintained. Geopolitical risks are identified as one of the key determinants of global tourism development. Their impact manifests itself through changes in tourist flows; the growing role of security as a factor in the competitiveness of destinations; the intensification of regionalization in tourism; and the integration of politics, economics, and tourism into a single global context. General trends in the impact of geopolitical challenges on the development of international tourism are considered. International tourism after the COVID-19 pandemic is showing a significant but unstable recovery. Global shocks can instantly halt the mobility of millions of tourists and cause significant losses in the tourism industry, highlighting the need to integrate geopolitical risks into destination management strategies. Armed conflicts and regional instability cause an immediate reduction in tourist flows to risk areas and lead to a redistribution of demand between countries. Geopolitical challenges are changing the structure of demand: there is an increase in the regionalization of travel and a partial redirection of tourists to "safe" and politically neutral destinations. This phenomenon is accompanied by an increase in the importance of factors such as a country's digital reputation, safety indices and the presence of insurance/evacuation mechanisms in tourism offers. At the same time, some countries are benefiting in the short term from the "substitution effect" by welcoming tourists who have abandoned risky destinations. Sanctions and airspace closures, visa complications, and banking restrictions create practical obstacles to normal travel routes and logistics. This not only reduces the volume of international travel to and from sanctioned countries but also increases transaction costs for tour operators and heightens uncertainty in long-term investments in the tourism sector. Thus, geopolitical challenges are significantly transforming the global tourism landscape. They not only reduce the number of trips to high-risk areas but also affect the structure of the tourism market, logistics processes, and long-term investment decisions.

KEYWORDS

geopolitical challenges, tourism market structure, international tourist flows, tourist trip, tourism industry, investments.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Геополітичні трансформації сучасності та їх вплив на динаміку міжнародних туристичних потоків

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.07

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АНОТАЦІЯ

Туризм є надзвичайно вразливою сферою до зовнішніх та внутрішніх кризових явищ. Сучасний стан розвитку міжнародного туризму визначається впливом динамічних геополітичних трансформацій, які істотно змінюють структуру, напрями й інтенсивність туристичної індустрії. Геополітичні процеси визначають просторову структуру міжнародних туристичних потоків, їхню динаміку та напрям розвитку глобального ринку подорожей. Метою статті є аналіз впливу геополітичних викликів на міжнародні туристичні потоки, визначення основних його тенденцій у світі. У результаті геополітичні виклики визначено як багатогранний набір факторів, що включає політичні конфлікти, воєнні дії, економічні санкції, міграційні кризи, загрозу тероризму та ряд трансформацій у системі міжнародних відносин між різними державами. Ці фактори призводять до скорочення туристичних потоків у постраждалі регіони та перерозподілу туристів у більш стабільні країни. Збільшення кількості міжнародних туристичних потоків забезпечується завдяки стабільним регіонам, де створено та підтримуються сприятливі умови для розвитку туризму. Розглянуто загальні тенденції впливу геополітичних викликів на розвиток міжнародного туризму. Міжнародний туризм після пандемії COVID-19 демонструє значну, але нестабільну відновлюваність. Глобальні потрясіння можуть миттєво зупинити мобільність мільйонів туристів і призвести до суттєвих збитків у туристичній індустрії. Збройні конфлікти та регіональна нестабільність спричинюють негайне скорочення туристичних потоків у зони ризику й викликають перерозподіл попиту між країнами. Геополітичні виклики змінюють структуру попиту: відбувається посилення регіоналізації подорожей і часткове перенаправлення туристів у «безпечні» та політично нейтральні дестинації. Це явище супроводжується зростанням значення таких чинників, як цифрова репутація країни, індекси безпеки та присутність страхових/евакуаційних механізмів у туристичних пропозиціях. Санкції та закриття повітряного простору, ускладнення візового режиму й обмеження банківських операцій створюють практичні перешкоди для звичних маршрутів і логістики подорожей. Таким чином, геополітичні виклики істотно перетворюють глобальний туристичний ландшафт. Вони не лише скорочують кількість поїздок у зонах підвищеного ризику, але й впливають на структуру туристичного ринку, логістичні процеси та прийняття довгострокових інвестиційних рішень.

КЛЮЧОВІ СЛОВА

геополітичні виклики, структура туристичного ринку, міжнародні туристичні потоки, туристична поїздка, індустрія туризму, інвестиції.

1. Introduction

The modern development of international tourism takes place in the context of dynamic geopolitical transformations, which significantly affect the formation of the structure, the choice of destinations and the intensity of tourist flows. Geopolitical challenges are a complex of factors that include political conflicts, military actions, economic sanctions, migration crises, terrorist threats, as well as changes in the system of international relations between states. These factors determine the level of security of regions, the availability of transport infrastructure and the overall attractiveness of certain territories for tourist travel. International tourist flows are defined as the movement of tourists between the countries of the world, which reflects the scale and directions of development of global tourism under the influence of various political, economic and social processes.

2. Literature Review

Various aspects of the development of international tourism have repeatedly been the subject of research by both domestic and foreign scientists. In the article N. Barvinok [2] the dynamics of changes in tourist flows of different countries due to the influence of geopolitical instability are studied, the causes and obstacles in the development of tourism (the impact of political coups, terrorist acts and military actions) are analyzed. Also, in his other work [1], the researcher assessed the impact of global security factors on the development of international tourism in Ukraine over the past decade. M. Bashchak [3] highlighted the factors of geopolitical instability (political coups, terrorist acts, military conflicts) that affect the development of international tourism. P. Shukanov and A. Kopyltsa [15] established how geopolitical events (conflicts, terrorism, political instability and border changes) affect tourist flows, the safety of travelers, the economy, and the development of the tourism industry in general. The article discusses negative consequences (a drop in demand for visiting certain regions) and positive aspects (the development of domestic tourism in the context of international travel restrictions).

O. Shymanskyi et al. [14] based on a comprehensive network analysis, we studied the global networks of tourist flows. E. Papagianni et al. [10] found that geopolitical fluctuations are the main driver of tourist demand. With geopolitical tensions rising, most countries are experiencing a persistent negative impact on their tourism demand. R. Grigoriadis et al. [5] identified a close relationship between political stability, social conditions and demand for tourism. Political factors directly affect the social environment of the destination, which in turn shapes visitors' perceptions of safety, quality of service, and overall impression. Ch.-Ch. Lee et al. [8] examined the causal relationships between geopolitical risks and tourist demand. Geopolitical risk negatively affects tourism demand, and pandemic outbreaks exacerbate the negative impact of geopolitical risks on tourism demand. I. Raheem S. Roux [12] noted a surge in waves of geopolitical uncertainty around the world. Geopolitical risk, in particular acts of terrorism, war risk, nuclear threats and tensions related to military action, has an impact on travel and leisure companies.

3. Problem Statement

The article is aimed at analyzing the impact of geopolitical challenges on international tourist flows, determining its main trends in the world.

4. Methods and Materials

In the course of the study, general scientific and specialized methods of cognition were applied. The theoretical basis of the study is the works of leading domestic and foreign scientists, who are devoted to the concepts of "geopolitical challenges", "international tourist flows". In the course of the analysis, system and dialectical approaches, methods of analysis and synthesis, comparative method, methods of generalization and systematization of knowledge were used.

5. Results and Discussion

At the present stage of development of the world economy, the tourism industry occupies one of the leading roles, activating numerous processes that contribute to the strengthening of economic indicators of countries. In particular, the tourism sector has a significant impact on the growth of the gross domestic product, stimulates progress in such sectors as transport, construction and services, creates a significant number of new jobs, and also serves as a powerful tool for attracting foreign investment. For many countries, tourism is a determining source of economic income, which creates a significant dependence of their budgets on the number of international tourist flows. However, tourist services do not belong to the category of basic life needs, so the demand for them is extremely sensitive to changes in socio-economic and political circumstances. This demand is considered elastic and can fluctuate significantly depending on the action of both objectively statistical and dynamic factors, such as the level of income of the population, seasonality, changes in air travel policies, or even fashion trends in travel. In turn, certain regions and countries of the world, having favorable climatic or cultural conditions, become world leaders in the field of tourism, while others, due to unfavorable circumstances, face a significant decrease in the tourist flow.

International tourism is a form and process of spatial activity at the global level, due to socio-economic and cultural factors, as well as the general dynamics of the development of political systems. Tourism has repeatedly served as an effective means of establishing trust and building interaction between states, regardless of their socio-political structure. It has played a powerful role in economic and political modernization, while helping to maintain political stability in various countries [11, p. 20].

International tourism is closely interconnected with a number of global security factors that can pose a threat to tourism activities and the development of the travel industry in a particular country. Among the main global factors that can negatively affect the development of the tourism sector, it is necessary to single out geopolitical instability in the countries where tourists live or rest (political coups, terrorist acts, armed conflicts); outbreaks of epidemics or pandemics in the regions where tourists live or stay; unfavorable natural and environmental circumstances in the places of rest of travelers; negative general economic situation both in the countries of residence of travelers and in the countries of their vacation [2, p. 142].

Geopolitical challenges are a set of political, economic, military and social factors that arise as a result of changes in international relations between states and affect stability in the world or in certain regions. In other words, they are situations or processes that pose threats or obstacles to the normal functioning of states, regions or the world community. They can manifest themselves in the form (Fig. 1) of armed conflicts and wars that violate security; international sanctions, economic pressure or trade restrictions; terrorist threats and political instability; mass migrations and refugee crises; competition for resources (energy, water, food); information wars, cyber threats and propaganda; global epidemics or environmental disasters that have political consequences. In the context of tourism, geopolitical challenges mean external circumstances that affect the tourist mobility and attractiveness of countries. They can reduce tourist flows to dangerous regions, change travel destinations, and even transform the international tourism market.

Geopolitical risk is currently classified as one of the top five business threats in the world [8]. Geopolitical risk is relevant with aspects such as political stability, security and protection. Events related to wars, conflicts, terrorism or human rights violations increase the level of this risk. As a result, this significantly affects tourists' choice of travel destinations and causes a decline in tourist activity in the affected regions. The tourism sphere of states that share a common border or are in proximity to each other is characterized by high sensitivity to geopolitical shocks of neighboring countries [10]. In addition to those discussed above, the researchers point to factors such as tourist income, overall quality of destinations, demographic structure, public tourism policy, and tourism attractiveness [14].

In recent years, there has been an increase in the number of geopolitical crises, in particular, armed conflicts, economic sanctions, terrorist threats, mass migration and information wars. All these factors significantly affect the structure and intensity of international tourist turnover.

International tourist flows should be understood as a dynamic process of movement of people between countries of the world for the purpose of temporary stay outside the place of permanent residence. These flows are formed under the influence of economic, political, social and geopolitical factors, reflect the scale and directions of global tourism development [16].



Figure 1. Geopolitical Challenges: Factors

Source: generated by the authors.

Taking into account the processes of globalization, the dynamics of international tourism are constantly undergoing changes, which is manifested through transformations in the flows of international tourists. The analysis of the structure and trends in the development of these flows is extremely important for comprehending historical changes and developing reasonable strategies for the further development of the tourism industry [Shao]. The roles and functions of countries or regions in the tourism system reflect the level of economic development of the state, the degree of its openness to international interaction, the index of price competitiveness, the features of state policy, as well as the volume of population. At the same time, roles and functions in the structure of inbound tourist flows are determined mainly by the competitiveness of the tourism sector, the presence of tourist attractions, cultural heritage and other similar factors [5, p. 2].

During periods of increased danger, the intensity of tourist trips within and outside countries tends to decrease sharply, and the issue of tourist safety always remains relevant and requires significant attention from tourism enterprises [1, p. 113]. Situations such as political coups, strikes, protests, or aggravation of relations between countries significantly affect the development of tourism and the formation of interest in certain destinations. It is only natural for people to avoid traveling to regions with low security. This phenomenon is deeply rooted in evolutionary mechanisms and is directly related to the instinct of self-preservation. Despite the development of society and the complexity of the modern world, the human perception of life's threats remains similar to what it was thousands of years ago. Tourists tend to prefer safe destinations when trying to avoid risky places where they experience increased levels of danger. That is why perceived danger can be considered one of the key deterrents influencing a tourist's choice and overall travel decision. This effect is especially noticeable for inbound tourism, as it forms a negative image of the destination in the imagination of potential visitors [6]. Among the main obstacles to the development of tourism during military conflicts are hostilities, which pose a danger not only to tourists, but also to the entire population of the country, especially in the zones of occupation and active hostilities; loss of a significant part of tourist and recreational resources (historical monuments, cultural and architectural sites, religious and tourist places, nature protection zones and medical and health complexes) due to their complete or partial destruction as a result of hostilities or their location in the zones of occupation; destruction of infrastructure in regions where active hostilities are taking place (hotels, catering establishments, entertainment complexes, etc.); closure of airspace for civil aviation; disruption of transport logistics due to the destruction of communication routes or the location of the occupying forces on these routes; occupation by the occupying forces of territories that are important as tourist centers; significant loss of labor resources due to the departure of employees, their displacement or involvement in hostilities [1, p. 113].

The deterioration and instability of the political situation create significant obstacles to the sustainable development of international tourism. The impact of the political environment on the industry cannot be ignored, so stakeholders need to respond quickly and effectively to political events. In the event that instability threatens the safety of tourists, it inevitably affects their travel preferences and destinations [17].

Terrorist acts are also one of the critical security factors that significantly affect the development of tourism. Modern terrorism has transformed: it has become a larger, more organized and widespread phenomenon. Most often, popular tourist destinations become the objects of attacks, which is due to the desire of terrorist groups to draw maximum attention to their actions. In such cases, tourism becomes a convenient mechanism for achieving this task. In addition, citizens of different countries often become victims of terrorist attacks, which emphasizes the international nature of the problem. The largest terrorist attacks mostly take place in states that are popular with tourists. Due to the international nature of tourism, terrorist groups can easily adapt to the tourist environment and use it to realize their goals [2, pp. 116–117]. Countering the consequences of terrorist attacks is usually carried out quite quickly, and there are numerous mechanisms to prevent the recurrence of such attacks. However, military conflicts are of a longer nature, can maintain their presence for years and cause significant damage to the country's tourism industry. The process of restoring and restoring attractiveness and a positive image requires significant efforts and resources from states.

Migration crises caused by the mass displacement of people due to military conflicts, economic difficulties or climate change can affect the tourist attractiveness of certain regions. The growth in the number of migrants often creates an increased burden on the local infrastructure, which negatively affects the quality of services for tourists. In addition, such crises can exacerbate social tension in society, which can discourage travelers from visiting regions that serve as transit zones for refugees. Some tourists deliberately avoid traveling to such places due to fears for personal safety and comfort during their stay [15, p. 117].

A serious challenge for world tourism is the sanctions policy and restrictions on movement. The ban on direct flights, complication of visa procedures and currency restrictions reduce the mobility of the population and the volume of international travel. This is especially noticeable after 2020, when the COVID-19 pandemic, combined with political factors, changed the usual routes and behavior of tourists.

For the most part, international and local tourists prefer to travel to countries or regions with a high level of social, economic and political stability. In addition, consumers of tourist services tend to spend more money on goods and services in places where security is ensured. In this regard, geopolitical risks may have a negative impact on the development of the tourism industry both in the short and medium and long term, affecting the profits of this sector and the overall economic growth [8].

Since the tourism industry is a complex and multifaceted industry, it faces serious challenges in the face of modern economic and social changes. Another of the key problems is information asymmetry, which makes it difficult to coordinate activities between different market participants, such as tour operators, investors and tourists themselves. This problem is especially acute in times of crisis, since information inequality significantly increases risks, causes disruptions in the tourism market and creates additional difficulties for effective risk management. Of particular importance is state policy, which turns out to be an effective mechanism for streamlining the work of inefficient market segments. It contributes to the coordination of actions of tourism entities, improves risk management and ensures the stable functioning of the industry even in difficult socio-economic conditions [7, p. 85].

Political instability, current security issues and negative media coverage pose significant barriers to tourists. At the same time, well-organized communication in crises, effective management and quality public services can significantly improve the image of the destination and contribute to its revival. Therefore, future tourism strategies must proactively address these risks, moving from reactive crisis management to proactive integration of risks into core business and policy planning [4].

Geopolitical challenges are driving operational and strategic changes in the tourism industry: increased attention to risk management, diversification of source markets, development of domestic and short-term tourism, investments in digital marketing and early warning systems. Government agencies and the private sector are increasingly integrating scenario approaches, insurance products and evacuation plans into the business models of tour operators, which increases the overall resilience of the sector, but at the same time requires coordination at the international level and investment in the country's image.

Table 1. General trends in the impact of geopolitical challenges on the development of international tourism

Reducing tourist flows in conflict zones	Geopolitical instability leads to a reduction in the number of trips to regions where there is a security threat. Classic examples are the decline in tourist flow to the Middle East, Eastern Europe, or North Africa during periods of conflict. Tourists tend to replace risky destinations with more stable countries – this phenomenon is called the "substitution effect".
Shifting tourist flows towards safe and politically neutral countries	Destinations such as Switzerland, Slovenia, Portugal, and the United Arab Emirates are gaining popularity because of their image of stability, security, and political neutrality. This is shaping a new geography of tourism, in which safety becomes a key criterion for choosing a trip
Strengthening the role of regional tourism	During periods of global crises and restrictions (such as COVID-19 or sanctions regimes), there is a regionalization of tourist flows, with people more likely to travel within their region or neighboring countries. This contributes to the development of local tourism and interregional partnerships.
Impact of sanctions and visa restrictions	Political conflicts are often accompanied by visa barriers, transport restrictions, and sanctions against airlines or hotel chains. This directly affects the volume of international tourism, changing travel routes and logistics.
Information and media factors	The influence of the media, social networks and risk indices (e.g., Global Peace Index, Geopolitical Risk Index), which form an idea of the security of countries, is growing. Tourists are increasingly focused on the digital reputation of destinations.
Diversification of tourism markets	States seek to reduce dependence on certain tourism markets (for example, the EU or the Russian Federation) and focus on expanding cooperation with the countries of Asia, Latin America, and Africa. This contributes to the globalization of tourism, but in a different, multipolar form.
Development of the concept of "sustainable and safe tourism"	Geopolitical challenges stimulate governments and international organizations to develop crisis management programs in tourism, risk insurance, evacuation protocols and partnerships between states to guarantee the safety of travelers

Source: Formed by the author based on [5; 8, pp. 28–30; 9, pp. 876–877; 10; 12, pp. 3–4].

6. Conclusions

Geopolitical challenges (armed conflicts, political crises, economic sanctions, migration waves and information wars) are transforming the global tourism landscape: they not only reduce the volume of current trips in risk areas, but also change the structure of markets, logistics and long-term investment decisions. Geopolitical factors are now actively influencing the formation of a new structure of the world tourism market. In these conditions, the key strategy for states and travel companies is adaptation to global changes, an emphasis on the development of safe destinations, the introduction of digital technologies in services and the expansion of the range of tourism products. The future stability of the tourism industry will largely depend on the ability to respond quickly to geopolitical challenges and effectively create a positive international image of the country.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Mechanisms of Psycho-Emotional Recovery of Personality in the Context of Natural and Recreational Practices and Restorative Tourism

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.10

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ABSTRACT

The recreational potential of tourism lies in restoring the physical and psycho-emotional strength of the body. Travel and tourist activities help people switch off from everyday stresses, change their usual environment, and get a boost of positive emotions and impressions. Communing with nature helps reduce psycho-emotional tension, restore inner harmony, and reduce symptoms of fatigue and the risk of emotional burnout. The purpose of the article is to analyze modern approaches to the organization of restorative tourism, which is considered an effective tool for psycho-emotional healing. Particular attention is paid to identifying current trends in the development of this type of tourism in the world and Ukraine. Results. It has been determined that restorative tourism combines recreational, psychological, and health elements thanks to the conditions created for a deep reboot of the body and mind. Its essence lies in the interaction of a person with the natural environment, which has a positive effect on the emotional state, reduces anxiety, and contributes to the formation of stress resistance. Psycho-emotional recovery through natural and recreational practices contributes to the formation of a new type of tourist behavior, where the main goal is not consumer demand, but the harmonization of a person's inner state and the restoration of their vital resources. International experience shows a wide range of models of psycho-emotional healing based on the use of natural and recreational practices. In global practice, this area of research is actively developing in the form of forest therapy programs, wellness retreats, mindfulness tours, and thermal and spa complexes, which have proven their effectiveness in restoring psycho-emotional balance. Domestic realities indicate significant potential for their active implementation and expansion. The synergy of natural resources, modern psychological techniques, and developed tourist infrastructure contributes to the creation of conditions for the development of competitive restorative tourism. Conclusion. Modern approaches to organizing restorative tourism in the context of psycho-emotional health are based on the principles of harmonious interaction between humans and nature, scientifically based psychological techniques, and environmental awareness. Such tourism is an important component of health culture and a new model of tourism of the future, focused on inner renewal, self-knowledge, and spiritual balance.

KEYWORDS

psycho-emotional recovery, nature-based recreational practices, restorative tourism, natural resources, digital detox, physical exercise.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Механізми психоемоційного відновлення особистості в контексті природно-рекреаційних практик та відновлювального туризму

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.10

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АНОТАЦІЯ

Рекреаційний потенціал туризму полягає у відновленні фізичних і психоемоційних сил організму. Подорожі та туристичні заходи допомагають людині переключитися від повсякденних стресів, змінити звичну обстановку та отримати заряд позитивних емоцій і вражень. Спілкування з природою сприяє зниженню психоемоційного напруження, відновленню внутрішньої гармонії, а також зменшенню симптомів втоми і ризику емоційного вигорання. Метою статті є аналіз сучасних підходів до організації відновлювального туризму, який розглядається як дієвий інструмент психоемоційного оздоровлення людини. Особлива увага приділяється визначенню сучасних тенденцій розвитку цього виду туризму у світ та Україні. Результати. Визначено, що відновлювальний туризм поєднує рекреаційні, психологічні та оздоровчі елементи завдяки сформованим умовам глибокого перезавантаження організму і свідомості. Його сутність полягає у взаємодії людини з природним середовищем, що позитивно впливає на емоційний стан, знижує рівень тривожності та сприяє формуванню стійкості до стресів. Психоемоційне оздоровлення завдяки природно-рекреаційним практикам сприяє формуванню нового типу туристичної поведінки, де головною метою виступає не споживча потреба, а гармонізація внутрішнього стану людини та відновлення її життєвих ресурсів. Встановлено, що міжнародний досвід демонструє широкий спектр моделей психоемоційного оздоровлення, в основі яких лежить використання природно-рекреаційних практик. У світовій практиці досліджуваний напрям активно розвивається у вигляді програм forest therapy (лісова терапія), wellness-ретритів, mindfulness-турів, термальних і спа-комплексів, які довели свою ефективність у відновленні психоемоційного балансу. Вітчизняні реалії засвідчують наявність значного потенціалу для їх активного впровадження та розширення. Синергія природних ресурсів, сучасних психологічних методик і розвинутої туристичної інфраструктури сприяє створенню умов для розвитку конкурентоспроможного відновлювального туризму. Висновок. Сучасні підходи до організації відновлювального туризму у контексті психоемоційного здоров'я базуються на принципах гармонійної взаємодії людини з природою, науково обґрунтованих психологічних методиках та екологічній свідомості. Такий туризм є важливою складовою культури здоров'я та новою моделлю туризму майбутнього, орієнтованою на внутрішнє відновлення, самопізнання та духовну рівновагу.

КЛЮЧОВІ СЛОВА

психоемоційне оздоровлення, природно-рекреаційні практики, відновлювальний туризм, природні ресурси, цифровий детокс, фізичні вправи.

1. Introduction

The modern rhythm of life, which is accompanied by a fast pace, oversaturation of information and chronic stress, gradually reduces the psycho-emotional stability of a person. As a result, it causes sleep problems, disability, and burnout. Habitual forms of recreation are not always able to fully restore internal resources, because they are often reduced to entertainment or consumption, and do not have a therapeutic or harmonizing effect. One of the most effective areas of support is restorative tourism, which is based on natural and recreational practices. It combines the physical, emotional and spiritual recovery of the human being through direct contact with the natural environment. Psycho-emotional recovery with the help of natural and recreational practices contributes to the formation of a new model of tourist behavior, which is focused not on consumption, but on achieving inner harmony and restoration of vitality. The study of modern approaches to the organization of restorative tourism is also of great importance in the formation of a competitive tourist product of Ukraine.

2. Literature Review

The study was based on a comprehensive analysis of scientific sources. K. Maksymova et al. (2024) consider varieties of health-improving fitness technologies as an effective tool for psycho-emotional recovery, in particular, in wartime. The authors consider fitness and various fitness technologies, the basis of which is the introduction of fitness programs, to be a modern, effective way to improve health. They presented the main classification of fitness programs as a key means of psycho-emotional recovery and improvement of mental and physical condition. Y. Vykhliaiev (2023) investigated recreational technologies, which are an algorithm for the use of motor exercises in accordance with the scientific and methodological principles of physical education, enhancing their health-improving effect due to recreational factors. Ye. Drazina et al. (2025) determined the role of tourist technologies in the system of health-improving and recreational motor activity and their complex impact on the physical, psycho-emotional and social state of a person. I. Shamara et al. (2024) highlighted the aspects of the positive impact of the retreat on human psychological health. The team of authors I. Avecillas-Torres et al. (2025) investigated the effects of outdoor tourism in relieving symptoms of depression, anxiety and stress. A systematic review of the effect of retreats on health was performed by D. Naidoo et al. (2018).

3. Problem Statement

The purpose of the article is to consider the features of modern approaches to the organization of restorative tourism as an effective means of psycho-emotional recovery of a person, as well as to determine the directions of development of this type of tourism in Ukraine based on the use of natural and recreational potential and international experience.

4. Methods and Materials

In the course of work on the article, general scientific methods of cognition were used: system and dialectical approaches, methods of analysis and synthesis, comparative method, as well as methods of generalization and systematization of knowledge. The theoretical basis of the work was the research of leading scientists from Ukraine and other countries, who are devoted to the study of the essence of psycho-emotional recovery, the application of natural and recreational practices and the specifics of restorative tourism.

5. Results and Discussion

Psycho-emotional recovery is a process of improving the psychological state of a person, reducing emotional stress and strengthening the nervous system through special programs, techniques and practices of relaxation. These sets of measures help to achieve psycho-emotional relief, improve the overall psychological state and strengthen the immune system.

Among the main aspects of psycho-emotional recovery are: unloading – reducing the level of stress and emotional stress; strengthening – improving the functioning of the nervous system and increasing immunity; psychological practices – the use of relaxation techniques, psychological exercises and additional techniques to improve the emotional state; sleep – ensuring a full and healthy rest, which is an important factor in the process of recovery; Nutrition is a balanced diet as an integral part of an integrated approach to maintaining psycho-emotional health.

Tourist activity is a unique phenomenon that harmoniously combines aspects of physical activity, recreation and the process of education. Its health, recreational and educational potential is due to the synergistic influence of various components, which in combination contribute to the improvement of the physical condition, psycho-emotional well-being and social adaptation of a person [1, p. 4]. The health potential of tourist activity is manifested primarily in the provision of regular physical activity of medium or variable intensity. Being in the fresh air and in natural conditions stimulates the immune system, normalizes metabolic processes and helps to harmonize the body's biorhythms. The recreational potential of tourism is manifested in the restoration of physical and psycho-emotional resources of the body. Tourist trips and events allow a person to escape from stressful situations, change the usual environment of activity and enjoy positive impressions and emotions. Contact with nature helps to reduce psycho-emotional stress, promotes internal balance, and reduces manifestations of fatigue and emotional burnout [1, p. 5].

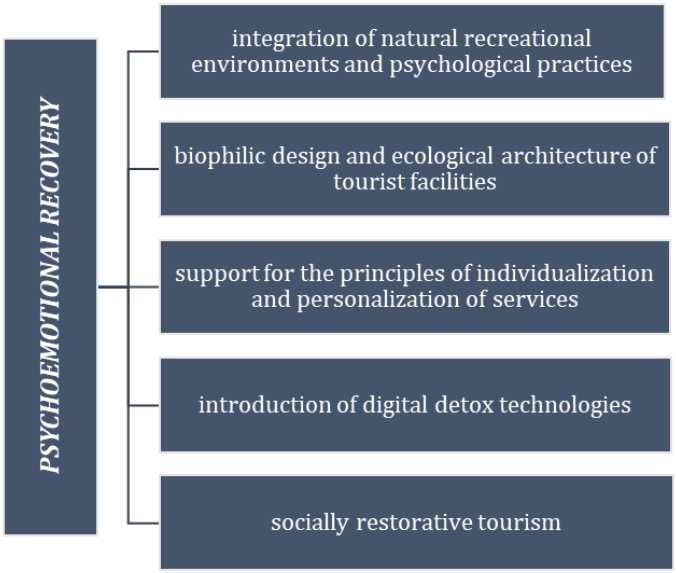


Figure 1. Modern trends in psycho-emotional recovery through natural and recreational practices

Source: Compiled by the authors.

Among modern approaches, it is worth highlighting the integration of the natural and recreational environment and psychological practices. This includes meditation techniques, yoga, breathing techniques, art and music therapy, which are carried out in the conditions of a natural landscape – forest, mountains, lake or sea coast. Such methods have an evidence base for influencing the nervous system, help reduce the level of anxiety, and increase concentration and emotional stability.

Another important approach is biophilic design and ecological architecture of tourist sites. Biophilic design is a concept in architecture and design that involves the integration of natural elements such as living plants, water, natural light, natural materials and organic forms into living and working spaces. Its main goal is to create an environment that improves the physical and psychological condition of a person. It helps to reduce stress, improve mood, increase concentration levels, sleep quality and overall productivity due to the harmonious combination of human life with nature [2]. Hotels, spa complexes, and recreation centers create a space that combines natural materials, natural light, open views of the landscape and calm colors. Such elements of the environment form a sense of security, harmony and comfort, which are basic for psycho-emotional recovery.

The modern organization of recreational tourism also involves the use of the principles of individualization and personalization of services. Tourist programs are created taking into account the

psycho-emotional state, stress level, physical activity, age and personal preferences of a particular client [3]. These may include psychologist consultations, psychotherapeutic sessions, relaxation programs, dietary nutrition, and dosed physical activity.

In addition to these trends, it is worth highlighting the introduction of digital detox technologies. This refers to the conscious rejection of gadgets, the Internet and social networks for the duration of their stay on recovery tours [4]. This helps a person reduce the information load, restore the ability to deep rest and live communication. In many countries, this practice is accompanied by workshops on meditation, working with the body and natural materials.

Another modern direction is social and restorative tourism, focused on supporting vulnerable groups of the population – military, volunteers, and medical workers who have experienced psychological exhaustion. Such programs combine natural factors with group psychotherapeutic practices, body-oriented techniques and recreational activities.

Various fitness programs are an effective and effective means of restoring the psycho-emotional state, in particular, in the context of a military conflict. This includes cardio training, strength exercises, dance classes, training with elements of martial arts, classes in the water using special equipment, as well as psych regulatory practices. A systematic classification of such programs allows you to choose the optimal type of fitness training that will meet the individual psycho-emotional needs and preferences of students who want to engage in health-improving exercises in order to improve psychological and emotional well-being [5, p. 69; 6, p. 32].

Physical exercises have a beneficial effect on the psycho-emotional sphere of a person. They awaken positive emotions, improve mood and strengthen confidence in a speedy recovery. Thanks to the performance of physical exercises, excitement and anxiety associated with the residual consequences of injuries or illnesses are reduced, as well as the phenomena of psychogenic inhibition of recovery processes are weakened. A positive emotional state that arises during classes stimulates physiological processes in the body, which plays a key role in restoring health [7, p. 245-246]. Water aerobics is one of the most versatile means of influencing the human body, aimed at improving overall health. It includes a wide range of adapted exercises, the effectiveness of which is significantly enhanced by the unique conditions of classes, such as a specially equipped pool, purity and transparency of the water, the aesthetic appearance of the instructor and well-chosen musical accompaniment. Within the integrative program known as water aerobics, various forms of motor activity are combined into a single recreational process. This process is aimed not only at improving physical indicators, but also at improving the psycho-emotional state [7, p. 292].

One of the most famous destinations in the world is the Japanese concept of “Shinrin-yoku” or “forest bathing”, which involves immersion in the atmosphere of the forest to reduce stress levels, restore emotional balance and improve overall health [8–10]. The positive effect of forest therapy on health is explained by the harmonious combination of relaxation techniques, moderate physical activity and the healing environment of natural forest spaces. This approach is considered a cost-effective way to manage stress, as it contributes to both improved physical condition and overall mental well-being. In South Korea, forest therapy is defined by law as an activity to strengthen immunity and promote health using various elements of the forest [11]. Such practices are actively implemented in Finland and Canada, where special forest routes have been created with qualified guides-therapists who help participants restore their psycho-emotional state through contact with nature.

In Europe and the United States, the format of wellness and mindfulness retreats is widespread – this is a wellness recreation that combines yoga, breathing techniques, balanced nutrition, aromatherapy and psychological consultations and can be held in various places, including specialized retreat centers, boutique hotels, or places in nature [12]. Such facilities range from small establishments (for example, ashrams in India, which are focused on a spiritual lifestyle) to upscale resorts and residential centers that provide support services for people with chronic diseases [13]. Well-known examples are the Swiss center Clinique La Prairie, the German chain Lanserhof, and the American Miraval Resort – combining traditional resort services with scientifically proven methods of reducing anxiety and restoring the nervous system.

In Ukraine, the direction of regenerative tourism is at the stage of formation. Ukrainian hotels, resorts and spa centers are actively expanding the range of their services, offering specialized programs. Visitors have access to meditation areas, yoga studios, spa and wellness treatments, and other resources aimed at relaxation and spiritual enrichment [14, p. 117]. The Carpathian region is gradually turning

into a center of natural and recreational practices. The complexes "Taor Karpaty Resort & Spa", "Verholy Relax Park", "Voevodyno Resort" offer programs that combine yoga, meditation, aromatherapy, bathing in vats and walks in the forests, using local natural resources [15]. In Truskavets, Morshyn and Skhidnytsia, classical balneological institutions are beginning to include art therapy, psychological trainings and relaxation sessions in their programs, which brings them closer to the concept of restorative tourism [16].

Special attention should be paid to initiatives aimed at the psychological rehabilitation of the military and volunteers. In the Carpathians and Podillia, specialized programs are organized, such as Forest Resilience Camp and Recovery Camp Ukraine, which combine communication with nature, art therapy, bodily practices, and team interaction [17]. In different parts of Ukraine, projects are offered for military personnel on leave and veterans in need of rest and recovery. One of them invites the military to live among a herd of Hutsul horses, where hippotherapy takes place through communication, observation and interaction, which contributes to relaxation and mental recovery. In Uzhhorod, recovery classes for the military and their families were organized in the form of dance therapy, which was initiated by the public organization "Volunteers of Transcarpathia". In Kyiv, in the Podilskyi district, there is a recovery garden where you can work on overcoming mental trauma. The space includes specially equipped areas: walking paths, a central location for group classes, gazebos for couples therapy and separate booths for individual privacy. Based on the Dovgan-art pottery workshop in the village of Khotiv, Obukhiv district, together with the Ukrainian Veterans Foundation, a platform for creativity has been created, where master classes in pottery are held. In addition, the Gorotherapy project, organized by the NGO "Metta", considers nature as a healing force in supporting war victims, including veterans struggling with post-traumatic stress disorder [18].

At the same time, short-term wellness tours and thematic retreats are developing – "detox tours", "yoga weekends", "mindfulness retreats", held in natural locations of the Carpathians, Shatsk Lakes and other parts of the country. Yoga tours are conducted by experienced instructors who develop programs that harmoniously combine classes for different levels of training. The program can cover a wide range of practices, including asanas, meditation, breathing techniques, as well as lectures and discussions on spiritual development and personal growth [19].

Thus, international practice demonstrates a variety of models of psycho-emotional recovery through natural and recreational practices, and the Ukrainian experience confirms the potential for their active development. The integration of natural resources, psychological approaches and tourist infrastructure creates conditions for the formation of competitive recreational tourism, which can positively affect both individual human health and the development of the tourism industry as a whole.

6. Conclusions

Psycho-emotional recovery with the help of natural and recreational practices contributes to the formation of a new model of tourist behavior, which is focused not on consumption, but on achieving inner harmony and restoration of vitality. Being in a natural environment, which is characteristic of most types of tourism, as a result, helps to reduce the level of stress and anxiety. Contact with nature activates psychophysiological mechanisms of relaxation: blood pressure decreases, heart rate evens out and hormonal levels stabilize. Walking along forest paths, water routes or mountain trails create favorable conditions for restoring emotional balance and enhancing the feeling of inner harmony. The international experience of psycho-emotional recovery through natural and recreational practices demonstrates the effective integration of natural, psychological and wellness techniques into the field of tourism. In Ukraine, interest in this direction is being formed, but it has a powerful potential due to the unique natural, climatic and cultural resources of the regions.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



European Approaches to Certification of Hotel Services and Prospects for Implementation in Ukraine

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.13

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ABSTRACT

The relevance of the study is determined by the urgent need to harmonize Ukraine's national system of hotel service certification with European standards of quality and sustainable development. In the context of Ukraine's integration into the EU tourism area and the post-war recovery of the hospitality industry, transparent mechanisms of quality evaluation are essential for restoring consumer trust, enhancing competitiveness, and attracting investment. It has been proven that the adoption of European approaches can act as a catalyst for the modernization of the Ukrainian hospitality sector through the integration of digitalization, environmental responsibility, and managerial maturity. The purpose of the article is to provide a scientific rationale and define strategic pathways for integrating European models of hotel service certification into the Ukrainian legal and institutional framework, taking into account international quality standards, the principles of sustainable tourism, European integration priorities, and the objectives of post-war restoration of tourism infrastructure. Methodology of the research is based on systemic, comparative, and structural-functional approaches that made it possible to study the interrelation between legal, organizational, and technological aspects of certification. Content analysis of EU normative documents was applied, as well as a generalization method to systematize the practices of Hotelstars Union, Green Key, and EU Ecolabel. A logical-analytical method was used to evaluate the prospects of implementing European certification models in Ukraine. Research results. It has been established that the European system of hotel certification functions as a multi-level quality control model combining state regulation, voluntary environmental labeling, and digital monitoring. It has been revealed that Ukraine's current model remains fragmented, lacking transparency and technological integration. The expediency of creating a national electronic register of certified accommodation facilities, implementing adapted ISO 22483 and ISO 18513 standards, and stimulating "green" investments in hotel modernization has been substantiated. Scientific novelty lies in improving the conceptual model of hotel service certification as a tool for ensuring quality, trust, and sustainability, as well as in defining mechanisms for integrating mandatory and voluntary standards within a unified digital quality management system. It has been proven that such a model could serve as a basis for European recognition of Ukrainian certificates. Conclusions. It has been summarized that the effective adaptation of European certification approaches requires reform of the normative base, development of digital infrastructure, training of qualified auditors, and implementation of partnership mechanisms between the state, business, and professional associations. Prospects for further research are related to modeling an integrated certification system for Ukraine's hotel industry, assessing its impact on competitiveness and sustainable development, and examining the socio-economic effects of introducing ecological and digital standards in the post-war reconstruction of the tourism sector.

KEYWORDS

quality standards, harmonization, sustainable tourism, eco-labeling, service digitalization, competitiveness, quality management, post-war recovery, world hotel industry.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Європейські підходи до сертифікації готельних послуг та перспективи їх впровадження в Україні

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.13

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АНОТАЦІЯ

Актуальність дослідження зумовлено потребою гармонізації національної системи сертифікації готельних послуг із європейськими стандартами якості та сталого розвитку. В умовах інтеграції України до єдиного туристичного простору ЄС і відновлення галузі після війни особливої ваги набуває формування прозорих механізмів оцінювання, що забезпечують довіру споживачів, підвищують конкурентоспроможність бізнесу та сприяють залученню інвестицій. Доведено, що адаптація європейських підходів здатна стати каталізатором модернізації українського ринку гостинності, зокрема через поєднання цифровізації, екологічної відповідальності та управлінської зрілості підприємств. Метою статті є наукове обґрунтування та визначення стратегічних шляхів інтеграції європейських моделей сертифікації готельних послуг в український правовий та інституційний простір із урахуванням міжнародних стандартів якості обслуговування, принципів сталого туризму, євроінтеграційних пріоритетів і завдань післявоєнного відновлення туристичної інфраструктури. Методологія дослідження базується на системному, порівняльному та структурно-функціональному підходах, що дали змогу дослідити взаємозв'язок між правовими, організаційними та технологічними аспектами сертифікації. Використано контент-аналіз нормативних документів ЄС, метод узагальнення для систематизації практик Hotelstars Union, Green Key, EU Ecolabel, а також логіко-аналітичний метод для оцінки перспектив впровадження європейських підходів в Україні. Результати дослідження. Встановлено, що європейська система сертифікації функціонує як багаторівнева модель контролю якості, заснована на взаємодії державного регулювання, добровільних екологічних маркувань і цифрового моніторингу. Виявлено, що в Україні домінує фрагментарна модель оцінювання, позбавлена належної прозорості та інтеграції цифрових механізмів. Обґрунтовано доцільність створення національного електронного реєстру сертифікованих об'єктів, упровадження адаптованих стандартів ISO 22483 та ISO 18513 і стимулювання «зелених» інвестицій у готельну інфраструктуру. Висновки. Узагальнено, що ефективна адаптація європейських підходів до сертифікації потребує реформування нормативної бази, розвитку цифрової інфраструктури, підготовки кваліфікованих аудиторів і впровадження партнерських механізмів між державою, бізнесом і професійними асоціаціями. Перспективи подальших досліджень пов'язані з моделюванням інтегрованої системи сертифікації готельних послуг України, оцінкою її впливу на конкурентоспроможність і сталий розвиток галузі, а також з вивченням соціально-економічних ефектів упровадження екологічних і цифрових стандартів у контексті післявоєнної реконструкції туристичного сектору.

КЛЮЧОВІ СЛОВА

стандарти якості, гармонізація, сталий туризм, екомаркування, цифровізація сервісу, конкурентоспроможність, управління якістю, післявоєнне відновлення, світова готельна індустрія.

1. Introduction

In the current conditions of Ukraine's integration into the European tourist space, the problem of certification of hotel services becomes especially relevant. The existing system of quality assessment and classification of accommodation facilities in Ukraine remains fragmented, which complicates the comparability of standards, reduces consumer confidence and hinders the development of a competitive environment. European approaches, built on the principles of transparency, multi-criteria and independent audit, demonstrate high efficiency in ensuring the quality of service and sustainability of the tourism sector. The lack of harmonization of Ukrainian standards with EU norms creates barriers to the international recognition of hotel certificates and limits the participation of Ukrainian establishments in global hospitality markets. From a scientific point of view, there is a need for a systematic study of the mechanisms for adapting European certification models to the national context, taking into account the legal, organizational and technical features of the tourism industry. In practical terms, solving this problem will contribute to increasing the competitiveness of Ukrainian hotels, expanding the opportunities for exporting tourist services, attracting investments and forming a positive image of Ukraine as a European destination with guaranteed quality of service.

2. Literature Review

The analysis of modern research on European approaches to the certification of hotel services and the prospects for their implementation in Ukraine allows us to identify four interrelated scientific areas.

The first direction covers the conceptual and institutional foundations of the development of certification of hotel services in the context of European integration. In the work of R. Korsak, it is substantiated that the adaptation of the Ukrainian hotel and restaurant industry to the requirements of the European Union provides for the harmonization of the certification system, the unification of criteria for assessing the quality of services and the creation of a national mechanism for mutual recognition of certificates [1]. Y. G. Korostashyvets considers the process of unification of the rules for the provision of hotel services in accordance with European standards, arguing that the harmonization of legal norms should be accompanied by updating the procedures for monitoring the quality and professional training of personnel [2]. T. V. Kozhukhova and G. O. Gorina analyze the system of certification of sustainable development in the EU hotel business, highlighting the leading programs Green Key, EU Ecolabel and Travelife as tools for increasing consumer confidence and forming a culture of responsible consumption [3]. Further research in this direction should be aimed at developing a national strategy for adaptation to European certification procedures, taking into account the socio-economic characteristics Ukrainian market.

The second direction concerns economic and managerial mechanisms for ensuring the quality of hotel services within the framework of integration processes. O. B. Kurakin proposes a model of economic management of the quality of hotel services, in which certification procedures are considered as a tool of strategic management capable of forming competitive advantages in the market [4]. V. Demko, in his work, emphasizes the expediency of transferring international experience in the field of quality management, in particular in the context of building internal control systems and external audit of services that increase market transparency [5]. V. Redko examines the transformation of the infrastructure of hotels in Ukraine under the influence of European integration standards, emphasizing the need to modernize the material base and management processes in accordance with the requirements of EN ISO 18513 [6]. V. A. Krasnomovets analyzes the effectiveness of environmental certification programs for the hotel industry, proving that their implementation stimulates corporate social responsibility and improves the international image of enterprises [7]. Further research in this direction should be focused on the econometric assessment of the impact of certification on the efficiency of management, profitability and long-term sustainability of hotel enterprises.

The third direction covers the legal and regulatory foundations of harmonization of the certification system with European requirements. G. V. Medvedev proves that the unification of hotel evaluation systems is an important prerequisite for simplifying control procedures and reducing administrative barriers [8]. L. Matviichuk and co-authors in their work emphasize the need to develop partnerships between hotel industry entities to strengthen Ukraine's competitive position within the

European service market [9]. M. Derevyanko et al. address the challenges associated with standardization and certification within the framework of Ukraine's partnership with the EU, emphasizing the need to create common regulatory platforms and digital registers of certificates [10]. O. V. Kiktenko and K. O. Naboka propose to integrate the principles of the circular economy into the system of state regulation of tourism, which will allow combining environmental criteria with the economic efficiency of certification procedures [11]. Further research in this direction should be aimed at the formation of coordinated interdepartmental mechanisms for mutual recognition of certificates and improvement of regulatory and legal procedures for accreditation.

The fourth direction concerns the integration of the principles of sustainable development into the certification system of hotel services. I. Trišić et al. prove that the introduction of sustainable tourism certifications in the countries of Southern Europe contributes to reducing the carbon footprint of hotels, increasing the efficiency of resource use and the formation of an ethical management culture [12]. E. Wszendybył-Skulska and A. Panasiuk analyze the hotel classification system in the European Union and Poland in the context of public policy of sustainable development, emphasizing that state participation in certification processes is a necessary condition for quality assurance and social trust [13]. Further research should be aimed at creating a national system of "green labeling" of hotels, which would combine ecological, social and management standards in accordance with EU requirements.

Despite numerous works covering the problems of certification of hotel services, some aspects have not received a full scientific explanation. Methodological approaches to the harmonization of European standards with Ukrainian standards, especially regarding the combination of mandatory and voluntary forms of certification, remain uncertain. The impact of eco-labels and digital quality control tools on the competitiveness of hotels has not been sufficiently studied, as well as a single system of criteria that takes into account social, environmental and economic indicators of sustainability has not been developed. The limited empirical base on the effectiveness of adaptation of the ISO series to Ukrainian realities does not allow the creation of a holistic model of national certification.

The proposed study fills these gaps through a systematic analysis of European experience, generalization of the practices of Hotelstars Union, EU Ecolabel, Green Key and the formation of an adaptive model for Ukraine. The use of comparative and logical-analytical approaches makes it possible to combine legal, managerial and digital tools into a single concept of a harmonized quality assessment system, which deepens the scientific understanding of standardization processes in the field of hospitality and creates the basis for further integration of Ukraine into the European quality space.

3. Problem Statement

The article is aimed at scientific substantiation and determination of ways to introduce European approaches to the certification of hotel services in Ukraine, taking into account international requirements for the quality of service, the principles of sustainable tourism, European integration priorities and the tasks of post-war restoration of tourist infrastructure.

1. To determine the structure and role of the EU hotel services certification system in ensuring quality and competitiveness.
2. To analyze the interaction of standards, law and quality management and the possibilities of their adaptation in Ukraine.
3. Identify problems and formulate recommendations for the harmonization of the national system with EU requirements.

4. Methods and Materials

The study applies systematic, comparative and logical-analytical approaches, which provided a comprehensive study of legal, organizational and technological aspects of hotel services certification. Content analysis of EU regulations, international standards ISO 22483 and ISO 18513, as well as practices of Hotelstars Union, EU Ecolabel and Green Key was used. The material basis was scientific publications, official EU documents and industry reports, which made it possible to substantiate the ways of harmonization of the Ukrainian system with European requirements.

5. Results and Discussion

The system of certification of hotel services in the countries of the European Union is based on a combination of regulatory standards, industry classifications and voluntary assessment schemes that provide comprehensive confirmation of the compliance of services with the established quality requirements. Its essence is to create a multi-level model of control, where the state determines the basic requirements for safety and comfort, and independent accredited bodies assess compliance according to unified criteria. Such systems provide for close interaction between legislative regulation, professional associations and market initiatives, which ensures a balance between mandatory norms and voluntary business responsibility for the quality of service. The European approach is focused not only on technical parameters of service, but also on the culture of hospitality, sustainable development and social responsibility, which makes certification a strategic tool for the competitiveness of the hotel business (Table 1).

Table 1. Structural elements of the hotel services certification system in the EU countries

System element	Content and functions	Examples of implementation
Regulatory framework	Defines mandatory requirements for safety, sanitation, architectural accessibility, environmental friendliness and consumer rights	EU regulations on consumer protection and sustainable tourism; National acts of the EU Member States
Harmonized quality standards	Establish uniform criteria for service, personnel management, hygiene, nutrition and risk management	ISO 22483:2020; ISO 9001:2015; ISO 14001:2015; EMAS (Eco-Management and Audit Scheme)
Hotel classification system	Provides a unified "star" system for assessing the level of service and comfort	Hotelstars Union (17 EU countries), National classification catalogs
Conformity assessment mechanisms	Include accreditation, audits, inspections, and periodic monitoring procedures	Accredited conformity assessment bodies; TAIEX; National Accreditation Agencies
Voluntary environmental and social labels	Promote sustainable tourism, environmental responsibility and social reputation	EU Ecolabel; Green Key; Travelife

Source: Systematized by the authors according to the data given in [15–21].

In practice, the hotel certification system in the European Union functions as a multi-level quality management model that combines legal regulations, standardization, classification, monitoring and voluntary participation of businesses in sustainable development. Its effectiveness is explained by the integration between EU regulations, international ISO standards and institutional support of industry associations that ensure control and continuous improvement of criteria. The Hotelstars Union system creates a "transparent ecosystem of trust" where hotel category assessment is not a commercial service but a public commitment by businesses to meet European quality expectations [15]. In fact, the certification process is a continuous cycle of improvement: after the initial verification of compliance with ISO 22483:2020 standards [14], the hotel must not only maintain the achieved level, but also confirm it during repeated audits carried out every 2-3 years. In Germany, Austria and the Czech Republic, such a procedure is accompanied by a system of internal "quality management reviews", which document customer feedback and staff productivity indicators [18]. In 2024, according to the updated catalogue of criteria of the Hotelstars Union 2025–2030, the mandatory parameters for the 4-star and 5-star categories include digital solutions – self-check-in systems, online satisfaction surveys and electronic energy managers, which make it possible to reduce costs by 10–15% and at the same time increase the comfort of guests [22]. The environmental component of certification is becoming more and more important. According to the European Commission, in 2025, more than 1100 hotels in the EU are certified under the EU Ecolabel program [19], and the Green Key program covers about 60% of hotel enterprises in Denmark, the Netherlands and Sweden. Such certificates not only increase market attractiveness, but also provide financial advantages – hotels with eco-labeling demonstrate an average of 12–15% higher occupancy compared to non-certified facilities [20]. At the same time, the authors of studies in the field of sustainable tourism emphasize that certification is turning into a social marker of the maturity of the industry – it indicates the ability of a business to meet not only consumer, but also environmental and cultural expectations of society. In this context, the Ukrainian tourism sector can use

the European model as a basis for the post-war reconstruction of the hotel industry by introducing a combined system – mandatory at the level of basic requirements and voluntary at the level of international eco-labels. This will allow Ukraine not only to ensure compliance with EU requirements but also to increase the trust of tourists and partners in the European space.

The European model of interaction of standards, law and management practices in the hotel industry appears as a continuous cycle of "rationing-evaluation-digital monitoring-improvement", where legal instruments set minimum requirements, standards and industry approaches structure processes, and management methods ensure effectiveness and public accountability. The key effect of this interaction is the transition from formal compliance with standards to a controlled improvement in the quality of service and sustainability, confirmed by independent verification and open data [23; 24] (Table 2).

Table 2. Main tools, methods and technologies of social marketing in the field of public administration

Level	What regulates/establishes	Typical tools	Examples
Legal (state)	Minimum safety requirements, transparency, frequency of control	State classification, accreditation of control bodies, open registers	National. classification and inspections every 5 years; Publication of results
Standards/Industry	Operational criteria of service, ecology, accessibility, management	Criteria catalogs, external audits, third-party eco-labels	Harmonized catalogs; independent audits; eco-certification
Managerial (companies)	Organizational maturity, KPIs, continuous improvement	EFQM/TQM, Balanced Scorecard, digital dashboards	Connection of service KPIs with staff training; Regular reviews

Source: Systematized by the authors according to the data given in [2; 3; 6; 9; 10; 13].

In practical terms, the interaction of standards and law in the European Union forms a transparent architecture of trust between the state, business and consumer. In France, the Atout France system provides an open classification of hotels: the official class is assigned based on the results of an independent audit carried out by an accredited body; The data are published in an open register, and re-verification is carried out every 5 years [23]. The industry level is represented by the harmonized catalog of Hotelstars Union, which contains more than 240 criteria and covers the requirements of service, digital technologies and sustainable development [24].

The environmental dimension is regulated by interstate labelling programs – Nordic Swan Ecolabel [25], EU Ecolabel [26] and Green Key [27] – which provide an independent assessment of resource efficiency, waste management and corporate social responsibility. In the Nordic countries, the presence of the Nordic Swan label is a prerequisite for the participation of hotels in state tourism programs to support infrastructure, and at the EU level, EU Ecolabel certification is integrated into public procurement schemes and grant initiatives.

The managerial level is based on the EFQM models of excellence, which allow you to evaluate not only the quality of service, but also organizational effectiveness, staff training and the degree of innovation. Systematic reviews prove that the implementation of EFQM in the hotel sector reduces the number of complaints by 9–11% and increases customer satisfaction [28]. In corporate practice, this is reflected in Marriott International's reports – in 2024, more than 60% of managed hotels in the UK and Ireland received Green Key certification as part of the Serve 360 ESG strategy [29]. In Northern Europe, all Scandic Hotels are Nordic Swan certified, and environmental KPIs are integrated into operational dashboards [30].

Digitalization of processes provides control and publicity of data in real time. The Your Europe portal integrates EU business procedures, in particular in tourism, allowing hotels to update their certification status online [31], while the e-Tourism Register in Estonia automatically synchronizes information between public registers and tourism platforms, increasing consumer confidence [32].

In Ukraine, the process of harmonization is only being formed. The State Agency for Tourism Development approved an open procedure for assigning categories to hotels with step-by-step validation and publication of results [33]; the electronic service is available through the portal "Guide Online" [34]. According to Interfax-Ukraine, as of 2025, less than 10% of accommodation establishments have an official category, which necessitates the creation of a national e-register and the stimulation of

voluntary certification initiatives [35]. This approach will bring the Ukrainian hotel industry closer to EU standards, ensure transparency and increase the competitiveness of the post-war recovery.

The integration of international certification experience into the national system of Ukraine is a key factor in increasing the competitiveness of the tourism sector, especially in the post-war recovery period. Such a process does not involve the mechanical transfer of foreign models, but their adaptive implementation, taking into account the economic, legal and socio-cultural characteristics of the country. Certification in the modern world has become not only a quality control tool, but also the basis of a service culture that combines sustainability, safety and trust between business and consumer. It is important for Ukraine to turn certification into a development management mechanism, where standards become part of the recovery strategy, and environmental and social responsibility become a competitive advantage in the international market (Table 3).

Table 3. European interaction of standards, law and quality management in the hotel sector

Vector of international experience	Integration mechanism in Ukraine	Prerequisites	Expected effect on sustainable tourism and service culture
Financing green upgrades in hotels	Attraction of lending programs for energy efficiency projects	Partnership with international financial organizations; Conducting an energy audit within the framework of certification	Reducing costs, reducing carbon footprint, meeting environmental sustainability criteria
Data openness and post-crisis management	Introduction of public quality registers and self-declaration with selective state supervision	Development of the legislative framework for digital services and open data	Increasing the trust of consumers and partners, reducing the administrative burden
Professional education and management accounting standards	Support for industry-specific training programs (USALI, revenue management) and personnel certification	Creating partnerships between business and EU educational institutions	Unity of financial standards and development of service competencies
Harmonization of national standards	Adoption of national versions of ISO series 22483, 18513, 10002	Interagency coordination and recognition of certificates in the grant and procurement system	Compatibility with the European market, increasing investment attractiveness
Public-Private Partnerships and Tourism Clusters	Pilot projects with OTA platforms and international network brands	Agreements between UHRA, DART, international associations	Increasing hotel occupancy, spreading standards through the market

Source: Systematized by the authors according to the data given in [1; 4; 7; 8; 9; 11; 12].

The post-war recovery of the hotel industry in Ukraine requires not only financial resources, but also the modernization of management processes in accordance with European sustainability standards. In 2025, the EBRD opened special lines of lending for energy efficiency projects for Ukrainian banks, allowing hotels to finance the replacement of heating, ventilation and lighting systems, while meeting the requirements of environmental certifications and reducing operating costs [36]. In this context, certification becomes not only an assessment tool, but a guarantee of transparent use of funds and monitoring of their impact on the environment.

Digitalization plays a key role in the formation of a culture of trust. The World Tourism Organization recommends the creation of open registers of accommodation facilities with public indicators of accessibility, safety and waste management, which increases business accountability and facilitates quality control [37]. A similar mechanism is successfully working in Estonia, where the electronic tourist register combines a database of certified establishments with automatic data updates and the ability to integrate with European booking platforms [38].

An equally important factor is the training of personnel. Within the framework of the EU4Business programme, Ukrainian hotels are implementing the USALI management accounting system, which allows to unify financial statements, reduce shadow revenues and ensure a transparent assessment of management effectiveness [39]. This not only increases economic discipline but also forms a new culture of service, where quality is perceived as a systemic component of management.

At the same time, the harmonization of standards at the level of DSTU ISO 22483:2022 and DSTU ISO 18513:2024 lays the legal basis for the mutual recognition of certificates between Ukraine and the EU countries, which simplifies the participation of Ukrainian enterprises in international tenders, grant programs and cross-border tourism initiatives [40]. At the market level, positive effects are demonstrated by the initiatives of the Ukrainian Association of Hotels and Resorts (UHRA), which, in cooperation with international OTA platforms, are developing a model of "priority showing" of certified establishments, which stimulates entrepreneurs to invest in compliance with European requirements [41].

Thus, the adaptation of international certification experience in Ukraine has a double effect: economic – through attracting funding, increasing efficiency and competitiveness; and socio-cultural – through the formation of a new service ethic built on transparency, sustainability and trust.

The implementation of European certification standards in Ukraine is complicated by a number of deep regulatory, institutional and personnel barriers [2; 3]. First of all, the regulatory framework remains fragmented: laws and by-laws in the field of tourism do not form a single procedure for conformity assessment, and criteria, terms and forms of reporting differ between regions. There is no unified methodology that would harmonize DSTU standards with international ISO 22483 and 18513, so certification often comes down to formal confirmation of status, rather than real quality control [14]. Institutional dispersion is no less noticeable. Powers in the field of certification are divided between several state bodies, associations and local administrations without clear coordination [10]. This leads to duplication of functions and loss of responsibility for the final result. There is no unified state register of certified hotels, and data on assigned categories are not verified. In the EU, on the other hand, publicity is a key condition for trust: audit results are available online and are subject to regular updates.

A serious problem is the personnel shortage. The Ukrainian system of training specialists in tourism does not cover disciplines in international quality management and audit of services, so there are almost no certified experts in conformity assessment in the country [5; 9]. Many hotels are forced to attract foreign consultants, which significantly increases costs. After the outbreak of the war, the migration of specialists to the EU countries further exacerbated the shortage of qualified personnel, especially in the field of quality management and energy management [12]. Technological backwardness is no less acute. The procedures for submitting documents and verifying are still mostly paper-based, which makes it impossible to automatically integrate Ukrainian registers with European ones [31; 32; 38]. The lack of a digital certification system reduces transparency and slows down data exchange. The financial aspect remains critical: certification according to European standards requires significant investments in modernization, staff training and environmental solutions [19; 20; 21; 36]. It is too expensive for small and medium-sized businesses, and there are practically no state compensations or tax benefits [11]. Because of this, voluntary certification is not perceived as a real development tool. At the same time, the lack of coordination between tourism, education, energy and environmental policy does not allow the formation of a unified national system of management of the quality of services [1]. Ukraine has the potential to integrate European standards, but this requires the creation of a central coordinating body, the introduction of a digital certification register, and the training of specialists who will be able to combine the requirements of quality, sustainability, and transparency in the post-war reconstruction of the industry [9].

The harmonization of the national system of certification of hotel services with European requirements requires not only updating the regulatory framework, but also changing the management philosophy of the industry itself. It is about moving from formal confirmation of standards to creating a culture of trust, in which certification is not a final procedure, but a component of continuous improvement of service. European experience shows that it is transparency, digital openness and professional competence that determine the success of the system quality in the field of hospitality. For Ukraine, this is especially relevant in the context of post-war recovery, when not only economic dynamics, but also the international image of the state, depend on the level of service. First of all, harmonization should take place at the level of standards. National DSTU, developed on the basis of ISO 22483 and ISO 18513, should not duplicate international standards, but create a bridge between them and Ukrainian legal realities. It is important that their introduction is not limited to the translation of technical documents, but forms a common language of quality assessment for government agencies, business and consumers. An appropriate step may be the creation of an interdepartmental platform at DART, which will coordinate the work of certification bodies and ensure consistency of criteria,

procedures and deadlines for inspections. Further development of the system is impossible without digital integration. The Unified National Electronic Register of Certified Facilities should become a public source of data on the category of the hotel, the date of the last audit and the validity period of the certificate. Its integration with the Hotelstars Union, EU Ecolabel or Green Key platforms will create an open system that is understandable for European tourists and partners. Electronic self-declaration, supported by random audits, will significantly increase the dynamics of updating information and reduce bureaucratic barriers without weakening control. The key area should be the training of specialists. Modern certification involves not only knowledge of standards, but also an understanding of quality management, sustainability, financial accounting, and energy efficiency processes. The formation of a national certification education program, which will combine modules on ISO management, USALI, ESG audit, and digital analytics, will create a personnel base for its own auditors and consultants. This will ensure the independence of the Ukrainian market from external experts and lay the foundation for a professional quality culture. No less significant is the economic aspect. Certification requires resources, so the state must provide financial incentives – partial reimbursement of costs, concessional loans for modernization and grants for energy-efficient solutions. Such mechanisms will not only simplify the access of small businesses to certification, but also turn it into a real development tool, and not an additional burden. The final step may be the introduction of the national quality mark *UA Hospitality Quality Mark*, which will combine ISO technical requirements with the value principles of sustainable tourism. This mark will serve as a symbol of trust for customers and at the same time, confirm the compliance of Ukrainian hotels with European expectations.

A harmonized certification system can become one of the most powerful tools for rebuilding the industry. It will not only increase the trust of consumers and partners, but also contribute to the formation of a new culture of service – open, responsible and focused on human experience. It is this culture that is a prerequisite for Ukraine's return to the European tourist space as a modern, safe and attractive destination.

6. Conclusions

Social marketing in public administration is a strategic tool for increasing the effectiveness of public policy focused on the public good, citizens' trust and strengthening social capital. Its application combines humanistic values with innovative communication approaches, which is in line with the principles of openness, participation and accountability of the authorities.

The results of the study prove that the integration of social marketing contributes to the growth of social trust, civic activity and legitimacy of institutions. Increasing the level of trust in the authorities and citizens' participation in social initiatives confirms the effectiveness of communication and educational campaigns as tools for forming partnerships between the state and society.

The most effective mechanisms are recognized as strategic communication platforms, digital technologies and network partnerships that ensure the adaptability of management and increase its social orientation. Social marketing is being transformed from an information tool into a means of social change that forms responsible behavior, cohesion and sustainability of society.

Thus, the development of social marketing is a key direction of modernization of public administration in Ukraine, which ensures effective communication between the authorities and citizens, supports the values of trust and partnership, and contributes to the achievement of sustainable development goals.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

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The Impact of Social Media and Online Reviews on Hotel Reputation and Guest Decision-Making

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.18

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ABSTRACT

The article explores the role of social media and online reviews in shaping a hotel's reputation and how these factors influence consumer decision-making in the hospitality industry. The study aims to identify how digital communication channels, particularly social media and customer reviews, affect brand perception, trust, and behavioral responses of potential guests. The research employed general scientific methods of cognition, including analysis, synthesis, generalization, classification, systematization, observation, comparison, and modeling. The study concludes that effective review management involves not only monitoring and responding to negative comments but also actively encouraging positive feedback, analyzing common complaints, and using insights to improve services. It is found that the level of detail and perceived credibility of reviews significantly enhances their influence on the audience. The importance of visualized forms of digital reputation – such as ratings on Booking.com, TripAdvisor, and Google Reviews – is highlighted, as they serve as a form of "social proof" of service quality. It is noted that even a single unanswered negative review can significantly reduce potential customer trust. The article analyzes relevant digital strategies used by hotels, including content marketing, SMM promotion, influencer marketing, email campaigns, chatbot implementation, customer behavior analytics, and feedback automation. The study concludes that a comprehensive use of these tools, combined with flexibility and openness to communication, enables hotels not only to maintain a positive reputation but also to build a loyal online community, increase booking rates, and gain long-term competitive advantage. The practical value of the study lies in the development of recommendations for effective digital reputation management as a tool for enhancing service quality, increasing customer trust, and strengthening market positioning.

KEYWORDS

digital marketing, social media, online reviews, hotel reputation, consumer behavior.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Вплив соціальних мереж та онлайн-відгуків на репутацію готелю та рішення гостей

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.18

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АНОТАЦІЯ

Стаття присвячена дослідженню ролі соціальних мереж і онлайн-відгуків у формуванні репутації готелю та впливу цих факторів на процес прийняття рішень споживачами в індустрії гостинності. Мета дослідження – з'ясувати, яким чином цифрові канали комунікації, зокрема соціальні медіа та онлайн-рецензії клієнтів, впливають на сприйняття бренду готелю, рівень довіри до нього та поведінкові реакції потенційних гостей. У ході наукового дослідження використовувалися загальнонаукові методи пізнання: аналіз, синтез, узагальнення, класифікація, систематизація, спостереження, порівняння та моделювання. Результати дослідження показують, що соціальні мережі стали стратегічним інструментом комунікації готелів із цільовою аудиторією, формування позитивного іміджу та управління репутаційними ризиками. У дослідженні зроблено висновок, що ефективне управління відгуками – це не лише моніторинг і реакція на негатив, а й активне стимулювання позитивних коментарів, аналітика типових зауважень, використання фідбеку для покращення сервісу. З'ясовано, що рівень деталізації та авторитетність відгуків підвищують їх вплив на аудиторію. Зроблено акцент на важливості візуалізованих форм цифрової репутації – рейтингах на Booking.com, TripAdvisor, Google Reviews, які слугують своєрідним "соціальним доказом" якості послуг. Визначено, що навіть одна негативна рецензія без відповіді може значно знизити рівень довіри потенційного клієнта. У статті досліджено актуальні цифрові стратегії готелів, серед яких: контент-маркетинг, SMM-просування, інфлюенсер-маркетинг, e-mail-кампанії, використання чат-ботів, аналітика поведінки клієнтів та автоматизація зворотного зв'язку. Зроблено висновок, що комплексне використання цих інструментів у поєднанні з гнучкістю та відкритістю до комунікації дозволяє готелям не лише підтримувати позитивну репутацію, а й формувати лояльну онлайн-спільноту, підвищувати рівень бронювань та довготривалу конкурентну перевагу. Практичне значення дослідження полягає у розробці рекомендацій щодо ефективного управління цифровою репутацією готелів як інструменту покращення сервісу, підвищення довіри клієнтів та зміцнення ринкових позицій.

КЛЮЧОВІ СЛОВА

цифровий маркетинг, соціальні мережі, онлайн-відгуки, репутація готелю, поведінка споживачів.

1. Introduction

In the current conditions of digitalization of society, social networks and online reviews have acquired the status of key factors in the formation of the reputation of hotel enterprises. Information technology has radically changed the way business and consumers interact, turning the digital space into the main arena of marketing communications. Hotels that previously relied on traditional promotion channels are now actively integrating social media tools into their strategies, as this is where public opinion, trust and customer loyalty are formed. Social platforms have become a universal environment for brand promotion, reputation management, collecting feedback, and building an emotional connection with guests, which significantly increases the competitiveness of the establishment.

At the same time, the phenomenon of online feedback has significantly affected consumer decision-making mechanisms. Today's customers focus not only on official advertising, but primarily on the experience of other users, which is reflected in digital reviews. Thus, online reputation management has evolved into a strategic tool for the development of the hotel business, which covers monitoring, analysis, and responding to real-time reviews. In the context of high market competition, it is effective digital communication, combined with quality service and professional work in social networks, that determines the level of customer trust and influences their final choice when booking a hotel.

2. Literature Review

The issue of the influence of social networks and online reviews on the reputation of the hotel and the decisions of guests is sufficiently researched in domestic and foreign scientific literature. However, despite the relevance of the topic, the vast majority of developments are still concentrated in the domestic scientific space, although there are also high-quality foreign studies.

A significant contribution to the study of the role of social media was made by such authors as R. V. Diachenko and O. H. Tonkykh, who emphasize the effectiveness of social platforms as a tool for promoting hotel services and emphasize that the interactivity of these communication channels increases consumer confidence [2]. This thesis is supplemented by I. Ya. Mendela and I. B. Rumiantseva, emphasizing that social media act not only as an advertising tool, but also as a platform for building customer loyalty [7].

A significant contribution to the study of the impact of online reviews is made by foreign researchers. M. Arzaghi, I. H. Genc, and S. Naik compare official hotel ratings with real consumer reviews, finding that it is reviews that are crucial for potential guests [1]. In turn, R. Du and M. M. He carried out an empirical analysis of the characteristics of reviews, finding that detailed, constructive, and emotionally colored messages significantly increase the usefulness and credibility of the hotel [3].

Domestic researchers H. M. Volianyk and N. S. Marushko focus on marketing strategies for retaining customers, among which an important place is occupied by working with online reviews [10], and L. O. Horshkova emphasizes the formation of a positive image as a factor of competitiveness [4]. In addition, L. Turchyn and V. Ostroverkhov consider modern trends in Internet marketing, which are the foundation for building an effective digital presence of hotels [8].

Expert literature was also used for the study – publications of modern online resources, such as Hotel-solution.com.ua, which consider the impact of reviews on the success of the hotel business and methods of attracting customers through digital channels [5; 6].

Despite the sufficient amount of literature on this topic, there is a lack of systematized material, and therefore, using various methods of scientific knowledge, information was analyzed, grouped, systematized and presented in the light of the research topic.

3. Problem Statement

The purpose of the article is to investigate the impact of social networks and online reviews on the formation of the hotel's reputation and the decision-making process by customers. To achieve this goal, the following tasks will be performed: to analyze the role of social networks in the formation of the image and trust in the hotel; to reveal the importance of online reviews as a tool of reputation

management; to identify the main strategies of digital communication of hotels to increase their attendance and competitiveness.

4. Methods and Materials

In the course of scientific research, general scientific methods of cognition were used: analysis, synthesis, generalization, classification, systematization, observation, comparison and modeling.

5. Results and Discussion

Digital marketing in the hotel business is developing rapidly, and the success of a hotel today is determined by its flexibility, adaptation to modern trends, and the ability to conduct a dialogue with customers in the online space [7].

Social networks have become an integral part of business communications in the hotel industry. They act as a one-stop platform for interacting with customers, building a brand image, and managing reputation. For hotels, social media is not just a means of advertising, but a space where public opinion, trust and loyalty of guests are formed. Platforms such as Facebook, Instagram, X (Twitter), LinkedIn, YouTube, TikTok allow establishments to actively communicate with consumers, present their services, share guest impressions, and at the same time track the audience's reaction in real time. The effectiveness of such tools in modern conditions prevails over traditional means of advertising, because it is Internet communications that today are the main channel of influencing the decisions of potential customers [7].

Today, marketing technologies in the hotel business are dynamically evolving, reflecting the overall digital transformation of the industry. The 2025 trends in hospitality marketing are mobile marketing, video marketing, influencer marketing, chatbots and instant messengers, content marketing, social content, and user collaboration [8]. Let us consider these trends in more detail in Table 1.

Table 1. Current trends in marketing for hotels

Trend	Brief description	Impact on the hotel business
Mobile Marketing	Targeting websites, apps and advertising campaigns to smartphone and tablet users	Increased convenience, speed of booking and mobile customer interaction
Video Marketing	Using short videos to present services, interiors, customer reviews	Attracting the attention of potential guests, improving brand awareness and emotional connection
Influencer Marketing	Cooperation with bloggers, travel opinion leaders and content creators	Growing trust, expanding audience reach, and increasing conversions
Chatbots and messengers	Using chatbots and messengers to communicate, book and provide information	Effective customer support 24/7, reducing staff workload
AI Marketing	Application of artificial intelligence to analyze guest behavior, forecast demand, and automate marketing messages	Optimizing advertising strategies, personalizing the guest experience, and reducing costs
Content Marketing	Regular creation of high-quality, useful and relevant content (articles, blogs, guides)	Building brand expertise, increasing customer trust and loyalty
Social content and collaborative creativity	Engaging users to create photos, videos, testimonials, and stories about your stay	Strengthening brand authenticity, increasing trust and emotional engagement
Personalized marketing	Segmentation of guests according to behavioral, socio-demographic and psychological criteria; Creation of individual offers and packages	Increased customer satisfaction, increased repeat bookings, and average revenue per guest
Voice Search & Local SEO	Content optimization for voice queries and local search engines (Google Voice, Google Maps, local keywords)	Increasing the hotel's visibility in local searches, attracting guests looking for accommodation nearby

Source: Systematized by the authors according to the data given in [8].

The influence of social networks on the reputation of hotels is due to their special properties. Within the network, an environment is formed where each user can act as an agent of influence – to spread his own opinion, assessment or recommendation. At the same time, there is an effect of opinion leaders, when the influence of individual users with a large audience can significantly increase or, conversely, reduce trust in the brand. Social networks are also characterized by the phenomenon of

clustering – the unification of users by common interests, which increases the speed of information dissemination. On the other hand, the high number of connections in the network makes the system vulnerable to negative feedback that can spread like an avalanche in the online space. That is why digital reputation management is becoming a strategically important component of the hotel's marketing policy [7].

Modern hotels are actively using social media to increase their brand visibility, attract customers, and drive sales. One of the easiest but effective ways is to create official pages on popular networks. Through such platforms, hotels share photos of rooms, interiors, events, special offers, and seasonal promotions. Video content helps to show the atmosphere of the establishment, and posts with feedback form a sense of openness and care for guests. In addition, social media has become a powerful tool for advertising events – from corporate meetings to gastronomic festivals – which creates additional touchpoints with potential attendees [9].

Special attention should be paid to interaction with customers through social networks. The modern user expects a quick response, a personalized approach, and constant contact. Hotels that respond promptly to comments, questions, or complaints create a sense of trust and respect among customers. Social networks allow you not only to communicate, but also to collect valuable feedback, which is used to improve the service. Many establishments organize interactive contests or surveys, which contribute to the formation of an active community around the brand [7].

Building a positive image of a hotel on the Internet requires compliance with certain rules. First of all, it is worth systematically monitoring reviews about the institution on specialized resources and on social networks. It is important to maintain high activity, encourage satisfied guests to leave comments and participate in communication. Reviews must be analyzed, used in advertising materials and demonstrated readiness to respond to comments. An effective online reputation cannot be random – it requires constant attention, analytics and a strategic approach to communication [4].

The role of social networks in the choice of a hotel by customers is growing every year. More and more consumers are looking for information not through official websites, but on social platforms or on recommendation services such as Booking and TripAdvisor. It is here that the first impression of the quality of services and the level of trust in the brand is formed. For a modern client, the experience of other users is no less important than official advertising. In this regard, hotels are forced to adapt their communication strategies to new conditions, be more open, interactive, and quickly respond to the expectations of the online community [2].

The marketing potential of social networks in the hotel industry is almost limitless. Researchers note that the platforms Facebook, Instagram, YouTube, Twitter, TikTok demonstrate the greatest efficiency. Through them, hotels can promote services, create brand communities, develop personal branding, and conduct reputation management. The introduction of modern SMM strategies allows not only to increase the recognition of the institution, but also to form long-term emotional ties with customers, which is the basis for sustainable business development [2].

Online reviews today are an integral element of hotel reputation management, because they form customer trust and significantly influence their booking decisions. In the face of growing competition in the hotel industry, it is the opinions of guests that become the decisive factor in the choice. Reviews perform several functions at once: they confirm the quality of service, act as an indicator of customer satisfaction and create an information field that forms the image of the institution in the digital environment. Positive comments help hotels attract new customers and increase the level of trust, while constructive criticism serves as a source for improving the service. That is why review management has become a strategically important component of the marketing policy of each hotel [6].

Guest reviews are important not only for creating an image, but also for the development of the hotel's internal processes. Each comment reflects the real experience of the client – the level of cleanliness of the rooms, the quality of food, the speed of service, the competence of the staff, etc. Their analysis allows the hotel management to quickly identify weaknesses, raise service standards and form a culture of continuous improvement. Moreover, reviews act as a free marketing tool: they are distributed through social networks, booking sites and recommendation platforms, influencing thousands of potential customers. Thus, online reviews become not just an element of communication, but an important resource for strategic reputation management [6].

The usefulness of online reviews depends on several key factors – the quality of the content, the credibility of the author, and the perception of the audience. According to research, reviews that are

detailed, reasoned, and published by users with a certain authority or history of activity have the greatest impact. The more specifically described the impressions, the higher the credibility of such a comment. At the same time, the perceived value of a review is determined by how much it helps a potential guest reduce uncertainty when making a choice. Reviews play an important role in choosing a hotel [3]. Let's take a closer look at the importance of positive reviews for hotel booking decisions in Table 2.

Table 2. The importance of reviews for hotel booking decisions

The meaning of reviews	Importance for booking
Confirmation of quality of service	Helps to build trust in the hotel and reduce the risk of bad choices
Customer satisfaction score	Serves as an indicator of the level of comfort, service and overall experience of guests
Formation of the image of the institution in the digital environment	Determines the hotel's reputation in the market, influencing the perception of potential customers
Source of service improvement	Allows you to identify weaknesses and improve service standards
Free Marketing Tool	Disseminates positive information through online platforms, attracting new guests
A means of reducing uncertainty when choosing	Helps potential customers make rational decisions based on the real experience of others
Mechanism of strategic reputation management	It is an important element of competitive advantage in conditions of high market competition

Source: Systematized by the authors on the basis of sources [6; 8].

Thus, well-structured and meaningful reviews from real customers become an effective mechanism for transmitting information about the quality of services and help other users make informed decisions [3].

Research shows that more than 80% of users check reviews before booking a hotel, and even one negative, unanswered review can significantly influence the decisions of potential guests. Therefore, hotels should consider each review as a communication opportunity – to thank, explain, apologize or offer a solution. This approach builds a reputation as an open and professional brand, and positive reviews become the best free advertising [5].

Effective review management involves a systematic approach to collecting feedback. The most common strategies are to survey guests after their stay, encourage them to leave comments on popular online platforms (TripAdvisor, Google, Booking.com), and use social media as a channel of interaction. Hotels are increasingly implementing mobile applications with the function of collecting feedback or offering to leave feedback directly on the spot – through tablets or QR codes. Staff can personally ask guests to rate the service, and automated collection systems help to centrally process the information received. Loyalty programs become an important incentive – discounts, bonuses or special offers for those who leave comments. All this contributes to the formation of a culture of constant dialogue between the hotel and customers [6].

Let's consider the approaches to the hotel with reviews on social networks in Table 3.

Negative reviews, although they can create reputational risks, are at the same time a valuable source of information for improving the service. The most important thing is a prompt response to criticism – a quick, polite and professional response demonstrates openness and care for the client. Acknowledging the problem, apologizing and offering a specific solution increase the level of trust in the brand. Many hotels use negative reviews as a basis for internal analysis and staff training. Open communication in response to criticism often makes a more positive impression on potential guests than even impeccable ratings. Thus, competent management of negative comments can turn a reputational challenge into a tool for improving the quality of services and strengthening the image of the institution [6].

In today's competitive environment, a hotel cannot be limited to advertising – it must constantly communicate with customers, share relevant content, maintain feedback and work with a reputation in the online space. Digital marketing strategies cover SEO optimization, content marketing, email campaigns, SMM promotion, and influencer marketing. They allow hotels not only to attract new customers, but also to maintain the loyalty of those who have already used the services [10]. Let's look at these online strategies in Table 4.

Table 3. The hotel's work with reviews on social networks

Direction of activity	Main actions	Expected result
Monitor reviews	Systematic tracking of comments and ratings on Facebook, Google, Booking, Instagram and other platforms	Timely response to problems, maintaining a positive image and reputation control
Working with negative reviews	Prompt, courteous and public response to complaints; suggestion of ways to resolve conflict situations	Reducing the impact of negativity, restoring customer trust, and increasing satisfaction levels
Maintaining positive reviews	Thanking guests, republishing or quoting positive comments on social networks, using them in marketing materials	Strengthening brand credibility, forming social proof of service quality
Motivation to leave reviews	Rewarding guests through bonuses, promo codes, QR codes in rooms, and post-check-out surveys	Increasing the number of reviews, increasing the rating of the hotel on online platforms
Analysis of review content	Identifying recurring remarks, key issues, and positive trends in feedback; Assessing the level of guest satisfaction	Improving the quality of service, optimizing service delivery processes
Communication openness	Public demonstration of the hotel's willingness to listen to customers, accept comments and make changes	Formation of the hotel's image as a customer-oriented, socially responsible brand
Management response to feedback by managers	Analysis of comments and recommendations, preparation of management decisions based on identified problems; development of instructions and recommendations for hotel staff and departments	Improving the quality of service, improving management processes, increasing the efficiency of the team

Source: Systematized by the authors on the basis of the sources [5; 6].

Table 4. Online strategies to boost hotel marketing

Strategy name	Purpose of implementation	Expected result
SMM promotion	Building brand awareness and audience engagement	Growth in coverage, number of bookings
Influencer and UGC marketing	Building trust through authentic content	Reputation Building, Loyalty Growth
Personalization and analytics	Optimization of communications and budgets	Improve targeting performance
Reputation management	Increasing customer trust	Rating growth, increased bookings
AI and digital tools	Automation and service improvement	Increase reaction speed, improve guest experience
Email Marketing	Support for repeat sales	Growth in the share of regular customers

Source: Summarized by the authors based on the source [10].

An important element of modern digital hotel marketing strategies is the system of star ratings and ratings on online platforms, which acts as an indicator of the quality of services and a powerful factor of influence on consumer behavior. High ratings on Booking.com, TripAdvisor, or Google Reviews increase the trust of potential customers and directly correlate with the level of bookings. This form of visualized reputation creates a social proof effect, in which users focus on the experience of other consumers, reducing the level of uncertainty when making a decision. For hotels, this means the need to systematically manage reviews and actively work to increase the average rating by improving service, personalizing service and responding effectively to criticism. Thus, the star rating system becomes not only a feedback mechanism, but also a tool for strategic positioning in a competitive digital environment [1].

6. Conclusions

Social media has become a central element in building the reputation of hotels and affects the decision-making process of customers. They act as a two-way communication channel that allows hotels not only to inform consumers about services, but also to actively interact with them. Through platforms such as Facebook, Instagram, YouTube, or LinkedIn, establishments get the opportunity to form a positive brand image, demonstrate the uniqueness of their service, and promptly respond to audience requests. Social networks have become a mechanism for creating trust and loyalty, and their

interactivity contributes to the spread of positive guest experiences, which is an important competitive advantage in today's hotel services market.

Online reviews are a critical factor in building customer trust and managing a hotel's reputation. In the digital environment, it is reviews from real guests that are the main source of social proof of the quality of services. Positive comments increase the attractiveness of the institution, while constructive criticism serves as the basis for improving the service. Research shows that most consumers check reviews before booking, so responding to reviews quickly, openly, and professionally increases brand credibility. Thus, online reviews simultaneously perform the functions of a marketing tool, an indicator of customer satisfaction and a means of strategic reputation management.

To ensure stable competitiveness, hotels must systematically implement digital strategies aimed at increasing customer awareness and loyalty. Among the most effective approaches are SMM promotion, cooperation with influencers, personalization of communications, and active reputation management. A special role is played by working with feedback – prompt response, content analysis and encouraging users to interact. The use of artificial intelligence tools, mobile applications, and analytics systems allows you to optimize these processes. As a result, a hotel that consistently develops an online presence and maintains an open dialogue with customers not only strengthens its reputation but also increases the level of attendance and financial stability in the long run.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Urban Tourism and New Forms of Leisure in Cities

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.19

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ABSTRACT

The relevance of the study is determined by the growing need to conceptualize urban tourism as a factor of sustainable urban development capable of integrating economic activity, cultural identity, and social interaction. In the context of the spatial transformation of Ukrainian and European cities, the problem of integrating transport, recreational, and digital infrastructures become crucial, as it defines the comfort and quality of the urban environment. The lack of systematic management of tourist flows, fragmented analytical data, and uneven development of urban spaces highlight the need for a comprehensive approach to organizing urban tourism. The purpose of the article is to examine the specific features of urban tourism and to substantiate methodological approaches to the formation of urban tourist routes and new leisure formats based on the rational use of recreational potential, cultural resources, and infrastructure. The research results made it possible to establish that the effectiveness of urban tourism is determined not by the number of attractions but by the level of integration between cultural, social, and transport environments. The main problems identified include imbalances in transport development, fragmentation of recreational spaces, and the absence of unified statistical monitoring. It has been proven that the use of digital technologies – such as electronic visitor cards, interactive route mapping, and real-time flow analytics – can reduce these disparities and ensure polycentric tourism development. Conclusions confirm that urban tourism is transforming from a traditional recreational activity into a component of urban governance aimed at improving spatial comfort, balancing visitor flows, and preserving cultural heritage. It is recommended to implement unified digital platforms, develop barrier-free infrastructure, and involve local communities in route planning.

KEYWORDS

urban tourism, tourist routes, city leisure, recreational potential, geoinformation systems, tourism infrastructure, digital technologies, sustainable urban development, cultural heritage, tourist mobility.

e-ISSN 3083-6018

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https://www.eu-scientists.com/index.php/sdel



Урбаністичний туризм і нові форми дозвілля в містах

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.19

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АНОТАЦІЯ

Актуальність дослідження зумовлена зростаючою потребою концептуалізації міського туризму як чинника сталого міського розвитку, здатного інтегрувати економічну діяльність, культурну ідентичність, соціальну взаємодію. У контексті просторової трансформації українських та європейських міст проблема інтеграції транспортної, рекреаційної, цифрової інфраструктур стає вирішальною, оскільки визначає комфорт та якість міського середовища. Відсутність системного управління туристичними потоками, фрагментовані аналітичні дані, нерівномірний розвиток міських просторів підкреслюють необхідність комплексного підходу до організації міського туризму. Метою статті є дослідження специфічних особливостей міського туризму та обґрунтування методологічних підходів до формування міських туристичних маршрутів та нових форматів дозвілля на основі раціонального використання рекреаційного потенціалу, культурних ресурсів, інфраструктури. Результати дослідження дозволили встановити, що ефективність міського туризму визначається не кількістю визначних пам'яток, а рівнем інтеграції культурного, соціального та транспортного середовища. Основні виявлені проблеми включають дисбаланс у розвитку транспорту, фрагментацію рекреаційних просторів та відсутність єдиного статистичного моніторингу. Доведено, що використання цифрових технологій – таких як електронні картки відвідувачів, інтерактивне картографування маршрутів та аналітика потоків у реальному часі – може зменшити ці диспропорції та забезпечити поліцентричний розвиток туризму. Висновки підтверджують, що міський туризм перетворюється з традиційної рекреаційної діяльності на компонент міського управління, спрямований на покращення просторового комфорту, збалансування потоків відвідувачів та збереження культурної спадщини. Рекомендується впроваджувати уніфіковані цифрові платформи, розвивати безбар'єрну інфраструктуру, залучати місцеві громади до планування маршрутів.

КЛЮЧОВІ СЛОВА

урбаністичний туризм, туристичні маршрути, міське дозвілля, рекреаційний потенціал, геоінформаційні системи, туристична інфраструктура, цифрові технології, сталий розвиток міст, культурна спадщина, мобільність туристів.

1. Introduction

In modern conditions of rapid urbanization, urban space is turning into a key center of social, economic and cultural dynamics, which leads to a rethinking of the role of tourism as a factor in sustainable urban development. Urban tourism takes on a new meaning, going beyond the traditional visit to historical and cultural monuments and focusing on integrated forms of leisure that combine cognitive, communication, creative and digital practices. The problem lies in the need to form a balanced model for the development of urban tourism, which would take into account the interests of the community, the needs of tourists and the requirements of environmental and social sustainability. The scientific significance of the study lies in finding out the mechanisms of adaptation of the urban environment to new formats of leisure – from event and gastronomic tourism to digital and virtual routes that form a new spatial identity of cities. In practical terms, this is due to the need to develop effective tools for planning tourist flows, managing recreational loads, improving the urban branding system and creating conditions for inclusive and safe leisure. The solution of these tasks will contribute to increasing the competitiveness of cities, expanding the economic opportunities of local communities and forming a holistic policy for the development of urban tourism as a component of the modern strategy of urban management.

2. Literature Review

The analysis of modern research on the problems of urban tourism and new forms of leisure in cities allows us to identify four interrelated scientific areas. The first direction covers the theoretical and methodological foundations of the formation of urban tourism. In the work of S. I. Dychkovsky, the essence of tourist development of the socio-cultural space of the city as a complex system of interaction of architectural, cultural and social structures that form the tourist identity of the urban environment is revealed [1]. V. Khudaverdiyeva studies the development of urban tourism in the largest historical centers of the world, emphasizing the relationship between the preservation of cultural heritage and the modernization of infrastructure to increase the competitiveness of urban destinations [2]. A. Pilchenko analyzes the world experience in the development of urban tourism, identifying the possibilities of adapting innovative management practices, city branding and cultural strategies to the conditions of Ukraine [3]. Thus, within this direction, urban tourism is considered as a socio-cultural phenomenon that integrates spatial, cultural and managerial components.

The second direction is devoted to the study of local aspects of the development of urban tourism and its impact on territorial communities. T. Kolesnyk and V. Bagneta analyze the peculiarities of the development of recreational tourism in territorial communities, considering it as the basis for the formation of a local welfare economy based on cultural and natural resources [4]. L. D. Bozhko and M. M. Zaitseva define the socio-cultural and economic foundations of urban tourism, emphasizing its role in strengthening social capital and developing innovative forms of leisure [5]. S. J. S. J. Page and J. Connell propose a systematic approach to urban tourism management, which combines spatial planning, mobility, culture and digital communications [6]. This direction defines urban tourism as a key factor in the socio-economic integration of territories.

The third direction concerns cultural innovations and new forms of urban leisure. G. Richards characterizes urban tourism as a form of cultural tourism focused on the creation of creative experience, interaction of local communities and tourists, and the development of the cultural economy [7]. A. Eldridge analyzes the phenomenon of night tourism, which forms new social leisure practices, changes the perception of urban space and influences the dynamics of urban culture [8]. A. Gonia and A. Jezierska-Thöle propose the concept of sustainable urban tourism, which combines urban areas with nature reserves, creating new forms of ecological recreation and harmonization of space [9]. This direction demonstrates the transition from traditional forms of tourism to creative and socially oriented practices that transform the city into an environment of integrated cultural experience.

The fourth direction covers digital, managerial and post-pandemic aspects of urban tourism development. A. Morrison and C. Maxim substantiate the need to create integrated urban tourism management systems based on digital analytics, strategic planning and smart technologies [10]. Q. Yu et al. investigate the tourism experience reflected in social networks and demonstrate the potential of

Big Data to analyze tourist behavior and personalize services [11]. A. Jiricka-Pürrer and co-authors study changes in urban tourism before and after the COVID-19 pandemic, highlighting the importance of climate adaptation, eco-management, and safe leisure formats [12]. N. Petrukha and co-authors propose the introduction of flexible Agile methods in the management of IT projects of urban tourism, which ensures adaptability and increases the efficiency of digital tourism systems [13]. Within this direction, urban tourism acquires the characteristics of a smart ecosystem capable of ensuring sustainable development and rapid response to environmental changes.

Despite scientific developments, the issues of a systematic understanding of urban tourism as an integrated phenomenon that combines spatial, cultural and digital factors remain unresolved. The methodology for building urban routes using GIS technologies has not been sufficiently developed, the mechanisms for the effective use of natural and socio-cultural resources have not been defined, and there is a lack of a unified system of statistical monitoring.

The proposed study fills these gaps by combining spatial-analytical and socio-cultural approaches, creating a methodology for integrated planning of tourist routes and forming an analytical model of urban tourism as a tool for sustainable urban development.

3. Problem Statement

The purpose of the article is to study the features of the development of urban tourism and substantiate methodological approaches to the formation of urban tourist routes and new forms of leisure on the basis of effective use of recreational potential and infrastructure.

To achieve the goal, the following tasks have been set:

1. To determine the essence of urban tourism and its role in the transformation of the urban environment.
2. To substantiate the methodology for the formation of urban tourist routes using digital and geographic information technologies.
3. To identify problems and develop recommendations for the development of infrastructure and improvement of the system of organization of urban tourism.

4. Methods and Materials

The methodology is based on systemic and spatial-functional approaches using cartographic and statistical analysis.

5. Results and Discussion

Urban tourism is one of the most dynamic forms of the modern tourist movement, which arises at the intersection of socio-cultural, economic and spatial processes in cities. Its essence lies in the knowledge of the urban environment as a multi-level system, where cultural heritage, architectural landscapes, event practices, gastronomic routes, creative spaces and innovative leisure infrastructure are combined. The specificity of urban tourism is that it simultaneously performs the function of economic development, cultural representation and social integration. In the process of transformation of the urban environment, it becomes an indicator of the quality of life, the level of openness of the city to innovations and its ability to adapt to the needs of different target groups of tourists, from cultural and business to educational or event. The growing role of digital technologies and hybrid travel formats is shaping a new paradigm of urban tourism, where traditional models of visiting attractions are complemented by interactive routes, virtual reality and inclusive leisure solutions (Table 1).

In modern urban conditions, the mechanism for implementing urban tourism involves the integration of three key components: infrastructure (transport, logistics, accessibility), information and digital (mobile applications, smart cards, big data analytics) and socio-cultural (interaction with local communities, event formats, creative spaces). In the city of Lviv, it has been established that the introduction of the Lviv City Card provides synergy of transport and cultural services, providing free or discounted access to more than 20 museums, public transport and partner attractions, which stimulates the redistribution of tourist flows outside the historical center [14; 15]. The system is based on the

integration of electronic ticketing with a CRM platform, which allows you to track the routes of card use and increase the accuracy of statistical estimates of tourist activity [16].

Table 1. Characteristics of urban tourism in the context of urban environment transformation

Sign	Traditional urban tourism	Urban tourism of a new type
Purpose of the trip	Sightseeing of historical and cultural monuments	Comprehensive immersion in the socio-cultural life of the city
Spatial organization	Centric, around the main tourist attractions	Polycentric, covering different neighborhoods and creative spaces
Means of interaction	Excursion format, printed guides	Digital maps, mobile applications, interactive routes
Type of leisure	Passive-cognitive	Active-research, creative, event
Economic role	Support for the hotel and restaurant sector	Formation of a multisectoral economy of the city (culture, IT, transport, service)

Source: systematized by the authors according to the data given in [1; 2; 5; 8; 10].

For the City of Vienna, the implementation of the Visitor Economy Strategy 2025 demonstrates the transition from quantitative to qualitative indicators of tourism, focusing on creating "value for all" – residents, businesses and guests of the city. The concept provides for the development of neighborhood-based tourism, digital management of flows based on data analytics and monitoring of the level of social comfort of residents [17]. According to the Vienna Tourist Board, as part of the implementation of the strategy, there was an increase in tourist satisfaction by 14% and an increase in the share of repeat visits to 36%, which indicates the effectiveness of the polycentric leisure model [18]. Taken together, such practices prove that urban tourism is turning into an urban development management tool that strikes a balance between economic benefit, cultural authenticity, and quality of life for the local community.

Globally, tourism continues to show a steady recovery even after the pandemic downturn. According to the UN World Tourism Organization, in 2023, the number of international tourist arrivals amounted to about 1.286 billion, which is equal to 88% of the level of 2019 [19]. In 2024, the figure reached UAH 1.465 billion, almost returning to the pre-crisis level [20; 21]. For comparison, in 2022 this figure did not exceed UAH 0.95 billion, which means that the increase in two years was more than 54% [22]. Such trends indicate a systematic recovery of tourist activity and structural changes in world leisure, in particular, the transition from mass consumption to urban-oriented forms of recreation, where the experience of interaction with the urban environment becomes the main thing (Fig. 1).

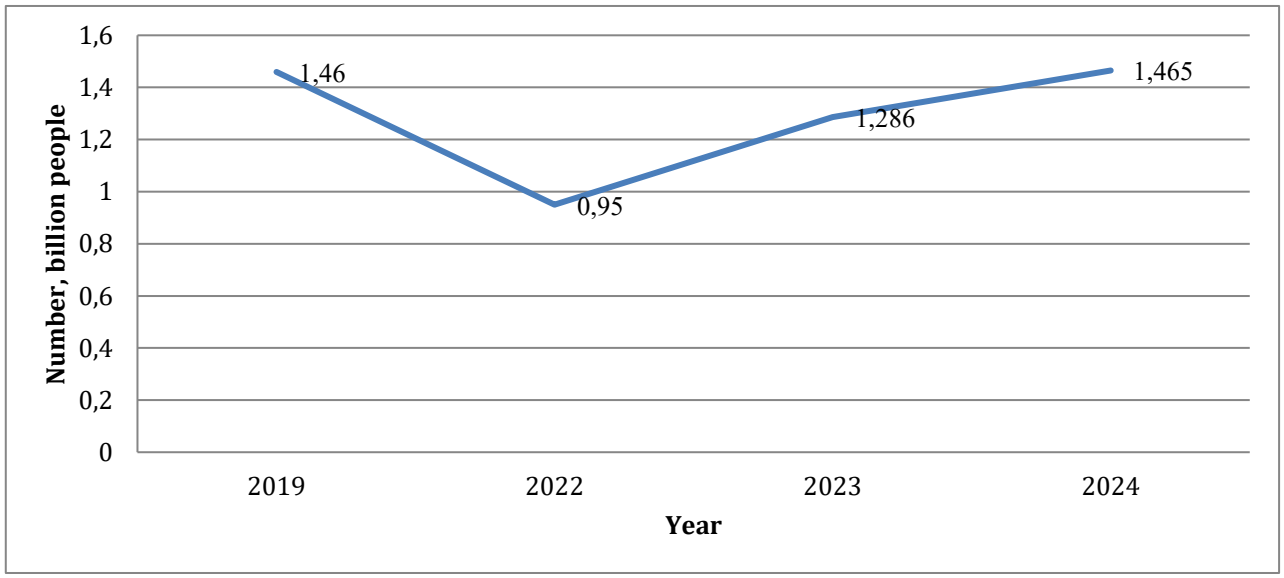


Fig. 1. Dynamics of international tourist arrivals (2019–2024)

Source: developed by the authors on the basis of [19–22].

The graph reflects the gradual return of global tourism to 2019 levels after the 2020–2021 crisis. The growth line demonstrates not only quantitative growth, but also qualitative stabilization of the sector, which creates the basis for the further development of urban tourism as a form of sustainable

urban leisure. The recovery has reached 97–100% of pre-crisis indicators, which confirms the potential of urban areas as the main drivers of the tourism economy.

The methodology for compiling urban tourist routes is based on a combination of analytics of tourist resources, statistics on attendance and the use of modern cartographic services. Its purpose is to provide a logical, convenient and informative structure of the trip, which meets the interests of different categories of tourists and contributes to the unleashing of the potential of the city. Geographic information systems perform an auxiliary function in this process: they make it possible to visualize the spatial location of monuments, cultural sites, catering establishments, green areas and transport hubs. Statistical data allows you to determine the most popular locations, time peaks in attendance, average length of stay and the main destinations of tourist flows. Digital technologies – mobile applications, interactive maps, QR routes – provide personalization of trips and convenient access to information in real time (Table 2).

Table 2. Methods of formation of urban tourist routes

Component of the methodology	Sources of information	Practical significance
Analysis of tourist resources	Official databases, reference books, tourist maps	Identification of objects of main interest for the trip
Study of demand	Attendance statistics, surveys, data from online platforms (TripAdvisor, Google Maps)	Formation of routes in accordance with the interests and age groups of tourists
Spatial visualization	Geographic information maps, Google Earth, Mapbox	Determining the logical sequence of objects and ease of movement
Route optimization	Analysis of time, distance, availability of transport	Building a rational route for one-day or multi-day trips
Digital Integration	Mobile apps, QR codes, interactive guides	Improving the quality of service, ease of navigation and attracting tourists

Source: systematized by the authors according to the data given in [3; 9; 11; 13].

In practice, this technique is implemented in projects aimed at increasing the tourist attractiveness of cities. For example, the Kyiv Region Tours platform systematizes more than 50 routes in the region with an interactive map, photo gallery, and the ability to upload routes to the navigator [23]. In Barcelona, a similar approach is used to optimize flows on the Rambla – installed antennas track the number of visitors and help the city administration redistribute flows, avoiding congestion of central streets [24]. Such experience demonstrates that digital tools do not replace tourist planning, but only expand the possibilities of its practical application – they help to make routes more comfortable, informative and balanced.

The potential of natural, historical, cultural and social resources forms the core of the urban tourism product: it is the combination of green corridors, heritage and active urban communities that determines the diversity of leisure scenarios and the readiness of the city to receive visitors without overloading the space. A science-based assessment of such potential relies on the inventory of resources, their spatial overlap and measurable effects on the tourist experience – from accessibility and safety to eventfulness and social interaction (Table 3)

Table 3. Matrix of the resource potential of the city for urban tourism

Resource Type	Content basis	Suitability metrics
Natural	parks, embankments, green corridors	the share of "green cover" in the route area; continuity of the pedestrian and bicycle network; accessibility to water
Historical and cultural	heritage, museums, contemporary art, gastronomy	POI density/km^2; opening hours; average time to visit the location
Social	creative clusters, events, local communities	calendar of events; residents' involvement; Safety and Tolerance Index

Source: systematized by the authors according to the data given in [4; 5; 7; 9; 10; 12].

A Ukrainian example is demonstrated by the Kyiv Region Tours platform, where at least 20 routes with clear parameters are open in the catalog: the number of points of interest, distance, and estimated travel time. The "Routes" page displays, in particular, routes for 9–14 locations with a distance of 22 km to 600 km and a travel time from 34 minutes to 9 hours 40 minutes; This allows you to balance the natural and cultural assets of the region and select trajectories of different saturation for family,

educational or memorial visits [25]. A foreign example – La Rambla (Barcelona) – illustrates how social resources and flow management maintain the quality of the urban experience: five geolocation antennas have been installed to count visitors and time peaks, and the first measurements have adjusted hyperbolized estimates of annual visits to less than 80 million. Real-time data is used to adapt services and redirect flows to reduce central axis congestion and reinforce adjacent neighborhoods with event and gastronomic scenarios [18]. As a result, the combination of natural, cultural and social dimensions, supported by open route parameters or sensory analytics, creates a reproducible mechanism for the formation of attractive urban tourism destinations, where decisions are based on facts, not on intuition.

The development of urban tourism in Ukraine and Europe is constrained by deep disproportions between the pace of digitalization of services and the real state of transport and recreational infrastructure [1; 6]. The first problem is the gap between tourist demand and urban transport capacity. In many cities, the transport system was designed for labor flows, not for tourist routes. Tram and bus lines often do not coincide with the main tourist areas, and the orientation of traffic remains chaotic, without taking into account seasonal or event peaks [2]. Even where e-tickets have been introduced, there is no flexible tariff policy for short-term visits, which makes urban tourism expensive within the daily budget.

The next block of problems is related to recreational infrastructure. City parks, embankments, and public spaces, for the most part, do not have tourist logistics – from elementary navigation to service points [9]. Some recreational areas are in an abandoned state or perform a purely local function, not integrating into the general tourist product of the city. The architectural heritage is revitalized in fragments: one street after reconstruction becomes a tourist showcase, while the surrounding quarters are left without infrastructure [3; 7]. The unevenness of spatial development creates a situation of "island tourism" – when a tourist locks themselves in several locations, not perceiving the city as an integral organism [5; 8].

A separate group of difficulties concerns the statistical support of management. Data on tourist flows, attendance at events, or hotel occupancy are collected by different structures, without unified formats and without communication with transport or utilities [11]. This makes it impossible to simulate a complete picture of the tourist's movement in the urban space, from arrival to departure. There is a lack not only of digital panels, but also of elementary accounting standards: one department reports on the number of tickets, another on museum visitors, the third on sales in the field of hospitality [12]. As a result, managerial decisions are made "blindly", based on fragments of information.

An additional factor is the lack of integration between municipalities and private platforms. Services such as Booking or Google Maps have detailed analytics of flows and requests, but city structures do not have access to this data [13]. The ability to plan the load on infrastructure, predict peak days, or coordinate transport is lost. Tourism turns into a spontaneous process in which information does not serve development, but only fixes its lag.

Improving the system of organizing urban tourism requires a transition from fragmented activities to a holistic urban leisure policy that combines spatial planning, digital analytics and social participation. First of all, it is necessary to ensure a balance between tourist flows and the comfort of residents. To do this, cities should form a polycentric structure of visits: the transfer of part of cultural and recreational activities beyond the historical cores reduces the load on the central zones, creating new tourist clusters in areas with untapped potential. This not only expands the spatial offer but also stimulates economic activity outside of traditional routes.

Another direction is the modernization of transport infrastructure in the logic of "tourist – city – community". The introduction of integrated tickets, single visitor cards and tourist passes with access to public transport reduces transaction barriers and increases mobility within the city. It is important not only to develop new lines or routes, but also to ensure their clear communication through mobile applications and interactive maps.

The data management system should become a key link in urban tourism. It is necessary to create a single city statistical monitoring base, where data from transport, cultural, hotel and event operators would be integrated. Such platforms are already successfully operating in Vienna, Krakow, and Barcelona, allowing cities to predict workloads and adjust visitor engagement policies. For Ukrainian cities, this can be implemented on the basis of municipal think tanks with open APIs for businesses and researchers.

The development of tourism infrastructure should be based on the principles of sustainability and inclusiveness. Reconstruction of public spaces, creation of green routes, and improvement of barrier-free entrances to attractions or museums not only improve conditions for tourists but also improve the quality of life of residents. A sustainable approach also involves the use of environmentally friendly materials, energy-efficient lighting, and waste sorting in tourist areas.

To ensure a long-term effect, it is advisable to create communication platforms for joint management – partnerships between the municipality, business and communities. It is these formats that allow you to coordinate priorities, avoid duplication of functions and develop travel products based on a common identity. In modern conditions, urban tourism should turn into a tool for restoring the social fabric of the city – through event initiatives, interactive spaces and the experience of co-creation, which makes leisure not consumer, but meaningful.

6. Conclusions

In the course of the study, it was found that urban tourism is formed as a complex system of intersection of spatial, cultural and social processes, in which the urban environment becomes not only the background of the trip, but its content. It has been proven that its effectiveness is determined not by the number of events or attractions, but by the quality of the interaction between the tourist, the space and the community. It is the city's ability to organize convenient navigation, safe mobility and open communication that turns a visit into an experience of cognition, not consumption. Urban tourism is increasingly performing a social function – it creates connections, forms an image of the city, which does not disappear after departure.

The problems identified during the analysis are systemic in nature. The transport infrastructure in most cities is not adapted to tourist routes – it gravitates towards pendulum flows and does not take into account seasonal or event peaks. The recreational network is unevenly developed: historical centers are overloaded, while peripheral areas are left without services and navigation. Additionally, the fragmentation of statistical data. Information about tourist flows, events, transport and hotels is collected by various structures without uniform formats, which deprives cities of the opportunity to manage tourism based on facts, not intuition.

The scientific novelty lies in the identification of a model of integrated management of urban tourism, which combines transport analytics, cultural resources and digital interaction. The paper summarizes the experience of cities implementing "smart" solutions – from Lviv City Card and Kyiv Region Tours to La Rambla sensor monitoring systems in Barcelona. Such examples prove that digital integration can not only optimize flows, but also change the nature of leisure – make it sustainable and meaningful.

The practical effect of the study is to develop recommendations for urban strategies: the creation of unified analytical platforms, the development of polycentric routes, barrier-free infrastructure and partnerships "government – community – business". It is these steps that form trust between the city and the tourist and turn leisure time into a tool of social stability.

Prospects for further research are related to the assessment of the impact of urban tourism on the recovery of Ukrainian cities, the development of integral indicators of sustainability and the creation of the UrbanTour Index model, which will allow measuring not only the economic but also the social efficiency of urban leisure.

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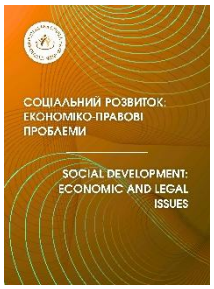
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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

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Analysis of Customer Loyalty Factors in the Business Market of Ukraine (Using the Example of the Baking Industry)

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.20

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ABSTRACT

The current state of loyalty of Ukrainian customers in the market of industrial goods in the segment of baking technological solutions is analyzed in this article. Key factors that determine the level of satisfaction and loyalty of business customers to suppliers of innovative technological solutions for the baking industry of Ukraine are identified. The study analyzes several factors that affect customer loyalty to the goods and services of the "Enzym" company and the "Innovative Center for Baking "Khlibnyi Dim", which is a separate strategic business unit of the enterprise. As part of the scientific study, a sociological survey of 50 customers was conducted and key determinants of loyalty were identified, among which a special place for Ukrainian buyers is occupied by: stable quality, technological efficiency and professional service. It is proven that the transparency of the pricing policy, the diversity of the assortment and the convenience of packaging significantly affect the emotional component of loyalty, forming a sense of trust and orientation to customer needs. Several issues regarding the transparency and validity of the pricing policy of the business unit "Innovative Center for Baking ", Khlibnyi Dim" were identified. The need for expanding the range and optimizing packaging forms to better meet customer needs was proven. A comprehensive approach to further research is proposed, which includes: an in-depth analysis of the relationship between the level of customer satisfaction with individual aspects of cooperation (price, range, quality, service) and the integral loyalty indicator; building a customer satisfaction assessment model based on fuzzy logic or machine learning methods; researching the perception of prices by key customer segments and benchmarking the range of the "Innovative Center for Baking "Khlibnyi Dim" of the Enzym company.

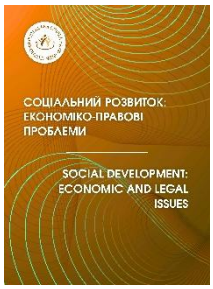
KEYWORDS

customer loyalty, customer satisfaction, personal selling, pricing policy, strategic range management, baking mixes, confectionery mixes, yeast, business market.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

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Аналіз чинників лояльності покупців на діловому ринку України (на прикладі хлібопекарської галузі)

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.20

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АНОТАЦІЯ

У науковій статті проаналізовано сучасний стан лояльності українських клієнтів на ринку товарів промислового призначення у сегменті хлібопекарських технологічних рішень. Виявлено ключові чинники, що визначають рівень задоволеності та лояльності бізнес-клієнтів до постачальників інноваційних технологічних рішень для хлібопекарської галузі України. У межах дослідження проаналізовано ряд чинників, які впливають на лояльність клієнтів до товарів і послуг компанії «Ензим» та «Інноваційного центру хлібопечення «Хлібний Дім», що є окремим стратегічним господарським підрозділом підприємства. В межах наукового дослідження проведено соціологічне опитування 50 клієнтів та визначено ключові детермінанти лояльності, серед яких особливе місце для українських покупців займають: стабільна якість, технологічна ефективність і професійний сервіс. Доведено, що прозорість цінової політики, різноманіття асортименту та зручність фасування істотно впливають на емоційну складову лояльності, формуючи відчуття довіри й орієнтації на потреби клієнтів. Виявлено ряд питань до прозорості та обґрунтованості цінової політики бізнес-одиниці «Інноваційний центр хлібопечення «Хлібний Дім». Доведено потребу в розширенні асортименту та оптимізації форм фасування для кращого задоволення потреб клієнтів. Запропоновано комплексний підхід до подальших досліджень, який передбачає: поглиблений аналіз взаємозв'язку між рівнем задоволеності клієнтів окремими аспектами співпраці (ціна, асортимент, якість, сервіс) та інтегральним показником лояльності; побудову моделі оцінювання задоволеності клієнтів на основі нечіткої логіки або методів машинного навчання; дослідження сприйняття ціни ключовими сегментами клієнтів і проведення бенчмаркінгу асортименту «Інноваційного центру хлібопечення «Хлібний Дім» компанії «Ензим».

КЛЮЧОВІ СЛОВА

лояльність клієнтів, задоволеність клієнтів, персональний продаж, цінова політика, стратегічне управління асортиментом, хлібопекарські суміші, кондитерські суміші, дріжджі, діловий ринок.

1. Introduction

In the modern environment of professional bakery production, competition among suppliers of food solutions in Ukraine shows an upward trend. Continuous improvement of technologies, increasing requirements for product quality and efficiency of production processes, and changes in consumer needs and demand create serious challenges for supplier companies operating in the business market of Ukraine.

Under such conditions, it is extremely important to build customer loyalty to the company producing bakery products. This is even more true in the business market, where the level of trust and loyalty are mandatory requirements for long-term cooperation and interaction. Despite the importance of forming and maintaining loyalty for bakery enterprises in Ukraine, which regularly purchase appropriate technological solutions, such research in the field of marketing is not enough. Scientific works in related sectors of the food industry give grounds to assert that the factors that form the loyalty of business customers are complex and not always linear.

Accordingly, several problems remain unsolved for the business market (B2B) of Ukraine, in particular: (1) specific factors (price, assortment, service, technological support, packaging, logistics) that most affect customer loyalty in the business market (B2B customers) in the baking industry have not been sufficiently studied; (2) there is no clear understanding of the significance of various loyalty factors in today's conditions and the adaptation of suppliers to current changes; (3) there is a lack of practically-oriented recommendations for suppliers-manufacturers of product solutions in the baking industry, which can increase customer loyalty and increase the effectiveness of partner satisfaction management, which, ultimately, will contribute to the growth of competitiveness.

Thus, in modern business conditions, there is a need for a systematic analysis of the factors that form the loyalty of B2B customers to product solutions in the bakery industry, taking into account the specifics of the industry, technological requirements, market conditions, and the current marketing macro environment.

2. Literature Review

In recent years, there has been an increase in attention in the scientific community to the study of consumer loyalty in the consumer and business markets. Scientists focus special attention on the food industry, which occupies a special place among the sectors and sectors of the national economy of Ukraine. At the same time, the level of research on customer behavior and the establishment of interaction in the business market in the field of food industry and production of ingredients in Ukraine is insufficient.

Foreign studies emphasize that loyalty in the B2B market is multidimensional and is formed mainly through the quality of relationships, trust and customer satisfaction. A number of scientific papers [9] indicate that the quality of relations between companies in the business environment is determined by three key components: trust, satisfaction and commitment to the supplier, which together create the basis for stable loyalty. The authors emphasize that in business markets, it is human interaction that has a greater impact than the product itself.

Similar conclusions are presented in the study "Factors Affecting Customer Loyalty and Satisfaction on B2B Food and Beverage Sector" [10]: it is proved that the key factors in the formation of loyalty are product quality, effective communication, supplier flexibility and the level of after-sales support. The authors also emphasize that customer satisfaction acts as an intermediate link between the perception of the value of the product and real loyalty.

According to the analytical study "Customer loyalty in Food B2B: A strategic approach for manufacturers, suppliers and wholesalers" [1], effective interaction with B2B customers in the food ingredients sector involves systematic management of the experience of cooperation, sustainability in product quality, and transparency in relationships. One of the key areas of increasing loyalty is the development of innovative solutions that can meet the technological needs of bread and confectionery manufacturers.

In turn, S. Gounaris and A. Almores in their scientific work "A dynamic, relational approach to B2B customer experience" [4] emphasize the importance of an integrated approach to customer experience

management in a B2B environment. They prove that strategic partnerships, joint problem solving, and professional technical support significantly increase loyalty levels even in highly competitive industries.

Domestic scientists also pay attention to the study of customer loyalty in the business environment. In particular, some authors [5] note that building B2B customer loyalty should be based on creating unique value for the partner, introducing flexible forms of communication and interaction, and adaptive service models.

Also, Y. Leyba, M. Shyrokopetleva and I. Gruzdo [8], studying modern methods of measuring customer loyalty in Ukraine, note the need to combine quantitative and qualitative indicators – such as the level of trust, readiness for repeated purchases and emotional perception of the brand.

Both foreign and Ukrainian scientific sources confirm that the loyalty of B2B customers in the production of food ingredients, in particular bakery, is formed under the influence of a complex of factors. Among them, the key ones are: product quality, stability of supply, technical support, flexibility of cooperation, professional communication provided through effective personal selling [7] and focus on long-term partnerships.

3. Problem Statement

The article is aimed at analyzing the current state of loyalty of Ukrainian customers in the business market of bakery technological solutions, identifying the key factors that determine the level of satisfaction and loyalty of business customers to suppliers of innovative technological solutions in the baking industry.

Among the main tasks of the study, which were solved on the example of a bakery enterprise, it is worth highlighting:

- to assess the perception of consumers of the price-quality ratio of products in the bakery industry of Ukraine;
- to find out the effectiveness of the pricing policy in the food industry in the business market;
- to analyze the strengths and weaknesses of the commodity policy of enterprises in the business market of Ukraine;
- to evaluate the effectiveness of personal sales in the B2B market of Ukraine in the baking industry.

4. Methods and Materials

The process of scientific research was based on the consistent application of scientific methods, starting from the empirical stage of collecting information to its subsequent statistical generalization and interpretation. The main method of collecting primary data was surveys. The obtained quantitative data are processed using statistical analysis methods. To interpret and present the results of the survey, the method of graphical analysis was used, which made it possible to visually reflect the distribution of answers according to various criteria. To assess the market position of products and services of the enterprise, the method of comparative analysis was used. The methods of synthesis and systematic approach were used to summarize the identified factors, their hierarchy of influence on loyalty and identify key problem areas. The applied approach ensured the validity of conclusions on the determinants of B2B customer loyalty in the Ukrainian market in the baking industry.

5. Results and Discussion

With the development of market relations in Ukraine, we observe a constant increase in the level of competition in all domestic markets. The food industry, in particular the baking industry, is no exception. Against the backdrop of increased competition in the field of innovative technological solutions for the baking industry, suppliers clearly understand that long-term partnerships with B2B customers are the key to success. Creating such loyalty requires more effort, because it is based on a systematic approach to cooperation: prompt response, deep technical expertise and support, guaranteed availability to the desired assortment and maximum flexibility of purchase conditions. The ability to meet the needs of partners and consistently build strong cooperation with them are becoming decisive strategic advantages of market players.

The object of the study was the activities of the biotechnology company Enzym, which develops and manufactures products in Eastern Europe based on yeast cells. The company has its own research laboratory, which helps to provide partners in 23 countries of the world with food (Enzym Food Solutions), feed (Enzym Feed Solutions), alcohol (Enzym Alcohol Solutions) and bakery (Enzym Bakery Solutions) products based on yeast cell [3].

The study focuses on the bakery business – Enzym Bakery Solutions, which, according to the company's definition, "helps create tasty and nutritious food products for millions of consumers every day" [2]. The line directly includes pressed and dry yeast, offers a variety of innovative solutions for the baking and confectionery industries. The company focuses on "the quality and safety of food solutions confirmed by international quality standards" [2].

In order to find out the key factors of loyalty in the business market of Ukraine within the framework of product solutions for the baking industry, an internal survey was conducted among 50 customers (buyers in the B2B market) of the "Khlibnyi Dim Bakery Innovation Center". The survey was conducted in 10 different cities of Ukraine, where consumers of relevant goods are most concentrated.

The questionnaire contained four blocks of questions regarding customer satisfaction:

1) product price;
2) assortment of goods offered by the company;
3) product quality;
4) service level.

The "Price" block contained questions regarding the customers' perception of the price-value ratio, the compliance of prices with the competitive level, the transparency of the pricing policy and the efficiency of the product in the production process.

The "Assortment" block covered the issues of product satisfaction (in particular, with each product category: yeast, improvers, bakery and confectionery mixtures), ease of packaging, clarity of actions described on the instructions for the use of products, compliance of the assortment with technological needs and motivation for purchases from other manufacturers.

Questions in the "Product Quality" block focused on the stability of the characteristics of product batches and their efficiency in production processes.

In the "Service level" block, attention was paid to the qualitative characteristics of personal selling in the company, in particular, the key was to find out the professionalism of consultants, the speed of response to requests and the convenience of logistics processes.

According to the results of the survey, 52 % of respondents consider the price-quality ratio to be satisfactory; 44 % – partially corresponding, expecting better results; only 4 % are unsatisfactory (Fig. 1).

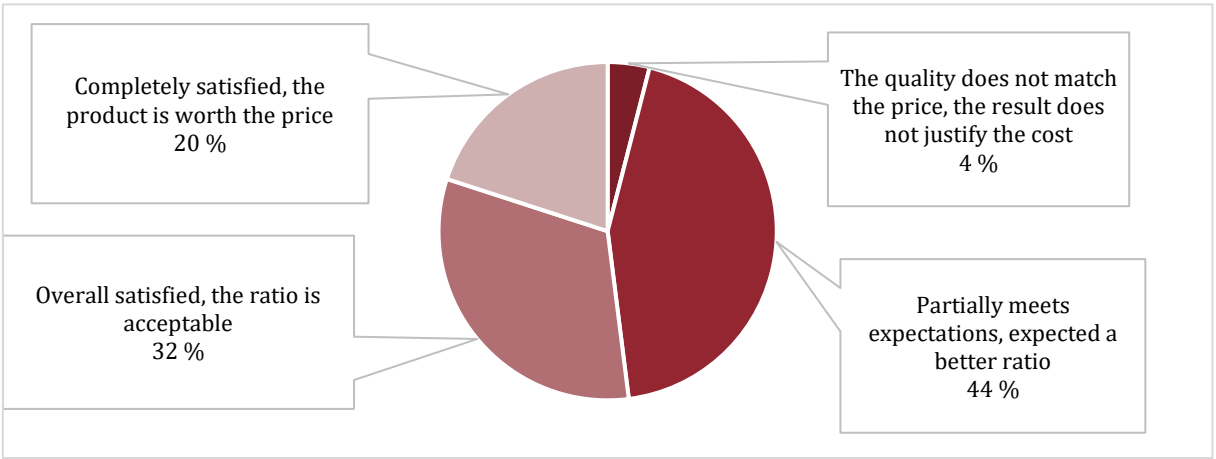


Figure 1. ***Respondents' answers regarding the ratio of price and quality of "Khlibnyi Dim" products***
Source: Developed by the authors.

Assessing the competitiveness of the company's pricing policy made it possible to find out that most customers consider products to be relatively more expensive than market analogues. Thus, 20 respondents noted a higher level of prices compared to competitors; 15 – The prices are partially acceptable, but they still consider other alternatives. Only 7 respondents consider prices to be adequate, and 5 consider prices more favorable than competitive ones (Fig. 2).

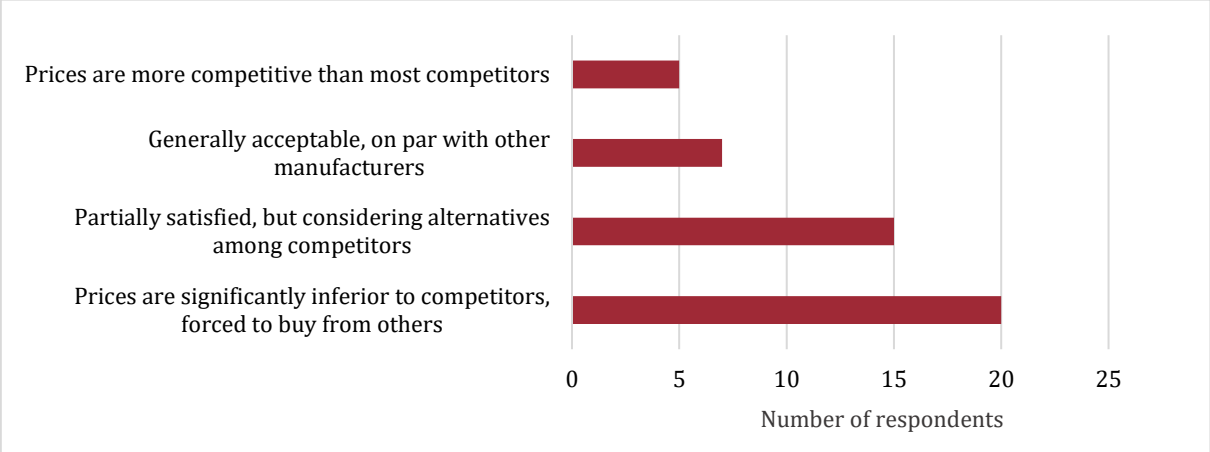


Figure 2. Respondents' answers regarding the compliance of the price of the "Khlibnyi Dim" products
Source: Developed by the authors.

It is important to note that only half of the respondents consider the pricing policy and mechanisms for forming prices for products to be clear, which indicates the need for closer interaction with buyers in matters of the contractual policy of the enterprise. Accordingly, 50 % of respondents consider the pricing policy to be generally understandable, but one that requires greater transparency; 30 % note insufficient reasonableness of prices; 12 % of respondents assess the pricing policy as completely transparent; 8 % of customers, the pricing mechanism is incomprehensible and requires a deeper explanation.

As part of the study, we also sought to understand the correspondence between the company's price and offer and, accordingly, the efficiency of the production process. The survey showed that (Fig. 3):

- 14 customers are completely satisfied with the price-result ratio;
- 10 – believe that the price mostly corresponds to the efficiency of the production process;
- 23 people noted that the cost of products is only partially justified;
- 3 respondents consider the price completely unjustified.

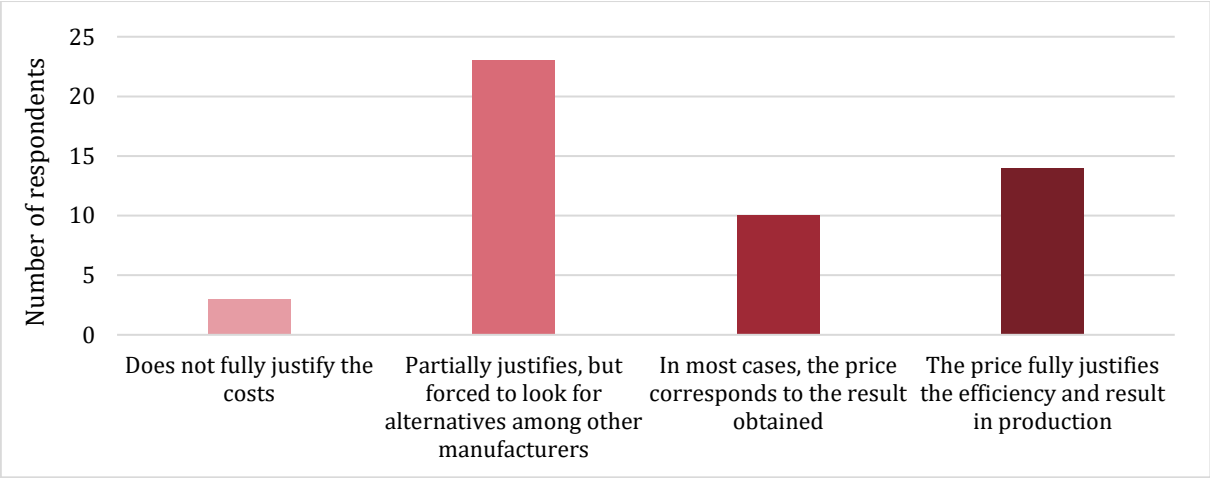


Figure 3. Respondents' answers regarding the extent to which the costs of Khlebnyi Dom's products justify the production result
Source: Developed by the authors.

As for the assessment of the level of customer satisfaction with the assortment of "Khlibnyi Dim", 70 % of respondents consider the assortment of "Khlibnyi Dim" to be fully relevant to their needs, while 30 % noted partial satisfaction and noted that because of this they turn to products of other brands (Fig. 4). It should also be noted that buyers of bakery products are generally satisfied with the methods of packaging, packaging, and separation of products. Thus, 37 respondents are completely satisfied with the available forms and volumes of packaging of products, while 13 people made proposals for adjusting the volume of yeast packaging.

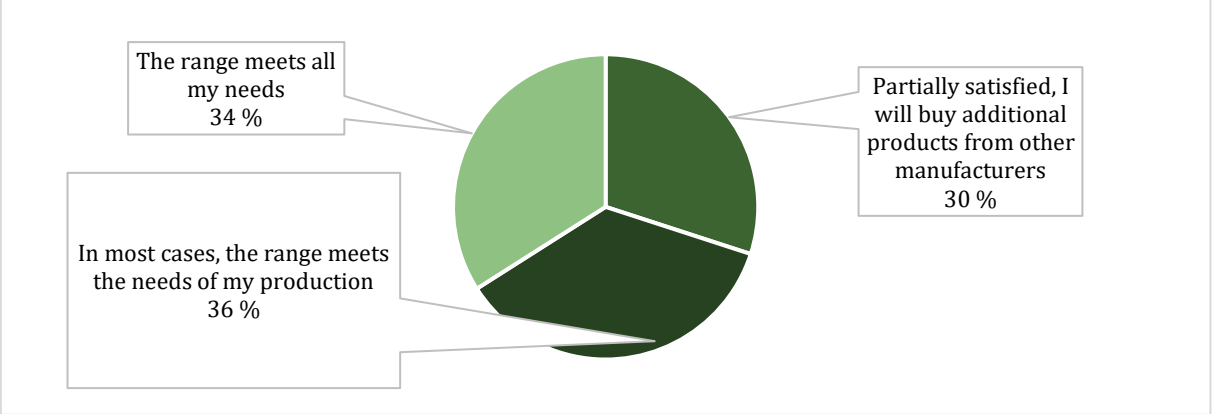


Figure 4. Respondents' answers regarding how wide they consider the range of products of "Khlibnyi Dim" to be

Source: Developed by the authors.

Since a significant part of customers were not completely satisfied with the range of products offered, a special study was additionally conducted to study the needs of individual product categories.

The results showed that the most popular are bakery mixtures and improvers, while yeast and confectionery mixtures are used by Ukrainian bakery manufacturers and confectioners in moderation or they focus on a different assortment.

Moreover, Ukrainian food industry enterprises prefer universal bakery mixes for everyday production, while niche mixes are used less often. 94.3 % of respondents noted that baking mixes optimize production processes. 46.5 % highly appreciated the variety of the assortment, 32.56 % were satisfied with the basic choice, and another 20.93 % considered the assortment limited.

The situation is similar in the market of improvers: the most popular are universal products that improve the structure of the dough and stabilize the processes of kneading dough and baking. That is why about 57 % of respondents highly appreciate the range of improvers. The rest of the customers partially or completely focus on other manufacturers. At the same time, it is worth noting that 25 % of respondents noted minor difficulties in using some of the dough improvers of the Enzym company, which they informed the company's sales employees.

As for yeast products, most customers use pressed yeast because of the convenience and stability of the result. Among buyers, according to the survey, 93.3 % use yeast of "Khlibnyi Dim" and are completely satisfied with the quality; 80 % – packaging and instructions. At the same time, 46.5 % of respondents noted that they turn to competitors for the purchase of yeast due to the lower price.

Confectionery mixtures are used sparingly by Ukrainian manufacturers. The most popular basic products for finishing and filling confectionery. In general, buyers of such goods are satisfied with the assortment of confectionery mixtures, this was noted by 55 % of respondents. At the same time, 25 % of respondents noted that they do not use brand products in this category. At the same time, customers of Khlebny Dom mainly buy confectionery mixtures of competitors because of the lower price.

The survey made it possible to identify a number of proposals that can be taken into account by the management of the company "Enzym" to expand the product policy and calculate the profitability of the new assortment. Customers expressed the need to expand the assortment, in particular: yeast with increased tolerance to sugar; sourdough starters for different types of bread; specialized mixtures for ciabata and pita bread; natural flavor enhancers; superfoods; products for dietary bread; fruit and chocolate fillings; decorative sprinkles; gelling agents and products of the Clean Label category.

After analyzing the satisfaction of the assortment, it is advisable to proceed to the evaluation of product quality by customers, since even a wide selection of products does not guarantee complete customer satisfaction without stable and high-quality products. The majority of respondents (35 people) assess the quality of products as stable, while the rest note isolated non-systemic deviations, in particular in the inappropriate smell, inconsistent color of products in different batches, and fragility of bakery products when sliced.

As for technological efficiency, 38 respondents (76 %) consider products created on the basis of Khlebnyi Dom products to be fully suitable for key production processes; 12 respondents (24 %) note limited versatility for niche formulations.

In the study, we sought to assess the effectiveness of personal sales of Enzym in the Bakery Solutions market, understanding the importance of this means of marketing communications for

enterprises operating in the market of industrial goods [7, p. 44, 94]. Therefore, the assessment of the professionalism of the staff testified to the high level of the company's sales representatives. Among the respondents, 37 people (74 %) confirmed the full competence of the employees of the "Innovative Bakery Center "Khlibnyi Dim", 8 people noted isolated cases of partial incompetence, only 5 people (10 %) indicated the need to improve the skills of the company's personnel (Fig. 5).

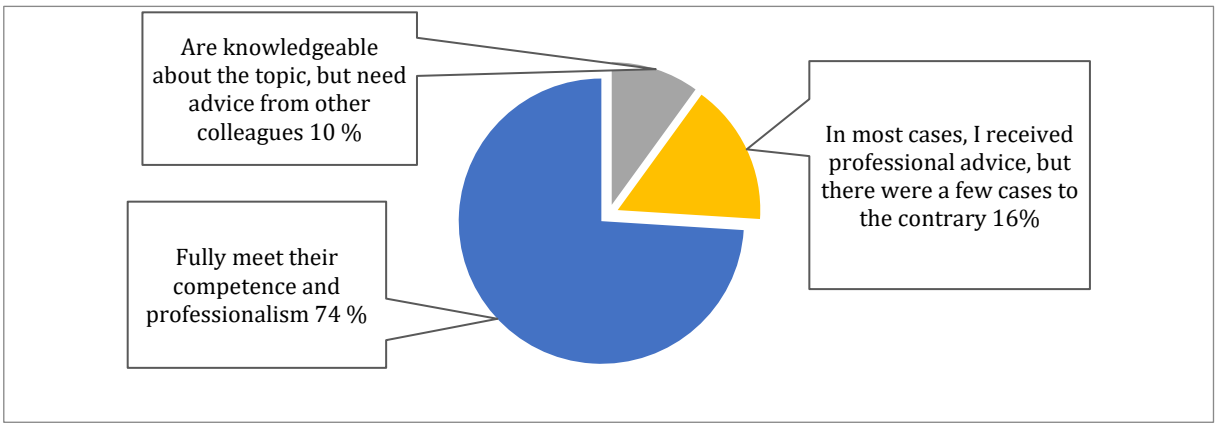


Figure 5. Respondents' assessment of the professionalism of managers and technical consultants of the "Khlibnyi Dim"

Source: Developed by the authors.

Also in the survey, we evaluated the reaction of Enzym sales employees to customer requests. As evidenced by the data of Fig. 6, the majority of respondents rated the efficiency of responding to requests and solving technical problems as "fast" or "very fast": 22 people noted a response within 1-2 days, 20 – a response on the day of the request, 8 respondents (16 %) had a negative experience regarding the speed of service. From our point of view, the figure of 16 % is quite high and requires a reaction of the marketing and commercial management department to the activities of its own personnel in order to find out in detail the relevant circumstances. It is advisable to introduce constant customer surveys in order to identify such negative experiences and increase the efficiency of personal sales of the company.

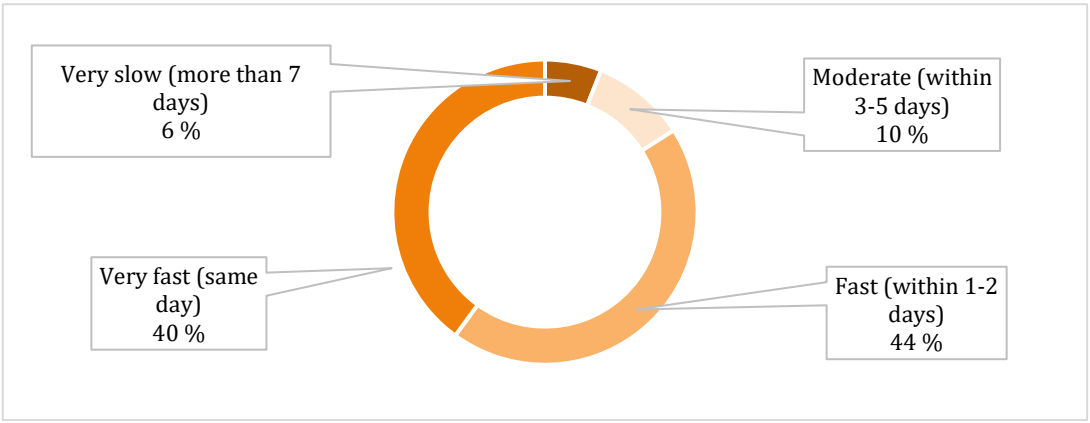


Figure 5. Respondents' assessment of the speed of response of the "Khlibnyi Dim" to requests or technical problems

Source: Developed by the authors.

The assessment of the ordering, delivery and logistics process turned out to be very high: 70 % of respondents consider it completely convenient, and 20 % consider it quite convenient if problems are quickly solved. However, 10 % of respondents indicated that there were minor problems, mainly related to delays and inconsistent shipment schedules.

6. Conclusions

The results of the customer survey of the "Innovative Bakery Center "Khlibnyi Dim" made it possible to identify the key factors influencing the formation of customer loyalty to the products of its production.

1. The greatest impact on the perception of the company's offer in the business market of Ukraine today is the stable quality and technological efficiency of products that provide predictable results in production. These parameters form the basic trust of customers and encourage them to repeat purchases, which is extremely important in the B2B market.

2. The second most important factor that determines the level of loyalty in the business market is the level of professional support and service. Quick response to requests, competence of managers, and convenience of logistics processes create a positive experience of interaction with the brand. This is the key to building close ties between producers (sellers) and buyers, a way to form long-term mutually beneficial relationships.

3. At the same time, such aspects as transparency of pricing policy, variety of assortment and convenience of packaging have a significant impact on the emotional component of loyalty, because they form a feeling of a personalized approach to the needs of the client.

4. The study showed the presence of certain problems in the pricing policy, the width of the assortment and forms of product packaging. These factors can reduce the level of emotional engagement of customers and weaken long-term commitment to the brand, despite the consistently high quality and effectiveness of products.

It is advisable to determine the directions of further research:

- in-depth analysis of the relationship between the level of satisfaction with certain aspects of cooperation (price, assortment, quality, service) and the integral indicator of loyalty;
- building a model for determining customer loyalty based on fuzzy logic or machine learning methods, which will simulate the impact of changes in pricing policy, assortment and packaging on loyalty, prioritize customer retention measures;
- research of price perception by key customer segments and benchmarking of the assortment of the "Innovative Bakery Center "Khlibnyi Dim" of the company "Enzym" among the main competitors.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

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The Influence of International Standards on the Development of National Legislation

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.04

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ABSTRACT

The article is devoted to the analysis of the influence of international standards on the development of national legislation, in particular the mechanisms of their implementation, the problems of harmonization of legal norms and ways of improving the legislative system of Ukraine in accordance with international obligations. Particular attention is paid to the analysis of the mechanisms of implementation of international standards into national legislation, the problems of harmonization of Ukrainian law with international norms and ways of increasing the efficiency of the legislative process in the context of international obligations. The purpose of the study is to determine the influence of international standards on the formation and development of national legislation and to suggest ways of increasing the efficiency of their implementation in Ukraine. In the course of the scientific research, general scientific methods of cognition were used, in particular: analysis and synthesis; comparative law; the method of abstraction and generalization; logical and systemic methods for forming conclusions and proposals for improving the legal system. The results of the study show that international standards play a key role in the development of national legislation, contributing to the harmonization of legal norms with international requirements, but the process of their implementation is often complicated by legislative conflicts, insufficient legal culture, and administrative barriers. Effective adaptation of international norms requires a systematic approach, modernization of legislative techniques and active participation of civil society institutions. The concept and classification of international standards in the field of law are considered. The mechanisms for implementing international norms into domestic legislation are substantiated. The role in harmonizing national legal systems and integration into the international legal environment is studied. The main mechanisms of the influence of international norms and principles on the formation of national legislation are determined. The forms and stages of implementing international treaties, conventions and recommendations into domestic law are studied. Barriers to the implementation of international norms into national legislation are systematized. Ways of improving the legislative process are proposed in order to more effectively take into account international standards in the national legal system.

KEYWORDS

international standards, legal system, implementation of international norms, integration, harmonization, European integration processes, national legislation, digitalization.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Вплив міжнародних стандартів на розвиток національного законодавства

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.04

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АНОТАЦІЯ

Стаття присвячена аналізу впливу міжнародних стандартів на розвиток національного законодавства, зокрема механізмів їх імплементації, проблем гармонізації правових норм та шляхів вдосконалення законодавчої системи України у відповідності до міжнародних зобов'язань. Особлива увага приділяється аналізу механізмів імплементації міжнародних стандартів у національне законодавство, проблемам гармонізації українського права з міжнародними нормами та шляхам підвищення ефективності законодавчого процесу у контексті міжнародних зобов'язань. Мета дослідження – визначити вплив міжнародних стандартів на формування та розвиток національного законодавства та запропонувати шляхи підвищення ефективності їх імплементації в Україні. У ході наукового дослідження використовувалися загальнонаукові методи пізнання, зокрема: аналіз і синтез; порівняльно-правовий; метод абстрагування та узагальнення; логічний та системний методи для формування висновків і пропозицій щодо удосконалення правової системи. Результати дослідження показують, міжнародні стандарти відіграють ключову роль у розвитку національного законодавства, сприяють гармонізації правових норм із міжнародними вимогами, проте процес їх імплементації часто ускладнюється законодавчими колізіями, недостатньою правовою культурою та адміністративними бар'єрами. Ефективна адаптація міжнародних норм вимагає системного підходу, модернізації законодавчої техніки та активної участі інституцій громадянського суспільства. Розглянуто поняття та класифікацію міжнародних стандартів у сфері права. Обґрунтовано механізми імплементації міжнародних норм у внутрішнє законодавство. Досліджено роль у гармонізації національних правових систем та інтеграції у міжнародне правове середовище. Визначено основні механізми впливу міжнародних норм і принципів на формування національного законодавства. Досліджено форми та етапи імплементації міжнародних договорів, конвенцій і рекомендацій у внутрішньодержавне право. Систематизовано бар'єри імплементації міжнародних норм у національне законодавство. Запропоновано шляхи вдосконалення законодавчого процесу з метою ефективнішого врахування міжнародних стандартів у національній правовій системі.

КЛЮЧОВІ СЛОВА

міжнародні стандарти, правова система, імплементація міжнародних норм, інтеграція, гармонізація, євроінтеграційні процеси, національне законодавство, цифровізація.

1. Introduction

In today's globalized world, the development of national legislation cannot be studied without the adoption of international standards. The growing interdependence of states, active involvement in international organizations and the conclusion of bilateral and multilateral agreements create the need for harmonization of domestic legal norms with world practices. International standards serve as a model for lawmakers. Promote the implementation of effective, open and predictable legal mechanisms.

The experience of the last decade shows that harmonization with international norms can significantly increase the level of economic stability. According to World Bank experts, countries that have adopted at least 70% of the recommendations of the Organization for Economic Co-operation and Development (OECD) have, on average, increased the inflow of foreign direct investment by 25-30% in the three years after the reforms. This is not a coincidence: international standards form clear "rules of the game", reducing risks for both business and the state.

It can be seen that the real difficulty lies not in the translation of international acts and not in changing legislative formulations, but in the practical integration of new principles into national mechanisms. It is this process that determines whether international norms will become effective, not declarative. Therefore, the attention of researchers is increasingly focused not on the formal adoption of norms, but on how they are rooted in the internal legal fabric – from the training of judges to the change of administrative procedures.

The adaptation of international law makes sense only when it passes the "filter of local experience". And it is this stage that is the most vulnerable, but at the same time the most important, because it depends on whether the international standard will turn into a real tool for the development of the legislative system, or will remain another item in the report on fulfilled obligations.

2. Literature Review

The issue of the influence of international standards on the development of national legislation is sufficiently studied in the domestic literature. A significant contribution to the study of this topic was made by O. V. Martseliak and S. M. Martseliak [1, p. 94], who highlighted the main mechanisms of influence of international organizations on law-making processes and constitutional reform in Ukraine. M. O. Baimuratov and B. Ya. Kofman [2, p. 108] studied the role and significance of international legal standards. N. Moskaliuk and V. Sloma [3, p. 37], O. I. Nalyvaiko and N. A. Bratishko [4, p. 411], D. A. Chyzhov [5, p. 124] studied international legal standards in the field of human rights protection and their impact on the legislation of Ukraine. I. V. Bilykh [6, p. 145] focused on the problems of implementation of international standards of administrative justice in Ukraine. T. Harasymiv [7, p. 38] analyzed the key theoretical and methodological problems and prospects for harmonization of national legislation with international legal standards. T. Oleksiiuk [8, p. 86] in her research analyzed international soft law standards from the point of view of finding answers to the challenges faced by the Ukrainian authorities and society in finding the right balance between the protection of national security and the right to information. V. P. Knyshov [9, p. 92] carried out research on the implementation of international standards of administrative law in the legislation of Ukraine. O. Yu. Kuchynska [10, p. 305] covered the process of adaptation of the legislation of Ukraine to the legislation of the European Union.

Despite a significant amount of literature covering the problems of the impact of international standards on national legislation, the issue of the effectiveness of their implementation and practical mechanisms for harmonizing Ukrainian law with international norms remains insufficiently studied. In this regard, information from various sources was analyzed, systematized and presented in the light of this research topic.

3. Problem Statement

The purpose of the study is to comprehensively study the impact of global standards on the development of domestic legislation, analyze the means of their implementation, assess the level of harmonization of Ukrainian law with international norms, identify difficulties and barriers to adaptation of international acts in the national legal system, as well as develop recommendations for improving the

effectiveness of the legislative process and guaranteeing the compliance of national legislation with international obligations.

4. Methods and Materials

The study is based on a combination of universal scientific approaches and specialized legal methods, which allows for a deeper understanding of the mechanisms of influence of international standards on the national legal environment.

Several methods were used, including comparative-legal, historical, analytical, and structural-functional. Each of them fulfills its role: comparative allows you to identify similarities and differences in legal models of different countries; historical – shows the evolution of legal ideas and how international norms have adapted to local conditions; analytical – helps to identify patterns of influence of international acts on domestic legal processes; structural-functional – explains how international standards interact with national institutions.

The research focuses on the dialectical method, which allows us to see the interaction of international and domestic law not as a static structure, but as a mobile system that is constantly changing under the pressure of political reforms, economic fluctuations and social transformations. It is this approach that allows us to trace how global processes – from reforms in the EU to UN decisions – gradually form a new logic for the development of national legal systems. As the German legal theorist Helmut Lauterbach notes, dialectics "reveals law in motion, not at rest," and is therefore key to understanding the mechanisms of its evolution.

The comparative legal method is the second analytical tool that allows you to compare the structure and content of international regulations with the norms of domestic legislation. Thanks to this, one can see not only the similarity of the wording, but also the real level of their coherence – where the international norm has become an organic part of the national system, and where it has remained declarative. For example, according to researchers at the Institute of International Law in Warsaw, about 40% of provisions borrowed from European acts in several post-socialist countries remain "inoperable" precisely because of the lack of internal legal adaptation.

No less important is the system-structural approach, which makes it possible to see where exactly international standards are located in the "legal architecture" of the state, how they interact with traditional sources of law, affect the structure of branches and transform the logic of the functioning of legal institutions. In practice, this method helps to determine not only the place of international norms in the system of sources, but also to identify the patterns of their integration into the legislative array, from the constitutional level to the sectoral level.

The use of the historical and legal approach made it possible not only to record the stages of development of implementation mechanisms, but to see them in dynamics – from the first attempts to adapt international norms to national legislation to modern integration processes. Thanks to this, it was possible to outline the regularities of the evolution of the legal system: how international ideas gradually changed the structure of domestic law, influencing judicial practice, administrative procedures and even political priorities of the state. As the British jurist David Lloyd emphasizes, historical analysis "reveals not only the sequence of events, but the logic of change", and this is what makes it indispensable for understanding the current state of the legal field.

The formal-legal method made it possible to understand the very nature of international acts – their normative force, legal nature and ways of penetrating domestic legislation. It examines how international principles are transformed into specific national norms and how they function in the practice of courts and state institutions. Particular attention is paid to how stable this transformation is.

The combination of different scientific approaches creates a holistic picture of the impact of international standards on national law. Each method – from historical and legal to systemic – complements the other, forming a multi-layered analytical toolkit capable of covering both the evolution of legal ideas and practical mechanisms for their implementation. Thanks to this combination, it is possible to trace not only external changes in legislation, but also the internal logic of its development, to identify where international principles have really become part of the legal culture, and where they have remained only formal declarations.

In the scientific literature, this approach is considered the most reliable. As the Swiss lawyer Heinrich Müller notes, "methodological synergy is not a whim of the researcher, but a condition for the

reliability of the results." In practical terms, this means that the conclusions obtained are not based on individual observations, but on a set of evidence tested through different methodological prisms. Such integration of approaches enhances the scientific argumentation and ensures the objectivity of the assessment of the impact of international norms on the legal system of the state.

5. Results and Discussion

In the XXI century, the active presence of states in global institutions – from the United Nations and the Council of Europe to the European Union and the World Trade Organization – is gradually turning international law into a system of universal guidelines. It sets the standards without which it is impossible to imagine modern politics or economics: respect for human rights, the rule of law, intolerance to corruption, rational use of natural resources, and transition to sustainable development models.

In practice, compliance with these standards turns into a necessary condition for economic integration. From opening markets and accessing IMF credit resources to participating in the EU's green transition programs, all this requires confirmation that the state shares the universal principles of justice, transparency and responsibility. In other words, modern international cooperation is increasingly based not only on interests, but also on a common value basis that determines the place of each country in the world community.

The classification of international standards in the legal sphere can be carried out on various grounds. According to the legal status, there are mandatory and recommended standards: mandatory ones are formed on the basis of international treaties and conventions, and recommended ones act as guidelines and guidelines for law-making activities. According to the scope of application, standards are divided into general law (regulating the basic principles of law), specialized (economic, criminal, civil law) and intersectoral, covering several areas at the same time.

Legislative bodies receive clear guidelines: which norms are mandatory for implementation, which are advisory in nature, and which can act as a kind of standard for judicial practice. In a number of cases, it can be seen that countries that implement a multi-level system of classification of international standards demonstrate a faster and more painless update of national legislation, reducing discrepancies in the interpretation of legal norms.

The concept of "international standards" is considered by scientists as a certain level or quality that must be achieved through the development of national legislation. By forming certain standards of law, international organizations encourage states to voluntarily adapt national legislation to the appropriate level. It can be said that the standardization of the best world practices in the development of effective legislation improves the very quality of work of legal institutions, which must adhere to the principles of democratic development and use reliable legal means to create a new legal regulation [11, p. 24].

The concept of "international standards" is mainly used in the context of UN standards in the field of human rights, which are contained in binding conventions, UN agreements and advisory acts adopted within the framework of the work of the Council of Europe. However, the modern Western doctrine of international law generally blurs the line between international standards and soft law acts, i.e., recommendations and reports of international organizations.

For example, J. Dugard points out that the regulation of interstate relations "goes beyond the narrow positivist perception of international law and includes soft law, including standards and recommendations of international organizations that establish international standards, as well as conferences and rules adopted by non-state actors" [12, p. 225].

A separate group of international standards that determine the directions of development of legislation is formed by international standards of law-making, which are formalized in the acts of international organizations. For example, the Venice Commission, influencing the reform of national legislation, does not create binding norms, but instead forms recommendations in its conclusions in order to bring Ukrainian laws and draft laws closer to European standards. The international standards of law-making of the Venice Commission are contained not only in its conclusions on the Member States, but also in reports and other documents that summarize the practice of the Commission, form minimum European standards of law-making, which are relevant for any state [13, p. 166].

International standards of law-making are contained in the acts of the EU, the OSCE and individual decisions of the ECtHR, which also emphasize the validity and legal certainty of the content of national laws. Such international standards create ideological and value foundations, priorities and general guidelines, in view of which further reform and development of means of creating high-quality and effective legislation should take place in order to fully ensure the fulfillment by the state of its international obligations to ensure and protect human rights, freedoms and legitimate interests.

The concept of "international standards of law-making" can be defined as general rules and ideological-value guidelines that are formalized in international legal acts (documents) and which contain requirements for ensuring a high level of organization of the law-making process [14, p. 213]. The use of such standards in the formation of legislation indicates the path of democratic development chosen by the state.

The types of international standards and their impact on the national legislation of Ukraine are summarized in Table 1.

Table 1. Types of international standards and their impact on the national legislation of Ukraine

Type of International Standard	Type of International Standard	Legal force	Impact on national legislation
Universal Mandatory Standards	UN	Mandatory after ratification; form general principles of international law (*jus cogens*)	Contribute to the establishment of human rights, humanism, and non-discrimination; form the basis of the Constitution and fundamental laws of Ukraine
Regional European standards	Council of Europe	Binding on Member States after ratification; recommendations are indicative	They cause reform of the judicial system, prosecutor's office, anti-corruption bodies, and establish the practice of the Constitutional and Supreme Courts.
European integration standards (EU law)	European Union	European Union	They cause the adaptation of laws in the fields of energy, competition, digitalization, and labor relations
Industry standards of specialized organizations	ILO, WHO, UNESCO, UIP, ICAO, FAO, WMO, etc.	ILO, WHO, UNESCO, UIP, ICAO, FAO, WMO, etc.	Establish standards in the field of labor, healthcare, intellectual property, transport, and agriculture.
International Judicial Standards (Case Law)	ECtHR, International Court of Justice, International Criminal Court, UN committees	The binding on the respondent State has precedent value	Influence changes in judicial practice, interpretation of the norms of the Constitution and laws
Advisory and "soft" standards (*soft law*)	UN, COE, OECD, OSCE, FATF	Optional, but has significant political and moral and legal significance	They are used in the development of draft laws, reform strategies, and anti-corruption policies
Global Anti-Corruption and Governance Standards	UN, OECD, GRECO, World Bank	Mandatory or recommendatory, depending on the mechanism of participation	Contribute to the development of transparent institutions, the prevention of corruption, and the improvement of the civil service
Digital and security standards	EU, UN, ITU, NATO	Mostly mandatory for participating countries; for Ukraine – implementation	Determine the update of laws on cybersecurity, personal data, and information policy

Source: Formed by the authors based on [4, p. 411; 15, p. 144; 16, p. 74].

The main mechanisms of implementation are the direct and indirect introduction of international norms. The direct mechanism provides for the direct inclusion of an international document in national legislation without additional changes, which is especially typical for the norms that are binding under international treaties. The indirect mechanism provides for the adaptation of norms through amendments or adoption of new laws and by-laws that take into account the specifics of the national legal system and the socio-economic conditions of the state [17, p. 82].

In practice, this is manifested in the fact that courts and regulatory authorities jointly form a kind of "implementation mechanism", where international standards become not a declaration, but an effective tool for ensuring the rule of law, protecting human rights and increasing the transparency of governance. This approach allows for a balanced system in which regulatory innovations are quickly integrated into the daily activities of state bodies, and potential gaps in legislative regulation are minimized.

For a better understanding of how international norms and principles affect the formation of national legislation in Ukraine in modern conditions, a generalized table of the main mechanisms of this influence is given. Table 2 demonstrates how international standards, treaties and court decisions are integrated into the national legal system, as well as provides specific examples of their implementation. This approach allows us to visually assess the relationship between international and national law and shows the role of the state in harmonizing legislation with international requirements.

Table 2. Modern Mechanisms of Influence of International Norms and Principles on the Formation of the National Legislation of Ukraine

Mechanisms of action	The essence and method of implementation	Examples for Ukraine
Ratification and implementation of international treaties	Implementation of the rules of international treaties in national legislation	Association Agreement with the EU; implementation of norms in the fields of energy, ecology and human rights.
Taking into account international standards in the development of laws	Application of recommendations and standards of international organizations	GDP and GMP certification standards in pharmaceuticals and healthcare.
Impact of international court decisions	Judicial authorities refer to the decisions of the ECtHR and other international courts to interpret national norms.	Use of ECtHR judgments in cases of human rights and freedom of speech.
The use of international standards in the legislative process	Formation of national acts based on international norms, even if they are not binding.	Harmonization of financial and personal data protection standards with EU requirements.
Participation in international negotiations and consideration of Ukraine's interests	Ensuring mutual recognition of standards and adaptation of international acts to national needs.	Adoption of GDP and GMP certificates to simplify the supply of medicines; participation in the development of international environmental standards.

Source: Formed by the authors based on [18, p. 329; 19, p. 181].

Table 2 clearly illustrates how international standards and principles penetrate into the national legal system of Ukraine, creating the effect of gradual harmonization. Through the ratification of international treaties and their further implementation, Ukrainian legislation is adapting to global norms, while the use of the practice of international courts and active participation in world negotiations add practical importance to this process.

For a visual presentation of the impact of international treaties and conventions on the reform of the legal system of Ukraine in modern conditions (Table 3).

Table 3. The Impact of International Treaties and Conventions on the Reform of the Legal System of Ukraine

Scope of reform	Mechanism of influence of international treaties and conventions	Examples for Ukraine	Outcome
Legislation	Harmonization of national laws with international standards	Association Agreement with the EU: adaptation of laws in the areas of the internal market, energy, and ecology	Compliance of Ukrainian law with international standards, integration into the European legal space
Judicial system	Use of decisions of international courts in the interpretation of national law	ECtHR decisions on human rights, freedom of speech, and private life	Unified law enforcement practice, strengthening human rights protection
Energy and economy	Implementation of standards and recommendations of international organizations	EU standards in energy regulation; IMF and FATF financial standards	Modernizing sectors, increasing transparency and efficiency of regulation
Health	Use of international norms and standards	WHO and EU standards in pharmaceuticals and medical services	Improving the quality of medical care, patient safety
Anti-corruption and the rule of law	Implementation of the recommendations of international bodies	GRECO, Venice Commission	Strengthening the transparency of state procedures, strengthening the rule of law
Public trust	Taking into account international standards in government processes	Anti-corruption laws and control mechanisms	Increasing citizens' trust in the judiciary and authorities

Source: Formed by the authors based on [20, p. 186; 21, p. 775; 22, p. 7].

It shows how international standards and recommendations are implemented in various areas of national law, affect legislation, the judicial system, the economy, health care and anti-corruption policy. This contributes to increasing openness and trust in state institutions. This approach allows us to assess the complex effect of international law on the development of the Ukrainian legal system.

International treaties and conventions today have become a catalyst for profound transformations in the legal system of Ukraine. This is manifested in faster consideration of cases, more transparent work of the authorities and better protection of citizens' rights.

In a number of cases, it can be seen that this approach changes not only the form, but also the essence of public administration: legislation becomes more adaptive, judicial processes become predictable, and the state becomes more open to cooperation at the international level. The integration of international norms transforms them from a declarative instrument into a real mechanism for improving the quality of legal regulation and the effectiveness of state policy.

Table 4 provides a visual representation of the main barriers to the implementation of international standards in Ukrainian national legislation. It systematizes the key types of obstacles – legislative, institutional, judicial, socio-political and economic – and demonstrates their impact on the process of harmonizing Ukrainian law with international standards. This approach allows for a clear assessment of the main problems and priorities for further reforms.

Table 4. Barriers to the implementation of international norms in the national legislation of Ukraine

Barrier type	Content	Examples for Ukraine
Legislative and legal	Conflict between international norms and national legislation; Formalism in the adoption of laws	Part of the EU directives in the field of energy and ecology has been partially implemented; laws are adopted under the pressure of international obligations, without effective application
Institutional	Low efficiency of government agencies, insufficient coordination and competence of personnel	Limited ability of authorities to ensure control over compliance with GDPR, FATF standards
Judicial and law enforcement	Insufficient consideration of international norms by the courts; problems with the execution of decisions	Courts do not always appeal to the ECtHR
Socio-political and cultural	Resistance to reforms, a low level of legal culture of the population and business	Opposition of business groups to the implementation of anti-corruption standards
Economic	High cost of implementing international standards; lack of resources	Insufficient funding to adapt EU energy and environmental standards, limiting investments in the health care system.

Source: Formed by the authors based on [23].

Table 4 demonstrates that the implementation of international norms in the national legislation of Ukraine in 2025 faces a complex of barriers: legislative, legal, institutional, judicial, socio-political and economic. Effectively overcoming these obstacles requires a comprehensive approach, which includes improving legislation, strengthening the institutional capacity of authorities, training qualified personnel, providing financial support and improving the legal culture of citizens and businesses. Only systematic work in these areas will ensure the full harmonization of Ukrainian law with international standards and the fulfillment of obligations in the context of European integration.

It can be seen that this approach forms a kind of "legal ecosystem", where Ukrainian legislation is interconnected with international practices, and public administration becomes more adaptive and predictable. In the long run, this creates a foundation for socio-economic stability, contributes to the protection of citizens' rights and increases reputation

It can be seen that this approach forms a kind of "legal culture", where the legislative process becomes not only a procedure for adopting acts, but a mechanism for continuous improvement of public administration. Systematic work at all stages allows us to transform international standards from a declarative principle into a real tool for improving the quality of legislation and the effectiveness of legal regulation.

Table 5 systematizes the main ways to improve the legislative process in Ukraine in order to more effectively take into account international standards. It allows you to visually assess the mechanisms for the implementation of reforms, examples of practical implementation and expected results for the national legal system, which is an important tool for analytical and scientific work.

Table 5. Ways to Improve the Legislative Process for Effective Consideration of International Standards in the National Legal System of Ukraine

Areas for improvement	Implementation mechanism	Expected effect
Harmonization of legislation	Systematic analysis of laws, development of draft laws for the implementation of international norms	Compliance of national law with international standards
Improving the quality of draft laws	Involvement of international experts, consultations with public organizations and business	Improving the effectiveness and practical applicability of laws
Strengthening parliamentary control	Creation of special committees, regular audit of laws	Ensuring compliance with legislation and international standards
Training and Competence Enhancement	Training programs, methodological support centers	Increasing the skills of legislators and officials
Digitalization and transparency	Electronic platforms for analyzing laws, online access to projects	Increasing the transparency and efficiency of the legislative process
Monitoring and control	Regular reports, use of case law, and feedback	Correction and improvement of laws, increasing the efficiency of implementation

Source: Formed by the authors based on [24, p. 25].

Increasing the effectiveness of taking into account international standards in Ukraine requires a synthesis of structural harmonization, expert involvement, development of competencies, digital transparency and continuous monitoring – an integrated approach that allows not only to "tighten" legislation, but to create a flexible, effective and predictable regulatory system.

This approach guarantees Ukraine's full integration into the European and international legal environment. It will increase the effectiveness of legislation and contribute to the fulfillment of international obligations. The comprehensive implementation of these measures makes it possible to make the legislative process in Ukraine more systematic, transparent and effective. This will ensure the harmonization of national law with international standards and contribute to successful European integration.

In the current conditions of Ukraine's development, the key task of state policy in the field of law is to ensure high efficiency of law-making activities in accordance with international standards of the rule of law and human rights protection. The process of European integration, the fulfillment of international obligations and the transformation of the legal system require a systematic update of approaches to the development, adoption and implementation of laws. This means the transition from the formal adoption of acts to the creation of qualitative, coherent and stable legal norms that meet the principles of justice, proportionality and legal certainty [1, p.94].

In the current conditions of global legal integration, the effectiveness of law-making activities of the state is becoming a key factor in ensuring sustainable development, protection of human rights and the implementation of the rule of law. For Ukraine, which is at the stage of deep institutional reforms and strives for integration into the European Union, the issue of improving the quality of the legislative process is of strategic importance. Not only the legitimacy of state decisions, but also the level of public trust in the authorities and the judiciary depends on the level of professionalism, transparency and compliance with international standards in the field of rule-making [25, p. 94].

Modern legislation cannot be imagined without the active involvement of civil society and highly professional personnel capable of working with complex legal models. In practice, this is manifested in the fact that consultations with experts and representatives of business and public organizations make it possible to weed out unreasonable norms and reduce the risk of political pressure on the content of laws. In countries where regular training programs for civil servants are combined with open consultations, the effectiveness of legal expertise increases, and the stability of the regulatory framework increases.

Fig. 1 systematizes the main directions and practical ways to increase the efficiency of law-making activities in Ukraine in accordance with the international principles of the rule of law and human rights. It demonstrates the connection between specific measures, international benchmarks and the expected results of reforming the legislative process.

Improving the quality of the legislative process in Ukraine is closely related to the integration of the principles of the rule of law and human rights protection into all levels of state regulation. In practice, this means not just adopting regulations, but creating a system where each law and by-law is aligned with international standards, reflects modern legal practices, and takes into account the needs of

citizens. In a number of cases, it is observed that states that synchronize national legislation with the European Convention on Human Rights reduce the number of litigations, increasing public trust in institutions.

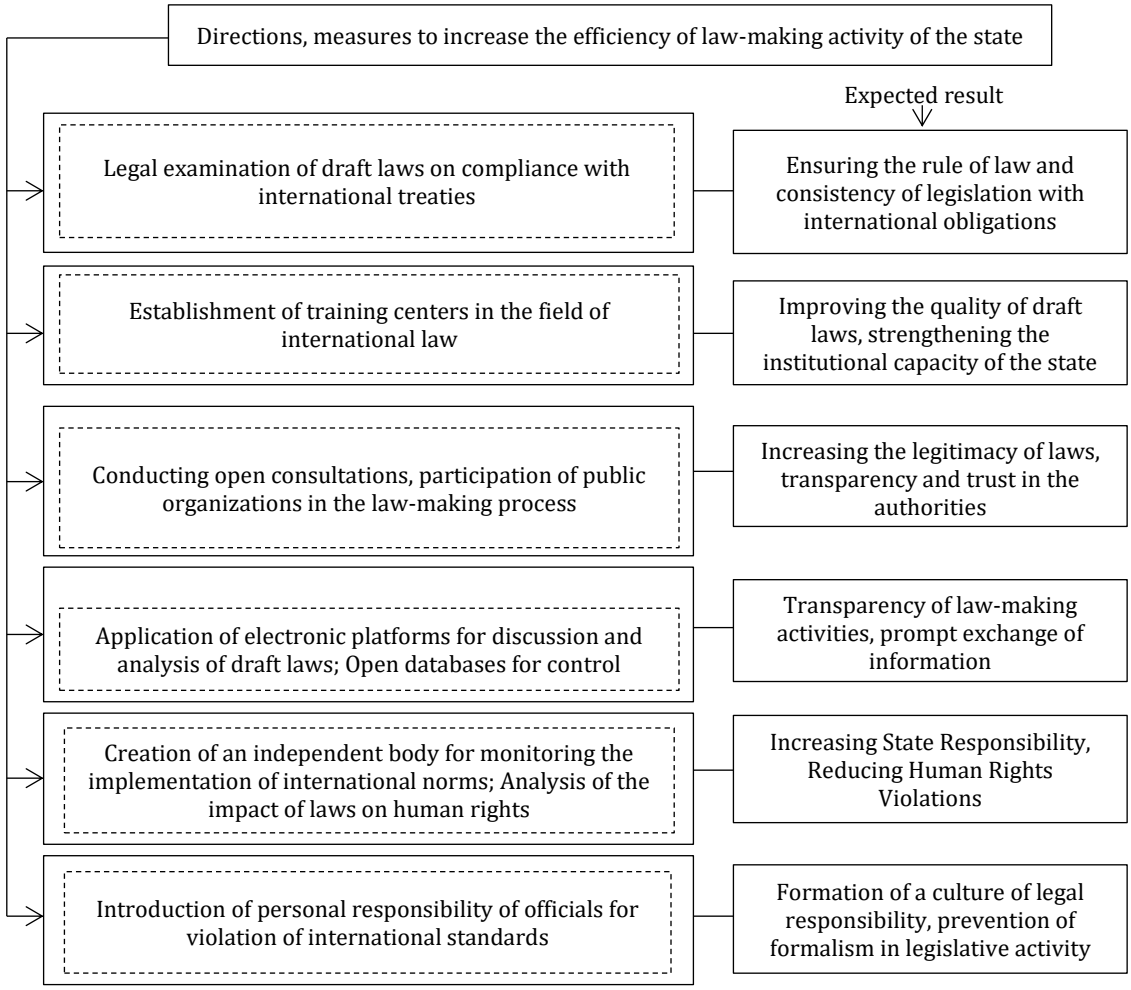


Fig. 1. Ways to increase the efficiency of law-making activities of the state in accordance with international principles of the rule of law and human rights

Source: Author's development.

Improving the quality of the legislative process in Ukraine is closely related to the integration of the principles of the rule of law and human rights protection into all levels of state regulation. In practice, this means not just adopting regulations, but creating a system where each law and by-law is aligned with international standards, reflects modern legal practices, and takes into account the needs of citizens. In a number of cases, it is observed that states that synchronize national legislation with the European Convention on Human Rights reduce the number of litigations, increasing public trust in institutions.

In modern conditions of globalization, international standards are becoming the main reference point for the formation of the legal system of each democratic state. For Ukraine, this process is of particular importance, as the state is actively reforming its legislation in accordance with the European and world principles of the rule of law, democracy and human rights protection. The influence of international law on national legislation is reflected both at the level of rule-making and in the practice of their application, which gradually transforms the Ukrainian legal system in accordance with the standards of the international community (Table 6).

Thus, today Ukraine is moving towards a model of a legal system that combines stability and flexibility, democracy and efficiency, creating preconditions for the law to become not a formal norm, but an instrument for the development of society and the protection of the interests of every citizen.

Table 6. Impact of International Standards on the Development of National Legislation of Ukraine

The direction of influence of international standards	Main manifestations	Implications for national legislation	Expected results
European integration harmonization	Unification of Ukrainian laws with EU law (*acquis communautaire*); adaptation of regulations to EU directives and regulations; reform of anti-corruption, energy, financial and labor legislation.	Implementation of laws aligned with European standards	Deepening integration into the EU legal space, improving investor confidence, and strengthening the institutional capacity of the state.
Implementation of human rights standards	Implementation of ECtHR judgments; consolidation of international legal guarantees in national laws; bringing judicial practice in line with the Convention for the Protection of Human Rights.	Improvement of laws on the judiciary, freedom of speech, gender equality, and protection of personal data.	Strengthening the rule of law, guaranteeing human rights, and increasing the authority of the judiciary
Unification of sectoral legislation	Use of recommendations of the UN, Council of Europe, FATF, ILO, etc.; adaptation of norms in the fields of ecology, finance, labor, and information security.	Formation of Uniform Legal Standards in Strategic Sectors of the Economy and Social Policy	Improving the efficiency of public administration, compliance of legal regulation with international practices.
Judicial integration of international norms	Application of international agreements as a source of law; references of courts to ECtHR decisions and international precedents; interpretation of legislation in accordance with international principles.	Consolidation of the precedent-setting approach in judicial practice; updating procedural legislation.	Unity of judicial practice, improving the quality of justice, and strengthening trust in the courts.
Digitalization of law-making	Introduction of electronic systems for assessing the compliance of draft laws with international standards	Integration into international electronic systems of legal exchange.	Transparency of rule-making, public involvement, and reduction of bureaucracy.
Educational and institutional impact	Training of personnel in the field of international law; cooperation with European institutions (Venice Commission, European Council, OSCE).	Formation of a competent legislative corps capable of implementing international norms.	Improving the professional level of lawmakers, stability and quality of the legislative process.
Reforming the management model	Use of Open *Government Partnership principles*: accountability, transparency, and anti-corruption standards.	Improvement of procedures for the development, adoption and control of the implementation of laws.	Strengthening democratic principles, citizens' trust, effectiveness of the implementation of legal norms.

Source: Formed by the authors based on [26, p. 29; 27, p. 32; 28, p. 200].

6. Conclusions

An in-depth analysis gives grounds to assert that international standards have become a catalyst for profound changes in the legal system of Ukraine. Their action covers all levels of legal regulation – from constitutional principles to specific sectoral norms, gradually forming a holistic model of modern law focused on people.

In practice, this means the need to develop think tanks at the Parliament, expand public participation in the law-making process and introduce systems for assessing the impact of regulations. Such tools have already proven their effectiveness in OECD countries, where the quality of legislation, according to data, has increased. For Ukraine, movement in this direction can become the key to a stable, balanced and truly modern model of law-making.

The impact of these standards covers the entire legal space – from constitutional provisions to specialized fields. It is not only about updating laws, but about changing the very philosophy of law-making. Most of the adopted laws have been adapted to the practice of the European Court of Human Rights and EU acts, which indicates a systemic transformation of approaches to law-making.

This influence is especially noticeable in the judicial system. The use of judgments of the European Court of Human Rights in national jurisdiction creates the effect of systemic renewal: judges receive tools for a unified interpretation of laws, and citizens receive a sense of legal certainty.

International standards are increasingly acting not only as external guidelines, but as a powerful mechanism for internal transformation of state institutions. Their implementation strengthens the

organizational capacity of authorities, ensures the improvement of the quality of regulatory documents and contributes to the formation of a more transparent and responsible management system. This is manifested in the ability of state structures to quickly adapt to new challenges, optimize internal processes and reduce the risks of inconsistency of norms, which is confirmed by numerous examples in the EU countries.

In addition, standards contribute to the formation of a culture of responsibility in public bodies and ensure stability in decision-making even in difficult political and social conditions. They act not as a tool for formal adaptation, but for real transformation, which allows the state to increase the trust of citizens and strengthen its own legitimacy in the international arena. Thus, the implementation of international standards becomes a strategic resource for the development of Ukraine as a legal and democratic state.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

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The Social Housing as a Mechanism of State Support for the Realization of the Right to Housing

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.05

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ABSTRACT

The article is devoted to the analysis of social housing as a mechanism of state support for the realization of citizens' right to housing in Ukraine. Particular attention is paid to current state policies, legislative regulation of housing relations, implementation of social programs, and ensuring housing accessibility for vulnerable population groups. The aim of the study is to identify key directions of state regulation and effective models for implementing the right to social housing under economic and social challenges, including the consequences of martial law. The research employed general scientific methods, including comparative and systemic analysis, analysis of legislation and normative acts, review of the practice of state programs, and synthesis of statistical data and contemporary studies by Ukrainian and foreign scholars. Data collection covered the analysis of legislative initiatives, implementation of experimental social housing programs, monitoring of the real estate market, and statistics on citizens' housing provision. The study results indicate that the effective realization of the right to social housing requires a comprehensive approach combining legislative consolidation of social guarantees, state funding, support for municipal initiatives, and the introduction of innovative housing management models. It is established that state social housing programs contribute to increasing housing accessibility for low-income groups, ensuring social stability, and reducing the risks of housing insecurity. The integration of municipal and state approaches to social housing enhances the efficiency of resource allocation, ensures transparency in housing fund management, and optimizes the use of budgetary funds. The introduction of social programs targeting specific population groups and the integration of modern financial and economic mechanisms for implementing the right to housing contribute to promoting social justice, stability of the housing market, and the competitiveness of the national housing provision system.

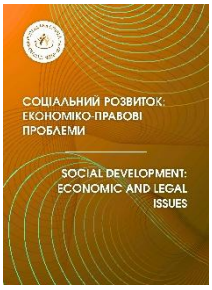
KEYWORDS

social housing, right to housing, state support, housing policy, municipal programs, housing accessibility, social stability.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Соціальне житло як механізм державної підтримки реалізації права на житло

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.05

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АНОТАЦІЯ

Стаття присвячена аналізу соціального житла як механізму державної підтримки реалізації права громадян на житло в Україні. Особлива увага приділяється сучасним державним політикам, законодавчому регулюванню житлових відносин, впровадженню соціальних програм та забезпеченню доступності житла для вразливих категорій населення. Мета дослідження – визначити ключові напрями державного регулювання та ефективні моделі реалізації права на соціальне житло в умовах економічних і соціальних викликів, включаючи наслідки воєнного стану. У ході наукового дослідження використовувалися загальнонаукові методи пізнання, зокрема порівняльний та системний аналіз, аналіз законодавства та нормативних актів, огляд практики державних програм, узагальнення статистичних даних та сучасних досліджень українських і зарубіжних вчених. Збір даних охоплював аналіз законодавчих ініціатив, реалізацію експериментальних програм соціального житла, моніторинг ринку нерухомості та статистики забезпечення житлом громадян. Результати дослідження показують, що ефективна реалізація права на соціальне житло потребує комплексного підходу, який поєднує законодавче закріплення соціальних гарантій, державне фінансування, підтримку муніципальних ініціатив та впровадження інноваційних моделей управління житловим фондом. Встановлено, що державні програми соціального житла сприяють підвищенню доступності житла для малозабезпечених категорій населення, забезпечують соціальну стабільність і зменшують ризики житлової незахищеності. Досліджено, що інтеграція муніципального та державного підходів до соціального житла дозволяє підвищити ефективність розподілу ресурсів, забезпечити прозорість управління житловим фондом та оптимізувати використання бюджетних коштів. Запровадження соціальних програм, орієнтованих на конкретні категорії населення, та інтеграція сучасних фінансово-економічних механізмів реалізації права на житло сприяють підвищенню соціальної справедливості, стабільності житлового ринку та конкурентоспроможності національної системи житлового забезпечення.

КЛЮЧОВІ СЛОВА

соціальне житло, право на житло, державна підтримка, житлова політика, муніципальні програми, доступність житла, соціальна стабільність.

1. Introduction

Providing the population with housing remains one of the leading problems of social policy in Ukraine [1]. The constitutionally enshrined right to housing (Article 47) is not always implemented in practice, since a significant part of citizens face limited access to housing resources due to economic, institutional and crisis factors [1]. Modern challenges, including martial law, mass internal displacement of the population (IDPs), and the destruction of the housing stock, create additional requirements for state housing policy.

The situation with access to housing has worsened since 2022: according to the Housing Institute, social housing is available in only 11.4% of territorial communities in Ukraine, while the total number of social units is 924, of which only 825 are habitable [2]. Among the categories of the population that are most in need of social housing, IDPs, large families, single mothers, and families with children with disabilities predominate [3].

The response to these challenges was the reform of the state housing policy: draft law No. 12377 was proposed, which should replace the Housing Code of 1983. The draft law provides for three main areas: social housing, service housing, and housing for military personnel [4]. At the same time, the government adopts amendments to resolutions aimed at improving the mechanisms for providing subsidies for renting housing for IDPs, in particular, expanding the conditions for providing such assistance from 2025 [5].

A significant trend in the market is the growth of housing prices. According to the State Statistics Service, in the second quarter of 2025, the housing price index increased by an average of 14.9% compared to the same period in 2024, with prices for two-room apartments growing especially rapidly [6]. This increases financial pressure on individuals who do not have sufficient resources to purchase housing and, accordingly, increases the need for social housing.

In the construction sector, there is a decrease in the rate of commissioning of new housing: in the first half of 2025, 51,557 new apartments were commissioned, which is 6.7% less than in the same period last year; The total area of commissioned housing was approximately 4.27 million square meters. meters, decreasing by 6.4 % compared to the previous year [7]. This situation complicates the formation of a housing stock that is able to quickly respond to an urgent need for affordable housing.

Thus, against the background of rising prices for residential real estate, a shortage of social housing and an increase in the number of IDPs, social housing is one of the key tools of state support in the implementation of the right to housing. This creates a need not only for regulatory changes, but also for the introduction of effective financing mechanisms, ensuring transparency in the distribution of housing resources and rapid response to emergencies.

2. Literature Review

The implementation of the right to social housing in Ukraine is a complex task that requires a synthesis of legislative, social and economic mechanisms. T. Bondarenko emphasizes that modern housing policy is in the process of reform, and the launch of experimental projects of social housing is a key tool of state support that ensures the availability of housing for socially vulnerable groups of the population [8]. This approach is complemented by the research of Y. Zaik, who draws attention to the peculiarities of the implementation of the right to social housing under martial law, emphasizing the need to protect citizens and adapt legislation to crisis circumstances [9].

The social dimension of housing is analyzed in detail by S. Synchuk and V. Burak, emphasizing the integration of state programs with the economic needs of the population and the assessment of the effectiveness of social support mechanisms [10]. At the same time, V. V. Kochyn focuses on the balance between market and socially oriented approaches, noting that social housing cannot exist in isolation from the real estate market and needs comprehensive regulation [11]. State regulation of citizens' housing rights, its coordination and assessment of effectiveness are considered by D. Kharechko and M. Kuybida, who emphasize the importance of interaction between the state and the private sector to ensure housing affordability [12].

International experience in social housing demonstrates the importance of partnership between the state and private organizations and active management of construction projects (Designing

Buildings [14]; J. Beswick, D. McCann, H. Wheatley [18]). M. Haliantych and V. Kochyn note that effective strategic planning of housing policy in Ukraine requires prioritization and integration of social and economic goals [16]. R. Kramar and R. Kramar draw attention to the systematic use of state resources and mechanisms for monitoring the implementation of housing programs, which makes it possible to increase the efficiency of social housing [2].

CEDOS emphasizes that the availability of social housing is of strategic importance in the post-war recovery of the country, as it affects social stability and economic recovery [8]. An important aspect is also public support and the willingness of the population to participate in social housing programs, which is confirmed by the research of K.-J. Chen, C. W. Peng and M.-H. Lee, who point to the importance of explanatory work and informing the population about the effectiveness of state programs [20]. Administrative and legal aspects of the implementation of the right to social housing are considered by V. D. Yashchenko and O. P. Sikorsky, emphasizing the need for clear procedures for the distribution of housing and control over their observance [21].

Thus, modern scientific literature demonstrates that the effective provision of social housing requires a systematic combination of legislative, social and economic mechanisms, integration of public and private resources and taking into account international experience. This forms a scientific basis for further study of the mechanisms of state support for the implementation of the right to housing in Ukraine.

3. Problem Statement

The purpose of this study is to analyze the effectiveness of the existing mechanisms of social housing in Ukraine, their compliance with modern challenges, as well as to propose ways to improve state policy in this area, taking into account new legislative initiatives, limited resources and the needs of IDPs.

4. Methods and Materials

Methods and materials

The methodology for researching social housing in Ukraine as a mechanism of state support for the implementation of the right to housing is based on a combination of quantitative and qualitative analyses. The quantitative analysis provided for the systematization of statistical indicators on the available social housing, the occupancy of apartments and the structure of residents, which makes it possible to assess the effectiveness of the use of the housing stock and the scale of state support.

The qualitative analysis included the study of legislative initiatives, in particular the draft law "On the Basic Principles of Housing Policy" No. 12377, government resolutions on experimental projects of municipal (social) rental housing, as well as analytical materials of experts and publications in the field of social policy. This approach makes it possible to comprehensively assess the effectiveness of state measures in the field of social housing, to determine the needs for the development of housing policy and to study the impact of new models of housing provision on the implementation of the constitutional right of citizens.

5. Results and Discussion

The Constitution of Ukraine defines the fundamental properties of the state, in particular its sovereignty and independence, democratic character, social orientation and legal nature (Article 1) [1]. According to the formed legal position of the Constitutional Court of Ukraine, the social orientation of the state is manifested in the support of social rights of citizens, in particular the rights to social protection and a sufficient standard of living (Articles 46, 48) [1]. The state, as a social institution, is obliged to regulate economic processes in such a way as to ensure a fair and effective redistribution of social income for the well-being of all citizens [8].

Theoretical approaches in jurisprudence emphasize that the welfare state recognizes a person as the highest social value, provides assistance to individuals who find themselves in difficult life circumstances, and provides everyone with a decent standard of living. In addition, the welfare state

implements the redistribution of economic goods in accordance with the principles of social justice and is aimed at maintaining civil peace and social harmony [9, p. 134].

In modern research, in particular in the work of T. Bondarenko, the welfare state is defined as an axiological concept aimed at the realization of social values – dignity, equality, freedom, justice, security and social solidarity. The achievement of these values is ensured by the state through the establishment of high standards of social policy, the formation of a legislative framework for the regulation of the social sphere and the implementation of appropriate legal procedures [8].

At the same time, in modern conditions, there are tendencies of liberalization, which is manifested in the desire to provide citizens with "full independence" not only in the exercise of subjective rights, but also in taking responsibility for negative consequences [10, p. 50].

In the context of the implementation of the right to housing, social housing is a key tool of state support, which allows to ensure minimum standards of living, protect vulnerable groups of the population and reduce social inequality. State intervention in the housing sector, including financing, regulatory regulation and control over the distribution of housing resources, is an integral part of social policy mechanisms [2, 7, 8].

It is necessary to understand that the state is a special participant in social relations, but first of all it acts as a form of organization of society, in which a balance between public (collective or public) and private (group) needs should be achieved [10, p. 50]. In modern conditions, the state must create effective legal mechanisms that allow individuals to independently realize their own legitimate private interests in accordance with the objective laws of the development of society and the economy. Active intervention of the state is permissible mostly as an exception, in particular in cases where a person cannot independently exercise his subjective rights [9, p. 135-136].

According to the position of V. D. Yashchenko and O. P. Sikorsky, law cannot be a direct tool for overcoming the economic crisis, but it is able to reduce the scale of its consequences. The activity of the state in the field of private law provides for the formation of a system where the law acts not only as a restrictive and punitive mechanism against offenders, but also as a set of guarantees and measures that ensure personal freedoms, subjective rights and legitimate interests of individuals and legal entities [21, p. 140].

Such guarantees include the establishment and development of civil society, which is an objective phenomenon in a democratic state and serves as an additional mechanism in the implementation of social policy [12]. T. Bondarenko notes that the current trend in the development of the welfare state is to strengthen its political role in the formation of social policy, the distribution of financial responsibility and the provision of social protection in cooperation with civil society, as well as to promote the expansion of the participation of non-state institutions in the implementation of social programs [8].

Thus, the welfare state not only performs the functions of redistributing social benefits, but also forms the basis for the development of the individual and civil society. Civil society, in turn, implements additional functions within the theories of economic and social regulation: market / government failure theory, trust / contract failure theory, donation theory, welfare state theory and interdependence theory [9, p. 137; 10, p. 48].

International recognition of social rights is carried out through a number of global documents, among which the International Covenant on Economic, Social and Cultural Rights, adopted by the UN General Assembly on December 16, 1966, occupies a key place. In accordance with the provisions of the Covenant, States Parties recognize the right of every person to an adequate standard of living for himself and his family, which includes adequate food, clothing and housing, as well as to continuous improvement of living conditions (Article 11, part 1) [11, p. 17-18].

S. Synchuk and V. Burak note that this document combines different approaches to human rights. On the one hand, he integrated the classical (liberal) concept, which considers rights as intrinsic freedoms of the individual, limiting the powers of state bodies. On the other hand, the pact included elements of the socialist concept, which emphasizes the duty of the authorities to ensure social security and social equality of citizens. In the context of states with authoritarian socialism, this combination led to a compromise between socio-economic justice and restriction of political freedoms [10, p. 50].

The European Social Charter (revised) of 3 May 1996 also separately enshrines the right to housing in Article 31. The Parties are obliged to take measures to ensure the effective exercise of this right, in particular:

–to promote the population's access to housing of the appropriate level;

–prevent homelessness and gradually eliminate it;
–to set housing prices affordable for low-income persons [12].

Along with this, provisions on housing are contained in other articles of the charter relating to the social integration of various categories of the population:

• Article 15 – the right of persons with disabilities to independence, social integration and access to housing;

• Article 16 – the right of the family to social, legal and economic protection, in particular through the provision of housing;

• Article 19 – the right of migrant workers and their family members to assistance and protection, in particular through assistance in housing issues;

• Article 23 – the right of older persons to social protection, including through the provision of housing adapted to their needs and health status;

• Article 30 – the right to protection from poverty and social exclusion, which provides for the provision of housing [12].

Housing is a special object of legal relations not only within the framework of the implementation of a specific right, but also ensures the effective implementation of other social rights. This approach is justified by the principle of protection of human dignity and social rights, since housing is a materialized manifestation of a sufficient standard of living [16, p. 28]. According to Article 48 of the Constitution of Ukraine, every person has the right to an adequate standard of living for himself and his family, which includes adequate food, clothing and housing [1].

For the legal regulation of housing relations, the key concepts are housing stock and housing. According to part one of Article 4 of the Housing Code of Ukraine, the housing stock is formed by residential buildings and residential premises in other buildings on the territory of Ukraine. In addition, the Code distinguishes the state housing fund, the public housing fund, the housing cooperative fund, the private housing stock and the social housing fund. However, in modern conditions, these approaches do not fully correspond to the constitutional model of exercising the right to housing (Article 47 of the Constitution of Ukraine) and provide a unified procedure for public management of the housing stock [1].

The Civil Code of Ukraine has regulated relations regarding housing as a place of residence and as an object of property rights. In the scientific literature, there is a certain inconsistency in the use of terms, in particular "housing" and "housing". It is recommended to use the term "dwelling" as a more established one, while "dwelling" focuses on the public law aspect of the object of registration (part one of Article 812 of the Civil Code of Ukraine) [21, p. 141-142].

Within the framework of the institution of ownership, the Civil Code of Ukraine separately regulates relations regarding land (Chapter 27) and housing (Chapter 28). These categories are key in meeting public and private needs. As Hegel noted, the interaction of these spheres demonstrates a complex system of interconnections, where individual spheres support each other or are influenced by external factors [21, p. 142].

In a market economy, housing is certainly considered as an object of civil turnover, similar to other types of real estate, but with certain specific features. In particular, T. Bondarenko notes that housing needs to be evaluated, a special procedure for acquiring ownership or use, regulating restrictions on use and determining the grounds for terminating the right to a particular housing [8].

Similar provisions are observed in foreign legal orders. Thus, Y. Zaika emphasizes that the housing issue should be considered as a political and economic problem, where there is a conflict between housing as a place of residence and housing as an object of investment real estate [9, p. 134–140].

Another problem is the use of investment mechanisms for obtaining housing, i.e. the use of entrepreneurial tools to achieve a non-entrepreneurial goal – obtaining housing for living without the purpose of its subsequent sale. S. Synchuk and V. Burak distinguish the following ways of investing in housing construction: construction financing funds, real estate transaction funds, collective investment institutions and participation in housing and construction cooperatives [10, p. 46–60].

The above-mentioned issues of civil, entrepreneurial and housing nature require a systematic approach to the assessment of housing relations. V. V. Kochyn defines housing and legal matter as a set of principles, norms, legal acts and prescriptions that regulate legal relations regarding living in housing and reflect the objective reality of these relations [11, p. 16–21].

Thus, there is a problem of providing a person with housing and determining the role of the state in this process. Housing is considered as a general civilizational value that ensures a decent existence of a person and the realization of the right to a sufficient standard of living. The welfare state is obliged to guarantee the right to a place of residence, which materializes in the form of housing – an object that a citizen can build, acquire or lease (part one of Article 47 of the Constitution of Ukraine). For persons in need of social protection, housing is provided free of charge or for an affordable fee (part two of Article 47) [1; 12].

Thus, social housing (social housing fund) functions as an exclusive form of ensuring the right to housing in cases where a person cannot exercise this right by private law means. The absence of such an opportunity may indicate a limitation of the subjectivity of a person, and the social state is called upon to ensure the fair distribution of housing resources, control over the costs of their maintenance and an integrated approach to the implementation of the provisions of Article 47 of the Constitution of Ukraine [13; 15].

V. V. Kochyn emphasizes the need to determine the guiding principles for the formation of a modern state housing policy, which ensure the balance of housing rights of citizens and the obligations of the state, as well as their social and economic validity. The author refers to such principles: the principle of legal understanding of the right to housing as a category of natural human rights, the principle of justice, the principle of accessibility, the principle of transparency and the principle of sustainable development [11, p. 16–21].

In the modern welfare state, the right to housing cannot be considered as a mandatory obligation of the state to provide housing to everyone individually. According to the Analytical Center and the Urban Bureau CEDOS, the state's declaration of a guarantee of providing citizens with housing in the context of the implementation of social rights is often perceived as a manifestation of the remnants of "unfinished socialism" and populist approaches [17]. At the same time, the state forms a legal order, which includes a system of normative legal acts, which is designed to contribute to ensuring an adequate standard of living of citizens in accordance with the realities of socio-economic development of society.

The legal regulation of housing relations is carried out on the basis of market principles, and the social component of the right to housing is implemented mainly in relation to citizens in need of social protection, i.e. those who do not have the opportunity to provide themselves with housing by private law methods [18; 19]. Thus, social housing acts as a key mechanism of state support for the implementation of the right to housing, ensuring a balance between private and public interests in the field of housing relations.

The right to housing is a fundamental social right enshrined in the Constitution of Ukraine and international acts. In the period 2022–2025. The problem of providing social housing has become extremely urgent due to the full-scale war, massive destruction of housing infrastructure and an increase in the number of internally displaced persons. The legal regulation of housing relations is carried out on the basis of market principles, and the social component of the right to housing is implemented mainly in relation to citizens in need of social protection, i.e. those who do not have the opportunity to provide themselves with housing by private law means, so social housing acts as a key mechanism of state support for the implementation of the right to housing, ensuring a balance between private and public interests in the field of housing relations [22].

In 2025, the Verkhovna Rada of Ukraine in the first reading adopted as a basis the draft law "On the Basic Principles of Housing Policy" (registration No. 12377 of 06.01.2025), which provides for a new regulation of the creation of a fund and the provision of social housing to persons in need. While the draft law is being considered by the Parliament, the Government has launched experimental projects of municipal (social) rental housing. In particular, Resolution No. 796 of July 2, 2025 approved the procedure for forming a municipal housing fund and leasing it, and Resolution No. 814 of July 7, 2025 approved the procedure for providing housing for internally displaced persons (IDPs) from the Mariupol territorial community [23].

Municipal (social) rental housing includes new buildings formed in the relevant funds, with the possibility of renting apartments or preferential mortgage lending. Recipients can be IDPs, persons who have suffered domestic violence, large families, families with children under three years old, persons with disabilities, war veterans, family members of deceased/deceased defenders and other categories determined by resolutions. The condition for obtaining housing is the absence of one's own housing

suitable for living, compliance with the criteria of income and place of residence (territories where hostilities are not taking place or are not occupied by the Russian Federation) [15].

As part of the pilot project for IDPs from Mariupol, it is envisaged that only persons who meet certain categories can receive rental housing, and the circle of potential users of preferential mortgage loans is limited. At the same time, the project provides for the construction of 10 residential buildings in the Kyiv region, which will provide housing for more than 1,500 people. The introduction of such models of social housing creates prerequisites for prompt and effective meeting of the housing needs of socially vulnerable categories of the population and allows combining state regulation, municipal initiatives and new tools for access to housing [23].

During 2022–2025, there is a trend towards an increase in the number of communities with social housing, as well as an expansion of the housing stock, an increase in the number of inhabited units and the average area of apartments. Specific figures for these indicators are given in Table 1.

Table 1. Social housing statistics in Ukraine (2022–2025)

Indicator	2022	2023	2024	2025
Number of communities with social housing	160	162	165	167
Total number of social housing units	880	900	915	924
Of these, habitable	780	800	815	825
Inhabited	680	700	715	722
The number of persons living in social housing	2,400	2,450	2,500	2,515
Structure of residents:				
– orphans	40%	41%	42%	42%
– IDPs	13%	13.5%	13.6%	13.8%
– large families	12%	12.2%	12.5%	12.6%
Average living area, m²	33	33.5	33.8	34
The need to restore housing infrastructure	65	66	68	70
It is planned to build apartments	45,000	46,500	48,000	50,000

Source: Systematized by the authors according to the data given in [24; 26].

During the period 2022–2025. There has been a gradual increase in the number of territorial communities with social housing from 160 to 167, which indicates some progress in expanding access to social housing at the local level. The increase in the number of communities implementing social housing programs is the result of comprehensive legislative and organizational measures aimed at providing housing for socially vulnerable categories of the population, in particular internally displaced persons, orphans and large families. At the same time, the total number of social housing units increased from 880 in 2022 to 924 in 2025, which indicates a gradual increase in the social housing stock. However, given the scale of destruction of housing infrastructure as a result of hostilities and the numerous needs of internally displaced persons, the available volumes of social housing are not enough to fully meet the demand.

At the same time, the number of inhabited social housing units increased from 680 to 722, which demonstrates an increase in the efficiency of the use of the existing fund, but this does not compensate for the existing deficit, and therefore requires an acceleration of the pace of settlement and large-scale construction of new social housing facilities. The average area of a social apartment remained relatively stable, increasing from 33 sq.m in 2022 to 34 sq.m in 2025, which indicates a gradual improvement in living conditions, but still does not provide an adequate level of comfort for all categories of the population.

The analysis of the structure of residents of social housing indicates that the largest share is made up of orphans (42%), internally displaced persons (13.8%) and large families (12.6%), which confirms the social orientation of state policy and the priority of supporting the most vulnerable groups. The need for the restoration of housing infrastructure during this period increased from 65 to 70 billion. euros, which indicates the scale of destruction and the need for significant investments for the full restoration of the housing stock. At the same time, the planned construction of more than 50,000 social apartments by 2025 is a positive step of state policy, but in order to meet all the needs of the population, it is necessary to significantly increase the pace of construction, expand funding and ensure effective coordination between state bodies and local communities [25].

The implementation of targeted state programs — primarily "eRecovery" and "eOseli" — has become a key mechanism for ensuring citizens' housing rights and restoring social stability in the regions.

The "eRecovery" program, introduced by the Ministry of Communities, Territories and Infrastructure Development of Ukraine, has become the main tool of state assistance to owners of damaged and destroyed housing [27]. According to official data from the mindev.gov.ua, as of August 1, 2025, more than 97 thousand families received compensation for damaged housing totaling more than UAH 9.7 billion. (Fig. 1). At the same time, the program also covered the category of destroyed housing: housing certificates for the purchase of new housing were issued to more than 21 thousand families in the amount of UAH 31.1 billion, of which about 12 thousand have already made actual purchases [28] (Fig. 2). Thus, we can state a significant expansion of the scope of the program, which is gradually turning into a systemic tool of the state's housing policy.

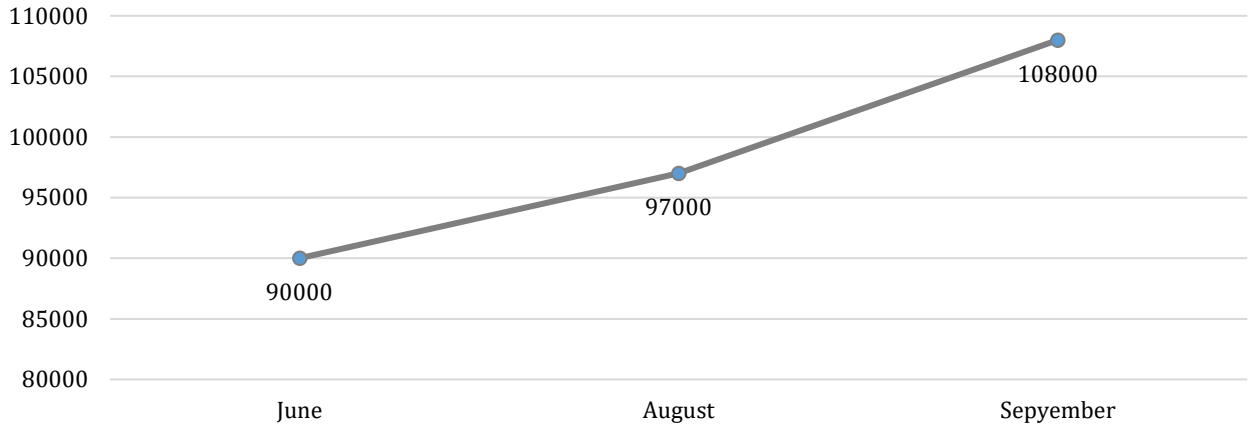


Fig. 1. Dynamics of the number of families who received compensation for damaged housing for the period from 01.06.2025 to 01.09.2025

Source: Systematized by the authors according to the data given in [28].

The average amount of compensation shows a certain differentiation depending on the degree of damage to housing: for minor repairs (category A), the average amount was about UAH 72 thousand, while for major repairs (category B) — UAH 341-342 thousand. "Reconstruction on your own land plot" in 2025, more than 580 people have already received the first tranches totaling more than UAH 700 million, which demonstrates the state's readiness to support both the restoration and the new construction of citizens' housing [28].

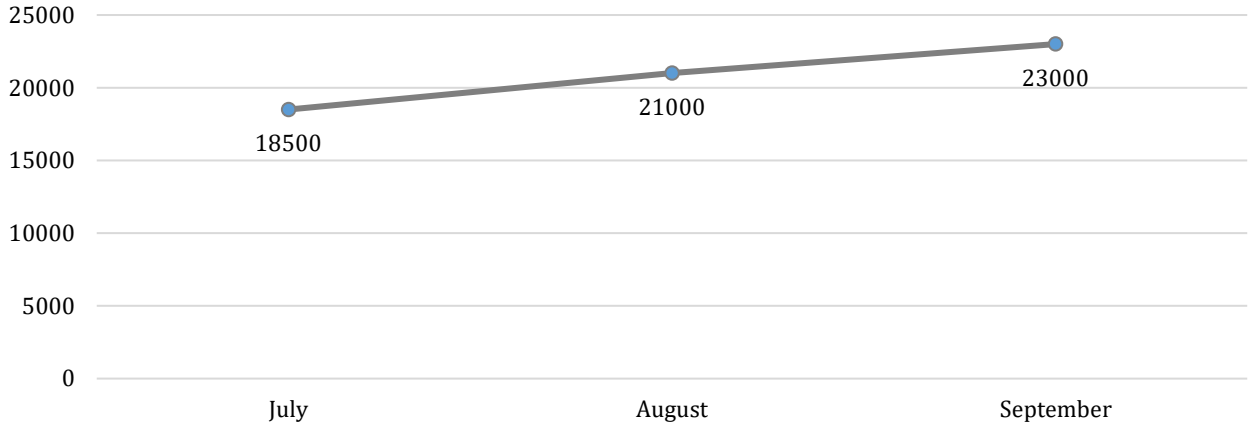


Fig. 2. Number of housing certificates for destroyed housing, for the period from 01.06.2025 to 01.09.2025

Source: Systematized by the authors according to the data given in [28].

At the same time, the eOseli program, focused on stimulating the affordable housing market, is an important factor in economic activity in the construction sector. According to budport.com.ua, during

the first nine months of 2024, it contributed to an increase in construction activity by 23.8% among developers, and as of 2025, more than 2000 people have already purchased housing on preferential terms [29]. The program provides not only solutions to the socio-economic problems of certain categories of the population (military personnel, educators, doctors), but also forms new institutional approaches to lending and state participation in the housing sector.

Taking into account the above, it can be stated that a systematic approach to the development of social housing, which involves a combination of public and private investments, the introduction of electronic systems for accounting and distribution of housing, as well as the development of social rental models, creates the basis for the formation of an effective state policy capable of ensuring the implementation of the constitutional right to housing for vulnerable categories of the population and bringing Ukrainian social policy closer to European standards.

6. Conclusions

So, in 2022-2025. social housing in Ukraine has undergone a stage of conceptual rethinking and transformation from a formal element of housing policy to a key mechanism of social protection of the population. State policy in this area includes the adoption of a new law "On Social Housing", the development of social rental models, the introduction of the institution of affordable housing operators and automated distribution systems, as well as the attraction of funding from public, private and international sources. These measures are aimed at ensuring transparency and fairness in the distribution of social housing, optimizing the use of housing stock and covering the maximum number of socially vulnerable categories of the population, such as orphans, internally displaced persons and large families.

In practical terms, it is envisaged to implement pilot projects of social rent, the extension of subsidies for renting housing for IDPs and partial financing of the first installment for orphans, which increases the level of social integration and provides access to housing for those who do not have their own financial resources. The increase in the number of communities with social housing, the increase in the number of inhabited units, as well as the expansion of the total area of the housing stock indicate a gradual improvement in housing conditions, but there are still significant needs for infrastructure restoration and increased construction.

An integrated approach that combines legislative innovations, financial mechanisms, social rental models and digital management tools creates prerequisites for the formation of an effective and transparent state policy in the field of social housing. The implementation of this approach allows guaranteeing the right to housing for vulnerable categories of the population and contributes to the integration of Ukraine into the European social policy space, ensuring compliance with modern international standards and principles of social justice.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



The Direction of the Activities of the Special Services of the Russian Federation as an Instrument of the State Policy of Aggression

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.06

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ABSTRACT

The article is devoted to the analysis of the activities of the special services of the Russian Federation as a key tool for implementing the state policy of aggression, identifying their main directions and methods of influence, and assessing the consequences for national and international security. Special attention is paid to the development of recommendations for countering this activity. The purpose of the study is to analyze the strategies, methods, and instruments of the activities of the special services of the Russian Federation in the context of aggressive foreign policy and to develop recommendations for countering their actions. In the course of the scientific research, general scientific methods were used, in particular: analysis and synthesis to identify the essence and structure of the activities of the special services; comparative analysis to compare the methods of their influence at different stages of aggression; a systematic approach for a comprehensive consideration of the interaction of the special services with state and military structures; as well as the method of logical generalization for formulating conclusions and recommendations, generalization, and a systematic approach. The features of hybrid war and special services as an instrument of the policy of aggression are indicated. International legal norms on the prohibition of aggression and the responsibility of states are systematized. The ideological basis of the activities of special services in the context of the policy of the "Russian world" is considered. The main areas of activity of the Russian special services used in the implementation of the policy of aggression are identified: information and psychological operations, cyberattacks, sabotage, support for terrorist groups and proxy structures. Specific examples (cases) of the use of Russian special services in foreign policy operations are analyzed – in particular in the context of armed aggression against Ukraine, the annexation of Crimea, the war in Donbas and the full-scale invasion of 2022. The focus is on the consequences of the activities of the Russian special services for international and regional security, as well as for the sovereignty of Ukraine. Mechanisms for countering the activities of the Russian special services and ways to strengthen national security are identified. In particular, the international reaction and legal mechanisms of the Russian Federation's responsibility for aggression and the actions of its special services are analyzed. The system of counterintelligence and cyber-defense measures of Ukraine is presented. The role of international partnerships in countering hybrid threats is characterized. Proposals are made to improve the state security policy of Ukraine.

KEYWORDS

special services, armed aggression, hybrid threats, international organizations, cyberattack, sabotage, counterintelligence, protection.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Спрямування діяльності спецслужб Російської Федерації як інструменту державної політики агресії

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.06

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АНОТАЦІЯ

Стаття присвячена аналізу діяльності спецслужб Російської Федерації як ключового інструменту реалізації державної політики агресії, виявленню їхніх основних напрямів та методів впливу, оцінці наслідків для національної та міжнародної безпеки. Особлива увага приділяється розробці рекомендацій щодо протидії цій діяльності. Метою дослідження є аналіз стратегій, методів та інструментів діяльності спецслужб РФ у контексті агресивної зовнішньої політики та розробка рекомендацій щодо протидії їхнім діям. У ході наукового дослідження використовувалися загальнонаукові методи, зокрема: аналіз та синтез для виявлення сутності і структури діяльності спецслужб; порівняльний аналіз для зіставлення методів їхнього впливу на різних етапах агресії; системний підхід для комплексного розгляду взаємодії спецслужб із державними і військовими структурами; а також метод логічного узагальнення для формулювання висновків та рекомендацій, узагальнення та системний підхід. Зазначено особливості гібридної війни та спецслужб як інструменту політики агресії. Систематизовано міжнародно-правові норми щодо заборони агресії та відповідальності держав. Розглянуто ідеологічне підґрунтя діяльності спецслужб у контексті політики «русского мира». Визначено основні напрями діяльності спецслужб РФ, які використовуються у реалізації політики агресії – інформаційно-психологічні операції, кібератаки, диверсії, підтримка терористичних угруповань і проксі-структур. Проаналізовано конкретні приклади (кейси) застосування російських спецслужб у зовнішньополітичних операціях – зокрема в контексті збройної агресії проти України, анексії Криму, війни на Донбасі та повномасштабного вторгнення 2022 року. Зосереджено увагу на наслідках діяльності спецслужб РФ для міжнародної та регіональної безпеки, а також для суверенітету України. Визначено механізми протидії діяльності спецслужб рф та шляхи посилення національної безпеки. Зокрема, проаналізовано міжнародну реакцію та правові механізми відповідальності Російської Федерації за агресію та дії її спецслужб. Представлено систему контррозвідувальних і кіберзахисних заходів України. Охарактеризовано роль міжнародного партнерства у протидії гібридним загрозам. Надано пропозиції щодо удосконалення державної політики безпеки України.

КЛЮЧОВІ СЛОВА

спецслужба, збройна агресія, гібридні загрози, міжнародні організації, кібератака, диверсії, контррозвідка, захист.

1. Introduction

Since 2014, when Russia annexed Crimea and then unleashed a full-scale war against Ukraine in 2022, its actions have become an obvious example of armed aggression and a gross violation of the fundamental principles of international law. It is not only about the seizure of territory, but about a systematic attack on the political independence and integrity of the Ukrainian state. This position was confirmed by more than 70 resolutions and resolutions of international organizations, including key ones – the decisions of the UN General Assembly, which unequivocally qualify Russia's actions as an act of aggression. Russia's policy towards Ukraine has a clearly imperial character and is based on the concept of a "zone of influence", which has been outdated since the Cold War.

This is manifested in the use of a whole range of special tools – from open combat operations to discreet, but no less dangerous, hybrid actions. A special role in this system is played by the so-called special forces of the Russian Federation. Their activities go far beyond the usual military operations: they create an information environment, influence public sentiment, carry out targeted cyberattacks and psychological campaigns.

An equally significant component of the Russian strategy is the support of quasi-state formations and controlled groups created by it, which act as "local partners". Through them, Moscow embodies the tactics of controlled chaos – fueling instability, manipulating information flows, and legitimizing its own presence. This type of influence is an inherent feature of the modern form of neocolonial policy, when, instead of direct control, a network of subordinate structures is used.

The special services of the Russian Federation have become one of the leading links in the implementation of state policy. Their subordination to the highest political leadership guarantees complete coordination of steps with the Kremlin's strategic plans. It is thanks to this vertical supervision that intelligence organizations have become an effective instrument of state whim. Russian special services function not so much as a protective wall as an offensive platform, where military, diplomatic and media means are brought together into a single hybrid structure.

Their activities are characterized by secrecy and agility, which is confusing for the detect of measures and global legal analysis. Fourthly, thanks to the media and disinformation campaigns, intelligence agencies influence public opinion and political alignments in other countries, creating favorable circumstances for achieving Russia's strategic plans. Finally, the experience of conducting "active operations" in Soviet times allows the current intelligence services to skillfully combine the usual methods with the latest means of influence.

Thus, the work of the intelligence agencies of the Russian Federation is a consistent and coordinated lever that guarantees the implementation of the hostile policy of the state both openly and covertly, combining political, informational, cybernetic and military means.

2. Literature Review

The issue of directing the activities of the special services of the Russian Federation as an instrument of the state policy of aggression is not sufficiently studied in the domestic literature. An important contribution to the study of this issue was made by such scholars as V. Palyvoda [1], who analyzed the use by the Russian authorities of pseudo-public organizations formed to influence their own society, to convey to the world community narratives favorable to the Kremlin. such organizations. S. O. Sidchenko et al. [2, p. 106], focused on the fact that actions in the information space were accompanied by provocations and demonstration actions of armed formations and special services of the PMR and the Russian Federation. According to G. Wilde [3], the FSB/GRU/SVR coordinate external sabotage and information campaigns, collect intelligence, recruit agents, and use from state to semi-state and private actors (for example, PMCs) for operations outside the official front. V. Ilnytskyi et al. [4, p. 45] covered propaganda activities by the special services of the Russian Federation, which became an indicator of the preparation of the armed aggression of the Russian Federation against Ukraine. O. A. Melnichenko [5, p. 31] noted that to equip and implement destructive information and psychological operations against Ukraine in the information space, Russian special services are increasingly using the capabilities of IT giants (services and platforms of Google, LLC), thanks to the

technical resources of which disinformation is spread in order to exert a manipulative influence on Internet users.

I. H. Verkhovtseva [6, p. 213] emphasized the methods of information aggression and information pressure. She analyzed the key narratives of the Russian information war against Ukraine and the latest trends in public diplomacy in the context of the digitalization of the global information space. The work [7, p. 88] states that while continuing their destructive activities, special services recruit for secret cooperation those who, under the influence of anti-Ukrainian propaganda, have developed a hostile attitude towards the Ukrainian authorities, considering them criminal (illegally elected), and their work is useful for residents of Luhansk and Donetsk regions. In preparation for the unleashing of armed aggression against Ukraine, the special services of the aggressor country can carry out large-scale subversive activities aimed at persuading part of the population of a certain territory or district to collaborate, support their armed formations, or reconnaissance and sabotage groups.

H. I. Samarets [8, p. 12] considered the use of the special services of the Russian Federation to resume the armed phase of the confrontation in 1992, which led to the suspension of the four-party process of conflict settlement with the participation of the Republic of Moldova, Transnistria, Ukraine, Romania, and the removal of the latter from it. In a professional report [9, p. 45], according to the verdicts of cybersecurity experts, since 2014, Ukraine has served as a testing ground for Russian intelligence and groups of attackers controlled by them to test the latest methods of cyberattacks. Several types of attacks aimed at information and psychological pressure on citizens, illegal collection of information, immobilization of the work of central authorities, as well as causing financial damage to the country and people due to the shutdown of information and telecommunication networks at vital infrastructure facilities, were recorded.

K. Kononenko [10, p, 4] notes that the Russian Federation has significantly intensified its efforts to destabilize European countries, which it has declared "hostile". The arsenal of Russian means aimed at achieving these goals includes attempts to influence political processes in European countries, the use of economic (including energy) pressure and the instrument of trade wars, threats to use military force, in particular nuclear weapons, the strengthening of the activities of Russian special services and the associated increase in cases of espionage, cyberattacks, the number of sabotages against the military and critical infrastructure of European countries, etc. In recent years, Russian special services have been actively recruiting citizens of European countries from among ethnic Russians and Russian-speakers for espionage, acts of sabotage and other subversive activities against their countries of residence [10, p. 8]. In its interference in the affairs of European countries, Moscow widely involves special services acting according to a clearly distributed list of tasks. The Foreign Intelligence Service of the Russian Federation performs traditional intelligence functions – obtaining information important for the Russian Federation on political and economic issues and other sensitive information. The Federal Security Service of the Russian Federation protects diplomatic missions and operational activities of Russian networks. In particular, Russian special services recruit the perpetrators of such crimes, "one-time" agents, through specialized groups on Telegram, without direct personal contacts (which further complicates their identification). Their target audience is people who are ready to cooperate for ideological or financial reasons, mainly migrants or low-income people who are used to casual "gray" earnings with low pay, Ukrainian refugees, and minors, who, in most cases, do not even realize that they work for Russian intelligence.

Modern research indicates: Russian aggression is a multi-layered war, where special services are the main catalyst for both "subversive" and covert military-political operations; counteraction requires comprehensive, interdisciplinary approaches and greater attention to the effectiveness measurements of non-quantitative operations.

3. Problem Statement

The purpose of the study is to thoroughly consider the functioning of the special services of the Russian Federation as a tool for implementing the militant policy of the state, outlining the main ways and methods of their pressure, assessing the consequences for state and world security, as well as forming proposals for effective resistance to their steps.

4. Methods and Materials

The study is based on a multifaceted approach to reviewing the activities of the special services of the Russian Federation as a means of the state policy of aggression. The methodological basis is a systemic concept that allows us to see the special services of the Russian Federation as a cohesive component of the political and military plan of the state and take into account the interaction of political, media, cyber and military levers of influence.

The study uses general scientific methods, in particular, analysis and synthesis to identify the essence, functions and ways of activity of special services, comparative analysis to compare methods and consequences of their influence at different stages of aggression, logical generalization to form conclusions and practical recommendations, as well as a systematic approach to in-depth consideration of the interaction of special services with state and military structures.

Methods that combine analytical depth with a proven empirical base are also used. One of the main tools is content analysis of open data – reports of international organizations, materials of leading think tanks, journalistic investigations and thematic publications. This approach makes it possible not only to organize disparate information but also to find patterns in the strategies and steps of the Russian special services.

The combination of quantitative indicators with deep qualitative analysis forms a reliable basis for reliable conclusions. This approach allows us to see not only the statistics of the activities of the Russian special services, but also the internal logic of their steps – motives, structure of influence, and coordination mechanisms. It is the symbiosis of empirical data and analytical interpretation that provides a true understanding of complex political processes, especially in situations of hybrid threats.

As a result, each method complements the other. This allows not only to assess the scale and nature of the actions of Russian intelligence agencies, but also to outline effective ways of protection – from strengthening cybersecurity to strengthening international mechanisms to deter the aggressor.

5. Results and Discussion

The modern Russian model of foreign policy influence is based primarily on the work of its special services – structures. They combine the functions of the army, diplomacy and propaganda. Their task is to create a controlled chaos in which you can promote your own interests while maintaining the appearance of "non-interference". In practice, this is manifested in the financing of pro-Russian parties, the launch of disinformation campaigns in the media space, pressure through energy resources, and even in the support of criminal networks that act as intermediaries. Such a multi-level system allows Moscow to act with high adaptability: "special services become not just executors, but architects of the political space of influence."

From 2014 to 2024, their activity went far beyond the usual espionage activities – it became the core of a hybrid war, where intelligence, financial transactions, cyberattacks, and propaganda work as a single mechanism. Thanks to this, the Russian security apparatus has turned into an autonomous force capable of implementing political decisions faster than official diplomatic channels. It can be seen that in the modern geopolitical reality, it is the special services of the Russian Federation that form the "strategic front" of the state – without public statements, without the march of tanks, but with tangible consequences for world security [1].

In the XXI century, the Russian Federation has made hybrid warfare its main weapon of influence on the world order. Its essence is in blurring the boundaries between peace and open conflict, when instead of fronts and armies, there are information campaigns, cyberattacks, economic blackmail and political destabilization. This format allows the state to achieve strategic goals without crossing the line of a formal declaration of war, which gives it room for maneuver and denial of its own involvement. Hybrid warfare has become a "new generation tool" that combines the logic of military strategy with methods of mind manipulation.

The basis of this system is the coordinated activities of special services. They act not just as executors of individual tasks, but as the think tank of a hybrid model that combines political, economic, cyber-technological and psychological operations. It is through intelligence that the Kremlin manages the hidden phases of the conflict – from spreading disinformation in the media to organizing sabotage groups on the territory of other states.

This creates the effect of constant uncertainty, when aggression looks like a set of local incidents, and not a purposeful strategy. This is the main strength of hybrid warfare – it deprives the enemy of the possibility of a quick response. Russia's special services, based on the experience of past decades, have learned to use information as a weapon no less effective than missiles or tanks. And it is this symbiosis of hidden methods and political pressure that makes hybrid aggression the most dangerous form of modern conflict [5, p. 31].

The special services of the Russian Federation, primarily the FSB, the GRU and the Foreign Intelligence Service, appear to be a key link in the implementation of operations aimed at destabilizing internal political processes in target countries, undermining the national security system and creating conditions for the implementation of the Kremlin's political interests. Their work includes cyberattacks, information and psychological operations, support for pro-Russian political and public structures, and organization of sabotage and intelligence operations. It is thanks to the capabilities of the special services that Russia carries out aggression against Ukraine not only on the battlefield, but also in the field of information, cultural and economic space.

Hybrid warfare involves minimizing the direct participation of regular troops and, at the same time, maximizing the use of non-linear means of influence. In this process, the security services act as an organizational and coordination cell, ensuring the coordination of actions between various components of the system of state aggression – military, diplomatic, informational and financial structures. This model allows Russia to maintain formal visibility at the wrong time, while using a wide range of hidden methods to achieve political goals.

The activities of special services within the framework of the hybrid war against Ukraine are systemic: from destructive influence on the information space to direct participation in military operations. They coordinate networks of agents, conduct cyber warfare, organize propaganda campaigns, and manipulate public opinion both inside Ukraine and internationally. All this indicates that it is the special services that are the core of the hybrid strategy of the Russian Federation – a tool that combines and embodies the political, military, and informational components of aggression.

In the current conditions, hybrid warfare is not only a form of confrontation, but also a strategy where special services act as decisive agents of influence. Their work allows the Russian Federation to pursue an aggressive policy against Ukraine and other states, while maintaining the appearance of the legitimacy of its own steps and avoiding direct responsibility for violations of international law.

After the beginning of the armed aggression of the Russian Federation against Ukraine, international organizations, including the UN, the International Criminal Court, the OSCE, and the Council of Europe, have been actively using legal mechanisms to condemn aggression, document crimes and determine the responsibility of the aggressor. The result was several resolutions of the UN General Assembly (2014-2025), which consistently record the position of the international community on the illegality of the actions of the Russian Federation, the demands for the cessation of aggression and the restoration of the territorial integrity of Ukraine.

A summary of these documents is given in Table 1, which systematizes the main international legal norms, their content and specific application to the case of Russian aggression against Ukraine.

The analysis of international legal acts shows that the aggression of the Russian Federation against Ukraine has all the signs of a gross violation of the UN Charter and the principles of international law. A set of norms – from the UN Charter and Resolution No. 3314 to the latest documents of 2024-2025 – forms a holistic system that not only condemns aggression, but also imposes legal, political, material and criminal responsibility on the aggressor state.

The decisions of the UN General Assembly in recent years confirm the steadfastness of the world's position: no state has the right to change its borders by force or occupy the territories of another country. Thus, the legal basis of the modern system of international security unconditionally defines the measures of the Russian Federation as an armed attack, and Ukraine as a victim of this act. This forms the legal basis for a future international court regarding the crime of aggression and compensation for damages.

The policy of the so-called "Russian world" has become the ideological framework of modern Russian statehood and a key tool for justifying external aggression, including the activities of the Russian special services. This concept, which arose at the intersection of political, cultural and religious narratives, is presented as "Russia's mission" to protect "compatriots" and "Orthodox civilization"

beyond its borders. In fact, it serves as a legitimation of expansionist policy, interference in the internal affairs of other states and undermining their sovereignty [6, p. 213].

Table 1. International legal norms on the prohibition of aggression and state responsibility

International legal act/document	Key provisions	The content of the norm (briefly)	Application to the Russian Federation
Charter of the United Nations (1945), Article 2(4)	Prohibition of the use of force or threat of force against the territorial integrity or political independence of any state	All states are obliged to settle disputes peacefully and not to use force to achieve political goals	The actions of the Russian Federation against Ukraine are a direct violation of Article 2(4), since the sovereignty and territorial integrity of Ukraine have been violated
UN General Assembly Resolution No. 3314 "Definition of Aggression" (1974)	Defines the concept of aggression and its forms	Aggression is the use of armed force, occupation, annexation, support for armed groups, blockade, etc.	The annexation of Crimea, the occupation of Donbas, the attack of 2022 – all these actions fall under the definition of aggression
Helsinki Final Act (1975)	Principles of inviolability of borders and non-interference in the internal affairs of states	Prohibits any actions aimed at changing borders by force	The principle of inviolability of borders and territorial integrity of Ukraine has been violated
Rome Statute of the ICC (1998), art. 8 bis (Kampala Amendments, 2010)	Defines the crime of aggression as an international crime	Heads of state bear individual criminal responsibility for planning, preparing or carrying out an act of aggression	The leadership of the Russian Federation may be prosecuted for the crime of aggression against Ukraine
Draft Articles on Responsibility of States for Internationally Wrongful Acts (UN International Law Commission, 2001)	Establishes the principles of international responsibility of states	The state is obliged to stop violations, compensate for damages and bear responsibility for aggression	The Russian Federation bears international responsibility for the occupation of Ukrainian territories and the damage caused
UNGA Resolution No. 68/262 (27 March 2014)	"Territorial integrity of Ukraine"	Condemns the annexation of Crimea and reaffirms the recognition of Ukraine's international borders	The world community does not recognize the annexation of Crimea, and calls on the Russian Federation to end the occupation
UN General Assembly Resolution ES-11/1 (2 March 2022)	"Aggression against Ukraine"	Recognizes the actions of the Russian Federation as armed aggression, demands an immediate cessation of hostilities	The first official international definition of Russia's war against Ukraine as an act of aggression
UNGA Resolution 77/1 (2022)	"Principles of the UN Charter for a Just Peace in Ukraine"	Demands the complete withdrawal of Russian troops and the restoration of Ukraine's sovereignty	Consolidates the international position on the need to end the occupation
UNGA Resolution No. 78/316 (11 July 2024)	"Safety and protection of nuclear facilities of Ukraine, in particular ZNPP"	Condemns Russia's military actions near nuclear facilities, demands their de-occupation	Highlights the threat to global nuclear security posed by Russia's actions
UN General Assembly Resolution ES-11/8 (24 February 2025)	"The Path to Peace"	Reaffirms Ukraine's sovereignty, calls for a just peace based on the UN Charter	The international community reaffirmed the qualification of the Russian Federation as an aggressor state and the need to bring it to justice

Source: Systematized by the author based on [11–15].

The origins of the ideology of the "Russian world" go back to the post-imperial and Soviet concepts of "great Russia" and "a single historical space". Its modern form was institutionalized in the 2000s through several state documents – primarily the Concept of Foreign Policy of the Russian Federation (2008, 2013, 2016, 2023), which proclaims the need to "protect the rights of Russian citizens and compatriots abroad." This message is used by the special services of the Russian Federation as an official justification for influence operations, destabilizing campaigns and subversive activities on the territory of neighboring states, primarily Ukraine, Moldova, Georgia and the Baltic States.

The ideological component of the "Russian world" is based on three main pillars:

1. The messianic idea of the special role of Russia as a "defender of traditional values" and the "civilizational center" of Eastern Orthodoxy.
2. The myth of a single people of Russia, Ukraine and Belarus, denying the right of Ukrainians to separate statehood.
3. The cult of victory in World War II, which is used as a tool for political mobilization and propaganda of the "anti-Nazi mission" of the Russian Federation.

The special services of the Russian Federation, primarily the FSB, the GRU and the Foreign Intelligence Service, are actively integrated into the mechanism for implementing this ideology. Their activities are not limited to intelligence or counterintelligence tasks: they perform ideologically colored functions of influence aimed at supporting the Kremlin's narratives and creating a "zone of Russian cultural and information control". Through controlled media, churches, public organizations and "cultural centers", special services form a favorable environment for spreading the ideas of the "Russian world" among Russian-speaking communities abroad.

A key component of the ideological toolkit is the fusion of Orthodoxy with government propaganda. The Russian Orthodox Church, closely associated with the FSB, essentially plays the role of an ideological unit, legitimizing foreign policy expansion under spiritual slogans. Thus, the special services use the religious and cultural factor as a "soft power" to justify aggression and form ways to influence public opinion in other countries.

In the context of the war against Ukraine, the "Russian world" has become the central ideological tool that united the political, military and intelligence structures of the Russian Federation. Under his cover, disinformation operations, cyberattacks, support for collaborationist groups, as well as efforts to destroy Ukrainian identity and national unity, are carried out.

Thus, the concept of the "Russian world" is not a cultural or humanitarian doctrine in the classical sense, but constitutes an integrated ideological platform of state aggression, in which the special services of the Russian Federation play a systemic role. It provides an ideological justification for expansion, legitimizes violence and creates pseudo-legal grounds for Russia's subversive activities under the guise of "protecting compatriots" [10].

The Russian Federation implements its policy of aggression against Ukraine and other neighboring states through the complex activities of special services that combine traditional intelligence tasks with modern means of hybrid influence. The main areas of this activity are information and psychological operations, cyberattacks, sabotage and providing support to terrorist groups and proxy formations. This approach makes it possible to achieve the Kremlin's strategic goals without officially declaring war, extending its control to the information, economic and military space.

Table 2 systematizes the main activities of the special services of the Russian Federation, methods of their implementation, key goals and characteristic indicators, which allows you to clearly assess the complexity and effectiveness of this toolkit of aggressive policy.

Analysis of Table 2 shows that the special services of the Russian Federation apply a multidimensional strategy, where different areas of activity act synergistically. Information and psychological operations prepare public opinion and demoralize the population, cyberattacks and sabotage disrupt critical infrastructure and management, and the support of proxy structures allows you to implement tactical tasks without the direct participation of regular forces.

The special services of the Russian Federation use a multidimensional strategy, where information and psychological operations, cyber operations, sabotage and the promotion of proxy formations work synergistically. This set of tools allows you to achieve strategic goals while reducing the risks of a direct military clash and complicating the process of international response. Effective resistance requires integrated national measures and close coordination with international allies [19].

Table 2. The main activities of the special services of the Russian Federation in the implementation of the policy of aggression

Direction of activity	Definition	Key methods	"Goals"	Performance indicators
Information and Psychological Operations (IPSO)	A set of measures to influence the information field to achieve political and strategic goals	Propaganda, fake news, troll farms controlled by NGOs, PSYOP	Demoralization of the population and troops, legitimization of aggression, polarization of society	Spikes in both activities, coordinated narratives, controlled movements, and organizations
Cyber-attacks and cyber intelligence	Using digital tools to undermine security, economics, and governance	Phishing, APT operations, DDoS, ransomware, SCADA/ICS attacks	Paralysis of critical infrastructure, collection of strategic data, and economic blackmail	Attacks on government/critical networks, coincident with political events, use of known APT tools
Sabotage and sabotage	Physical actions to undermine infrastructure and combat capability	Explosions, fires, destruction of objects, and coordination with proxies	Disruption of logistics, demoralization, and creation of conditions for control of territories	Man-made accidents, simultaneous sabotage, and activity of controlled groups
Support for terrorist groups and proxy structures	Provision of resources and coordination of the actions of illegal formations	Financing, armament, training, and use of PMCs	Achieving strategic goals without the direct participation of regular forces, destabilizing regions	Flows of weapons and personnel, PMC activity, connections of pro-Russian groups with special services
Integration of tools (system approach)	Integration of tools (system approach)	Integration of tools (system approach)	Achieving strategic goals while minimizing a direct military clash	Simultaneous operations of different types, a high level of coordination between directions

Source: Systematized by the author based on [16–19].

The operations of Russian special services and special forces units have become a central element in the implementation of the Kremlin's strategic interests in the Ukrainian direction. From the first days of the conflict, these structures acted not as an auxiliary force, but as the main mechanism of political, military and information pressure. They combined methods of forceful intervention with finely planned hybrid scenarios – sabotage, cyberattacks, manipulation of public opinion, support for local pro-Russian groups.

In 2014, it was the special forces of the "green men" that became a key tool for the annexation of Crimea, an operation carried out with almost laboratory precision. In parallel with the military control of the territory, a large-scale information campaign was unfolded aimed at legitimizing the occupation and creating the illusion of "popular support". A similar scenario was repeated in Donbas, where Russian agents organized armed formations, provided them with equipment and funding, while coordinating the political component – the creation of pseudo-republics and "people's councils".

After 2022, the activities of these structures reached a new level. Under the cover of a full-scale offensive, the special services focused on parallel tasks: reconnaissance of critical infrastructure, intimidation of civilians, undermining energy systems, and conducting psychological operations in the digital space.

Table 3 summarizes the most notable episodes of the use of these tools – from operations in Crimea to the latest forms of hybrid aggression. They demonstrate how Russia systematically combines classic intelligence operations with the tools of modern information warfare, turning its special services into the main lever for the implementation of foreign policy.

The interference of Russian special services in the implementation of the policy of aggression creates the effect of multi-level influence – from global processes to local crises. Their activities create not only security risks, but also deep political, economic and communicative deformations. In the international arena, Moscow's actions have caused an erosion of trust between states, strengthened militarization trends in Europe, and forced NATO to reconsider the concept of collective defense.

Table 3. The use of Russian special services in foreign policy operations against Ukraine

Event (period)	Actions of the Russian special services	"Goal"
Annexation of Crimea (2014)	Seizure of administrative buildings, blocking of airports, "green men" without identification marks	Ensuring control over Crimea, organizing a "referendum", and legalizing annexation
War in Donbas (2014–2015)	Support for pro-Russian groups, the presence of Russian special forces, the supply of weapons, and intelligence	Destabilization of the region, creation of Russian-controlled "republics"
Full-scale invasion (2022–2025)	Landing of sabotage and reconnaissance groups, participation in battles for strategic objects, and elimination of key targets	Advancing Russia's military goals, destroying Ukraine's defense capabilities
Hybrid warfare and information influence	Cyberattacks, disinformation, propaganda campaigns, and economic pressure	Formation of pro-Russian public opinion, undermining Ukrainian stability

Source: Systematized by the author based on [20; 21, p. 98].

The activities of the special services of the Russian Federation have systematic, long-term and complex consequences. At the international level, it undermines the principles of security and international law, creates hybrid threats and escalation risks. At the regional level, it destabilizes neighboring states, undermines trust and threatens critical infrastructure. For Ukraine, these actions directly violate sovereignty and territorial integrity, destroy governance and defense systems, and weaken socio-political stability. Effective counteraction requires integrated measures at the national and international levels, including informational, cybernetic, defense and diplomatic components (Table 4).

Table 4. Consequences of the activities of the special services of the Russian Federation for the security and sovereignty of Ukraine

Direction of activity of the special services of the Russian Federation	Implications for international security	Implications for regional security	Consequences for Ukraine (sovereignty and territorial integrity)
Information and Psychological Operations (IPSO)	Undermining the stability of the international order, the creation of global information threats	Polarization of society in the region; destabilization of the political situation	Demoralization of the population; discrediting state institutions; spreading pro-Russian narratives
Cyber-attacks and cyber intelligence	Threat to international cybersecurity; escalation of potential conflicts	Disruption of the functioning of critical infrastructure; Economic vulnerability of neighboring states	Disabling government systems; undermining defense and management structures; a Threat to critical infrastructure
Sabotage and sabotage	Undermining international trust and security	Destabilization of transport and energy infrastructure; Threat to regional stability	Damage to strategic facilities; undermining logistics and life support; Threat to civilians
Support for terrorist groups and proxy structures (PMCs)	Using the "gray zone" to avoid direct liability, the spread of international tensions	Destabilization of neighboring states; escalation of local conflicts	Undermining security in the frontline regions, strengthening of separatist sentiments, and increased risk of violence
Integration of tools (system approach)	Integration of tools (system approach)	Synchronized attacks on regional security and infrastructure	Complex violation of sovereignty; complication of management and defense; demoralization of the population

Source: Systematized by the author based on [22–24].

Consideration of Table 4 proves that the activities of the special services of the Russian Federation pose systemic dangers to international and regional security, as well as significantly violate the sovereignty and territorial integrity of Ukraine. Information and psychological operations, cyberattacks,

and sabotage multiply the destabilization of regional institutions and critical infrastructure, and sponsorship of proxy structures and PMCs allows the Russian Federation to achieve strategic goals without direct military intervention.

The activity of the Russian special services forms a long and systemic chain of consequences that covers all levels of international security. On the global stage, these structures undermine trust between states, undermine the principles of international law, and create a new type of threat – hybrid, blurred, and difficult to identify. Over the past decade, the number of recorded cyberattacks related to the activities of Russian intelligence networks has more than tripled, demonstrating the scale and sustainability of this strategy.

The international community is demonstrating a multidimensional response to the activities of the Russian special services, which increasingly go beyond the usual diplomatic procedures. At the UN level, violations of the fundamental principles of international law are emphasized, while the European Union is increasing pressure due to economic restraints and political sanctions that have already affected more than 70 major enterprises of the Russian Federation in the period from 2020 to 2024, reducing their integration into global supply chains. At the same time, NATO is strengthening the alliance's eastern border by investing in the renewal of defense mechanisms and providing Ukraine with technical and strategic assistance in countering hybrid challenges, which include cyberattacks, disinformation and financial sabotage [24].

In practice, this is manifested in the fact that the operations of the Russian special services are increasingly seen not only as local incidents but as a systemic threat to international security and stability in the region. In several cases, it is observed that coordinated actions of Western institutions allow not only to deter potential escalation, but also to increase the effectiveness of preventive measures. The dynamics of the last four years show that the combination of sanctions pressure, diplomatic channels and defense strategies creates a complex barrier that can minimize the risks of hybrid conflicts spreading to neighboring states.

Modern special operations are increasingly integrating technological and information tools, transforming traditional forms of influence into a multidimensional pressure strategy. In the light of these trends, it can be seen that the international response to Russia's actions is becoming not just reactive but gradually proactive, forming new approaches to ensuring security and stability in Europe [16].

In light of Russia's full-scale invasion of Ukraine, the functioning of an effective system of counterintelligence and cyber defense has become an important component of state defense. The enemy zealously uses hybrid methods: from an agent network and sabotage to large-scale cyberattacks and information pressure, creating direct dangers to state institutions, vital infrastructure and military formations of the state.

To address these challenges, Ukraine has developed a multi-layered defense system that includes state and military counterintelligence, cyber defense of critical infrastructure, and unity with international allies. The main purpose of this system is to find, neutralize and protect against pervasive dangers created by the activity of the Russian special services.

Table 5 shows key bodies, areas of their activities and examples of specific steps in the field of counterintelligence and cyber defense, which makes it possible to visualize information about the Ukrainian security structure and weigh the effectiveness of its response to modern challenges.

The assessment of the system of counterintelligence and cyber defense measures of Ukraine shows the complexity and multi-layered nature of the state's approach to countering threats from Russian special services and hybrid aggression. The connection between the work of the Security Service of Ukraine, military counterintelligence, the State Service for Special Communications and International Cooperation guarantees effective detection, neutralization and preventive protection against agent activities, sabotage, cyberattacks and information attacks.

The system makes it possible to respond to dangers in time, protect critical infrastructure and important state facilities, and increase the overall degree of cyber resilience of the region. The integration of world experience and intelligence sharing with NATO, EU and US allies strengthens Ukraine's ability to counter modern types of hybrid warfare. Thus, counterintelligence and cyber defense measures are a vital component of national security and the foundation for protecting the sovereignty and sustainability of the state.

Table 5. Systematization of counterintelligence and cyber defense measures of Ukraine

Direction	Body/Unit	Task	Examples of specific measures
Counterintelligence measures	Security Service of Ukraine (SBU)	Detection and neutralization of agent activities of foreign special services, protection of strategic objects, and control of information security	Checking civil servants for ties with the Russian Federation, blocking pro-Russian networks, and detaining sabotage groups
	Military counterintelligence (Ministry of Defense, SBU)	Protection of military facilities and units from espionage and sabotage	Detection of Russian agents at the front, inspection of ammunition and equipment, and access control to strategic facilities
	National Police	Countering sabotage, terrorist attacks, and pro-Russian organizations	Prevention of subversive actions, detention of agents and organizers of provocations
Cyber defensive measures	State Service for Special Communications and Information Protection (SSSZI)	Protection of critical infrastructure and state information systems	Monitoring cyberattacks, blocking malware, and responding to intrusions in government networks
	CERT-UA	Responding to cybersecurity incidents, detecting threats	Malware analysis, coordination with other authorities, and publication of recommendations for enterprises
	Ministry of Digital Transformation	Cyber protection of government agencies, digital services	Protection of government portals, development of cybersecurity standards, and staff training
International cooperation	NATO, EU, USA	Threat Information Sharing, Training, Cyber Resilience Support	Joint exercises, development of protocols for responding to cyberattacks, and consultations on cyber defense

Source: Systematized by the author based on [25, p. 222; 26–28].

Increasing the effectiveness of countering the aggressive activities of the special services of the Russian Federation requires a systematic combination of national resources, legal mechanisms and international partnership. At the national level, the primary task is to strengthen the counterintelligence capabilities of the state by improving the analytical, operational and technical base of the Security Service of Ukraine and related structures. cyber operations of the Russian Federation through the creation of an integrated system for collecting and analyzing intelligence information, which will combine data from public and private actors.

An important vector is the optimization of the legal regulation of activities in the field of counterintelligence and cyber defense. It is necessary to update the legislative framework in view of modern forms of hybrid aggression – cyber espionage, disinformation campaigns, influential operations, and information pressure. It is expedient to form a special interagency coordinating cell to counter the activities of foreign intelligence services, which will ensure rapid data exchange, coordination of operational actions and analytical support for government decisions.

At the international level, it is advisable to deepen cooperation with the intelligence structures of NATO and the European Union, in particular in the field of joint intelligence processing, participation in multilateral trainings and the development of standards for responding to information and cyber threats. Ukraine should actively participate in technology exchange programs in the field of cybersecurity and counterintelligence, and develop partnerships with NATO centers of excellence (for example, CCDCOE in Tallinn).

In addition, it is important to strengthen the information and diplomatic component of the resistance. It is necessary to increase the international publication of evidence of the aggressive activities of the Russian special services, forming political and legal pressure on the invading state. The

development of international sanctions against persons involved in espionage and computer attacks must become one of the levers of deterrence.

No less important is the training of new generation specialists who are able to act in the conditions of a multidimensional hybrid war. It is mandatory to create professional training programs for counterintelligence analysts, cyber operations and security intelligence specialists in cooperation with the main universities of the EU and the United States.

In general, effective counteraction to the aggressive activities of the special services of the Russian Federation is possible only if national and international efforts are synchronized, the technological potential of intelligence is strengthened, the level of interagency coordination is increased, and a joint system of strategic deterrence is formed. This approach will allow Ukraine not only to defend itself, but also to act proactively in the field of information and cybersecurity, ensuring the long-term stability of national statehood.

6. Conclusions

Thus, the activities of the special services of the Russian Federation go far beyond the typical internal security and become a central tool for the implementation of the Kremlin's foreign policy aspirations. They act as a hidden mechanism for promoting the state policy of aggression, capable of influencing world processes without open military steps. This is manifested in the use of hybrid methods – from financial and political pressure to disinformation and cyberattacks, which makes it possible to achieve strategic objectives with minimal visibility in the arena of hostilities.

It is indicated that such a practice creates a new kind of foreign policy, where special operations become a continuation of the state strategy and, at the same time, a means of demonstrating power in the world context. In several episodes, it is noticed that through the manipulation of information flows and technological platforms, the Russian Federation is able to create political pressure on nearby states while reducing the risks of a direct armed clash. This capability makes the Kremlin's intelligence services not just a body of stability, but a key lever of geopolitical influence, the effectiveness of which is constantly assessed by international experts and strategic institutions.

The arrangement of counterintelligence and cyber defense steps of Ukraine against the special services of the Russian Federation indicates a high degree of coordination and adaptability of the state security system. Counterintelligence measures are the main lever for eliminating the activities of Russian special services aimed at destabilizing state structures and undermining national defense.

Effective protection against Russian cyber operations is achieved by merging sustainable counterintelligence methods with modern digital tools. The organizational and legal framework and interagency coordination ensure the legality of actions and the rapid effectiveness of measures. Continuous updating of practices, improvement of technical equipment and training of specialists increase the deterrent potential of the country. Together, these steps form a holistic doctrine of protecting Ukraine's vital infrastructure, information field and strategic goals, serving not just as a way to respond, but as part of the state strategy to counter Russian aggression.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Features of the Application of the Principle of Good Faith in EU Law

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.08

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ABSTRACT

The article analyzes the principle of good faith in the legal framework of the European Union (EU), emphasizing its multifaceted nature as both an ethical and legal cornerstone that integrates private and public law. Originating in Roman law as bona fides, it evolved into a fundamental standard. In private law, this principle is enshrined in the Principles of European Contract Law (PECL, Art. 1:201) and is used by the Court of Justice of the EU (CJEU) to protect weaker parties, for example, in Directive 93/13/EEC on unfair contract terms, balancing freedom of contract. In public law, good faith is inextricably linked to the principle of sincere cooperation (Art. 4(3) TEU), obliging Member States and EU institutions to work loyally toward the Union's objectives, fostering mutual trust. The study examines the interaction of good faith with other key EU principles, such as the rule of law, proportionality, and trust. In public law, it complements the rule of law, particularly in the context of candidate countries (e.g., the Western Balkans), and ensures the proportionality of EU measures. This synergy promotes institutional trust, crucial for initiatives like Next Generation EU. Despite this, the main challenge remains the lack of a clear normative definition of the principle. This leads to inconsistent interpretations across Member States' diverse legal traditions. In private law, it creates conflicts with freedom of contract, and in public law, its application is complicated by political sensitivities, such as sanctions for rule of law violations. The article highlights the need for a clearer framework for the uniform application of good faith. The author suggests avenues for future research, including developing a clearer definition to harmonize private law and studying the principle's application to new challenges, such as the digital economy and artificial intelligence. An analysis of good faith in EU enlargement is also proposed. The principle of good faith remains a vital tool for promoting justice, trust, and integration within the EU's legal framework.

KEYWORDS

principle of good faith, EU law, Roman law, sincere cooperation, contract law, rule of law, case law.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Особливості застосування принципу добросовісності в праві ЄС

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.08

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АНОТАЦІЯ

Стаття аналізує принцип добросовісності в правовій базі ЄС, підкреслюючи його багатогранну природу як етичного та правового наріжного каменя, що поєднує приватне і публічне право. Виникнувши в римському праві як bona fides, він еволюціонував у фундаментальний стандарт. У приватному праві цей принцип закріплений у Принципах європейського договірного права (PECL, ст. 1:201) та використовується Судом ЄС (СЄС) для захисту слабших сторін, наприклад, у Директиві 93/13/ЄЕС про несправедливі договірні умови, балансуючи свободу договору. У публічному праві добросовісність нерозривно пов'язана з принципом чесної співпраці (ст. 4(3) Договору про ЄС), зобов'язуючи держави-члени та інституції лояльно працювати для досягнення цілей Союзу, сприяючи взаємній довірі. Дослідження вивчає взаємодію добросовісності з іншими ключовими принципами ЄС, такими як верховенство права, пропорційність та довіра. У публічному праві вона доповнює верховенство права, зокрема в контексті країн-кандидатів (наприклад, Західні Балкани), та забезпечує пропорційність заходів ЄС. Ця синергія сприяє інституційній довірі, що важливо для таких ініціатив, як Next Generation EU. Попри це, головною проблемою залишається відсутність чіткого нормативного визначення принципу. Це призводить до невідповідних тлумачень у різних правових традиціях держав-членів. У приватному праві це створює конфлікти зі свободою договору, а в публічному – ускладнює застосування через політичні делікатності, наприклад, при санкціях за порушення верховенства права. Стаття наголошує на необхідності чіткішої системи для однакового застосування добросовісності. Автор пропонує напрямки для майбутніх досліджень, включаючи розробку чіткішого визначення для гармонізації приватного права та вивчення застосування принципу до нових викликів, як-от цифрова економіка та штучний інтелект. Також пропонується аналіз ролі добросовісності в процесі розширення ЄС. Принцип добросовісності залишається життєво важливим інструментом для сприяння справедливості, довірі та інтеграції в рамках правової бази ЄС.

КЛЮЧОВІ СЛОВА

принцип добросовісності, право ЄС, римське право, щира співпраця, договірне право, верховенство права, судова практика.

1. Introduction

The principle of good faith, which permeates legal systems from antiquity to the present, occupies a central place in European Union (EU) law, acting not only as an ethical guide but also as a legal instrument that ensures harmony between individual interests and the common goals of integration. In the context of EU law, good faith is of particular importance because, on the one hand, it contributes to the implementation of the principle of sincere cooperation between the Member States and the institutions of the Union. On the other hand, it serves as a basis for the regulation of private law relations, particularly in contract law [1]. In fact, the versatility of this principle, its ability to adapt to various legal contexts, makes it the object of close attention of both scientists and practitioners.

The problem of applying the principle of good faith in EU law is relevant for several reasons. Namely, in the process of European integration, when member states transfer part of their sovereignty to supranational institutions, good faith becomes the key to effective interaction based on trust and mutual respect. Also, in private law, where the harmonization of national legal systems remains a difficult task, good faith is a universal standard that allows balancing the interests of the parties in contractual relations, while taking into account the cultural and legal differences of the Member States [2]. In today's environment, when the EU faces challenges related to economic crises, climate change, or political instability, the principle of good faith acquires a new meaning as a tool for ensuring the stability and legitimacy of regulatory regimes [3].

From a practical point of view, the relevance of the problem is increased by the ambiguity of the interpretation of good faith in various areas of EU law. For example, if in contract law this principle is clearly enshrined in documents such as the Principles of European Contract Law (PECL), then in the context of interinstitutional cooperation, its application often depends on judicial interpretations [4]. This uncertainty raises the question: how exactly can good faith be effectively applied in different legal contexts without losing its universality? (Perhaps this is where the key lies to understanding its uniqueness as a principle that unites public and private law.) Thus, the study of the peculiarities of the application of the principle of good faith in EU law is not only theoretical, but also practical, because it is aimed at improving legal regulation, ensuring justice and strengthening trust in European institutions.

The scientific significance of the problem lies in the need to systematize knowledge about good faith as a multifaceted principle that affects various aspects of EU law. Despite numerous studies devoted to this issue, there is a lack of a comprehensive analysis that would combine the historical origins of the principle, its normative consolidation and interaction with other principles of EU law, such as proportionality or the rule of law [5]. Therefore, this article is designed to fill this gap by offering a thorough understanding of the role of good faith in the EU legal system and outlining the prospects for its further development.

2. Literature Review

The problems of good faith in EU law were previously studied by G. De Baere, T. Roes, M. Hesselink, H. Collins, S. Reinhold, R. Zimmermann, S. Whittaker, S. Djajić, K. Verhoest, M. Maggetti, E. Guaschino, J. S. Schumacher. Weinen, F. Mitch, N. Lee, E. Morrow, A. Hodjai, P. Leino-Sandberg, M. Ruffert, D. Bush, O. Lando, J. S. Schumacher. Cartwright, A. Kok, K. Turner, R. Kinley, M. Kutarjar, J. de Bohr, C. Figueres, however, the issues of the systematic application of the principle and its interaction with other principles of EU law remain insufficiently covered, which determines the focus of this article.

3. Problem Statement

The purpose of the article is to investigate the peculiarities of the application of the principle of good faith in the law of the European Union. At the same time, we carefully take into account the historical background, normative consolidation and intertwining with other legal principles.

Understanding the versatility of good faith (which combines ethical and legal planes), we do not limit ourselves to disclosing its content in the context of EU law. It is also important for us to outline the practical implications for institutional cooperation and private law relations.

4. Methods and Materials

The methodological basis of this research is a comprehensive approach that combines general scientific and special legal methods of cognition. The central method is the formal-legal (dogmatic) analysis, which is applied to study the normative entrenchment of the principle of good faith in the EU legal framework. The materials for this analysis were primary and secondary sources of EU law. To uncover the evolution of the concept, the historical-legal method was used. This method allowed for tracing the genesis of the principle from its origins in Roman law (bona fides), where it regulated contractual and property disputes, through its transformation in medieval canon law and subsequent codifications, to its modern perception as a universal standard in EU law. An important component of the research is case-law analysis. The materials included decisions of the Court of Justice of the European Union (CJEU), which play a key role in interpreting good faith and ensuring a balance between contractual freedom and societal interests. Using systemic analysis, the dynamic interaction and interconnection of the principle of good faith with other fundamental principles of EU law were examined. Specifically, its connection with the rule of law (in the context of EU enlargement to the Western Balkans), proportionality, freedom of contract, and solidarity was analyzed.

5. Results and Discussion

Bona fides – this is how the principle of good faith is called in the Latin tradition – is one of the cornerstones of European legal culture. Its roots go back to the depths of Roman law, where good faith was not just an ethical category, but also a legal measure for regulating relations between the parties.

This was especially evident in contractual and property disputes. We can mention actio bonae fidei – these lawsuits allowed judges to take into account all the circumstances of the case, guided by the principle of justice. Thanks to this, conflicts were resolved flexibly, especially where the formal application of the law did not give a satisfactory result.

Scholars note: it was this approach that later became the basis for the development of the concept of good faith in the civil law of continental legal systems, primarily in the law of obligations. In ancient Rome, good faith was also associated with trust (fides), a prerequisite for concluding agreements and fulfilling obligations. This is how the moral and legal basis of social relations was formed.

Over time, the principle of bona fides has changed significantly, but, interestingly, it has not lost its universality. It has perfectly adapted to the new legal realities. In the Middle Ages, the principle found its place in canon law – here the emphasis was on the ethical aspect of good, faithful behavior. And later it was reflected in the codifications of civil law (at least the German BGB or the French Code Civil can be mentioned), which significantly influenced modern EU law.

It should be noted that in the context of European integration, the principle of good faith has sounded in a new way in the process of deepening European integration at the present stage. It ceased to be just a standard of private law relations and turned into an instrument for ensuring cooperation between the Member States and the institutions of the Union [6]. Thus, the development of the principle of good faith has a long way, from an ethical maxim to a universal legal principle that plays a key role in the EU legal system, organically combining historical aspects and modern challenges.

The principle of good faith not only regulates the conduct of the parties in contractual relations, but also serves as the basis for the implementation of sincere cooperation enshrined in Article 4(3) of the Treaty on European Union. As the researchers note, in private law, this principle is a universal standard. On the one hand, it adapts the rules to the different legal traditions of the Member States, and on the other hand, it also contributes to the harmonization of contract law [7], ultimately, of the entire private law.

In public law, good faith is associated with the loyalty of member states to the objectives of the Union. The latter is manifested in their cooperation with the EU institutions and the fulfillment of obligations under European law. Thus, good faith in EU law is a kind of integral category that covers both ethical and legal aspects and plays the role of a kind of cement in the legal system of the Union.

The sources in which the principle of good faith is enshrined in EU law are diverse. This only confirms the versatility and flexibility of the principle [8]. In the field of private law, the key document is the Principles of European Contract Law (PECL), in particular Article 1:201. In it, good faith is defined as a standard of conduct of the parties in contractual relations, which is based on honesty and fairness.

Although this document is not legally binding, it serves as a direction for the harmonization of contract law in Europe, influencing national legal systems and judicial practice. For example, in countries with a continental legal tradition (Germany, France), good faith has long been enshrined in civil codes. This facilitates its integration into European law through initiatives such as PECL.

In public law, good faith is enshrined in primary EU law, first of all in the aforementioned Article 4(3) of the Treaty on European Union. It obliges Member States and institutions of the Union to cooperate in a spirit of sincere loyalty. This norm mustn't be just declarative – it has a completely practical application. For example, in cases related to the implementation of EU directives or regulations by member states.

The case law of the European Court of Justice (CJEU) also significantly affects the formation of the content of the principle of good faith. In many judgments, especially those related to consumer protection or termination of contracts, the CJEU interprets good faith as a principle that strikes a balance between freedom of contract and the protection of the weaker party.

For example, cases concerning unfair terms in consumer contracts (Directive 93/13/EEC). Here, the principle of good faith is used as a criterion for assessing the fairness of contractual provisions. This clearly demonstrates its practical significance in protecting the rights of citizens.

In public law, judicial decisions, such as cases of breach by Member States of their obligations, emphasize the role of good faith in ensuring the effective functioning of the Union. For example, if we look at initiatives aimed at strengthening the rule of law in the Western Balkans, we can see that here, good faith is seen as a necessary condition for the integration of candidate countries into the EU.

It should be emphasized separately that good faith in EU law does not exist in isolation, but instead closely interacts with other norms and values [9]. In particular, in private law, it complements the principles of freedom of contract and justice. And in public law, there are principles of solidarity and proportionality.

Such interaction allows good faith to adapt to different social and legal contexts – from the circulation of finance to the environment. It is important that both here and there it becomes the basis for trust and cooperation between European partners. At the same time, as the researchers rightly note, the lack of a clear definition of good faith in EU regulations partially complicates its application (we add that this also affects the relative frequency of recourse to this principle). This seems to be especially true for situations where national legal traditions differ significantly, and reaching a consensus of a certain level is necessary (for example, in the context of the regionalization of the modern economy).

Thus, good faith in EU law is a legal principle enshrined in various sources (from primary legislation to judicial practice) and which plays a leading role in ensuring the fairness, trust and efficiency of the Union's legal system.

The principle of good faith in the law of the European Union does not exist as if in a vacuum. It operates in a complex system of interrelated legal principles, which together form the unique legal architecture of the Union. The ability to coexist harmoniously with other principles (including the rule of law, protection of human rights, as well as proportionality, freedom of contract, and solidarity) makes good faith not just an auxiliary tool, but a fundamental principle that ensures the integrity and effectiveness of the EU legal system.

In this context, the interaction of good faith with other principles is extremely important. Understanding this aspect can not only adapt good faith to different legal areas, but also strengthen the effect of other norms [10]. Here, it seems, there is a kind of synergistic effect that contributes to the achievement of the goals of European integration.

In considering this interaction, it is necessary to pay attention in particular to its manifestation in public and private law, as well as to how it affects the balance between individual interests and the general objectives of the Union.

Thus, in public law, good faith is strongly linked to the principle of sincere cooperation enshrined in Article 4(3) of the Treaty on European Union. This principle obliges the Member States and institutions of the Union to act together in order to achieve the objectives of the EU.

According to the researchers, good faith in this context acts as an ethical and legal basis for the loyalty of Member States to the European project [11]. This is manifested in the timely implementation of directives, regulations, or judgments of the Court of Justice of the EU.

For example, in cases of breach by Member States of their obligations, the Court of Justice of the EU often refers to good faith as a criterion for assessing their conduct. He emphasizes that sincere

cooperation is impossible without conscientious performance of duties. This interaction is strengthened by the principle of solidarity, which requires Member States to jointly take responsibility for challenges such as, in particular, economic crises, migration flows, etc. In this case, good faith acts as a tool to ensure that solidarity does not remain only a declarative value, but will have a practical implementation.

For example, within the framework of initiatives such as Next Generation EU, where Member States cooperate for economic recovery, the faithful implementation of commitments is the key to the success of this entire project.

6. Conclusions

The above study of the peculiarities of the application of the principle of good faith in EU law allows us to draw the following conclusions.

The principle of good faith in EU law is not just an ethical guideline, but rather a universal legal principle that has deep roots in Roman law. Therefore, it is also a kind of bridge between the historical legal heritage and the modern challenges of European integration.

A characteristic feature of good faith in EU law is its versatility. In public law, it serves as the basis for the principle of sincere cooperation, and in private law, it provides a balance between freedom of contract and justice. It is this flexibility and adaptability that allow this principle to function effectively in a variety of legal contexts.

Good faith in EU law is enshrined in various sources – from founding treaties to judicial practice, which has a precedential nature. This underlines its universality and its extraordinary importance for the legal system of the Union.

The principle of good faith interacts closely with other principles of EU law, such as the rule of law, proportionality, solidarity, freedom of contract, etc. This interaction creates a synergistic effect, strengthening the effect of each principle and, last but not least, contributing to the achievement of the common goals of European integration.

At the same time, attention should be paid to the problems associated with the application of the principle of good faith. Among them is the lack of a single definition, which can lead to ambiguous interpretation, especially in the context of different legal traditions of the Member States. The issue of the limits of the application of good faith in EU regulatory regimes, in particular in the areas of economic and financial regulation, remains relevant. Obviously, the application should be based on clear criteria that combine flexibility with the possibility of legal foresight.

From a practical point of view, there is every reason to say that the principle of good faith has significant potential for improving legal regulation in the EU. It can serve as a tool for the harmonisation of national legislation, especially in the field of private law, and for ensuring effective cooperation between Member States and Union institutions.

Finally, the interaction of good faith with other legal concepts, such as trust, legitimacy, and efficiency, which is (especially) relevant in the context of EU jurisprudence and the reform of the Union's institutions, obviously needs a deeper study.

The principle of good faith, of course, remains one of the cornerstones of the European legal culture; therefore, its consistent implementation in the national legal system is one of the priority tasks facing the national political and legal system.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Legal and Corporate Social Responsibility of Business Entities: Ukrainian and European Aspects

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.09

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ABSTRACT

In the current context of European integration, the problem of harmonizing Ukrainian legislation with European standards is of particular importance. Legal responsibility of business entities is one of the significant categories of legal relations that determine the effectiveness of the state's economic system and ensure the protection of the rights of participants in economic relations. The topicality of the study is due to the fact that the national legal system has to be brought in line with EU standards, which, in turn, implies the thorough analysis of the mechanisms of corporate responsibility and their adaptation to the European principles. The process of bringing together Ukrainian and European legislation in the sphere of entrepreneurship is a complex scientific phenomenon. The purpose of the study is to analyze the legal mechanisms of legal and corporate social responsibility of business entities in Ukrainian and European legislation to determine the directions of their harmonization and improvement of the national legal system. The study has shown that there are significant differences between the Ukrainian and European legal regulation of corporate responsibility. The need to optimize the mechanisms of economic responsibility and include the principles of sustainable development into the State legislation for the effective convergence of the legislation has been identified. The study shows that successful adaptation of the Ukrainian legislation to the European standards in the field of corporate responsibility requires a systemic approach and includes the modernization of legal institutions, the introduction of new forms of corporate responsibility, as well as the implementation into the national legal system of international principles on their responsibility.

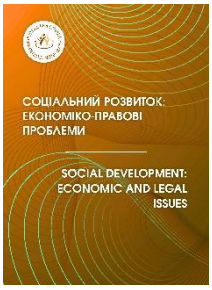
KEYWORDS

legal liability, corporate liability, convergence, adaptation, implementation, harmonization, business entities, legal entities, civil liability, tort liability, business partnership, obligations.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Юридична та корпоративна соціальна відповідальність суб'єктів підприємництва: український та європейський аспект

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.09

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У сучасних умовах євроінтеграційних процесів проблема гармонізації українського законодавства з європейськими стандартами набуває особливої актуальності. Юридична відповідальність суб'єктів підприємництва є однією зі значущих категорій правовідносин, що визначає ефективність функціонування економічної системи держави та забезпечує захист прав учасників економічних відносин. Актуальність дослідження зумовлена тим, що національну правову систему необхідно привести у відповідність до стандартів ЄС, що своєю чергою, передбачає ґрунтовний аналіз механізмів корпоративної соціальної відповідальності та їх адаптацію до європейських принципів. Процес зближення українського та європейського законодавства у сфері підприємництва є складним науковим явищем. Метою дослідження є аналіз правових механізмів юридичної та корпоративної соціальної відповідальності суб'єктів підприємництва в українському та європейському законодавстві для визначення напрямків їх гармонізації та вдосконалення національної правової системи. Дослідження показало, що між українським та європейським правовим регулюванням корпоративної соціальної відповідальності існують суттєві відмінності. Визначено необхідність оптимізації механізмів економічної відповідальності та включення принципів сталого розвитку до державного законодавства для ефективної конвергенції законодавств. Дослідження показує, що успішна адаптація українського законодавства до європейських стандартів у сфері корпоративної соціальної відповідальності вимагає системного підходу та включає модернізацію правових інститутів, впровадження нових форм корпоративної соціальної відповідальності, а також імплементацію в національну правову систему міжнародних принципів щодо їхньої відповідальності.

КЛЮЧОВІ СЛОВА

юридична відповідальність, корпоративна відповідальність, конвергенція, адаптація, впровадження, гармонізація, суб'єкти підприємницької діяльності, юридичні особи, цивільно-правова відповідальність, деліктна відповідальність, господарське товариство, зобов'язання.

1. Introduction

The current stage of development of the Ukrainian state is characterized by the intensification of the processes of European integration, which requires the harmonization of national legislation with the legal standards of the European Union. In this regard, the issue of legal responsibility of business entities is of particular importance, since the effective functioning of the state economic system is directly related to the level of legal regulation of economic relations and the mechanisms for ensuring the responsibility of their participants.

The transformation of the Ukrainian legal system against the background of European integration involves a complete rethinking of traditional approaches to the regulation of entrepreneurial activity and the introduction of new standards of corporate social responsibility. This is due not only to political and economic factors, but also to the objective need to create a favorable investment climate and competitiveness of the national economy in the European market.

Jurisprudence as a science is designed to provide a theoretical justification of the processes of legal convergence and to develop practical recommendations for improving the mechanisms of legal and corporate social responsibility in the field of entrepreneurship. A comparative analysis of Ukrainian and European legislation allows us to identify both common trends in the development of legal systems and specific features of national legal regulation that require adaptation to international standards.

2. Literature Review

The issue of adaptation of Ukrainian corporate legislation to European standards is studied in detail in the work of I. Horodyskyy et al. [1, p. 58], where the authors analyze the main directions of harmonization of legal norms. V. Korol, O. and Nebyltsova [2, p. 170] consider the convergence of EU and Ukrainian legislation on the criteria for classifying sustainability reporting entities, which has a direct impact on the formation of a system of corporate social responsibility.

The legal status of business entities in Ukraine in the context of changes in the current legislation is analyzed by Y. M. Yurkevych, and M. Z. Vovk [3, p. 25], emphasizing the need to modernize legal regulation. O. Kurepina [4, p. 35] examines the legal regime of stimulating economic activity through the prism of the convergence of Ukrainian legislation with EU law based on the Sustainable Development Goals.

The implementation of EU acts in the field of capital markets in Ukrainian legislation is considered by Y. O. Koval [5, p. 42], which is important for understanding the mechanisms of legal responsibility in the financial sector. I. Timoshenkov et al. [6, p. 18] analyze the institutional foundations of Ukraine's transition to a green economy, which affects the formation of new standards of corporate social responsibility.

The modernization of EU legislation on the reporting of economic entities on sustainable development is studied by V. Korol, and O. Nebyltsova [7, p. 40], which is directly related to the issues of corporate social responsibility. M. V. Danylova et al. [8, p. 15] consider international principles and standards of labor law as a basis for improving the labor legislation of Ukraine.

The legal regulation of economic responsibility in accordance with the legislation of Ukraine is analyzed in detail by S. O. Nishchymna, and T. S. Andrushchenko [9, p. 43], which is directly relevant to this study. V. Cherneha [10, p. 12] examines the mechanism of legal regulation of tort obligations of business entities in Ukraine.

The important role of comparative legal research is emphasized by M. Z. Islam, and M. Uddin [11, p. 35], which substantiates the methodological approach of this work. S. Mancuso [12, p. 8] considers legal landscapes in the context of the semiotics of law. G. A. Mashkurov [13, p. 20] analyzes legal monitoring of the implementation of legislative acts through the prism of comparative legal analysis. I. Vuletic [14, p. 30] presents an overview of the Croatian model of corporate criminal liability after 20 years of practice, which allows us to evaluate European approaches to the regulation of business liability. The legal provision of information security of legal entities in accordance with Lithuanian and Ukrainian legislation is studied by M. Pleskach, and I. Tumasoniene [15, p. 18], which expands the understanding of the mechanisms of corporate social responsibility in the information sphere. V. V. Anatiichuk [16, p. 135] analyzes the peculiarities of the legal regulation of general and limited

partnerships in Ukraine and European countries, which is important for understanding various forms of entrepreneurial responsibility. I. V. Bushuieva et al. [17, p. 8] consider the aspects of the analysis of Ukrainian legislation regulating the production of veterinary drugs, demonstrating the sectoral features of legal regulation.

The issue of legal responsibility of social service providers under the legislation of Ukraine is considered by P. D. Pylypenko, and S. M. Synchuk [18, p. 55], which expands the understanding of the scope of application of the principles of entrepreneurial responsibility. D. Luchenko et al. [19, p. 25] investigate the implementation of the principles of open science in Ukrainian legislation through European experience and national characteristics, which demonstrates the complexity of the processes of legal harmonization.

According to the "Association Agreement between Ukraine and the EU", on the one hand, and the European Union, the European Atomic Energy Community and their member states, on the other hand [20, p. 293, 422]: "The Parties shall make efforts to facilitate trade in goods to promote sustainable development, in particular goods that are subject to "fair and ethical trade", as well as those related to the principles of corporate social responsibility and accountability."

The Parties promote the establishment of corporate social responsibility and accountability, as well as encourage socially responsible economic activities.

The Commission, within the framework of A renewed EU strategy 2011-2014 for Corporate Social Responsibility [21, p. 6], proposes a new definition of CSR (corporate social responsibility) as "the responsibility of enterprises for their impact on society". Compliance with current legislation and collective agreements between social partners is a prerequisite for the fulfillment of this responsibility. To fully fulfill their corporate social responsibility, businesses must implement a process of integrating social, environmental, ethical, human rights and consumer issues into their business activities and core strategy, in close cooperation with their stakeholders.

According to Kolohoida et al. [22, p. 296, 299]: "Corporate Social Responsibility is aimed at fostering a responsible attitude of enterprises to their social duties, educating corporations in a responsible attitude to their social duties while maximizing corporate profits, including achieving an important social effect. According to the authors, "CSR has a mutual impact on other types of liability: on the one hand, the law defines the rules of conduct that the corporation is obliged to follow; On the other hand, legal regulations are designed to ensure the profitability of the company and establish environmental and basic ethical standards."

At the same time, Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 [23] details the reporting requirements for business entities on sustainable development, which has a direct impact on corporate responsibility standards in the EU. This document serves as a basis for harmonization of the national legislation of the Member States with the European principles of sustainable development.

3. Problem Statement

The current stage of Ukraine's development is characterized by intensive processes of European integration, which necessitate a fundamental rethinking of the system of legal responsibility of business entities. The Ukrainian legal system, formed in the context of post-Soviet transformation, needs comprehensive modernization to bring it in line with European standards of legal regulation of economic relations.

The problem is that there are significant differences between the Ukrainian and European approaches to the regulation of corporate social responsibility, which can create obstacles to the effective integration of the national economy into the European economic space. The lack of uniform standards of responsibility causes legal uncertainty, reduces the business attractiveness of Ukraine and the process of doing business for foreign investors.

Of particular relevance in this regard is the need to create effective mechanisms for harmonization of national legislation with European legislation in the field of corporate social responsibility. It is not only about the issue of formal compliance of regulations with European directives, but also about the development of an effective law enforcement system that will ensure real convergence of legal systems and promote the development of entrepreneurship in Ukraine.

The scientific problem of the study is the lack of a comprehensive comparative analysis of the mechanisms of legal responsibility of business entities under Ukrainian and European legislation, which does not allow for formulating reasonable recommendations for improving the national legal system and its harmonization with European legislation.

4. Methods and Materials

The purpose of the study is to analyze the legal mechanisms of legal and corporate social responsibility of business entities in Ukrainian and European legislation to determine the directions of their harmonization and improvement of the national legal system.

This goal corresponds to the relevance of European integration processes and the need to bring Ukrainian legislation in line with European standards. There are several approaches to understanding the relationship between corporate and legal responsibility. 1) Corporate responsibility includes both legal and social components. Corporate responsibility is a complex category that goes beyond the purely legal field. 2) Corporate responsibility and legal responsibility as parallel but interrelated categories. This approach emphasizes that corporate responsibility is neither completely legal nor exclusively social.

The study applied a mixed approach to the analysis of the ratio of corporate and legal responsibility of business entities, which made it possible to take into account both legal and broader socio-economic aspects of this category. The first approach, which is considered in the work, treats corporate responsibility as an integrated concept that includes both legal and social components. This interpretation goes beyond purely legal regulation, encompassing the responsibilities of business to society, reflecting modern requirements for sustainable development and corporate social responsibility. The second approach, which is also reflected in the analysis, considers corporate and legal responsibility as parallel but interrelated categories. This view emphasizes that corporate responsibility is not limited only to legal obligations or exclusively to social initiatives, but is formed on the basis of their complementarity. Such a mixed methodological approach provided a comprehensive understanding of the phenomenon of responsibility in the context of harmonization of Ukrainian legislation with European standards, contributing to the development of balanced recommendations for its improvement.

The relevance of the disclosure of this topic is due to a number of factors. Firstly, the processes of European integration imply the need to bring national legislation to European standards, and this is impossible without a deep understanding of the mechanism of legal convergence. Secondly, the successful operation of the economic system of Ukraine requires the development of an effective system of legal responsibility of business entities, which will contribute to attracting investments and business development. Thirdly, the practical significance of the presented study lies in the possibility of using the results of the study to improve the current legislation and legal doctrine in the field of responsibility in business.

5. Results and Discussion

The analysis of Ukrainian and European legislation in the field of legal responsibility of business entities shows that there are significant differences in approaches to legal regulation. The article by I. Horodyskyy et al. [1, p. 60] presents the idea that the adaptation of Ukrainian corporate legislation to European norms implies systemic changes in the mechanism of corporate social responsibility. The authors note that it is necessary to develop consolidated approaches to the regulation of responsibility, which will ensure the effective integration of the national economy into the European space.

The interaction of Ukrainian and European legislation, considered by V. Korol, and O. Nebyltsova [2, p. 172], is especially pronounced in the field of sustainability reporting, which has a direct impact on the development of new standards of corporate social responsibility. These authors support the need to harmonize the criteria for classifying reporting entities to comply with the European principles of transparency and accountability.

In order to systematize the main directions of adaptation of Ukrainian legislation to European standards in the field of corporate social responsibility, it is advisable to analyze the features of important elements of legal regulation.

To assess the level of harmonization of Ukrainian and European legislation in terms of legal responsibility of business entities, it is advisable to use a comparative approach to conduct a comparative analysis of key aspects of legal regulation. In particular, it would be useful to systematize the differences in approaches to corporate social responsibility, sustainability reporting, economic responsibility, and tort liability regulation. Such an analysis allows for the identification of the main gaps in national legislation and assesses the priority areas of its alignment with European standards. The comparative cumulative characteristics presented in Table 1 give an idea of the current state of comparative convergence in legal systems and indicate areas that require priority reforms.

Table 1. Comparative characteristics of the mechanisms of legal responsibility of business entities

Comparison criterion	Ukrainian legislation	European legislation	Degree of convergence
Corporate Social Responsibility	Fragmented adjustment	Integrated approach	Low
Sustainability reporting	Partial implementation	Mandatory standards	Medium
Economic responsibility	Traditional mechanisms	Innovative approaches	Low
Tort obligations	Classic adjustment	Extended interpretation	Medium

Source: Developed based on [1–4].

As shown in Table 1, the greatest differences are observed in the field of corporate social responsibility and economic responsibility, which require priority measures to harmonize national legislation.

The results of the comparative analysis presented in Table 1 confirm the need for a comprehensive modernization of Ukrainian legislation to bring it in line with European standards. Fragmentation of corporate social responsibility regulation and the use of traditional mechanisms of economic responsibility are obstacles to Ukraine's effective integration into the European economic space. At the same time, the partial implementation of sustainability reporting standards shows some progress, but needs further improvement. In the area of tort obligations, the average level of convergence provides opportunities for adaptation through the assimilation of European experience. Thus, the results of the analysis are a call for targeted reforms in order to fully converge legislation and increase the competitiveness of the national economy.

The legislation of Ukraine provides for the main types of liability of business entities: administrative, criminal and civil, which are contained in the Code of Ukraine on Administrative Offenses, the Criminal Code of Ukraine and the Civil Code of Ukraine, respectively. At the same time, within the framework of this study, considerable attention is paid to corporate, economic and environmental responsibility, which characterize modern challenges and features of the regulation of entrepreneurial activity. Corporate social responsibility, in this sense, refers to the obligations of legal entities to the law and society, which overlap in part with civil liability, but focus on internal management and reporting systems. Economic liability refers to traditional mechanisms of compensation for damages, which is related to the norms of civil law, but also has new approaches characteristic of European standards.

The legal status of business entities in Ukraine, studied by Y. M. Yurkevych, and M. Z. Vovk [3, p. 27], is characterized by dynamic changes that reflect the general trends in adaptation to European standards. The authors emphasize the need to modernize approaches to determining the legal status of various organizational and legal forms of entrepreneurship to ensure their compliance with European principles.

O. Kurepina [4, p. 37] examines the legal regime of stimulating economic activity through the prism of the convergence of Ukrainian legislation with EU law based on the Sustainable Development Goals. This study demonstrates that the effectiveness of mechanisms of legal stimulation of entrepreneurship directly depends on the degree of harmonization of national norms with European standards of corporate social responsibility.

For a visual representation of the process of adaptation of Ukrainian legislation to European standards, it is advisable to consider the structural model of this process, shown in Figure 1.

For a systematic understanding of the process of harmonization of Ukrainian legislation with the standards of European legislation in the field of legal responsibility of business entities, it is necessary to take into account the stages of adaptation of the national legal system. This is a complex procedure that includes several tasks implemented sequentially to analyze, compare and optimize legal

regulations. The rational chain of actions in the structural adaptation model, as described in Figure 1, can be considered as the reason for the successful approximation of Ukrainian legislation to the European one and the creation of a favorable legal environment in which business activities can be carried out.

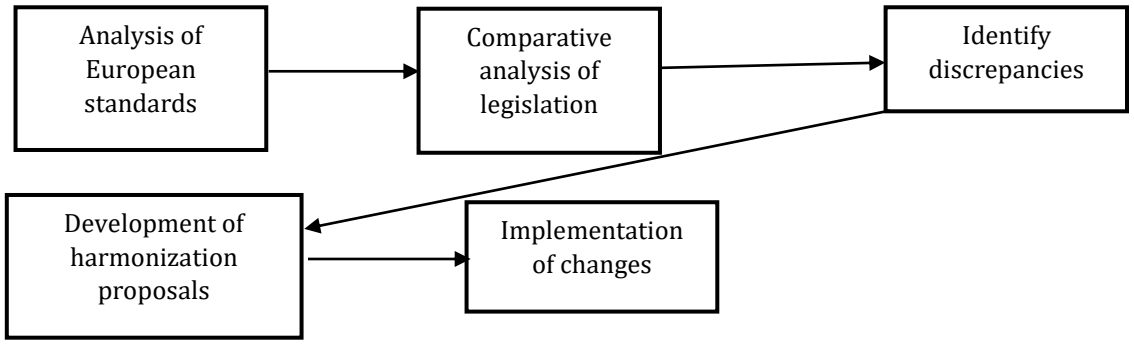


Figure 1. Adaptation of Ukrainian legislation to European standards of the structural model
Source: Author's development.

The process of adaptation of Ukrainian legislation, as can be seen from Figure 1, is systemic and involves the sequential passage of all phases from the analysis of European standards to the implementation of changes in the national legal system in practice.

Figure 1 shows a systemic model of harmonization of Ukrainian legislation, consisting of five stages: from the analysis of European standards to the practical implementation of changes. Each step also has its own meaning; in particular, an important comparative analysis allows you to understand the differences between national and European approaches to the regulation of legal liability, and the creation of proposals for harmonization is the basis for the development of an effective legal mechanism. Such a structured model guarantees the consistency and complexity of the adaptation process, which is of great importance for the successful integration of Ukraine into the European legal and economic space.

The implementation of EU acts in the field of capital markets in the Ukrainian legislation, studied by Y. O. Koval [5, p. 44], is of particular importance for understanding the mechanisms of legal responsibility in the financial sector. The author emphasizes that the priority areas of adaptation include the creation of effective mechanisms for supervision and control over the activities of financial institutions, which requires the improvement of the system of their legal responsibility.

The institutional foundations of Ukraine's transition to a green economy, analyzed by I. Timoshenkov et al. [6, p. 20], demonstrate the need to form new standards of environmental responsibility of business entities. The study shows that an effective transition to sustainable development requires a radical rethinking of traditional approaches to corporate social responsibility.

For a better understanding of the mechanisms of harmonization of Ukrainian legislation in the field of legal responsibility of business entities with European standards, it is necessary to classify the types of main liability and assess the level of their compliance with European standards. The analysis of civil, administrative, criminal and environmental liability makes it possible to determine the level of readiness of the national legal system for integration into European approaches. Such a classification, which is reflected in Table 2, demonstrates the status quo of the regulation of various types of legal liability in Ukraine and future expectations for their harmonization with EU norms, which is valuable for formulating specific reforms.

Table 2. Classification of types of legal liability of business entities

Type of responsibility	Ukrainian regulation	European standards	Prospects for harmonization
Civil law	of the Civil Code of Ukraine	EU Directives	High
Administrative	Code of Administrative Offenses	EU regulations	Average
Criminal	of the Criminal Code of Ukraine	Framework solutions	Low
Environmental	Special legislation	EU Green Deal	High
Corporate	Association Agreement	EU Directive	High

Source: Developed based on [5–9].

Table 2 shows the different degree of readiness of certain types of legal responsibility for harmonization with European ones. Civil and environmental liability has great potential for adaptation due to the compliance of the principles of the Civil Code of Ukraine with European directions and the intensive development of special legislation in the context of the EU Green Deal. In turn, administrative liability, which requires harmonization of the provisions of the Code of Administrative Offenses with EU regulations, has an average chance. The greatest difficulties are related to criminal liability, in which the lack of convergence is explained by differences between the national norms of the Criminal Code of Ukraine and the EU framework decisions. Thus, the results of the classification emphasize the need for a differentiated approach to reforming legal regulation in order to ensure effective legal convergence.

Although environmental responsibility is regulated by special legislation, it has common features with administrative and civil liability, but it is aimed at implementing the principles of sustainable development (including the EU Green Deal). This connection brings to the fore the need to expand and change the legal framework in such a way that there is a holistic approach to the harmonization of legislation.

Modernization of EU legislation on reporting of economic entities on sustainable development, studied by V. Korol, and O. Nebyltsova [7, p. 42], has a direct impact on the formation of new standards of corporate social responsibility. The authors substantiate that the implementation of ESG principles in corporate governance requires a radical rethinking of traditional approaches to the legal responsibility of business entities.

International principles and standards of labor law as a basis for improving the labor legislation of Ukraine are considered by M. V. Danylova et al. [8, p. 17]. The study demonstrates that the harmonization of labor legislation with European standards requires improving the mechanisms of responsibility of employers for violation of labor rights of employees.

The legal regulation of economic responsibility under the legislation of Ukraine is analyzed in detail by S. O. Nishchymna, and T. S. Andrushchenko [9, p. 45]. The authors emphasize that the current system of economic responsibility needs to be significantly improved to bring it in line with European standards of effectiveness and proportionality of sanctions.

For a proper analysis of the legal responsibility of business entities, it is important to consider such responsibility as a systemic category that combines different types of responsibility into a single logical structure. This system is based on a regulatory system and covers civil, administrative and criminal liability, which are gradually implemented through special mechanisms. Figure 2 presents a systemic model of legal responsibility, which represents the relationship between the main components and demonstrates the consistency of its functioning in the context of harmonization of Ukrainian legislation with European standards.

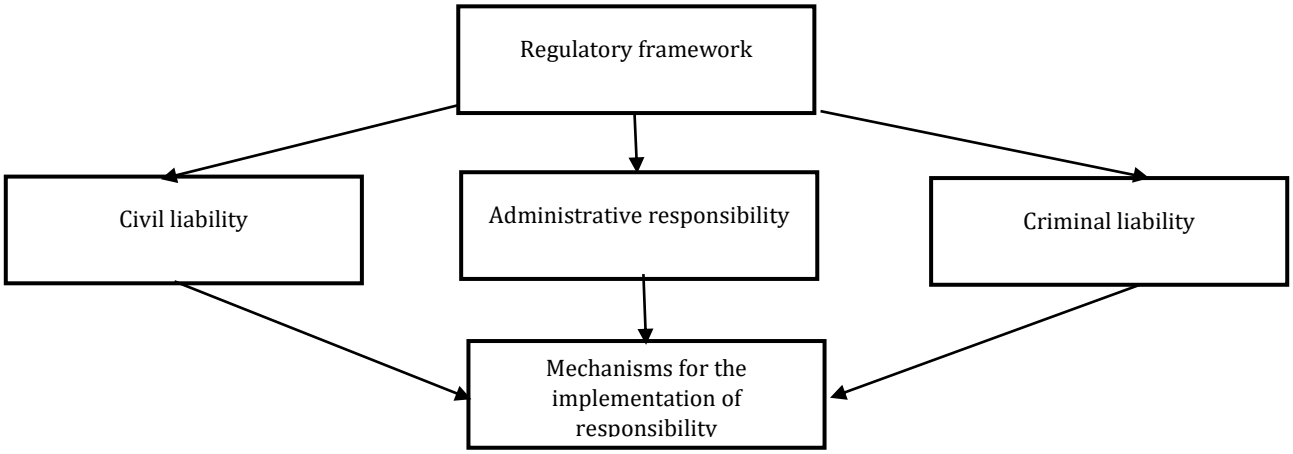


Figure 2. System model of legal responsibility of business entities

Source: Developed based on [10; 11].

Figure 2 shows a comprehensive approach to understanding the legal responsibility of business entities, where the regulatory framework is the basis for civil, administrative and criminal liability, which are ultimately implemented through effective mechanisms. Such a structure emphasizes the need for consistency of legal norms with practical means of their application, which is important for the adaptation of national legislation to European standards. The system model shows that the

improvement of each of the components – from the level of the regulatory framework to the implementation mechanisms – contributes to increasing the efficiency of legal regulation and the fair functioning of entrepreneurial activity in the context of Ukraine's integration into the European economic space.

The mechanism of legal regulation of tort obligations of business entities in Ukraine, studied by V. Cherneha [10, p. 14], demonstrates the specific features of the national approach to the regulation of non-contractual liability. The author emphasizes the need to modernize legal mechanisms to ensure their compliance with European principles of fair compensation for damages.

The importance of comparative legal research, substantiated by M. Z. Islam and M. Uddin [11, p. 37], emphasizes the methodological importance of comparative analysis for understanding the processes of legal harmonization. The authors emphasize that effective adaptation of national legislation to international standards is impossible without a deep comparative analysis of different legal systems.

To ensure effective harmonization of the legal frameworks of Ukraine and European models in the field of legal responsibility of enterprises, a clear action plan should be developed, the implementation of which should be organized in stages. This procedure should be organized and will include activities such as the preparation, development of regulatory changes, their practical implementation and continuous monitoring of their effectiveness. The stages of implementation given in Table 3 make it possible to determine the main measures, expected results and deadlines of implementation that will contribute to the successful approximation of the national legal system to European requirements.

Table 3 demonstrates a step-by-step approach to the implementation of European standards, which ensures the consistency and effectiveness of the process of legal adaptation in the field of entrepreneurial responsibility. The monitoring phase, which is of an ongoing nature, assesses the effectiveness and possibility of policy change. Such a structure emphasizes the importance of uniformity in the implementation of reforms to achieve stable integration of Ukraine into the European legal space.

Table 3. Stages of implementation of European standards of entrepreneurial responsibility

Stage	Main activities	Expected results	Implementation period
Preparatory	Analysis of current legislation	Gap detection	6 months
Legislative	Development of amendments to legislation	Draft regulations	12 months
Implementation	Adoption and enactment	Updated legal framework	18 months
Monitoring	Performance control	Evaluation of results	Constantly

Source: Developed based on [12–15].

The data in Table 3 demonstrate a step-by-step approach to the implementation of European standards, which ensures consistency and predictability of the harmonization process. The preparatory stage of 6 months involves the identification of gaps in the current legislation, and the stage of development of legislative acts lasting 12 months forms the basis for new regulations. The implementation phase, designed for 18 months, guarantees the implementation of changes at the practical level (updating the legal framework).

The legal landscapes studied by S. Mancuso [12, p. 10] in the context of the semiotics of law allow a deeper understanding of the processes of transformation of legal systems. The author emphasizes that successful harmonization of legislation requires not only formal harmonization of norms, but also ensuring their semantic and functional coordination.

Legal monitoring of the implementation of legislative acts through the prism of comparative legal analysis, conducted by G. A. Mashkurov [13, p. 27], demonstrates the importance of systematic control over the processes of legal adaptation. The study shows that the effectiveness of the implementation of European standards largely depends on the quality of legal monitoring and the timely adjustment of legislative initiatives.

Corporate criminal liability, considered by I. Vuletic [14, p. 32] on the example of the Croatian model after 20 years of practice, provides valuable experience for Ukraine in the formation of an effective system of criminal liability of legal entities. The author emphasizes that the success of the Croatian model lies in a balanced approach to establishing the criminal liability of corporations, which provides both a preventive effect and fairness of punishment.

Legal provision of information security of legal entities in accordance with Lithuanian and Ukrainian legislation, studied by M. Pleskach, and I. Tumasoniene [15, p. 20], expands the understanding of modern aspects of corporate social responsibility in the information sphere. The authors emphasize the need to form special mechanisms of responsibility for information security violations that meet European standards of personal data protection and cybersecurity.

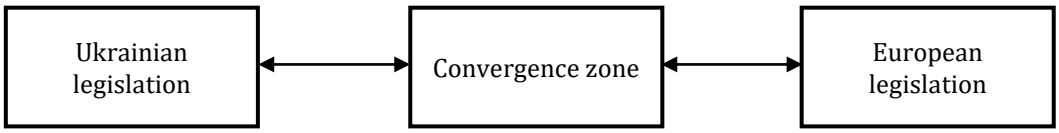


Figure 3. Conceptual model of harmonization of Ukrainian and European legislation
Source: Author's development.

Figure 3 demonstrates a conceptual model of the harmonization process, where the convergence zone is a space of interaction and mutual influence of legal systems, which ensures a gradual approximation of national legislation to European standards.

The peculiarities of legal regulation of general and limited partnerships in Ukraine and European countries, analyzed by V. V. Anatiichuk [16, p. 137], are important for understanding the specifics of responsibility of various organizational and legal forms of entrepreneurship. The author emphasizes that the harmonization of the legal status of companies requires taking into account the European experience in the distribution of responsibility between participants.

The aspects of the analysis of the Ukrainian legislation regulating the production of veterinary drugs, considered by I. V. Bushuieva et al. [17, p. 12], demonstrate the sectoral features of legal regulation and the specifics of responsibility in the field of pharmaceutical activity. The study shows the need to adapt industry legislation to European quality and safety standards.

Table 4. Projected Effects of Harmonization of Legislation in the Field of Entrepreneurial Responsibility

Sphere of influence	Positive effects	Possible risks	Mitigation measures
Investment climate	Increasing investor confidence	Temporal uncertainty	Transitional provisions
Corporate governance	Improving standards	Increased costs	Phased implementation
Enforcement	Unification of practice	Adaptation difficulty	Law enforcement training
International competitiveness	Integration into the EU	Loss of national specificity	Maintaining basic principles

Source: Developed based on [18; 19].

Table 4 illustrates the complex nature of the impact of harmonization processes on various areas of legal regulation of entrepreneurial activity, emphasizing the need for a balanced approach to reforming legislation.

The issues of legal responsibility of social service providers under the legislation of Ukraine, considered by P. D. Pylypenko, and S. M. Synchuk [18, p. 57], expand the understanding of the scope of application of the principles of entrepreneurial responsibility to the social sphere. The authors substantiate the need to create special mechanisms of responsibility for entities providing social services.

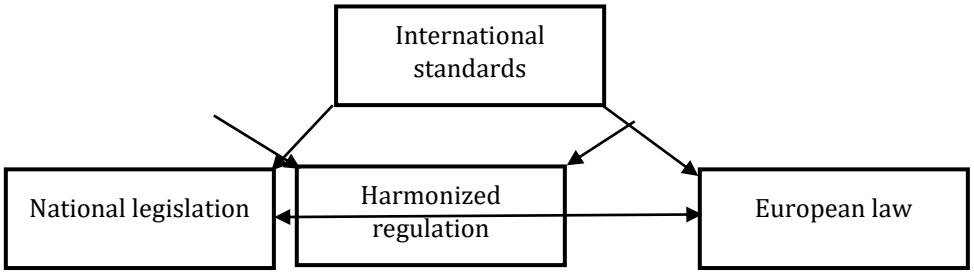


Figure 4. Integrated model of legal regulation of entrepreneurial responsibility
Source: Author's development.

Figure 4 presents an integrated model of legal regulation, where harmonized regulation is the result of the interaction of international standards, national legislation and European law, which provides an integrated approach to the formation of a system of entrepreneurial responsibility.

The implementation of the principles of open science in Ukrainian legislation on the basis of European experience and national characteristics, studied by D. Luchenko et al. [19, p. 30], demonstrates general trends in the harmonization of legal systems. The authors emphasize that the successful implementation of European principles requires taking into account national specifics and the gradual nature of legal changes. The results of the study show that the harmonization of Ukrainian and European legislation in the field of legal responsibility of business entities is a complex and multifaceted process that requires a systematic approach and taking into account many factors. The key areas of further research are the development of specific mechanisms for adapting national legislation to European standards and the creation of an effective system of legal monitoring of harmonization processes.

The analysis of legal mechanisms for harmonization of Ukrainian legislation with European standards in the field of legal responsibility of business entities is based on key international and national documents. The Association Agreement between Ukraine and the EU [20, p. 293, 422] establishes a general framework for the adaptation of Ukrainian law to the EU norms, in particular in the field of business regulation, which provides for the introduction of corporate social responsibility standards.

The updated EU Strategy on Corporate Social Responsibility for 2011–2014 [21, p. 6] defines strategic directions for the development of business responsibility in the European space, focusing on social and environmental aspects that can serve as a guide for Ukraine.

Corporate social responsibility (CSR) is a key element of modern business, combining legal, economic, social and environmental aspects of business entities. Responsibility in this area is regulated by both the national legislation of Ukraine and international standards, such as ISO 26000, GRI Standards and EU directives, in particular the CSRD. It covers not only binding legal norms, but also voluntary initiatives aimed at ensuring sustainable development, protecting the rights of stakeholders and minimizing the negative impact on society and the environment. In the context of globalization and the growing demands of investors and partners, in particular in European markets, business entities are forced to adapt to new standards that imply both legal and reputational liability. For a systematic understanding of the grounds and forms of liability of business entities in relation to CSR, Table 5 is given below, which details the legal bases, subjects, grounds for occurrence and forms of liability.

Table 5. Grounds and forms of liability of business entities in relation to CSR

Type of responsibility	Legal framework	Responsible entities	Grounds for liability	Forms of responsibility
1. CIVIL (PROPERTY) LIABILITY	Civil Code of Ukraine (Article 96), Law of Ukraine No. 4196-IX "On Peculiarities of Regulation of Legal Entities" (from 28.08.2025)	All legal entities (LLC, JSC, PJSC) Individual entrepreneurs State and municipal enterprises Other business companies	Non-fulfillment or improper performance of contractual obligations Causing property damage to other entities Violation of consumer rights Production of low-quality or dangerous products Intellectual property infringement	Indemnification (real losses + lost profits) Payment of penalties (fines, penalties) Payment of compensation for moral damage Late payment penalty 3% per annum for the use of other people's funds
2. ECONOMIC AND LEGAL LIABILITY	Commercial Code of Ukraine (expired on 28.08.2025) Law No. 4196-IX (transition period)	Business entities of all forms of ownership Participants in economic relations Management bodies of enterprises	Violation of commercial contracts Failure to fulfill economic obligations Supply of low-quality products Violation of antimonopoly legislation Unfair competition	Indemnification Penalties Penalty for delay Operational and economic sanctions Administrative and economic sanctions
3. ADMINISTRATIVE RESPONSIBILITY	Code of Ukraine on Administrative Offenses (Code of Ukraine on Administrative Offenses)	Since 2017: only officials of enterprises (director, chief accountant, managers) Exception: sole proprietorship as individuals Legal entities are NOT administratively liable	Violation of tax legislation Violation of sanitary standards Violation of trade rules Violation of fire safety Violation of landscaping rules Violation of license conditions	Administrative fine from 5 to 100 tax-free minimum incomes of citizens (from 85 to 1700 UAH) Warning Confiscation of items Suspension of activities (temporary)

Type of responsibility	Legal framework	Responsible entities	Grounds for liability	Forms of responsibility
4. CRIMINAL LIABILITY OF LEGAL ENTITIES	Criminal Code of Ukraine (Chapter XIV-1) Law No. 4111-IX of 04.12.2024 (effective from 26.12.2024)	NEW FROM 2024: Legal entities (for certain crimes) Officials of enterprises (managers, owners)	Bribery of officials of foreign states Money laundering Corruption crimes Financing of terrorism Environmental crimes (significant damage) Criminal liability is possible without a suspected individual	To legal entities: Fine up to 75,000 tax-free minimums (up to UAH 1.275 billion) Temporary restriction of activities (from 1 to 3 years) Confiscation of property Liquidation of a legal entity To officials: Imprisonment Fines Restriction of the right to hold positions
5. LABOR LIABILITY	Labor Code of Ukraine (Article 265), Law on Labor Protection	Employers (legal entities) Individual entrepreneurs with employeesDirectors, managers Responsible officials	Late payment of wages Non-compliance with the minimum wage (minimum wage from 01.04.2025 = UAH 8,000) Admission of employees without registration Violations of labor protection Violation of the work and rest regime Discrimination against employees	Financial sanctions (fines) under Art. 265 of the Labor Code: - For late payment of wages: 10 times the minimum wage (up to UAH 80,000)- For non-compliance with the minimum guarantees: 10 times the minimum wage - For non-registration of employees: 30 times the minimum wage (up to UAH 240,000) Compensation for moral damage to employees During martial law, the State Labor Service suspended fines
6. ENVIRONMENTAL RESPONSIBILITY	The Law "On Environmental Protection" (Articles 68-70), the Code of Administrative Offenses (Chapter 7), Law No. 3855-IX "On Integrated Prevention and Control of Industrial Pollution" (effective from 08.08.2025), Law "On Environmental Impact Assessment" (Art. 15-16)	All business entities Nature users Polluting Enterprises Officials of Enterprises	Environmental pollution (air, water, soil) Exceeding emission standards Work without an Integrated Environmental Permit (IDD) Violation of waste management rules Destruction of natural objects Non-payment of environmental tax	Administrative fines from UAH 510 to 18,000 (Code of Administrative Offenses) Compensation for environmental damage (according to special methods) The obligation to restore the environment Penalty of 10% of unpaid eco-tax Suspension or TERMINATION of the activity of the enterprise Revocation of permits NEW: mandatory IDD for major pollutants
7. TAX LIABILITY	Tax Code of Ukraine (Chapter II)	All taxpayers (legal entities) Individual entrepreneurs Tax Agents	Late payment of taxes Failure to submit tax reports Understatement of tax liabilities Violation of the accounting procedure Non-withholding of tax by an agent	Penalty of 25% of the amount of unpaid taxes Penalty of 120% of the NBU key policy rate Penalty for late reporting from 170 to 1020 UAH Fine for gross violation of accounting up to UAH 5100 Criminal liability (in case of an amount of more than UAH 18 million)
8. LIABILITY IN THE FIELD OF COMPETITION PROTECTION	Law "On Protection of Economic Competition"	Monopolistic business entities Enterprises abusing a dominant position Participants in anti-competitive concerted actions	Abuse of monopoly position Anti-competitive concerted actions Unfair competition Violation of public procurement rules	Fine up to 10% of the company's annual income Penalty of up to 5% of annual income for repeated violations Obligation to indemnify Forced distribution of the subject
9. RESPONSIBILITY FOR ESG/NON-FINANCIAL REPORTING	Draft Law No. 13598 (registered on 04.08.2025, expected adoption) EU Directive 2022/2464 (CSRD)	SUBJECT to mandatory reporting: Large enterprises (revenue >40 million euros, assets >20 million euros, employees >250)	Failure to submit non-financial reporting (ESG reporting) False or incomplete information in an ESG report Lack of audit (assurance) of reporting	PLANNED: Penalties for non-submission of reports Administrative Responsibility of Officials Reputational risks

Type of responsibility	Legal framework	Responsible entities	Grounds for liability	Forms of responsibility
	European ESRS standards	Medium-sized enterprises of public interest Subsidiaries of large EU groups	Non-compliance with ESRS standards	Restriction of access to EU funding Inability to participate in EU tenders Implementation stages: 2026-2027: large enterprises 2028-2029: medium-sized enterprises
10. SOCIAL RESPONSIBILITY OF BUSINESS (CSR) - VOLUNTARY	International standards: ISO 26000, SA 8000, GRI Standards UN Global Compact Strategy of the Cabinet of Ministers of Ukraine on Sustainable Development	Large and medium-sized companies (voluntary) Socially responsible enterprises Participants of the UN Global Compact Exporters to the EU (actually mandatory)	Violation of ethical standards of doing business Failure to fulfill obligations to stakeholders Human rights violations in the supply chain Negative impact on the community Non-compliance with ESG principles	Reputational losses Loss of investors and partners Exclusion from the lists of socially responsible companies Reducing brand value Consumer rejection of products Loss of access to European markets Note: formally, there is no legal responsibility, but the actual liability is growing due to the demands of partners and investors

After analyzing Table 5, which systematizes the grounds and forms of responsibility of business entities in relation to corporate social responsibility (CSR), it can be concluded that responsibility in this area is multifaceted and covers a wide range of legal, economic, social and reputational aspects. Civil and economic liability focuses on compensation for damages and penalties for non-fulfillment of contractual obligations, production of low-quality products or violation of consumer rights, which is regulated by the Civil Code of Ukraine and Law No. 4196-IX. Administrative liability defined by the Code of Ukraine on Administrative Offenses concerns officials and provides for fines for violation of tax legislation, sanitary standards or licensing conditions. Criminal liability of legal entities, introduced in 2024 by Law No. 4111-IX, includes significant fines, confiscation of property and even liquidation for corruption crimes, legalization (laundering) of property obtained by criminal means, and others. Labor liability regulated by the Labor Code focuses on the protection of employees' rights, in particular through fines for late payment of wages or failure to formalize labor relations. Environmental liability, based on environmental legislation, is aimed at preventing industrial pollution and provides for fines, compensation for damages and suspension of activities. Tax liability and liability in the field of competition protection further increase regulatory pressure on business entities. Particular attention is drawn to CSR corporate social responsibility, which, although it has no formal legal basis, is gaining actual weight due to reputational risks, loss of markets, and stakeholder requirements, especially in the context of exports to the EU and compliance with ESG standards. Thus, an integrated approach to CSR requires business entities not only to comply with legal norms, but also to actively implement ethical and socially responsible practices to ensure sustainable development and competitiveness.

O. Kolohoida et al. [22, p. 296, 299] analyze the legal foundations of corporate social responsibility in Ukraine, emphasizing the need to integrate European principles into the national legal system to increase business competitiveness.

Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 [23] details the obligations of business entities to report on sustainable development, which is an important element of harmonization of legislation.

6. Conclusions

The study allows us to formulate several fundamental conclusions on the state and prospects for the development of legal regulation of legal responsibility of business entities in the context of harmonization of Ukrainian and European legislation.

Firstly, it has been established that the modern system of legal responsibility of business entities in Ukraine is characterized by fragmentation of legal regulation and an insufficient level of integration

with European standards. The biggest disagreements are observed in the areas of corporate criminal liability, environmental responsibility and mechanisms for ensuring social responsibility of business.

Secondly, it is revealed that the process of convergence of legal systems requires not only the formal implementation of European norms, but also a deep transformation of the legal culture and institutional structure. Effective harmonization is possible only if national legal traditions are preserved while adapting to international standards.

Thirdly, the need for a differentiated approach to the regulation of liability of different categories of business entities, taking into account their organizational and legal form, size, scope of activity and socio-economic significance, has been proved. Small and medium-sized enterprises need special attention, for which simplified procedures and proportionate sanctions should be created.

Fourthly, the critical importance of developing preventive mechanisms of legal responsibility that would stimulate compliance with the law and ethical standards of doing business has been established. European experience demonstrates the effectiveness of a combination of punitive and stimulating measures of influence.

Fifthly, priority areas for further development of legislation have been identified, including: the creation of a comprehensive corporate governance system, the introduction of ESG standards, the modernization of consumer and investor protection mechanisms, and the development of alternative dispute resolution institutions.

Future research in this area should be directed to a detailed analysis of the sectoral features of legal regulation of liability, the study of foreign experience in the functioning of specialized corporate supervision bodies, as well as the development of a methodology for assessing the effectiveness of legal liability mechanisms. The study of the impact of digitalization on the transformation of traditional approaches to corporate social responsibility and the need to adapt legal mechanisms to the challenges of the digital economy is of particular relevance.

As of 2025, corporate social responsibility in Ukraine is transforming from a voluntary initiative to mandatory regulation, combining traditional forms of liability (civil, labor, tax) with new ones (criminal for legal entities, enhanced environmental), while ESG reporting is in the process of legislative consolidation, and CSR remains formally voluntary, but actually mandatory for companies cooperating with the EU.

The practical implementation of the results of the study requires coordinated efforts of the legislative and executive authorities, the scientific community, representatives of business and civil society. Only with a comprehensive approach and consistent implementation of the proposed measures can it be ensured that an effective and fair system of legal responsibility can be ensured, which will contribute to the sustainable development of the national economy and the successful integration of Ukraine into the European economic space.

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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



Economic-Legal Incentives as a Tool of State Policy for the Production and Use of Autonomous Systems: Doctrine, Instruments, and Effectiveness Criteria

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.12

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ABSTRACT

Autonomous systems are moving from labs to production lines and public services, exposing mismatches between traditional innovation incentives and heightened demands for safety, transparency, and accountability. This paper reframes economic-legal incentives not as a scatter of perks but as an integrated architecture of mutual obligations among the state, developers, and procurers. The objective is to design a risk-oriented framework for selecting and combining instruments–tax, financial, regulatory, procurement, and infrastructural–across classes of autonomy and contexts of use while preserving procedural legitimacy. The study blends doctrinal legal analysis with comparative law, policy design, and regulatory impact reasoning. Empirical inputs include recent scholarly debates, data on innovation-oriented public procurement, case studies of regulatory sandboxes and fiscal incentives in peer jurisdictions, and sectoral examples from transport, healthcare, and industrial automation. Results are operationalized via three indicator groups: innovation outputs, procedural-legal quality, and safety outcomes. The paper proposes a taxonomy of instruments with criteria for legal fitness and conditions of use, and advances a model of "contingent incentives" linked to conformity assessment, algorithmic audit, data traceability, and rapid recall mechanisms. It develops an algorithm for composing instrument bundles from risk profile and autonomy level to a trio of sandboxing, mission-oriented procurement with control gates, and fiscal levers tied to verifiable milestones. The analysis shows that innovation procurement acts as a demand multiplier, whereas tax incentives are effective only when they "read" the technology lifecycle and the availability of testing infrastructure. A set of indicators sensitive to both innovation output and procedural quality is articulated. Effective stimulation of autonomous systems is not the sum of benefits but an architecture of "stitches" between support, responsibility, and oversight. The most successful bundles accelerate innovation while ensuring adjacent risks and preserving the capacity to stop or recalibrate without collapsing entire programs. The proposed framework is directly implementable in procurement documentation and R&D support schemes, strengthening verifiability, procedural legitimacy, and public trust.

KEYWORDS

autonomous systems, economic-legal incentives, regulatory sandboxes, innovation-oriented public procurement, risk-based regulation, R&D tax incentives, accountability and safety, effectiveness indicators.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Економіко-правові стимули як інструмент державної політики щодо виробництва та використання автономних систем: доктрина, інструменти та критерії ефективності

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.12

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АНОТАЦІЯ

Автономні системи переходять із лабораторій у виробництво й публічні послуги, оголюючи нестиковки між традиційними інструментами підтримки інновацій та підвищеними вимогами до безпеки, прозорості й підзвітності. У статті пропонується читати господарсько-правове стимулювання не як розсип пільг, а як інтегровану конструкцію взаємних зобов'язань держави, розробника й замовника. Мета дослідження – створити ризик-орієнтовану рамку добору й поєднання інструментів (податкових, фінансових, регуляторних, закупівельних, інфраструктурних) під різні класи автономності та контексти застосування, зі збереженням процедурної легітимності. Застосовано поєднання догматичного аналізу, порівняльно-правового підходу, policy design та оцінювання впливу регулювання. Емпіричний матеріал включає сучасний масив доктринальних праць, дані про інноваційні закупівлі, кейси «пісочниць» і фіскальних стимулів у суміжних юрисдикціях, а також секторальні приклади з транспорту, охорони здоров'я та промислової автоматизації. Операціоналізація результатів здійснюється через три групи індикаторів: інноваційні, процесуально-правові та безпекові. Запропоновано таксономію інструментів із критеріями правової придатності та умовами застосування; обґрунтовано модель «умовних стимулів», прив'язаних до оцінювання відповідності, аудиту алгоритмів, трасованості даних і механізмів швидкого відкликання. Сформовано алгоритм добору комбінацій: від профілю ризику й рівня автономності – до «зв'язки» регуляторної пісочниці, місіє-орієнтованих закупівель із контрольними точками та фіскальних важелів, прив'язаних до верифікованих етапів прогресу. Показано, що інноваційні закупівлі виконують роль мультиплікатора попиту, тоді як податкові стимули демонструють ефективність лише за умови «читання» життєвого циклу технології й доступності інфраструктури тестування. Виведено набір індикаторів, чутливих одночасно до інноваційного виходу і до якості процедур. Ефективне стимулювання автономних систем – це не сума пільг, а архітектура «швів» між підтримкою, відповідальністю й наглядом. Найкраще працюють комбінації інструментів, де кожен елемент не лише прискорює, а й страхує ризики сусіднього, зберігаючи можливість зупинки та корекції курсу без руйнування програми. Запропонована рамка придатна до прямої імплементації в політику інноваційних закупівель і програми підтримки R&D, забезпечуючи перевірність, процедурну легітимність та збереження довіри.

КЛЮЧОВІ СЛОВА

автономні системи, господарсько-правове стимулювання, регуляторні пісочниці, публічні закупівлі інновацій, ризик-орієнтоване регулювання, податкові стимули R&D, відповідальність і безпека, індикатори ефективності.

1. Introduction

Autonomous systems are no longer an exception and are increasingly becoming the infrastructure of everyday economies – invisible "engines" of production lines, logistics networks, service platforms and public services. That is why both public policy and economic and legal mechanisms to support innovation can no longer operate by inertia: they must learn to adapt to the risks that autonomy generates, as well as to the opportunities it presents – from accelerating industrial modernization to increasing productivity and resilience of supply chains [1–3]. In this plane, stimulation is not a purely fiscal or administrative technique; This is a legal matrix of choice, in which support tools must be internally aligned with the regimes of product safety, cyber defense, liability for damages and integrity of public procurement, so that the innovation impulse does not turn into a regulatory "corrosive environment" [4–9].

The Ukrainian context adds to this task the dimension of speed and strategic autonomy. The need for economic recovery, the technological breakthrough of the military-industrial complex, the digitalization of the public sector, and the emergence of special regimes for the food industry raise the question: what should be the dimensional and weight formula of legal incentives in order not only to create "greenhouse" conditions for developers, but also to sew into the fabric of the market responsible procedures for access to the operation of autonomous systems [10; 11]. Such a task is not solved by "one lever" of tax preferences or grants; It requires a flexible combination of tools – from innovative procurement to regulatory sandboxes, from contractual liability standards to data infrastructures that are open as safe as possible and closed as required by law [2; 7–9].

The European evolution of frameworks – from artificial intelligence to data, from general product safety to machines and cyber resilience – offers useful optics for Ukrainian law and order. Harmonized approaches to risk and compliance assessment, the principles of transparency and accountability of developers and users, new models of experimental regulation make it possible to turn incentives into conditional, gradual and verifiable – with reference to the level of autonomy, scope of application and safety evidence [1; 4–6; 8; 12]. At the center of such a model is not a "subsidy as such", but an incentive that is both a filter and a contract: it accelerates innovation, but for this, it requires higher standards of verification, algorithm auditing, and readiness to withdraw in case of detected flaws [12–14].

The scientific discourse of recent years only reinforces this thesis. The analysis of regulatory sandboxes in EU law, the relationship between innovation and security, the debate around models of responsibility for the actions of autonomous systems, as well as the study of public procurement of innovations as a policy – all this points to the advantages of risk-oriented, mission-oriented and adaptive capacities of the state compared to "flat" support instruments [12; 15–17]. Empirical work on the effects of tax incentives on R&D and startup markets shows that design matters: the same benefit works differently depending on the phases of the technology life cycle, funding structure, human resources and availability of test sites [18; 20]. In the legal plane, in the end, any stimulation of autonomy must be stitched with responsibility: otherwise, the "innovation debt" turns into external costs for the consumer and society [19; 13; 14].

The Ukrainian scientific conversation, which is growing around "sandboxes", European integration of standards, procurement of innovations and human rights in the context of the expansion of AI, suggests another framework – the framework of legitimation. Incentives should not only be legitimate from the point of view of economic law and related industries; They must be legitimate for the communities affected by autonomy: medical patients, urban communities, workers, and defense users. This requires high-quality communication, procedural guarantees of participation and supervision, as well as the integration of human rights standards into technical protocols and contractual terms [22–24; 27; 28]. As a result, we are faced with a research question that determines the trajectory of this article: how to design an economic and legal system of incentives for the production and use of autonomous systems in such a way that it simultaneously increases innovation output, reduces systemic risks and strengthens trust in public policy [7; 8; 16; 21; 25; 26].

The purpose of the study is to develop a risk-based, evidence-based framework for the selection and combination of economic and legal incentives – tax, financial, regulatory, procurement and infrastructure – for different classes of autonomous systems and scenarios for their use in Ukraine, taking into account European and global dynamics. Such a framework is designed to combine the efforts of rule-making with policy instruments, to create conditions for experimental, but responsible

implementation of autonomous systems and create mechanisms for evaluating effectiveness sensitive to security, human rights and competition [1–3; 6; 7; 12; 15; 17; 18; 22–24].

2. Literature Review

The thesis that the innovativeness of autonomous systems does not contradict security, but requires a different design of legal incentives, is consistently argued in modern European doctrine. Thus, T. Buoc, together with A. Fernandez et al. convincingly show that regulatory "sandboxes" can serve not as a "privilege to experiment", but as a procedural form of matching the speed of testing with verification, transparency and conditional admission to the market; To do this, the "pilot" status must be associated with increased requirements for supervision, data tracing and readiness for product recall [12]. The arguments of T. Moraz and co-authors are also consonant with these considerations, emphasizing that ethical "sandboxes" in AI ecosystems work only when they are embedded in the conformity assessment cycle and provided with feedback channels with users and the regulator [15].

In the plane of risk and responsibility distribution, A. Sáenz et al. rightly note that in the absence of algorithm audit procedures and clear rules for interaction between the developer and the operator, economic incentives "wash out" responsibility, shifting external costs to the consumer or the budget [13]. A view from a specific industry is added by M. L. Kubitsa, showing on the material of transport law how delicate differences in the doctrine of torts and insurance affect the distribution of risks between the manufacturer, integrator and operator of autonomous solutions; Therefore, any incentive scheme should be aligned with the national model of responsibility [19]. In the medical and legal context, A. Eldakak and co-authors emphasize that autonomous systems in healthcare increase the need for evidence-based safety and clear accountability routes; otherwise, the "legal debt" is rapidly growing in proportion to the scale of implementation [14].

When it comes to public policy instruments, S. F. Grimber et al. convincingly demonstrate that it is public procurement of innovations – in their "conventional", adaptive and mission-oriented forms – that becomes a key multiplier of demand for autonomous technologies, provided that the state has the procedural capacity to deal with uncertainty and risks [16]. O. Chiappinelli et al. summarize the state of knowledge in a broad overview: without strategic task setting and qualitative procurement performance metrics, even generous incentives are not converted into an innovative output [17]. This picture is complemented by the conclusions of J. S. Chen et al.: the effects of tax credits on R&D significantly depend on the phase of development of companies, access to venture capital and local knowledge infrastructure – so the same fiscal benefit gives different results in different sectors [18]. In a related plane, P. Hayek draws attention to the specifics of the tax credit for software development: the legal design of the benefit must "recognize" the immateriality of the result and the iterativeness of the development cycle, otherwise the incentive becomes a regulatory fiction [20].

Ukrainian scientific discourse adds localized accents. V. Ustymenko et al. conceptualize the regulatory sandbox as an innovation-oriented legal experiment, for which clear access criteria, time limits, exit procedures, and mechanisms of public control are critically needed, so that the experiment does not replace law and does not create asymmetries in the market [22]. A. Hachkevych rightly notes that "adaptation to EU standards" is not only technical harmonization, but synchronization of ethical and human rights requirements with engineering practices, especially for high-risk applications of autonomous systems [23]. V. Chubenko, continuing the line of demand policy, shows how public procurement in Ukrainian realities can (and should) become a channel for deep-tech innovations – provided that competitive neutrality, contestability and standardization of technical requirements are observed [24].

At the intersection of technology and human rights, V. Ignatusha emphasizes: contexts with increased humanitarian risk (in particular, defense) require an even stricter procedural framework of legitimation – transparency, accountability, external control – and the acceptability of any economic and legal incentives depends on it [25]. M. Popovych et al., analyzing privacy in the world of AI, actually set an "ethical barrier" beyond which stimulation loses its social license if it is not built into the mechanisms of data protection and procedural fairness [26]. S. Kravchuk focuses on general recommendations for the sustainable implementation of AI, where the key is the institutional design of safeguards – from algorithm audits to user complaint mechanisms [27]. Y. Volkova, reflecting on the right to use AI technologies through the prism of human rights, leads to an important point for our story: state incentives are legitimate only to the extent that they are integrated into the processes of assessing the impact on rights and freedoms and are accompanied by transparent communication practices [28].

Summarizing this body of work, we can derive a common denominator: mature stimulation of autonomous systems is not a "scattering" of benefits, but a design connection between experimentation (through "sandboxes"), state demand (through innovative procurement), fiscal levers (through R&D loans) and liability regimes that fix the limits of acceptable risk. It is this integrative optics of literature that determines the formulation of the task and the choice of methods in the following sections.

3. Problem Statement

The object of the study is the state policy of stimulating the production and use of autonomous systems, in which economic and legal instruments should be co-configured with risk-oriented regimes of safety, compliance and accountability [1]. The subject is economic and legal incentives and their combinations – tax, financial, regulatory, procurement and infrastructure – can accelerate the innovation cycle without undermining standards of responsibility and transparency [12].

The aim of the study is to create an integrated framework for the selection and combination of incentives for different classes of autonomous systems, taking into account the context of application, risk profile and institutional capacity of customers and regulators [7]. Accordingly, the main research question is formulated: what combinations of incentives provide the best ratio of innovation output and legal affiliation in Ukrainian conditions, taking into account the European trajectory of regulation and data exchange [2]?

The analytical hypothesis of the study proposed below is that contingent incentives tied to conformity assessment and supervision procedures outperform "flat" benefits when combined with innovative procurement tools and regulatory sandboxes that reduce the transaction costs of the experiment [8]. An additional hypothesis concerns measurability: the effectiveness of incentives is determined not only by the number of resources involved, but primarily by the quality of the legal result, which is recorded through the metrics of compliance, security and appealability of procedures [17].

To test hypotheses, it is proposed to solve several interrelated tasks: firstly, to conceptualize the concept of economic and legal stimulation of autonomous systems and to distinguish it from general instruments of innovation policy [12]. Secondly, to develop a taxonomy of incentives indicating the conditions for their lawful application and marginal risks, including anti-corruption and competition restrictions in the field of public procurement [9]. Thirdly, to construct a risk-based algorithm for selecting combinations of incentives depending on the level of autonomy, scope of use and evidence of safety, taking into account the modes of access to and use of data for training and testing [2]. Fourthly, to propose performance indicators that are sensitive to the phases of the technology life cycle and to the quality of procedures – from algorithm audits to complaint mechanisms [16].

The empirical field will be cases of innovative procurement and sandboxes in related jurisdictions, which allow comparing the institutional ability of the state to manage uncertainty and risk distribution between the producer, integrator and operator [15]. The Ukrainian section focuses on the possibilities of combining procurement, special digital economy regimes, and R&D support programs to generate demand for autonomous solutions, while maintaining appealability and competitive neutrality [11].

The expected scientific contribution is to build a verifiable, transparent methodology for political design of incentives, which simultaneously works as a map of legal constraints and as a tool for the strategic selection of tools for specific technological scenarios [7]. The practical result is a set of procedural "seams" between incentives, conformity assessment and public procurement, which can be directly implemented in standard conditions of support programs and customer documentation [9].

4. Methods and Materials

Methodologically, the article relies on an integrated framework that combines a dogmatic analysis of the norms of economic and related branches of law with a comparative legal approach, elements of policy design and assessment of the impact of regulation. This combination makes it possible not only to describe the available incentive tools, but also to design them in conjunction with the security, compliance and accountability procedures inherent in autonomous systems [1; 7]. Particular attention is paid to cross-validation of conclusions: legal arguments are tested on empirical and managerial suitability, while managerial hypotheses are "grounded" in legal constraints and procedures.

The empirical material consists of three types of sources: first, the corpus of judgments and conclusions of the modern doctrine of "sandboxes", public procurement of innovations, models of responsibility and the effects of fiscal stimulus; secondly, open data on procurement, grants and R&D

activity; thirdly, descriptive and analytical cases of the implementation of autonomous solutions in the fields of transport, healthcare and industrial automation. To compare managerial practices in the field of innovative procurement, instructive sources were used to assess the capabilities of public customers and mechanisms for the formation of "demand for innovations" [21]. The paper also uses an analysis of the modes of access to and use of data in the training and test circuits of autonomous systems in order to operationalize the requirements for transparency and reproducibility of results [2].

The selection of cases was carried out according to the logic of the contrast of jurisdictions and sectors: examples where experimental modes are integrated into compliance procedures (through "sandboxes") and procurement cycles, with cases where these relationships are absent or fragmentary, are compared. This design allows you to "see" the difference between speed without support and speed with procedural handrails, which is critical for high-risk applications [12; 16]. The same observation blocks are formed for each case: incentive tools, control configuration, responsibility distribution, performance metrics, and user feedback.

The operationalization of variables is carried out through three groups of indicators: innovative results (prototypes, pilots, market entry), legal affiliation of processes (audits, time/quality of conformity assessment, share of contested procedures) and security results (incidents, recalls, compliance with standards). The choice of such indicators is based on reviews of the effectiveness of procurement as an instrument of innovation policy and on empirical studies of the impact of R&D loans on the behavior of companies [17; 18]. To minimize biases, a "double binding" is used: each metric is interpreted simultaneously from the point of view of legal requirements and from the point of view of the manageability of the management process.

Analysis methods include qualitative comparison of cases, content analysis of documents and scientific publications, as well as logical and normative synthesis to build an algorithm for selecting combinations of incentives for different levels of autonomy. A separate step is risk mapping: for each application scenario, the "nodes" of potential harm are defined, to which the requirements of transparency, traceability, and feedback are attached, which arise as conditions for providing support [12]. The reliability of the conclusions is ensured by the replication of procedures: all steps of source selection, case coding and calculation of indicators are described so that they can be repeated in another sample or jurisdiction.

The limitations of the study are due to both the dynamics of regulatory changes and the heterogeneity of data by sectors and countries. To reduce the risk of the "snapshot effect", the analysis combines cross-section with short retrospective trajectory tracking in key cases, and also applies the sensitivity of the findings to variations in indicators. This allows you to maintain a balance between the rule-making horizon and the practical verification of management decisions in the field of autonomous systems.

5. Results and Discussion

Let's start with a framework in which "incentive" is understood not as an isolated benefit, but as a condition for admission to a controlled experiment, sewn with standards of security, transparency, and responsiveness. Such a reading translates the language of support from the plane of fiscal incentives to the plane of contractual and procedural obligations of the developer and the customer [12]. In this logic, the very fact of receiving support entails requirements for data traceability, model auditing, and readiness to quickly withdraw decisions in case of identified flaws, which reduces the risk of "washing out" responsibility in favor of external effects [13].

The taxonomy of tools in the proposed model consists of five interrelated branches: tax incentives for R&D and validation, grant and voucher mechanisms, regulatory sandboxes with conditional access, public procurement of innovations, and infrastructure agreements for polygons and shared datasets. Each branch is evaluated not only by the financial effect, but also by the ability of the tool to be embedded in conformity assessment and supervision procedures, which is critical for autonomous systems [1; 7]. Actually, this is where the "seam" between the economic and the legal arises: a support tool is considered mature only when it contains built-in mechanisms for stopping, restarting and transparent appeal.

Regulatory sandboxes streamline the experiment if their status does not turn into carte blanche, but work as a vertical of mutual obligations and procedural safeguards. The European doctrine convincingly shows that it is the linking of the "sandbox" to the conformity assessment cycle, to testing protocols and to feedback channels with the regulator that removes the main objections of skeptics [12;

15]. Additional legitimation is provided by the publicity of access rules and exit mechanisms, which is especially important in sectors with increased humanitarian risk.

Public procurement of innovations in this system is not just a way of acquisition, but a policy of generating demand for technologies for which there are no mature markets yet. When the state can formulate "mission" tasks, work with uncertainty, and measure intermediate results, procurement becomes a multiplier that entails private investment and standardizes security and transparency requirements [16]. Generalized reviews confirm that without such capabilities, even generous preferences do not turn into a verifiable innovation [17].

Fiscal tools perform better where they "read" the life cycle of technology and business, rather than acting uniformly across the entire field. Empirical studies demonstrate that the same benefit gives different effects depending on access to venture capital, team competencies, and local testing infrastructure [18]. The specifics of software development additionally require tax design to recognize the iterativeness and immateriality of the result, otherwise the incentive becomes declarative [20].

Liability regimes must be designed in parallel with incentives; otherwise, the immediate benefit of innovation turns into a long-term legal debt. Transport examples clearly show how the distribution of risks between the manufacturer, integrator and operator depends on subtle differences in national doctrines of tort law [19]. In the healthcare sector, safety evidence and decision tracing procedures act as an additional stabilizer, without which any stimulus quickly loses its social license [14].

A generalized algorithm for selecting instrument combinations suggests moving from a risk profile to a support design. First, the level of autonomy and the context of application are determined, after which a "bundle" of sandboxes, procurement contracts with built-in control points, and fiscal levers tied to verified stages of progress is selected [7]. The final tactic is the connection of infrastructure components such as polygons and shared data sets with clear rules for access and protection of user rights [2].

The Ukrainian section adds important contours of legitimation and implementation. A. Hachkevych's arguments about the "double crosslinking" of technical norms and human rights requirements in high-risk applications suggest how to avoid constitutionally significant conflicts at the stage of incentive design [23]. The conceptualization of "sandboxes" by V. Ustymenko and his colleagues helps to avoid the substitution of law for "experiment" by maintaining transparent access criteria, time limits, and exit mechanisms [22].

V. Chubenko's work on innovative procurement in Ukrainian realities shows how the demand tool works only under conditions of competitive neutrality, standardization of technical requirements and an effective appeal procedure [24]. In parallel, V. Ignatusha emphasizes the need for a stricter procedural framework where humanitarian risks are especially high, which directly affects the admissibility of any economic and legal incentives [25]. This is echoed by the conclusions of M. Popovych et al. about the need to protect privacy as a prerequisite for the acceptability of experimental regimes in civilian sectors [26].

To turn a framework into a management tool, indicators are needed that are sensitive to both the innovation result and the legal affiliation of the process. The first group includes prototypes, pilots, and validated market entry; the second is the time and quality of conformity assessment, the share of contested procedures and the results of algorithm audits [21]. The third group captures security consequences: incidents, recalls, compliance with industry standards and the effectiveness of complaint mechanisms, which closes the feedback loop.

As a result of the application of this matrix, we get several practical conclusions for political design. The "bundles" of instruments work best, in which each element not only stimulates, but also ensures the risks of other elements, while maintaining the possibility of stopping and correcting the course without destroying the entire program [16]. Where these "seams" are absent or declarative, incentives generate asymmetries and a zone of legal uncertainty, which ultimately affects trust and the pace of implementation [13].

6. Conclusions

In this article, it has been proposed to read incentives not as a set of scattered benefits, but as a holistic construction of mutual obligations, where each instrument must simultaneously accelerate innovation and ensure the risks that the neighboring one generates. Such a shift in perspective turns the incentive into a condition for responsible access to a controlled experiment, sewn into procedures of

transparency, verifiability, and readiness to quickly withdraw decisions. It is in this connection that economic and legal cease to compete and begin to work as one mechanism.

The key result was a matrix of instrument combinations that moves from the risk profile to the support design: from the regulatory sandbox and innovative procurement contracts with control points to fiscal levers tied to verified stages of progress, and the final link in the form of data infrastructures and test sites. This sequence allows you to accelerate the launch of autonomous systems from laboratories to production without losing trust, and therefore without increasing hidden external costs.

It has been established that the true effectiveness of the policy is manifested not only in the growth in the number of prototypes and pilots, but primarily in the quality of procedures: in the timing and transparency of conformity assessment, in the ability of the customer to work with uncertainty without substituting the right for "experiment", in the effectiveness of appeal mechanisms, and in the ability to promptly stop or restart projects. Where these "seams" are missing, incentives inevitably produce asymmetries that ultimately destroy the social license to implement.

The practical value of the proposed approach lies in the ability to directly integrate it into the documentation of customers and support programs: determine the thresholds for entering the experiment, formulate transparent rules for access to shared data, lay control points in contracts and preliminarily agree on "painless stop" algorithms. In this way, the state receives not only acceleration tools, but also a steering wheel for maneuvering in case of unforeseen consequences.

For Ukraine, this means the opportunity to stitch three previously disconnected trajectories – innovative procurement, fiscal incentives and experimental regimes – into one policy that works according to the logic of "security and accountability first, then scale". The recommendation is simple but demanding: the stimulus should be issued together with the procedure, and the procedure should be issued together with the measurable responsibility. Only in this format do autonomous systems turn from a source of regulatory anxiety into a lever of growth, which at the same time does not undermine institutional guarantees and does not deplete public trust.

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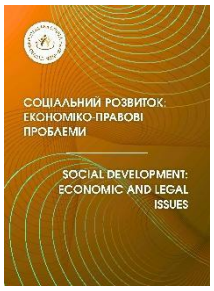
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e-ISSN 3083-6018

SOCIAL DEVELOPMENT: Economic and Legal Issues

https://www.eu-scientists.com/index.php/sdel



European Standards in the Field of Social Protection and Their Implementation in Ukraine

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ARTICLE INFO

Research Article

DOI: 10.70651/3083-6018/2025.10.15

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ABSTRACT

The study's relevance stems from the urgent need to harmonize Ukrainian legislation with European social protection standards in the context of European integration and post-war reconstruction. Ukraine, as a candidate for EU accession, faces challenges including low levels of social benefits, gender inequality, and insufficient guarantees for vulnerable groups, which are exacerbated by the protracted war, economic crisis, demographic shifts, and institutional weaknesses such as corruption and fragmented governance. The purpose of this study is to conduct a comparative legal analysis of European social protection standards, assess their implementation in Ukrainian legislation, and identify ways to improve the national regulatory framework in the context of European integration. The analysis of key European standards, including the European Social Charter (revised in 1996) and EU directives, highlights their emphasis on the principles of equality, solidarity and dignity, covering pensions, social assistance, working conditions and protection of vulnerable groups, with monitoring through the European Committee of Social Rights and the European Semester. Ukrainian legislation is in the process of active alignment with the European Union (EU) acquis. The main obstacles to this process are financial constraints, institutional barriers, adverse external factors and political challenges. To accelerate the harmonization of Ukrainian legislation, it is necessary to carry out legislative reforms to align with EU directives, increase financing for social programs while reducing dependence on state budget subsidies, and implement institutional reforms. Future research should focus on empirical assessments of the post-war implementation of European social protection standards to ensure sustainable social protection.

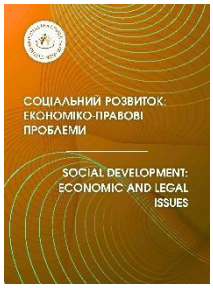
KEYWORDS

European standards, social protection, implementation, European integration, post-war recovery, harmonization, labor legislation, pension provision, unemployment.

e-ISSN 3083-6018

СОЦІАЛЬНИЙ РОЗВИТОК: економіко-правові проблеми

https://www.eu-scientists.com/index.php/sdel



Європейські стандарти у сфері соціального захисту та їх імплементація в Україні

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СТАТТЯ

Дослідницька

DOI: 10.70651/3083-6018/2025.10.15

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АНОТАЦІЯ

Актуальність дослідження обумовлена нагальною потребою узгодження українського законодавства з європейськими стандартами соціального захисту в умовах європейської інтеграції і післявоєнної відбудови. Україна, як кандидат на вступ до ЄС, стикається з такими викликами, як низький рівень соціальних виплат, гендерна нерівність та недостатні гарантії для вразливих груп населення, що посилюються тривалою війною, економічною кризою, демографічними зрушеннями та інституційними слабкостями, такими як корупція та фрагментоване управління. Метою цього дослідження є проведення порівняльно-правового аналізу європейських стандартів соціального захисту та оцінка їх впровадження в українському законодавстві, з метою визначення шляхів удосконалення національної нормативно-правової бази в контексті євроінтеграції. У результатах аналізу ключових європейських стандартів, включаючи Європейську соціальну хартію (переглянуту 1996 року) та директиви ЄС, підкреслюється їхній акцент на принципах рівності, солідарності та гідності, що охоплюють пенсії, соціальну допомогу, умови праці та захист вразливих груп, з моніторингом через Європейський комітет соціальних прав та Європейський семестр. Українське законодавство перебуває у фазі активного узгодження з правовими нормами Європейського Союзу (ЄС). Головними перешкодами цього процесу є фінансові обмеження, інституційні бар'єри, несприятливі зовнішні чинники та політичні виклики. Для прискорення гармонізації українського законодавства необхідне проведення законодавчих реформ для узгодження з директивами ЄС, збільшення фінансування соціальних програм із одночасним зменшенням залежності від субсидій із державного бюджету та здійснення інституційних реформ. Майбутні дослідження повинні зосередитися на емпіричних оцінках післявоєнного впровадження європейських стандартів у сфері соціального захисту для забезпечення сталого соціального захисту.

КЛЮЧОВІ СЛОВА

європейські стандарти, соціальний захист, імплементація, євроінтеграція, поствоєнне відновлення, гармонізація, трудове законодавство, пенсійне забезпечення, безробіття.

1. Introduction

Social protection, aimed at minimizing the risks of poverty, unemployment, disease and old age, is one of the key components of a sustainable society in today's world. The European Union (hereinafter referred to as the EU) has introduced a developed system of regulations in the social sphere, which is based on the principles of solidarity, equality and social justice. The fundamental normative acts are the European Social Charter of 1961 (revised in 1996) [1] and the European Pillar of Social Rights of 2017 [2], which enshrine guaranteed minimum standards covering access to social security, equality in benefits and protection of vulnerable groups. The standards implemented in the EU countries are aimed at maintaining macroeconomic stability and are a tool for reducing social inequality. According to Eurostat, in 2024, the share of the population that could face the risk of poverty was about 21.0%. At the same time, the highest level of 30.3% was recorded in Bulgaria, while the lowest was recorded in the Czech Republic, where it was 11.3% [3]. The introduction of European standards of social protection is critically necessary for Ukraine, which strives for full integration into the European space. Social protection reform is an important part of European integration, but this process has slowed down due to difficulties caused by the economic crisis, russia's full-scale invasion in 2022, and demographic changes, including population decline. Under the 2014 Association Agreement with the EU, Ukraine has committed itself to aligning its legislation with European standards, but progress in this area remains uneven, underscoring the importance of careful assessment.

The problem is that due to discrepancies in the existing Ukrainian legislation, European standards of social protection cannot be fully implemented in Ukraine. All this is further complicated by the existing differences in the principles of building national and European legal systems. European standards provide for clear mechanisms for the implementation of social guarantees and financial security, while compliance with some norms of Ukrainian legislation cannot be fulfilled due to the limitation of available funding opportunities. When it comes to how broad social rights are, in the EU the priority is to ensure equality and non-discrimination, while in Ukraine, corruption, weak state institutions and weak law enforcement hinder the achievement of these priorities. Insufficient consistency of procedures for controlling and monitoring the quality of social services is also a significant problem. In addition, the national system lags behind the European model in terms of modern instruments of social dialogue and partnership. As a result, the adaptation process requires not only harmonization of legislation, but also a revision of the conceptual foundations of social policy.

2. Literature Review

Analyzing the current state of research in the field of social security standards, the authors aimed to systematize the existing developments on European standards of social security and their implementation in Ukraine, which will help to identify key theoretical approaches and practical problems. This review will identify scientific gaps that need to be eliminated in the context of Ukraine's European integration, as well as outline promising areas for further research, in particular in the field of comparing national legislation with EU legislation. In general, the analysis of publications confirms that this topic is actively researched by Ukrainian scholars, but it should be noted that there is a certain lack of comprehensive comparative studies focused on post-war realities, digitalization of social services, and the impact of global crises such as pandemics or migration.

European social security standards. The article by I. Shumliaeva defines the place of social human rights in the general system of rights with an emphasis on their role as a minimum standard for ensuring decent living conditions. The researcher analyzed European social acts that enshrine rights and guarantees related to access to quality public services, education, healthcare, social protection, housing, employment and the rights of social minorities, paying special attention to the monitoring mechanisms of the European Committee of Social Rights through collective complaints and reporting systems. The result of the study was the proposals developed for Ukraine on the implementation of comprehensive and gradual measures to build an internal system for ensuring social human rights [4].

In turn, L. Nalyvaiko focuses on European standards of the right to social protection, considering them as an evolutionary process based on the principles of dignity, equality and solidarity. The author analyzes sources, including the European Social Charter, acts of the International Labor Organization

(ILO), and the practice of the European Court of Human Rights (ECtHR), emphasizing the legally binding nature of these norms. The study has a deep integration of judicial practice, for example, the ECtHR judgment on social rights, which adds a critical dimension [5].

The object of N. Cherevko's research was the European Social Charter (revised), namely the analysis of its history and principles, such as equality, social justice and protection of vulnerable groups. The researcher focused on the mechanisms of implementation in the Council of Europe and partial ratification by Ukraine, offering recommendations for full implementation [6].

Implementation in post-Soviet countries and the EU experience. The issue raised in L. Nalyvaiko's research acquires special importance in the light of the latest transformations in the post-Soviet space. The scientist emphasizes that one of the main obstacles to the implementation of European social standards in post-Soviet countries is insufficient institutional capacity [5].

Important for understanding the problem is the research of S. Synchuk and O. Rym, who analyzed European standards for displaced persons from Ukraine, focusing on the standards of temporary protection in the EU (Directive 2001/55/EC) and the Council of Europe. It is worth noting the criticism of the double standards of asylum (European vs. non-European) and the proposal of cooperation through the "Solidarity Platform" of the European Union [7]. This work is of a practical nature, focusing on monitoring mechanisms and children's rights.

A comparative analysis of the systems of protection of social rights in Ukraine and the EU was made by O. Savchuk et al., focusing on the regulatory framework (European Social Charter, EU-Ukraine Association Agreement) and implementation mechanisms [8]. Scientists focus on the importance of maintaining an optimal level of implementation of social rights, in particular in the context of pandemic challenges, as well as ensuring the protection of social rights of persons belonging to hostilities.

Valuable for understanding the topic is the scientific research of V. Zhuravel et al., where social security in the context of European integration was studied and an analysis of the EU's influence on Ukrainian social policy and problems was carried out. The results include proposals for reform for harmonization with international standards [9].

Specifics of Ukraine. Certain aspects, namely financial, legal and organizational support of social protection in the context of European integration, were studied by E. Dmytrenko and Y. Dmytrenko, highlighting the problems of budgeting, for example, the deficit of the Pension Fund and the imbalance between the obligations of the state and financial capabilities. The authors proposed amendments to the current legislation in order to implement EU standards, namely the expansion of the powers of local authorities [10].

The evolution of social standards in Ukraine from the Soviet period to European integration was considered by I. Nalyvaiko, focusing on the impact of the ILO and the European Social Charter. The study highlights the challenges for vulnerable groups (pensioners, IDPs) and provides proposals for reform to ensure the resilience of the system. An interesting aspect was the analysis of the historical context, which is relevant for modern Ukraine [11].

The issue of the system of protection of vulnerable segments of the population, raised in the article by T. Pavliuk and I. Yurchyk, acquires special importance in modern conditions. Analyzing the mechanisms of payments and social policy, the scientists emphasized the role of the state in regulating the subsistence minimum [12].

In the article by Y. Alimenko et al., an analysis of the possibilities of adapting the labor legislation of Ukraine to European standards of social security with an emphasis on harmonization with EU norms, is carried out. A valuable result of the study was the proposals for strengthening social guarantees [13].

V. Heyets et al. highlighted the possibilities of Ukraine's recovery through the prism of social quality, focusing on the post-war development of the socio-economic sphere on the principles of social cohesion, inclusion and ecological balance. Scientists propose a model based on social quality for a balance between security and development [14].

Thus, the analyzed scientific publications confirm some progress in the study of the problem. However, it should be noted that there is a certain lack of research devoted to the identification of obstacles to the harmonization of Ukrainian legislation with European standards of social protection in modern conditions. This article fills this gap through systematic comparative legal analysis by offering recommendations for the harmonization of national legislation with EU standards.

3. Problem Statement

Taking into account the above-mentioned scientific gaps, there is an objective need to conduct a comprehensive comparative legal study of the prospects for the implementation of European standards of social protection in Ukraine, taking into account post-war realities, digitalization of social services, migration crises and the impact of global challenges.

Thus, the purpose of the study is to conduct a comparative legal analysis of European standards in the field of social protection and assess the prospects for their implementation in Ukrainian legislation to identify ways to improve the national system in the context of European integration.

To achieve the goal of the study, the following tasks were set:

1. To analyze key European standards of social protection, in particular EU directives and the European Social Charter.
2. To study the relevant regulatory legal acts of Ukraine in the field of social protection.
3. Compare EU and Ukrainian norms and identify potential obstacles to implementation.

4. Methods and Materials

The main method on which the study was based was comparative legal analysis, which made it possible to compare the legal systems of the EU and Ukraine in the field of social protection according to key criteria: legal architectonics, content of norms, effectiveness of implementation and impact on social protection of vulnerable groups of the population. The application of this method made it possible to identify coincidences, discrepancies and gaps in national legislation, which contributed to the assessment of the prospects for its harmonization with EU standards. The following methods were also used: formal-legal – for a detailed analysis of the texts of normative acts; historical – to study the evolution of standards; systemic – to analyze the relationships between the elements of social protection; dialectical – to assess the dynamics of changes in national legislation under the influence of European integration processes.

The study was carried out in three stages, which corresponded to the tasks. At the first stage, the key aspects of the comparison were identified, reflecting the main areas of social protection in European standards and Ukrainian legislation: pension provision, social assistance and inclusion, working conditions and employment, as well as protection of special groups of the population. At the second stage, a comparative legal analysis of the compliance of the EU and Ukrainian norms was carried out, with the systematization of the results in the form of a table highlighting the discrepancies. At the third stage, the prospects for the implementation of European standards in Ukraine were assessed, taking into account the identified obstacles, such as budget deficit, administrative fragmentation, martial law and political challenges.

5. Results and Discussion

Using economic, legal and humanitarian elements, European standards of social protection create a fundamental basis for ensuring social justice and human dignity within the European Union. In the EU member states, social protection is seen as a means of reducing inequality, supporting vulnerable groups and ensuring sustainable development. The analysis of important components, in particular the directives of the European Union and the European Social Charter, shows their role in the formation of common rules. Such standards combine general principles with mechanisms for adaptation to national legislation. They are especially important in the face of global challenges, such as demographic changes and economic crises, as they not only declare rights, but also provide ways to implement and monitor them.

The European Pillar of Social Rights [2], which was approved in 2017, plays a key role in shaping the EU's social policy. It consists of twenty basic principles and is divided into three main themes: equal opportunities and access to the labor market, fair working conditions and social protection with inclusion. The principles laid down in this document are the strategic basis for the development of EU Directives. The EU's social protection directives provide a legal framework that helps Member States align their policies with a focus on equality, inclusion and accessibility of social services. Directive 2019/1152 [15] on transparent and predictable working conditions strengthens the protection of

workers against precarious employment through contract disclosure requirements and limitations on probationary periods. Similarly, Directive 2000/43/EC [16] on equality on racial or ethnic grounds prohibits discrimination in various areas, such as social protection, ensuring that ethnic minorities receive equal benefits. Directive 79/7/EC [17] establishes the principle of gender equality in social security systems and aims to eliminate gender discrimination in pension programs and benefits. In turn, Directive 2022/2041 [18] on adequate minimum wages emphasizes the economic dimension of social protection in the fight against poverty by setting minimum wage standards that affect social benefits. Monitoring of the effectiveness of national social reforms, which assesses indicators such as the level of poverty risk and employment, is carried out within the framework of the European Semester using the European Pillar of Social Rights as an analytical framework, while the European Committee of Social Rights (ESPOO) provides supervision over the implementation of the obligations of the European Social Charter.

The European Social Charter [1] was adopted by the Council of Europe in 1961 and revised in 1996. This document expands the EU's strategy by focusing on economic and social rights as a complement to the civil and political rights enshrined in the European Convention on Human Rights. The Charter provides a wide range of rights in the areas of employment, health, education, housing and social protection. Particular emphasis is placed on non-discrimination and the protection of vulnerable groups, including children, the elderly, persons with disabilities and migrants. The document contains detailed rules relating to the right to social security, including the right to adequate compensation in the event of unemployment, illness, or old age, as well as the right to health, which provides access to health services and preventive measures. In the area of employment, the Charter ensures fair working conditions, including restrictions on working hours and protection against unreasonable dismissals. The European Committee of Social Rights conducts monitoring, which includes the analysis of national reports of the participating states and the receipt of collective complaints from organizations. This makes it possible to assess the compliance of legislation with the provisions of the Charter. Such a mechanism facilitates dialogue between states and civil society, which distinguishes it from the judiciary. The revised version of the Charter expanded the rights to include elements of gender equality and protection of families. This makes it a tool for adapting social systems to modern problems, such as the cost-of-living crisis.

The difference between the European Directives and the European Social Charter is that the former guarantees implementation in European Union law, while the latter provides a broader ethical and legal standard for all European states, including non-EU members. These instruments contributed to the formation of the Charter of Fundamental Rights of the European Union [19], which combines social standards with the constitutional level. However, challenges such as fragmentation of national systems and economic imbalances require increased coordination, in particular through common indicators and funding from EU funds, such as the European Social Fund.

The comprehensive system of legal norms that constitutes social protection in Ukraine is aimed at ensuring a decent standard of living for citizens, especially vulnerable groups of the population, through the mechanisms of pension provision, state assistance, mandatory state social insurance, and social services. This mechanism is based on Article 46 of the Constitution of Ukraine, which guarantees the right to social protection, which includes the right to security in case of full, partial, or temporary disability, loss of breadwinner, unemployment due to circumstances beyond the recipient's control, as well as in old age and in other cases provided for by law [20]. The evolution of legislation indicates the transition from post-Soviet standards to European ones. This process focuses on integration and resilience in the context of economic reforms, demographic changes and active hostilities. The analysis of the regulatory framework shows its hierarchical structure, where special laws and by-laws complement the constitutional provisions, balancing between general guarantees and targeted assistance.

Pension provision is one of the main components of social protection in Ukraine. It is regulated by a number of laws that establish the combination of compulsory insurance with state benefits. The Law of Ukraine "On Compulsory State Pension Insurance" No. 1058-IV of July 9, 2003, defines a three-tier system of pension provision. The first level is the solidarity system, which is based on the principles of solidarity and subsidies and ensures the payment of pensions at the expense of the Pension Fund (system of immediate payments). The second level (not yet operating in Ukraine) is the accumulation system, which provides for the formation of individual pension savings in the Accumulation Fund or

non-state pension funds. The third level is the system of non-state pension provision, which is based on the principle of voluntary participation of citizens and employers in the creation of individual pension savings. At the same time, the mentioned law defines the minimum guarantees in the field of pension provision and establishes special conditions for the provision of pensions to certain categories of citizens. In addition, other regulations regulate special conditions of pension provision, in particular the Law of Ukraine "On Pension Provision for Persons Discharged from Military Service and Certain Other Persons". The Law "On Collection and Accounting of the Single Contribution to Compulsory State Social Insurance" No. 2464-VI of July 8, 2010, unifies the mechanisms of financing social insurance in order to increase the transparency and efficiency of collection, accounting and use of funds in this system.

State social assistance in Ukraine functions as a mechanism of targeted support, aimed mainly at providing socially vulnerable segments of the population who, due to circumstances beyond their control, have an income below the established social standards. In particular, the Law of Ukraine "On State Social Assistance to Low-Income Families" No. 1768-III of June 1, 2000 is aimed at reducing the level of poverty and provides for a combination of two mechanisms – the provision of monthly cash payments to low-income families (taking into account the subsistence minimum and the average monthly income of the family) and the implementation of measures that contribute to the economic independence of recipients. Similarly, the Law of Ukraine "On State Social Assistance to Persons Not Entitled to a Pension and Persons with Disabilities" No. 1723-IV of May 18, 2004 regulates the provision of assistance to persons who have reached the age of 65 or have a disability, but have not acquired the right to pension provision. The amount of assistance is determined by taking into account their income and other criteria. It should be noted that the system of state social assistance operates on the basis of a set of normative legal acts regulating various types of social benefits. This legal framework includes, in particular, the Law of Ukraine "On State Social Assistance to Persons with Disabilities from Childhood and Children with Disabilities" No. 2109-III of November 16, 2000, the Law of Ukraine "On State Assistance to Families with Children" No. 2811-XII of November 21, 1992, as well as by-laws detailing the procedures for appointment and payment. Since July 1, a new type of social benefits has appeared in Ukraine – basic social assistance, which consolidated five types of state social benefits into a single payment. The amount of assistance is determined individually as the difference between the total amount of the basic amount for each family member and the average monthly total income of the family. At the same time, the size of the base value is 4500 hryvnias. Such unification of social benefits ensures an increase in efficiency, targeting and transparency in the distribution of state resources.

Protection of vulnerable groups of the population in Ukraine is also implemented through the system of social benefits and services, the conditions, volumes and procedure for the provision of which are regulated by several regulatory legal acts. In particular, the Law of Ukraine "On the Status of War Veterans, Guarantees of Their Social Protection" No. 3551-XII of October 22, 1993 provides for the provision of several benefits to veterans, including free medical care, housing subsidies and pension allowances. Similarly, the Law of Ukraine "On the Status and Social Protection of Citizens Affected by the Chornobyl Catastrophe" No. 796-XII of February 28, 1991 regulates the provision of compensation and benefits to persons with the appropriate status, in particular in the areas of medical care, housing and communal services, social and labor relations, etc. The Law of Ukraine "On the Basics of Social Protection of Persons with Disabilities in Ukraine" No. 875-XII of March 21, 1991, defines the principles of integration of persons with disabilities into society, providing access to education, employment, medical services and social guarantees. Under martial law and the ongoing armed aggression of the Russian Federation, the regulatory framework is expanding and improving. In particular, in 2014, the Law of Ukraine "On Ensuring the Rights and Freedoms of Internally Displaced Persons" No. 1706-VII of October 20, 2014, came into force, which enshrines guarantees for the implementation of the rights and freedoms of internally displaced persons, including the sphere of social protection. The Law of Ukraine "On Social and Legal Protection of Persons Who Have Been Deprived of Personal Liberty as a Result of Armed Aggression against Ukraine and Members of Their Families" No. 2010-IX of January 26, 2022 establishes mechanisms for legal assistance, medical rehabilitation and monetary compensation for persons in respect of whom the fact of deprivation of personal liberty as a result of armed aggression against Ukraine, as well as for members of their families, has been established.

The organizational and legal basis for the provision of social services is determined by the Law of Ukraine "On Social Services" No. 2671-VIII of January 17, 2019. This regulation establishes standards for the provision of services such as home care, social adaptation and support for families in crises, with

an emphasis on deinstitutionalization and the development of public initiatives, positioning social services as a dynamic element of the overall protection system. By-laws, such as the Resolution of the Cabinet of Ministers of Ukraine "On the Organization of the Provision of Social Services" No. 587 of June 1, 2020, ensure the practical implementation of these norms at the local level, detailing procedures, financing mechanisms and supervision of implementation.

An integral component of the European integration process is the alignment of the standards of social protection of Ukraine with the EU requirements, which provides for the harmonization of national legislation with the acquis communautaire. A comparison of Ukraine's current legislation in the field of social protection with EU standards shows a certain degree of compliance, as Ukraine has made progress in basic guarantees, but there are still some differences on implementation and coverage mechanisms. The discrepancy analysis carried out, which is presented in Table 1, concerned the basic principles of social protection, with special emphasis on possible obstacles to implementation related to financial, institutional and external factors.

Table 1. Comparative characteristics of social protection standards in Ukraine and the EU

Aspect of social protection	EU norms and the European Social Charter	Norms of Ukraine	Comparisons and differences
Pension provision	The European Social Charter [1] guarantees the right to social security, including adequate old-age, disability or survivor's pensions, with indexation, non-discrimination and coordination mechanisms between Member States to ensure the mobility of workers. Monitoring through the European Committee of Social Rights ensures compliance with recommendations for indexing payments according to inflation and economic indicators. Directive 79/7/EC [17] establishes the principle of gender equality in social security systems and aims to eliminate discrimination, exclusively with discrimination based on sex in pension programs and benefits. The European Pillar of Social Rights [1] emphasizes minimum guarantees for decent old age, including universal access to pension schemes with elements of savings and protection against poverty in old age.	National legislation is based on the Constitution of Ukraine and defines a three-tier system of pension provision (Laws of Ukraine "On Compulsory State Pension Insurance", "On Non-State Pension Provision"). However, this system does not work fully because the second layer has not yet been implemented. At the same time, regulations regulate special conditions of pension provision for certain categories (Laws of Ukraine "On Pension Provision for Persons Discharged from Military Service and Certain Other Persons", "On the Status and Social Protection of Citizens Affected by the Chornobyl Catastrophe", etc.) Preferential conditions for retirement provided for by Chapter XIV-1 of the Law of Ukraine "On Compulsory State Pension Insurance". At the constitutional level, it is determined that pensions, other types of social payments and benefits, which are the main means of subsistence, must ensure a standard of living not less than the subsistence minimum.	EU legal acts aim to ensure universal accessibility, gender equality and coordination of systems for mobility, with a focus on preventive mechanisms against poverty in old age through mandatory accumulation elements and indexation. Ukrainian legislation focuses on the length of service and payment of the USC and stimulates official employment. Difference in funding. The EU provides for wider coordination through funds (e.g., the European Social Fund) and less dependence on the state budget. The Ukrainian pension system, especially under martial law, needs additional funding through transfers from the state budget and the support of international partners. The system of preferential pensions in Ukraine causes the fragmentation of the pension system and the uneven implementation of rights in this area. This contrasts with the European Union's universal approach, which is focused on ensuring equality and fairness without excessive exceptions.
Social Assistance and Inclusion	The European Social Charter [1] provides the right to social and health assistance to prevent poverty, with a focus on the poor and vulnerable groups, including minimum guarantees of assistance without discrimination (Article 30 – protection from poverty and social exclusion through	The system of state social assistance in Ukraine is regulated by a set of special regulations that provide targeted support to vulnerable categories of the population and promote social inclusion. The Law of Ukraine "On State Social Assistance to Low-Income Families" defines a mechanism that combines the provision of monthly cash payments based on the subsistence	Both systems are aimed at ensuring a basic standard of living and social inclusion of vulnerable categories of people. The EU emphasizes preventive mechanisms and anti-discrimination, with higher minimum standards of assistance, while Ukraine focuses on targeted

Aspect of social protection	EU norms and the European Social Charter	Norms of Ukraine	Comparisons and differences
	comprehensive integration measures). Directive 2000/43/EC [16] prohibits discrimination based on race or ethnicity in access to assistance, guaranteeing equal benefits for ethnic minorities. Principle 17 of the European Pillar of Social Rights [2] emphasizes the inclusion of persons with disabilities through rehabilitation, access to education and employment, with preventive mechanisms.	minimum and measures to stimulate the employment, economic independence and social activity of recipients. The Law of Ukraine "On State Assistance to Families with Children" defines the following types of state support: in connection with pregnancy and childbirth, at the birth of a child, single mothers, children under guardianship and care, children with serious illnesses. Cash payments are part of a comprehensive state program to support families with children, which has recently been implemented in Ukraine. A special place in the system of social guarantees is occupied by norms aimed at protecting the rights of persons with disabilities. The Law of Ukraine "On the Basics of Social Protection of Persons with Disabilities in Ukraine" defines the principles of equal opportunities in access to education, medical services, and employment (in particular, through job quotas). The Laws of Ukraine "On State Social Assistance to Persons Who Are Not Entitled to a Pension and Persons with Disabilities", "On State Social Assistance to Persons with Disabilities from Childhood and Children with Disabilities", "On Rehabilitation of Persons with Disabilities in Ukraine" are also of great importance, which provide a comprehensive approach to the implementation of the rights of not only persons with disabilities, but also citizens of the elderly, which ensures their social integration, ensuring equal opportunities in society.	assistance. The difference is in inclusion. In the EU legal system, the emphasis is on a comprehensive approach, which is designed to ensure the achievement of maximum autonomy and an independent lifestyle. There is proper legal regulation in Ukraine, but there is a need for further development of the institutional and resource component, in particularly in the system of support for persons with disabilities. Introduction of basic social assistance in Ukraine (consolidation of individual social benefits in 2025) is aimed at the formation of a holistic and targeted system of social protection, which provides minimum standards of well-being and contributes to the reduction of social inequality. The implementation of this pilot project is in line with the European trend of unification of social standards and the desire for transition to effective, transparent social protection systems.
Working conditions and employment	The European Social Charter [1] establishes the right to safe and healthy working conditions, including restrictions on working hours, and fair remuneration sufficient for a dignified life. Directive 2019/1152 [15] requires contract transparency and protection against precarious employment. Directive 2022/2041 [18] establishes adequate minimum wages, with collective agreements to combat poverty.	The Constitution of Ukraine (Article 43) guarantees the right to work without discrimination. The Labor Code defines the legal basis for regulating labor relations, in particular, regulates the procedure for terminating an employment contract, including mandatory warning and payment of compensation, as well as establishes guarantees in the field of remuneration, rationing of working hours (in particular, limits the working week to 40 hours), provides additional protection for certain categories of employees. The Law of Ukraine "On Remuneration of Labor" defines state guarantees of remuneration of employees in the economic, legal and organizational planes, including the establishment of a minimum wage and the prohibition of discrimination.	Both systems guarantee the right to work, safe working conditions and decent treatment. The EU focuses on predictability and gender/age equality in pay through collective agreements with higher standards, while Ukraine provides basic guarantees but with weaker protection against precarious employment. The difference: the EU has stronger monitoring mechanisms (through the European semester), Ukraine needs reforms for harmonization, especially under martial law.
Protection of special categories of the population	The European Social Charter [1] protects older persons through access to services, social assistance and participation in society; employees with family	The legal framework of Ukraine in this area includes a set of special laws that provide differentiated support to vulnerable groups of the population. In particular, the Law of Ukraine "On the Status of War Veterans,	The EU integrates rights into a universal framework for all special groups, with a focus on inclusion and prevention, while Ukraine uses specialized laws for

Aspect of social protection	EU norms and the European Social Charter	Norms of Ukraine	Comparisons and differences
	responsibilities – through equal opportunities. Directive 2000/43/EC [16] extends anti-discrimination to ethnic minorities and migrants in access to services.	Guarantees of Their Social Protection" establishes a system of benefits for combatants, persons with disabilities as a result of war, war participants and other categories of persons subject to this law. The Law of Ukraine "On the Status and Social Protection of Citizens Affected by the Chornobyl Catastrophe" defines the legal mechanisms for providing compensation, providing sanatorium-resort treatment, and assigning early pensions for persons who suffered damage as a result of radiation pollution. In the field of protection of internally displaced persons, the Law of Ukraine "On Ensuring the Rights and Freedoms of Internally Displaced Persons" is in force, which provides for state support through housing programs, social benefits, and ensuring the implementation of the right to employment. The Law of Ukraine "On the Basics of Social Protection of Persons with Disabilities in Ukraine" establishes the key principles of social integration of persons with disabilities, determines the features of material, social and medical support. The legal status of persons in respect of whom the fact of deprivation of personal liberty as a result of armed aggression against Ukraine and members of their families has been established and the guarantees of their social protection is regulated by the Law of Ukraine "On Social and Legal Protection of Persons in Respect of Whom the Fact of Deprivation of Personal Liberty as a Result of Armed Aggression against Ukraine and Members of Their Families Has Been Established". An important role in the formation of a unified system of social support is played by the Law of Ukraine "On Social Services", which defines the principles, procedure and conditions for the provision of various types of social services to persons who belong to vulnerable groups of the population and/or are in difficult life circumstances.	historical groups (veterans, Chernobyl survivors, IDPs), which provides targeted support (subsidies, compensations) but leads to fragmentation (different procedures for groups) and less focus on ethnic minorities or migrants. The difference: the EU requires comprehensive integration (through quotas and anti-discrimination), Ukraine requires reactive assistance, but bureaucracy and corruption reduce efficiency, unlike monitoring in the EU. Deinstitutionalization in Ukraine (since 2019) is similar to the EU, but its speed is limited by funding opportunities.

Source: Authors' own development.

Potential obstacles to the implementation of European norms in Ukrainian legislation include financial constraints as Ukraine faces a budget deficit due to the war and economic crisis, making it difficult to raise minimum standards as required by Directive 2022/2041. Institutional barriers manifest themselves in administrative fragmentation and corruption, which hinder effective monitoring, similar to the model used by the European Committee of Social Rights. This requires structural reforms of the system of social protection bodies, both at the central and local levels. External factors, such as martial law, lead to the postponement of reforms. This, in particular, applies to adaptation to the European Social Charter, which Ukraine ratified on December 21, 2006, acceding to 74 out of 98 points of the document.

6. Conclusions

The analysis of key European standards in the field of social protection has demonstrated that they establish a mandatory legal framework for the harmonization of national policies, focusing on universal accessibility, non-discrimination and preventive mechanisms. The European Social Charter (revised in 1996) complements the social protection mechanism by guaranteeing rights in the areas of employment, social security and protection of vulnerable groups, with monitoring through the European Committee of Social Rights.

The result of the study of Ukrainian legislation in the field of social protection demonstrates its multi-level and hierarchical structure. In this system, the Constitution of Ukraine forms the fundamental foundations, enshrining constitutional guarantees of the rights to pensions, unemployment benefits and in case of disability. These provisions are specified and developed in the system of special laws and by-laws, which constitute a multi-level mechanism for the implementation of state social guarantees.

A comparison of the current EU norms and the legislation of Ukraine showed partial compliance with the latter, but with significant differences. Thus, in pension provision, the EU emphasizes universality and gender equality, in particular through the elimination of gender discrimination in access to most benefits and the coordination of systems for employee mobility. In Ukraine, gender inequality in the retirement age has been eliminated, and the pension depends on the length of service and contributions. However, the national pension system retains a significant number of special (preferential) regimes for certain categories of citizens, which leads to fragmentation and deviation from the universal model typical for the EU countries.

In the field of social assistance and inclusion, EU policy focuses mainly on poverty prevention and social inclusion, while in Ukraine, the emphasis is on the provision of targeted support, which may be accompanied by excessive administrative procedures (within the framework of non-digitalized services). At the same time, the implementation of the pilot project on the introduction of basic social assistance is consistent with the European trend of unification of social standards and reflects the desire of the state to move to a more effective and transparent social protection system.

To protect working conditions, the EU requires transparency of employment contracts and high minimum wages, while Ukrainian legislation, although it provides basic guarantees for workers, weakly protects against precarious employment. In the protection of special groups, the EU integrates a universal approach, while Ukraine integrates a fragmented one through special laws, with less emphasis on migrants. The identified obstacles to the implementation of European standards in the field of social protection in Ukraine include financial constraints due to the war and a significant budget deficit; weak institutions due to administrative fragmentation, which hinders effective monitoring; external factors due to the ongoing martial law and international political instability; and political fears of unpopular reforms.

To accelerate the harmonization of Ukrainian legislation, the following priorities should be established: 1) legislative reforms to align with EU directives, in particular in the field of gender equality and social inclusion; 2) optimization of financing of social programs through diversification of sources, with an emphasis on reducing dependence on direct budget subsidies through active attraction of grants from EU funds, international assistance and reforming the system of social contributions to increase the self-sufficiency of funds; 3) implementation of institutional reforms, further digitalization of the social sphere, as well as active fight against corruption through the introduction of anti-corruption monitoring mechanisms. Future research should focus on empirical assessments of the post-war implementation of European standards in the field of social protection to ensure sustainable social protection.

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