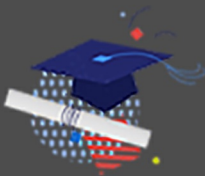




SUSTAINABLE DEVELOPMENT: MODERN THEORIES AND BEST PRACTICES



Teadmus OÜ

Sustainable Development: Modern Theories and Best Practices

Materials of the Monthly International Scientific and Practical
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FINANCIAL AND ECONOMIC ISSUES OF SUSTAINABLE DEVELOPMENT

AI-DRIVEN INNOVATION AND 5G INTEGRATION IN THE TRANSFORMATION OF FINANCIAL DIGITAL INFRASTRUCTURE

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Artificial intelligence (AI) and fifth-generation wireless technology (5G) are converging at an increasing rate and accelerating change to the most basic of financial digital infrastructure layer. In the migration of financial services from traditional centralized systems toward cloud-native, decentralized systems, the need for real-time processing of data, secure communication, and dynamic adaptive systems has become increasingly pronounced. As dual pillars of the Fourth Industrial Revolution, AI and 5G are acting as strong agents of change in service delivery while simultaneously shifting the competitive paradigms in the global financial ecosystem. By leveraging this transformation, banking operations can become modernized, customer experience becomes integrated through intelligent automation as well as it ensures resilience in a volatile digital economy. The marriage of AI-based algorithms and the ultra-low latency of 5G makes it possible to apply predictive analytics, algorithmic trading, fraud detection, and autonomous financial management, things that were impossible before.

Typically, the financial sector has been a vanguard of the adoption of emerging technologies and has been especially so when those technologies can improve operational efficiency and regulatory compliance. With the amalgamation of AI with 5G and advanced networking technologies, financial institutions are able to move to edge computing environments, assisting them in making faster decisions and reducing the lag time between data acquisition and action to almost zero. Furthermore, this convergence helps to support the infrastructure of open banking, which facilitates secure and instant information exchange between the banks, fintech platforms, and customers. In this case of AI - 5G integration, its implications for the future regulatory frameworks for financial systems, investment strategies, and technological involvement cannot be ignored.

In the period 2021 to 2024, by comparing the investments made by the financial institutions in Germany, South Korea, the United States, the United Kingdom, Singapore, China, France, and Japan, it has been found that there is a definite upward trend in the investments made by the institutions in digital infrastructure. In the case of these countries, the proportionate increase in capital expenditures related to AI and 5G in financial infrastructure is 18,4% per annum. The growth of AI-driven financial system modernization investments was cumulatively at a record 72% with South Korea leading the way followed by Singapore (Statista, 2024).

Efficiency ratios and digital transaction volumes convey the second reality of

financial performance indicators that banks with AI and 5G integration definitely register an uptick. For instance, a German leading digital bank reported a 28% improvement in its cost/income ratio after adopting AI-powered, 5G-enabled, customer service chatbots to make their customer interaction a continuous, high speedy but uninterrupted one (PwC, 2023). Just like, in the United States, algorithmic trading platforms with AI for real-time analysis of market and 5G for data transfer, reduced execution latency by 43%, and there is an increase in average yields during trading in selected portfolios by 15% (McKinsey & Company, 2023).

As a result, 5G infrastructure supporting AI-driven threat detection frameworks was utilized in financial institutions that experienced cybersecurity efficacy. According to Capgemini Research Institute (2023), when financial firms in France equipped 5G edge computing with distributed AI monitoring nodes, they reported that the number of successful cyberattacks fell by 31%. Additionally, the satisfaction rate of the customers in institutions with AI personal Finance Assistants was higher; this is more pronounced in urban centers that have strong 5G technology coverage. According to a consumer survey in Tokyo and Seoul (Deloitte Insights, 2024), 64% of the respondents had shown a preference for AI-integrated digital banking solutions instead of mobile banking apps as they need speed, personalization, and predictive financial services.

It was concluded that the symbiotic integration of AI and 5G technologies relates directly to improving the performance metrics of an organization in the operational, financial, and customer experience dimensions. From the strategic view, the 5G's latency reduction and the ability to transmit real-time data make the AI algorithms perform at a higher level of efficacy. This becomes very important in the area where you need to get the response really quickly, like in fraud, market prediction, or customer onboarding.

AI-automated processes in digital banks have improved the cost-income ratio and hence reduced the dependency on human resources and streamlined the services. Institutions can interact with customers with high quality and reduced overhead costs due to 5G-enabled seamless AI chatbot communication. These are the factors that make the convergence of AI and 5G herald scalability - a point that explains how the growing digital demand in financial services can be managed without a proportional rise in staffing and infrastructure.

In addition, the growth in trading yield and decreasing latency in AI-based algorithmic trading platforms shows the importance of network speed in the current finance industry. In high-frequency situations, the microseconds gained by utilizing a 5G network could make a great difference to the trading outcomes. This is indicative of how network infrastructure has become a strategic asset to the digital operation of a financial service.

Distributed AI detection systems built over these advances carry aspects of the promise of edge computing brought about through 5G. Rather than being shrouded in centralized security models, financial institutions can deploy localized AI units that can monitor the data traffic in real-time and identify the anomalous activity, and mitigate it accordingly. The sophistication of cyber threats is growing and financial platforms are becoming increasingly vulnerable, especially in the context of their operations on the cloud.

The data in customer service demonstrates a major change in the consumer's expectations and behavior. The use of AI-enabled financial solutions instead of regular platforms is just a part of a larger trend of hyper-personalization that 5G and massive

data processing capabilities of AI allow us to enjoy. In other words, these developments not only impact the orientation of consumer engagement but also of value proposition in a competitive marketplace.

The challenge with integrating AI and 5G in financial infrastructure, however, is its lack of misapplication. Problems regarding data privacy, regulatory compliance, interoperability, and systemic risk management continue to persist. Real-time handling of thousands of personal financial data in real-time demands a strong legal framework that will guarantee to answer to AI use code of conduct, transparency, and accountability. In addition, differential deployment of 5G in different regions has the potential to further aggravate the digital divide and exclude smaller financial institutions or underdeveloped markets from the new technology.

Because of the powerful potentials of AI and 5G in the financial digital infrastructure, a few vital suggestions as follows will help stakeholders.

1. The ethical, privacy, and security implications need to form a complete framework within which governments and financial regulators can integrate AI within 5G. Concentration should be paid to the global compatibility of cross-border data flows and AI accountability.

2. It is an investment in edge computing and 5G infrastructure that financial institutions need to make, to take advantage of real-time capabilities of AI systems. In addition, the adoption of AI operations (AIOps) for IT management and cybersecurity is included in this.

3. The deployment of AI and 5G technologies necessitates the development of specialized skill sets. Financial firms must spend resources on training data scientists, cybersecurity personnel, and network engineers, in order to gain a competitive advantage.

4. To meet this challenge, institutions need to choose a modular, scalable digital architecture that enables continuous integrated AI tools, and network upgrades as well. This will help organizations to sustain the long-term digital transformation strategy and become fast pace in adapting to technological changes.

5. To achieve digitization, financial services have to implement AI insights to design personalized, accessible, and transparent digital products supported by 5G capabilities. These innovations should be accompanied by enhancing digital financial literacy to foster trust and inclusion.

6. Expanding digital infrastructure needs to be monitored and have an impact on the environment. To match global priorities for sustainability, energy-efficient green 5G technologies and energy-efficient AI algorithms must be prioritized.

The combination of artificial intelligence and 5G technology now leads us to important changes in how financial companies build digital foundations. The studies show better performance in both running the business and serving customers plus stronger financial returns and enhanced protection measures. Success with these technologies needs financial institutions to support them through thoughtful regulations combined with well-time investments and ethical development practices.

The development represents a complete change in how financial services operate and how their customers experience them. Businesses that integrate 5G and AI into their operations will develop platform superiority and gain important market positions in financial services. The potential advantages rely on stakeholders recognizing and planning for related difficulties ahead of time. Through 5G technology and AI, the

financial sector can develop its functions to provide responsive and predictive help in the field of economy.

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COMPLIANCE SECURITY IN AGRIBUSINESS

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Agricultural business is one of the key sectors of the economy that ensures food security, contributes to economic growth and development of regions. However, modern challenges, in particular strengthening regulatory control, globalization of markets, environmental and social threats, increase the importance of compliance safety in the agricultural sector. Compliance covers a set of measures aimed at complying with legislative, ethical and corporate norms governing the activities of companies. Its implementation in agribusiness allows you to avoid fines, increase the level of trust from partners, investors and consumers, as well as create stable conditions for the development of enterprises.

The importance of compliance in the agricultural sector is especially relevant due to the high regulatory dependence of this business, the need to comply with international standards of product safety, environmental requirements and legal norms in the field of land relations. Having an effective compliance system helps businesses avoid corruption risks, financial losses, and reputational losses.

This study examines the main aspects of compliance security in agribusiness, analyzes legal norms and current regulatory trends, and provides practical recommendations for ensuring compliance with legal and ethical standards.

For Ukrainian agribusiness, the compliance function is currently quite new. Combating corruption and any other manifestations of fraud in the agricultural sector is a

long-term systematic work, which is given a lot of attention in Ukraine due to active integration into the international space. The introduction of the compliance function allows participants in all business segments to act more effectively and helps to strengthen the atmosphere of trust and transparency both in the domestic market and on the global stage. The inclusion of compliance measures in daily operational processes will help minimize risks and introduce the right business culture in accordance not only with national but also with international legislation. The basis for the implementation of compliance principles in the activities of Ukrainian companies, including agricultural ones, is the support of international and national initiatives, the creation of an anti-corruption ideology of doing business on their basis.

Ukraine is living in an environment of active political restructuring, which includes the creation and improvement of national legislation and support for international anti-corruption initiatives. In this context, the peculiarity of agribusiness is that Ukrainian agricultural companies act as suppliers of agricultural products to foreign markets. Therefore, agricultural products must meet the requirements of all business partners. For effective business development at the international level, it is important for Ukrainian agricultural companies to confirm that the offered raw materials and goods were grown and manufactured by enterprises whose activities meet the requirements of the current legislation, international quality standards, established ethical and business standards for doing business in the field of combating corruption and fraud, as well as risk management in relation to international sanctions.

Strengthening economic cooperation between Ukraine and other countries of the world has created conditions for joining efforts in combating corruption. Such cooperation takes place within the framework of international organizations, which define the prevention and combating of corruption as one of the priorities of their activities. Ukraine has ratified and is actively integrating into national legislation the main international acts on combating corruption:

- the UN Convention against Corruption, ratified by Ukraine in Law No. 251-V of 18.10.2006;
- Criminal Convention of the Council of Europe on the fight against corruption ETS No. 173, which entered into force in Ukraine on 18.10.2006;
- the UN Declaration on Combating Corruption and Bribery in International Commercial Transactions;
- Convention for the Suppression of Bribery of Foreign State Officials in the Conduct of International Business Transactions.

Extraterritoriality played an important role in the implementation of compliance principles of doing business, in particular, in the agricultural sector. Among the international acts that significantly affect the fight against corruption in Ukraine are the following: Foreign Corrupt Practices Act/FCPA, which has been in force since 1977; UK Bribery Act (UKBA), which came into force on 1 July 2011; French law SAPIN II. The scope of these laws regulates anti-corruption activities within the framework of the prohibition of bribery of foreign officials, including employees of foreign public authorities, public international organizations or their representatives, individuals in commercial organizations. It is worth noting that in Ukraine, the extraterritorial principle has already established itself as an effective tool for combating corruption. Ukraine: Anti-Corruption Laws The international practice of implementing compliance has a long history, a formed base of legislative acts and a number of precedents for their

improvement. All this in combination allows us to use international initiatives as a legal basis for national legislation within the framework of the implementation of compliance policy in all business sectors both at the state level and in internal business processes of companies.

In Ukrainian legislative practice, relevant laws were adopted to combat corruption: the Laws of Ukraine "On the National Anti-Corruption Bureau of Ukraine" (2014), "On Prevention of Corruption" (2014), "On Public Procurement" (2010), "On Prevention and Counteraction to Legalization (Laundering) of Proceeds from Crime, Financing of Terrorism and Financing of Proliferation of Weapons of Mass Destruction" (2014). Also, in order to strengthen the effectiveness of the fight against corruption in Ukraine, amendments were made to the Criminal Code of Ukraine, the Administrative Code of Ukraine, Acts of the President of Ukraine, Acts of the Cabinet of Ministers of Ukraine, Orders of the Ministry of Justice of Ukraine, Decisions of the National Agency for the Prevention of Corruption, etc.

In addition to the legislative framework in the fight against corruption, representatives of the agricultural sector act through business associations within the market. Such interaction allows you to outline the range of issues that the sector participants face, receive professional advice from experts and form appeals to the relevant state authorities. The main advantage of participation in associations is the possibility of feedback from the state at the level of organizations. Individual www.unic.org.ua appeals of representatives of agricultural business 8, regardless of the form of ownership, are less promising in terms of conveying and solving than appeals from associations. Agribusiness, like other areas of activity of Ukrainian companies, is constantly at risk of becoming an object of corruption. The introduction of a compliance function based on international anti-corruption requirements will help increase the level of trust in Ukrainian agricultural companies on the world stage, attract investment and apply innovations, have a positive example of partnership within the country, and will become a tool for protecting shareholders, investors, top management and other stakeholders from anti-corruption risks.

A feature of agrarian social responsibility is interaction with landlords and local communities. Cooperation between agribusiness and landlords is based on the principles of honesty and transparency. This is declared in business regulations, relevant statutes and procedures. Representatives of agricultural companies closely communicate with landlords to understand the needs of the region, study the social, economic and environmental problems of the area, form a development budget, etc. The following tools are used to interact with local communities based on compliance principles:

- ✓ holding a general meeting on the ground;
- ✓ annual approval of the budget and development plan of the region on the basis of the general meeting;
- ✓ reporting on the use of funds (protocols and maintenance of internal documents and accounting);
- ✓ verification of the facts of the use of funds for their intended purpose;
- ✓ counseling;
- ✓ speeches of the compliance officer at the general meeting;
- ✓ checking counterparties for interested parties, etc.

Corporate social responsibility of agricultural companies creates many opportunities for the development of the regions of presence. Given that the process of expanding the

geography of exports continues in Ukraine, the development of new markets will be impossible without improving various aspects of business, interaction with the state and representatives of the local community. Comprehensive development includes product quality, pricing, and the introduction of world standards of business communication. An additional advantage of introducing a compliance strategy in the direction of corporate social responsibility in the activities of agricultural companies is the creation of an effective tool for changing the established forms of doing business on the ground, the way to replace corruption stereotypes of cooperation with new transparent models.

Active actions to introduce compliance in Ukraine indicate the interest of national business in creating a transparent model of activity and orientation towards international integration. Anti-corruption policy, as one of the components of compliance, plays a key role in these processes. In view of this, Ukrainian companies continue to improve existing tools and intensively implement new effective anti-corruption mechanisms in their business processes. An integrated approach to the implementation of a compliance system and the creation of a powerful control vector will contribute to building transparent interaction between all market participants. Measures for the effective implementation of the compliance program should include:

- analysis of existing business processes for corruption and compliance risks, with their further revision and updating if necessary;
- development of policies and procedures that reflect the company's areas of activity, regulate the rules of such activities, provide mechanisms that minimize risks and contain a list of disciplinary and administrative sanctions in case of their violation;
- updating information systems and databases, IT programs in accordance with the principles of personal data protection;
- assistance to employees in appropriate actions through individual training;
- work with incidents, which includes the practice of simulating their occurrence in the work process as a preventive and educational measure, as well as solving and analyzing real cases in order to avoid similar situations in the future;
- introduction of a hotline for the possibility of obtaining information about violations of the rules of business conduct and corporate ethics. To spread a sense of trust in this tool among employees, the principles of the hotline must be clearly declared in the company's internal rules;
- protection of employees/third parties who report corruption. The global anti-corruption practice provides for the development of instructions regulating the application procedure, a mechanism for conducting internal verification of the facts obtained and a guarantee of confidentiality;
- conducting corporate trainings on compliance. It is important that such training courses are regular and customized according to the field of activity of employees. For example, separately for managers from areas most exposed to corruption risks (procurement, contacts with civil servants, etc.);
- corporate newsletters, news on the corporate portal about updates in anti-corruption legislation, as well as about situations with the detection of corruption violations and their consequences;
- creation of a register of gifts, the value of which exceeds the limit established by internal rules. It is important that the register is publicly available to all employees and audits;
- checking counterparties, business partners, suppliers, consultants, brokers,

contractors and third parties for corruption and sanctions risks, anti-money laundering and tax financing;

- development of an anti-corruption clause, which includes mandatory guarantees and obligations to comply with the anti-corruption law and comply with the international sanctions regime;

- inclusion of an anti-corruption clause in contracts and contracts.

An important element of implementing a compliance strategy is a systematic check of the level of its implementation and implementation. When measuring the level of compliance, the following principles should be followed.

The level of compliance culture. Includes compliance with the "tone from above" by the company's top management; appropriate behavior of employees (involvement, attitude, ability to recognize potential compliance non-compliance); absence of repetitive violations; prompt corrective actions, as well as 100% awareness of employees about the company's rules.

Defense of applicants. The protection system should be based on the principle of building trust and confidence of employees. For this purpose, reports of possible violations are considered in a positive context. At the same time, investigations are carried out promptly with mandatory punishment of violators.

Effective compliance risk management. Includes identification of the most important risks, systematic monitoring

Attention not only to fraud issues, but also to unethical behavior or misconduct.

Effective compliance policies and procedures. The list of rules should embody the connection of operational activities with compliance requirements. In this direction, an important step for each company is the formation and implementation of a single system of regulated business processes with sufficient built-in internal controls.

The basis for such a system is a risk-based approach, structuring activities and determining the owners of business processes. Internal standards should clearly and transparently define the rules for the implementation of business processes, the areas of responsibility of participants while maintaining the rules for the distribution of powers. All regulatory documents must be reviewed and supplemented in a timely manner, including in accordance with changes in current legislation and compliance requirements. The lack of a compliance function, insufficient level of its control or implementation is immediately noticeable in the activities of companies in all areas of business and interaction with the state. The negative consequences of this state of affairs are poor business reputation, loss of investment attractiveness, financial losses (fines, failure to comply with current control of renewal or introduction of additional control methods, reduction of time for implementation of recommendations based on audit results).

The analysis of compliance security in the agricultural business allows us to draw a number of important conclusions. Firstly, ensuring compliance is a prerequisite for the sustainable development of agro-industrial enterprises, as it minimizes legal and financial risks, increases the level of transparency of doing business and helps to strengthen trust on the part of partners and regulatory authorities. Secondly, in today's environment, an effective compliance system should include monitoring changes in legislation, developing internal policies and procedures, staff training, auditing, and risk assessment. Particular attention should be paid to the introduction of digital technologies to automate compliance processes, which contributes to their efficiency and efficiency.

Thirdly, agricultural enterprises should focus not only on compliance with legal requirements, but also on compliance with international standards in the field of ecology, product quality and social responsibility. This will contribute to their competitiveness in global markets and attract investment.

Thus, compliance security is a key element of strategic management of agricultural business, ensuring its stability, efficiency and long-term profitability. The implementation of a comprehensive approach to compliance will allow enterprises to adapt to modern challenges and create a solid foundation for sustainable development.

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ECONOMIC CHARACTERISTICS OF FORESIGHT TECHNOLOGIES

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The modern world is characterized by dynamic changes in the socio-economic sphere, science, technology and politics. In this regard, there is a growing need for forecasting and strategic planning methods that allow you to form a vision of the future and adapt economic policy to new challenges. One of these approaches is foresight technologies — long-term forecasting methods based on expert assessments, trend analysis, scenario modeling, and active stakeholder involvement.

Foresight technologies are actively used in economic forecasting, as they allow to identify promising areas of industry development, develop innovative strategies, as well as ensure effective interaction between government institutions, business and the scientific community. In the context of globalization and digitalization, foresight methods are becoming a key tool for economic planning and forecasting, helping not only to identify possible risks, but also to seize new opportunities for development.

The use of foresight technologies in the modern economy is a multifaceted process that covers both the macroeconomic level (state regulation, development of national development strategies) and the microeconomic level (enterprise management, development of new business models, increasing competitiveness). Therefore, the study of the economic characteristics of foresight technologies is important for understanding their potential, limitations and prospects for implementation.

Foresight, as an economic category, is an important tool for strategic planning and forecasting, which allows you to determine long-term priorities for the development of the economy and society. It is aimed at identifying promising areas of scientific and technological progress and innovations that can provide the maximum positive impact on the economic development of Ukraine in the future.

Foresight is considered as a systematic process that combines expert knowledge to form a coherent vision of the long-term prospects for the development of science, technology and innovation. The main structural elements of this concept are the purpose, principles, objectives, functions, objects and subjects of application. The purpose of foresight is to determine strategic directions of development that will contribute to increasing the competitiveness and sustainability of the economy. The principles include consistency, comprehensiveness and participation of a wide range of stakeholders. The tasks of foresight are to identify key trends, risks and opportunities, as well as to develop scenarios for future development. Foresight functions include analytical, prognostic, communicative, and educational components. The objects of research are economic sectors, technological sectors, social and environmental systems, and the subjects are scientists, entrepreneurs, civil servants and public organizations.

Foresight, as an economic category, is a systematic approach to forecasting and shaping the future, aimed at identifying long-term trends and developing strategies to achieve the desired results. In the Ukrainian context, foresight has established itself as an effective tool for choosing priorities for the development of science and technology, which contributes to the identification of key areas of innovative development of the

country. Foresight research is an important strategic planning tool that allows you to predict future trends and form long-term development strategies. An analysis of existing publications on this topic reveals several key aspects that deserve attention.

Foresight is based on the involvement of a wide range of stakeholders, including representatives of the state, business and the scientific community. The main methods are expert panels, scenario analysis, the Delphi method, bibliometric and patent analyses. These methods allow you to obtain a comprehensive vision of possible development scenarios and determine priority areas of research and technologies. In the public sector, foresight is used to develop policies that take into account long-term perspectives. The involvement of the public and experts contributes to the formation of consensus on strategic directions of development. An example is the experience of Estonia, where the Foresight Center at the Parliament is actively engaged in the development of development scenarios until 2030, involving external experts and consultants.

In Ukraine, foresight research is becoming increasingly important. The National Institute for Strategic Studies (NISS) conducts scientific, analytical and forecast research, preparing analytical materials for public authorities. Also, at the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" there is a World Data Center for Geoinformatics and Sustainable Development, which specializes in interdisciplinary research of complex systems.

Among the significant foresight studies in Ukraine, the project "Economic Revival through Industrial Development of Ukraine" stands out, the purpose of which was to determine the strategic directions of industrial growth and integration into the world economy. The use of foresight methods in the management of scientific and technological development makes it possible to adapt international experience to Ukrainian realities, ensuring effective forecasting and planning.

Despite the active development of foresight research, there are certain challenges, in particular, an insufficient number of publications detailing the methodology of foresight and the need to improve the information support of research. It is important to integrate modern information systems and technologies, such as Big Data and artificial intelligence, to increase the efficiency of foresight projects.

In different countries, foresight is used to determine scientific and technical priorities and form strategies for innovative development. For example, in the UK, there are competence centres in the field of foresight, such as the Science and Technology Policy Research Unit of the SPRU and the Engineering, Science and Technology Research Unit of PREST. These institutions bring together national experts to work on foresight projects, disseminate information, and perform educational functions.

In Ukraine, foresight is also becoming increasingly important as a strategic planning tool. An example is the study "Economic Strategy of Ukraine 2030", which is aimed at determining the long-term priorities of the country's development. A feature of this foresight is the wide involvement of different categories of participants, which increases the degree of coherence of decisions and reduces the polarization of views. In general, foresight as an economic category is a powerful tool for the formation of long-term development strategies based on a comprehensive analysis of trends and the active participation of all stakeholders.

Based on the short historical period of development and use of foresight, we can say that this economic category has not yet been sufficiently studied. In our opinion, special attention needs to be paid to an in-depth study of the essence of this definition,

the principles of its formation, conditions and methodological tools for the use of foresight, which will contribute to a more effective functioning of various kinds of enterprises in solving development problems by innovative methods. Foresight technologies play a significant role in modern economic forecasting and strategic management, providing a systematic approach to the analysis of future challenges and opportunities. Their effectiveness is based on the integration of scientific methods, expert assessment and broad stakeholder involvement, which contributes to the development of realistic development scenarios.

Studies of the current conditions of functioning of the industrial sector of the national economy have revealed significant uncertainty in their strategic future, the impact of globalization factors, external aggressive challenges and threats, which produces the use of foresight to ensure their innovation and investment attractiveness in the national and international environment. Thus, foresight technology is a methodological tool for involving macroeconomic actors in the process of developing and implementing strategic structured modernization in the national industry through a transparent dialogue.

Foresight technology is a modern means of intensifying communication dialogue in industry between relevant institutions, investors, innovators, partners and other stakeholders. Modern foresight technology ensures the democratization of the regulation and management process. Foresight technology presents and visualizes probable trends in the development of industry and its components through the socio-economic and technological component, with a focus on future periods of operation, achieving priority coherence and understanding between the relevant institutions, national and international society, the entrepreneurial environment in the strategic areas of national industrial development, which ensures the effective competitiveness of national industrial producers and solving priority socio-economic and environmental problems. Foresight technology is focused on determining the most priority alternative directions of industrial development in the national economy. Foresight projects of the industrial sector, including corporate ones, are aimed at identifying industrial and technological priorities, substantiating factors that can significantly affect the change in the market environment, assessing industrial products that have prospects of significant demand in society, identifying the industrial and technological potential of the subjects of the national economy, choosing priority measures necessary for the effective development of existing and achieving new competitive advantages of the national economy. industry in a global international environment.

The use of foresight methods in public administration allows you to create long-term economic strategies, increase innovation activity and ensure the competitiveness of national economies in the global space. At the enterprise level, foresight helps to identify promising market niches, adapt business models to technological changes, and minimize the risks of uncertainty.

However, despite significant advantages, foresight technologies have certain challenges, including the subjectivity of expert assessments, the complexity of long-term forecasting in conditions of instability, as well as the need for a high level of interdisciplinary cooperation. To increase the effectiveness of their application, it is necessary to develop a methodological base, use modern data processing technologies (artificial intelligence, big data) and improve communication mechanisms between different participants in the process.

Thus, foresight technologies are a promising tool for economic analysis, which helps to form informed decisions at all levels of economic management. Their widespread implementation will contribute to increasing the adaptability of economic systems to changing conditions and ensure sustainable development in the long term.

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EXPLORING THE ECONOMIC ESSENCE OF CRYPTOCURRENCIES: ADVANTAGES AND DISADVANTAGES

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In the context of the digital transformation of the economy, financial innovations are becoming more and more popular, changing traditional approaches to the exchange of values, investment activities and capital preservation. One of the most revolutionary technologies of recent decades has been blockchain technology, which serves as the basis for the creation and operation of cryptocurrencies.

Cryptocurrencies such as Bitcoin, Ethereum, Ripple and many others have become not only an alternative to fiat money, but also the object of active scientific and practical discussions. Their rapid development has aroused interest not only among investors and financial institutions, but also among regulators, governments and the scientific community. Discussions are held around a wide range of issues, including the essence of

cryptocurrencies as an economic phenomenon, their role in the global financial system, as well as the possible benefits and risks of their use.

On the one hand, cryptocurrencies offer new opportunities to conduct financial transactions without intermediaries, providing greater speed, security, and decentralization. On the other hand, they pose significant challenges related to regulation, financial stability, and the possibility of being used in illegal schemes.

The purpose of this study is to analyze the economic essence of cryptocurrencies, identify their main advantages and disadvantages, and assess their potential impact on the modern economy.

The rapid development of information technologies has a direct impact on the modern economic system, in particular, it concerns the sphere of settlements and payments. Due to constant challenges to this system and market crashes during periods of crisis, society subconsciously ceases to trust financial institutions. But after the advent of Bitcoin, which aims to solve the problem with the financial system, interest in cryptocurrency began to grow, the pace of development of which is growing every year. More and more new tokens and platforms are being created that use blockchain technology. Due to the high volatility and risks, cryptocurrencies must be regulated by the state for the safety of its citizens in the first place and for the collection of tax revenues in the second. Although cryptocurrencies have been in development for more than 10 years, the world still cannot decide what legal framework to introduce in order to make the most of this latest technology. Currently, Ukraine has adopted the law "On Virtual Assets" of February 17, 2022, which actually legalizes cryptocurrencies in Ukraine. Of course, this law is still quite fresh and requires further revisions and time to draw conclusions about its effectiveness.

There are a lot of scientific papers to be found about cryptocurrencies, but they mostly just describe the technology itself. It all boils down to a similar value of cryptocurrency in the monetary system. As for the legal framework, you can also find a lot of such works, but they are all quite different, since even the G7 countries do not yet have a time-tested legal framework. Therefore, this topic is not yet sufficiently covered for conclusions, but just right for analysis.

The cryptocurrency was created with the aim of replacing the banking system after the 2008 crisis. For a deeper understanding, it is necessary to identify the strengths with which the cryptocurrency has already succeeded and is moving towards its goal and the weaknesses due to which it can cause a lot of trouble for both the economy and the ecology of the world.

The study carried out allows you to establish the main economic advantages of cryptocurrency. These include the following.

Protection from the state. Inflation has caused many currencies to depreciate over time. Almost all cryptocurrencies are laid out with a fixed amount at launch. The source code indicates the number of any coins. Thus, as demand increases, the cost will correspond to the market value and ultimately prevent inflation.

Self-management and controllability. The management and support of any currency is a factor in its development. Cryptocurrency transactions are stored by developers/miners on their hardware, and they receive transaction fees as rewards. Because of this, they ensure high accuracy and relevance of transaction records, the integrity of cryptocurrencies and decentralized records.

Security and privacy. Blockchain technology encrypts any actions in it to the

ledger. This makes cryptocurrency more secure than a regular electronic transaction. Cryptocurrencies for greater security and privacy can use pseudonyms that are not covered by users or accounts.

Currency exchange can be done easily. Cryptocurrency can be bought in almost every currency in the world. With a variety of cryptocurrency wallets and exchanges, you can convert one currency to another by trading cryptocurrencies.

Decentralization. The main advantages of cryptocurrencies are that they are mostly decentralized. This helps keep the monopoly free and 8 controlled, so that no single entity can determine the flow and value of the coin, which in turn keeps it stable and secure, unlike state-controlled fiat currencies.

A cost-effective way to make transactions. One of the main uses of cryptocurrency is to send money across borders. With cryptocurrency, the transaction fees paid by users become negligible or zero. This is achieved by not needing a third party such as VISA or PayPal. Fast way to transfer funds. Cryptocurrencies have always been considered an optimistic outcome for transactions. Operations, whether international or domestic, are carried out at lightning speed. This is because processing takes very little time because there are very few hurdles to overcome.

The study carried out allows you to establish the main economic disadvantages of cryptocurrency. These include the following.

Illegal operations. The privacy and security of cryptocurrency transactions is high, making it difficult for a government agency to trace any user to a wallet address or track their data. Bitcoin is used as a way to exchange money in many illegal transactions, such as buying drugs and weapons on the dark web. Cryptocurrencies are also used to convert their money obtained illegally through a network intermediary to hide its source.

Decentralized but still manageable. The flow and quantity of some currencies on the market is still controlled by their creators and 9 large organizations. These owners can manipulate the coin for significant fluctuations in its price. Even widely traded coins such as Bitcoin or Ether, the value of which increased more than 15 times in 2020-2021, are suitable for these manipulations.

Negative impact of mining on the environment. Cryptocurrency mining requires a lot of computing power and electricity costs, which makes it very energy-intensive. The main culprit is Bitcoin. Bitcoin mining requires modern computers and a lot of energy. The main Bitcoin miners were located in countries such as China (until 2021). This has significantly increased China's carbon footprint.

Prone to hacking. Although cryptocurrencies are very secure, exchanges are not as secure. Most exchanges store the user's wallet data so that their ID works properly. This data can be stolen by hackers, giving them access to many accounts. Also, cryptocurrencies whose blockchain was written with at least one gap can be hacked.

There is no return or cancellation policy. If there is a dispute between interested parties or someone mistakenly sends money to the wrong wallet address, the sender cannot receive the coin back. This can be used by many people to deceive others for profit.

As the use of cryptocurrency grows around the world, cryptocurrency regulations are also being enacted to regulate them. Cryptocurrency is constantly evolving and the rules for its regulation are changing. Almost all countries regulate cryptocurrency only conditionally, because you can always receive funds without any tax returns, since cryptocurrency is anonymity. Basically, all countries simply limit its use, and all

organizations dealing with virtual assets are monitored by the securities commission. Some countries have completely banned any activities with cryptocurrencies and prevent its spread. Countries such as China, Turkey and Egypt have banned any financial transactions with cryptocurrencies, those who violate this will face criminal implementation.

Basically, all governments ban or suppress cryptocurrency due to several important aspects:

- cryptocurrencies are anonymous and contribute to money laundering, which significantly affects the economy;
- can become a strong competitor or interfere with the development of their fiat currencies or a new trend towards state digital currencies such as the digital yuan;
- due to poor financial literacy, citizens may lose money, which will contribute to the transfer of funds from the country. Some countries, on the contrary, welcome cryptocurrency with a hug.

EU countries, Japan, and Australia have legalized all cryptocurrency transactions. In these countries, they are defined as assets or property and are taxed from 0-50% on capital gains. Cryptocurrency exchanges are the most regulated – a mandatory KYC procedure (know your customer) has been implemented for all customers, limits on transaction volumes have been set. It is mandatory for all civil servants to submit declarations on cryptocurrencies, if any. In countries such as the United States, Canada, and Singapore, cryptocurrencies are not legal tender, but they are quite loyal. Regulation is on a par with legalized countries.

The definition of cryptocurrency is quite vague and each government network or organization sees it differently. The United States has taken a rather interesting approach to the regulation of cryptocurrencies, or rather their securities commission (SEC). They prohibit all companies and organizations that are related to cryptocurrencies and are not registered in the United States. That is, if someone wants to expand into their market, they are forced to engage in paperwork and compliance with all the rules and conditions, as if they want to get a loan from the IMF. After registration, the company must pay taxes at 21% and constantly report. But this allowed the country to have almost the only cryptocurrency exchange Coinbase, which significantly reduced the outflow of funds to other countries and, conversely, their inflow. The main problem of legal regulation of cryptocurrencies in the world for each country is money laundering. So far, countries have not found an effective solution to prevent this. Even those countries that have banned it cannot get rid of the darknet and the black market. The main decisions and future plans for cryptocurrency regulation are to tighten the rules on the KYC procedure. Also, many countries are going to introduce mandatory data collection from cryptocurrency exchanges and wallets. This will allow you to receive reports from exchanges about suspicious activity for high-volume transactions, and wallet owners to identify themselves. This should significantly reduce or completely eliminate money laundering and darknet activity.

Cryptocurrencies are a unique financial phenomenon that continues to evolve and change the global economic landscape. They provide users with new options for conducting financial transactions, increasing speed, transparency and reducing transaction costs. At the same time, their decentralized nature contributes to reducing dependence on traditional financial institutions, which makes cryptocurrencies especially attractive in conditions of economic instability.

Despite the significant benefits, there are a number of risks that slow down the mass adoption of cryptocurrencies. The lack of a clear regulatory framework, high volatility, the possibility of being used in illegal transactions, and the problem of blockchain energy consumption are the challenges that need to be addressed for the further integration of cryptocurrencies into the global economy.

The development of the cryptocurrency market and its regulation will require a balanced approach from governments and financial regulators. It is possible to create hybrid models that combine the advantages of decentralized digital assets with mechanisms of state control and consumer protection. Therefore, cryptocurrencies are an important element of today's financial ecosystem, and their future will depend on society's ability to balance innovation and risk. The growing interest of institutional investors, the development of new technical solutions and the development of legal regulation will contribute to the further development of this industry and its integration into traditional financial systems.

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FORMATION OF COMPETITIVE ADVANTAGES OF MACHINE-BUILDING PRODUCTS

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The machine-building industry is one of the key components of the national economy, which determines its technological development, level of innovation and competitiveness on a global scale. In the conditions of increased market competition, the issue of formation of competitive advantages of machine-building products acquires special importance. Manufacturers are forced to constantly adapt to changes in the global economy, introduce the latest technologies, improve product quality and optimize production processes. The main factors influencing the competitiveness of machine-building products are the level of technological development of the enterprise, innovative capabilities, production efficiency, cost of products, compliance with international quality standards, marketing strategy and flexibility in meeting consumer needs. State support mechanisms, international cooperation and environmental standards also play an important role. Modern trends in the development of the machine-building industry require the active use of digital technologies, automation and robotization of production processes. The successful integration of innovative solutions such as artificial intelligence, the Internet of Things (IoT) and big data (Big Data) can significantly increase production efficiency and competitiveness of products in the global market.

The purpose of this report is to analyze the main approaches to the formation of competitive advantages of machine-building products, to identify key factors of influence and to consider effective strategies for increasing the competitiveness of enterprises in the machine-building industry.

The category of "competitiveness of a machine-building enterprise" can be characterized by a list of certain properties, namely:

- comparability: the competitiveness of the enterprise is determined and studied in comparison with real competitors who are engaged in the manufacture of similar products or substitute goods, operate in the same market, or the comparison takes place with an ideal enterprise (as a rule, provided that the studied enterprise acquires a monopoly position in the market);

- spatiality: the competitiveness of an enterprise is determined within a certain specific market, since under equal conditions an enterprise can be identified as competitive in one market and non-competitive in another;

- dynamism: the concept of competitiveness is limited in time, because an enterprise can be competitive in one period, and lose these positions in another;

- subjectivity: provides for the allocation of a list and a set of parameters that form the competitiveness of the enterprise, namely: high quality and low prices for products, modern equipment and technology, high qualification of personnel, a positive image of products and brand of the enterprise, developed marketing communications and promotion channels, availability of financial opportunities for development, availability of own areas, buildings, structures and other fixed assets, availability of patents for unique inventions, the use of advanced management technologies;

- attribution: allocation of a unique characteristic, which primarily forms the competitive advantage of the enterprise (unique products, additional range of services, original production technology, etc.);

- taking into account internal and external conditions of functioning: when assessing or forecasting the competitiveness of a machine-building enterprise, it is necessary to take into account the whole set of factors that have influenced or potentially may affect its formation;

- systematic: it involves taking into account the entire set of parameters and conditions that form the competitiveness of a machine-building enterprise, as well as the relationships between them and mutual influences.

That is, the competitiveness of a machine-building enterprise can be defined as a complex system concept that reflects the competitive advantages of a particular machine-building enterprise over others by a set of parameters (economic, financial, production, market, personnel, commodity, etc.), which are in a certain way combined with each other and form a priority uniqueness and consolidation of positions in a certain market in a specific period of time under a certain influence of the operating environment. This definition takes into account all the properties listed above.

Competitiveness acts as a key aspect of the functioning of the market economy, which affects the efficiency of all participants in the market environment and ensures the stable development of this system. The success of an enterprise in a market economy is determined by its financial results, which include expenses and income received. In connection with the conduct of hostilities on the territory of Ukraine, the restriction of access to world markets, the growth of risks in managerial decision-making and the intensification of competition for increasing market share both at the external and internal levels, the problem of ensuring the profitability of Ukrainian enterprises arises.

The share of mechanical engineering in the structure of industrial production of Ukraine is only 13%, while in economically developed countries it reaches 35-50%. More than 50% of machine-building products manufactured in Ukraine are exported, but the volume of imports of these products is 2.4 times higher than the volume of its exports. The growth rate of imports is significantly ahead of the rate of exports, which negatively affects the trade balance. In 2022, the share of engineering products in the structure of exports amounted to 16.4%, and in 2023 – 7.1%, imports in 2023 – 31.1%, while in the economically developed countries of the world, mechanical engineering determines their export potential and provides from 32 to 40% of all exports. Among the nomenclature of exports, mechanical equipment, machinery, mechanisms, vehicles, devices prevail, and the markets remain mainly the countries of Eastern Europe, while knowledge-intensive equipment is imported, in particular metallurgical, printing, for the textile industry, agriculture, medical equipment. Before the onset of the war with Russia, mechanical engineering was the leader in terms of sales of products among other industries. Back in the first half of 2021, the increase in production in the industry was 29.5% (the average for the industry was 7.7%). Mechanical engineering began to actively enter foreign markets. In January 2022, production volumes in mechanical engineering decreased by 58.3% compared to the same period last year.

Mechanical engineering industries have different development potential after the start of the war. The growth of automotive production depends on the renewal of the creditworthiness of banks, due to which the main part of demand is formed. The production of electrical equipment is promising, the demand for which has remained and

will continue to grow on world markets. It is urgent to form additional competitive advantages of machine-building enterprises, which, in our opinion. First of all, it is necessary to attribute the quality of products, the effectiveness of brand policy, and the acquisition of consumer loyalty.

The volume of the machine-building products market in 2023 amounted to 74 billion UAH. UAH. This is 15.5% of the total turnover of the manufacturing industry or 11% of the turnover of all Ukrainian industrial enterprises. The main reason for such a sharp drop in production volumes in 2022 is a decrease in consumer demand, as well as the use of imported components, the cost of which has risen sharply with the devaluation of the hryvnia. The share of unprofitable enterprises in 2022 was 47.4%.

The analysis showed the unsatisfactory state of competitiveness of the Ukrainian economy, the development of energy-, capital-, ecological-, labor-intensive industries that have export potential, and the strengthening of its low-tech specialization in the system of international division of labor. In the short term, the economy benefits from an increase in low-tech exports, and this is contrary to Ukraine's strategic interests. The monitoring of the competitive state of the main sectors of the domestic economy revealed that mechanical engineering today is low competitive and requires technological modernization and investment support. The data in Table. Figure 2 shows that in 2009 all machine-building enterprises of Kremenichuk sharply reduced the volume of production. Crisis phenomena in the country have negatively affected the activities of these enterprises. The main reasons for this state were external factors, ineffective management, as well as the lack of a development and stabilization strategy. The activity of the enterprise should be aimed at the production of products for a certain market segment, which is its important competitive advantage. Ensuring and maintaining the competitiveness of products, manufacturers incur appropriate costs, and it is very important that the level of these costs is optimal (allowing the products to be competitive and the enterprise profitable).

In 2023, enterprises in the machine-building industry faced a number of problems related to the war:

1. Reduction or cessation of production due to rocket attacks on energy infrastructure, which led to interruptions in the supply of electricity.
2. Moving the industrial potential of enterprises to safe regions. The government implemented a program that provided for the resettlement of more than 800 enterprises, of which more than 650 began work in new places.
3. The continuation of the work of enterprises during martial law, as well as significant damage to critical infrastructure and a decrease in labor resources due to the mobilization of employees.
4. Difficulties with the export of machine-building products due to the destruction of Ukraine's port infrastructure and the blocking of sea routes.
5. Fluctuations in the foreign exchange market, which complicated the foreign economic activity of enterprises.

The formation of competitive advantages of machine-building products is a multidimensional process that includes technological, economic, organizational and marketing aspects. The main factors that determine the competitiveness of products include a high level of innovation, optimization of production processes, improvement of product quality, reduction of cost and adaptation to changes in market conditions.

One of the key elements of ensuring competitive advantage is the introduction of

the latest technologies, such as automation, robotics, digital design, and artificial intelligence. The use of modern technological solutions allows you to increase production productivity, minimize costs and reduce the time for the development of new products. An important aspect remains the compliance of products with international quality standards, which provides access to global markets and increases consumer confidence. In addition, an effective marketing strategy and flexibility in meeting customer needs allow businesses to quickly respond to changes in the market situation and strengthen their positions. For the sustainable development of the machine-building industry, it is necessary to develop research activities, support innovations and strengthen interaction between enterprises, scientific institutions and government agencies. State support, tax incentives and infrastructure development also play a key role in shaping the competitive advantages of national engineering products.

Therefore, achieving high competitiveness of machine-building products requires an integrated approach, which includes the introduction of innovations, increasing production efficiency, compliance with international standards and effective resource management. Only a combination of these factors will allow enterprises of the machine-building industry to ensure sustainable development and take a leading position in the world market.

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GOAL COSTING AS AN INNOVATIVE METHOD OF COST FORMATION IN INDUSTRY

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In modern conditions of economic development and high competition in the industrial market, enterprises are forced to introduce the latest approaches to cost management. One of these approaches is Goal Costing, an innovative method of forming the cost of production, which is focused on strategic cost management and maximization of economic efficiency of production. Traditional costing methods, which are based on accounting for actual costs, have a number of limitations, including a lack of flexibility in forecasting financial results and a lack of close connection with the marketing and innovation strategies of companies. In response to these challenges, goal costing offers a new approach to cost formation, which involves determining the target cost based on the expected market price and ensuring that it is achieved by optimizing costs at all stages of production.

The introduction of goal costing in industrial enterprises helps to increase the competitiveness of products, as it allows you to take into account the possibilities of reducing costs without losing quality even at the stage of product design and development. In addition, the methodology contributes to the rational allocation of resources, which is extremely important in a period of economic instability and rapid changes in global industry.

This scientific report examines the basic principles, mechanisms and benefits of using goal costing in industry. The prospects for its implementation and potential challenges that enterprises may face during the adaptation of this method are also analyzed.

Due to the significant increase in competition in the national and world market of industrial products, its constant development and improvement, focus on the end consumer and the constant increase in the share of labor cost in the structure of the cost of industrial products, the use of out-of-order and other traditional for domestic industrial enterprises method of calculating the cost does not allow to fully take into account all the features of industrial products and services, produced in this field of activity. The author's hypothesis is that the calculation of the cost of products and services in the field of industrial production should be carried out according to the method of targeted cost formation, which is based on the principles and tools of the methods of targeted costing and kaizen costing, as well as elements of the out-of-order method.

Usually, the system of forming the production cost of using the scientific and methodological provisions of "kaizen-costing" is used at industrial enterprises along with the "target-costing" system, which is quite close to it. They have one goal - to obtain the target cost of industrial products, although according to the target costing model, this important goal for the enterprise is sought at the stage of designing new products, then according to the kaizen costing model - at the stage of its manufacture. Combination of the two methods allows you to achieve maximum efficiency. Target costing sets acceptable costs and contributes to the effective start of product development, while

kaizen costing ensures further continuous improvement in the production process. Examples of large Japanese corporations, including Toyota and Sony, demonstrate that it is the combination of targeted costing with kaizen costing that allows them to remain leaders in the industry.

In the model of formation of the cost of industrial products standard-costing, which is currently the most widely represented in the practice of management accounting and cost management at Ukrainian industrial enterprises, possible deviations of the values of actual costs from the defectively established (normative) ones are accounted for. The amounts of deviations received by economists are recorded and reproduced on accounts specially created for this operation. At the end of the reporting (planned) period, all amounts of detected deviations are written off to the results of the financial activity of the enterprise. At the same time, a simple method of analyzing the detected deviations is used, on the basis of which a decision is made to adjust the norms and standards established at the enterprise. At the same time, a common task for the methods of standard-costing and kaizen-costing is the task of controlling the state of costs and results by comparing the actual (achieved) results with the goals set in advance. Since, unlike the target costing method, kaizen costing is used at the same stages of the product life cycle as the standard costing method, managers will face an important question about choosing one of these methodological approaches, or about forming a proposal for their combination. Despite the more progressive logic of kaizen costing compared to standard costing, there is no need to oppose these systems to each other. Each of these fairly progressive systems can solve the corresponding problems, each of them has both significant advantages and certain disadvantages. The solution to the problem can be the integration (combination) of the accounting methodology of standard-costing and the accounting methodology of kaizen-costing, since there are good reasons for such a decision.

The combination of targeted costing and kaizen costing systems in the production and commercial activities of industrial enterprises is expedient, since these approaches complement each other, providing a balance between strategic cost planning and their continuous improvement in the production process. The main factor provisions for the justification of such integration are determined in several strategic directions of the enterprise's activity.

Based on this, the scientific and methodological combination of targeted costing and kaizen costing in the activities of industrial enterprises, regardless of the country in which it takes place, provides the enterprise with an integrated approach to targeted cost management, this methodological approach is focused on achieving strategic and tactical goals. In our opinion, the combination of targeted costing (targeted cost management) and kaizen costing (system of continuous cost improvement) provides a significant increase in the efficiency of industrial enterprises. This is achieved due to the complementarity of these systems at different stages of the product life cycle.

In our opinion, it is advisable to use the following indicators to assess the results of the integration of target and kaizen costing: reduction of the cost of production; the level of compliance with the target cost; dynamics of operational efficiency; the share of waste in the production process; increase in customer satisfaction. The absence of a system of cost control of the process of creation and production of industrial products, timely prompt effective response to the actions of competitors, taking into account the wishes of consumers, as well as the need to solve strategic tasks of management of an industrial

enterprise implies the need to develop and improve the methodological, theoretical, methodological and practical foundations of the development and improvement of the process of formation (calculation) of products and services in the industrial sector sphere.

It is proposed to combine in one methodical approach the advantages of the order-by-order method of formation of the cost of industrial products, which is now widely used in the practice of production and commercial activities of Ukrainian enterprises, systems of target-costing and kaizen-costing, the effectiveness of practical use has been proven by the practice of the activities of automobile concerns in Japan and many industrial enterprises of the European Union. The main task of this methodological approach is supposed to be to achieve the value of the target cost. The development of such a method for the formation of the cost of industrial production involves the introduction into scientific circulation of a fundamentally new concept of the target cost, the achievement of which is set as a goal (English. "Goal" - "Goal") industrial enterprise. Based on these premises, it is advisable to call this methodical approach to the formation of the cost of industrial products "goal-costing".

We will offer our own definition of goal costing as an innovative method of forming the cost of industrial products, adapted to the modern realities of production and commercial activities of domestic enterprises.

Goal costing is a methodical approach to the formation of the target cost (target costing) of industrial products by setting and practical implementation of kaizen tasks, the solution of which leads to a gradual reduction in costs and the achievement of the desired level of cost, which provides the necessary profit margin for enterprises.

Studies show that targeted costing is aimed at strategic cost management at the product design stage, focused on long-term goals, such as achieving profitability of a new product and entering new markets. It takes into account market needs, customer desires, and price sensitivity, allowing you to set a target value that will ensure competitiveness and profitability. It is based on market analysis, determination of an acceptable price for consumers and calculation of allowable costs in the reverse way. Kaizen costing focuses on operational activities, reducing costs through incremental improvements in the production process, maintains operational efficiency, providing flexibility in the short term through improvements in production processes. It is applied after the launch of the product into production, aimed at continuous cost reduction through gradual improvements. These two systems together cover different stages of the product life cycle, creating a single continuous cost management system. Their combination provides a balance between achieving strategic goals (target costing) and solving current production tasks (kaizen costing).

Target costing allows you to optimize costs during planning, which is especially important in a highly competitive environment, avoids unjustified costs at the design stage, ensuring that the product meets market expectations. Kaizen costing provides continuous improvement after the launch of the product, allowing you to adapt to changes in the market or internal conditions of the enterprise.

Target costing is effective in the early stages of the product life cycle, when key decisions are made about design, materials and technologies. At the same time, the target cost is formed taking into account the needs and capabilities of consumers. This ensures the creation of a product that meets the requirements of the market. focuses on eliminating losses (including time, materials, resources) in the production process. This system allows you to maintain the quality of the product at a high level, while reducing

costs, which is beneficial for the end consumer. The implementation of both systems makes it possible to create an effective management system that prevents the occurrence of waste and at the same time eliminates existing inefficiencies. The integration of these systems ensures not only competitiveness, but also increased customer satisfaction.

In kaizen costing, employees are involved in continuous process improvement, which helps to increase their motivation and increase the quality culture. This system is directly based on the active participation of employees in continuous improvement processes, forming a corporate culture of innovation and responsibility. In targeted costing, teams from different departments collaborate at the design stage to ensure that they meet target costs. Targeted costing includes cross-functional collaboration (marketing, engineering, finance), which contributes to the creation of a unified vision and employee engagement to achieve targets.

The integration of target costing and kaizen costing allows you to reduce the risks of budget overruns, providing control both at the strategic level and in the production process. Constant cost reduction due to kaizen costing allows you to maintain competitive advantages even after the launch of the product.

To effectively combine these systems, it is important to develop a clear integration methodology:

- creation of multifunctional teams for the implementation of targeted costing;
- introduction of PDCA (Planning, Execution, Check, Adjustment) cycles for kaizen costing;
- the use of digital tools for cost monitoring and process analysis.

The combination of targeted costing and kaizen costing allows industrial enterprises to achieve high efficiency, adaptability and profitability in a changing market.

Thus, the introduction of the accounting and analytical system of kaizen costing should not simply replace the standard costing methodology, which is rooted in a large number of Ukrainian enterprises. Only their organic interaction can provide a positive result of use, which is reproduced in minimizing production costs and corresponding optimization of the amount of profit.

If standard costing and the studied kaizen costing system can be used as a somewhat compatible option in the formation of the cost of production, then the method of target-costing (target costing), based on the life cycle of the product, seems to be to some extent the "predecessor" of kaizen costing [Kachalay, p.276]. The system of targeted costing and kaizen-costing have the same national roots (developed in Japan), more than 80 percent of large Japanese enterprises and organizations use this method of cost formation at this time. These two accounting and analytical systems try to achieve the same goal – to achieve the value of the target cost. That is, if we go through the stages of the product life cycle, then target costing tries to achieve the goal at the stage of designing a new product, and kaizen costing is already at the stage of production of new products. That is, the statement that kaizen costing looks like a certain continuation of the target costing system seems fair. It should be noted that this kind of consistency in the application of these accounting and analytical systems, in integration with the considered standard costing, is extremely important and simply necessary for the enterprise to achieve the goal of minimizing production costs.

Goal costing is an effective tool for strategic cost management in the industrial sector. Its application allows enterprises to reduce the cost of production without compromising quality, and also provides competitive advantages in the conditions of the

modern market. Unlike traditional costing methods, goal costing is future-proof, allowing businesses to develop products based on the company's target market price and financial strategy.

One of the key advantages of this method is its integration into all production processes — from product concept development to the final stage of release. This contributes to increasing the efficiency of resource use and reducing unproductive costs. In addition, the methodology stimulates enterprises to an innovative approach in the field of cost management, which allows them to adapt to changes in consumer needs and market conditions.

At the same time, the implementation of goal costing requires certain organizational changes from enterprises, in particular, personnel training, improvement of internal processes and the use of modern information technologies. The use of digital technologies for cost modeling and automation of management processes can significantly increase the efficiency of this technique.

Thus, goal costing is not just a cost management tool, but a comprehensive technique that allows industrial enterprises to be more efficient, flexible and competitive. In the context of globalization and rapid changes in technologies, the use of goal costing can become a key factor in the success of an enterprise in the modern market environment.

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INDICATORS OF ECONOMIC ASSESSMENT OF AN INDUSTRIAL ENTERPRISE

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In modern conditions of dynamic economic development and increased competition both in domestic and international markets, the economic assessment of industrial enterprises is of particular relevance. The efficiency of an enterprise is largely determined by the level of its financial indicators, the structure of assets and liabilities, as well as the ability to adapt to changes in the external environment. That is why the study and analysis of indicators of economic valuation of industrial enterprises is a key task for managers, investors and economists.

The economic assessment of an enterprise includes a whole range of methods and tools aimed at identifying its financial condition, competitiveness and investment attractiveness. Among the main indicators are the ratios of liquidity, profitability, business activity, financial stability, as well as integral estimates of the value of the enterprise. These indicators allow you to objectively assess the current state of the enterprise, its development prospects and possible risks.

The purpose of this study is to consider and analyze the key indicators of the economic assessment of industrial enterprises, as well as to identify their role in making management decisions. The paper will consider methods for calculating the main financial ratios, their interpretation and practical application in real business conditions. Particular attention will be paid to the issues of strategic management based on economic assessment, as well as possible areas for improving the analysis system.

The relevance of the topic is due not only to the need to improve the efficiency of industrial enterprises, but also to the growing interest in sustainable development and digitalization of the economy. Modern trends require business to be flexible, innovative, and able to quickly adapt to changes in the economic environment. Thus, an in-depth analysis of economic indicators and their competent use make it possible to increase the competitiveness of the enterprise and ensure its long-term stability in the market.

The functioning of an industrial enterprise contributes to the creation of various sources of effects that determine the effectiveness of this system. Experts distinguish four groups of effects: social, environmental, scientific and technical, and economic. Each of the effects can be both potential and real. However, at the same time, the economic effect from the implementation of measures to improve quality can be both potential and real (commercial), while the scientific, technical, social and environmental types of effects, as a rule, are mainly of the nature of a potential effect.

In fact, if we take into account only the final results of measures to improve the

work of the enterprise, then any result can be evaluated in value terms. The criteria for the final assessment here are: the time of obtaining the actual economic effect and the degree of uncertainty of its receipt (in other words, the level of risk of investing in projects to improve the quality of the company's performance).

Let us consider the most typical types of effects for each of the above groups for the mechanical engineering industry.

In the group of social effects from improving the efficiency of the enterprise, experts distinguish the improvement of: the qualification of managerial and production personnel and the efficiency of the management apparatus as a whole; the quality of managerial decision-making and their implementation; the degree of safety of products, services and works; the degree of satisfaction of the physiological, social and spiritual needs of employees; improvement of: working conditions and organization; the structure of management and production personnel, etc.

The group of environmental effects due to the improvement of quality management includes: reduction of environmental pollution and, as a result, fines for violation of environmental requirements; improving the environmental level of products and services; reduction of production waste; improvement of ergonomics (reduction of noise levels, vibration, etc.) of manufactured goods, etc.

Scientific and technical effects resulting from more rational quality management include: an increase in the number of registered copyright certificates and patents; increase in the share of new information technologies and advanced technological processes; improvement of the level of labor organization and production processes, etc.

The most significant in the context of this study are the economic effects achieved as a result of increasing the level of quality of products and improving the quality management system. At the same time, the scale of the achieved effect is determined by the degree of efforts made by the company's management in relation to quality improvement. Thus, if efforts are aimed at improving the quality of products (or services), the following types of economic effect are possible:

- obtaining additional profit by increasing the price of products of higher quality (due to the transfer of goods to the premium class);
- increase in the volume of products sold due to the expansion of the customer base;
- increasing the share of the company's presence in the market by achieving competitive advantages in relation to similar products;
- increase in the life cycle of products (extension of the stage of maturity), which allows the enterprise to save financial resources on the development, production and promotion of new types of products;
- increasing the life cycle of customers, which makes it possible to save money on the search and winning new potential consumers of the company's products.

Assessing the economic effect achieved by improving quality indicators is not very difficult, since the effect is expressed in understandable financial values: an increase in sales, an increase in the company's market presence, a reduction in production and operating costs, etc economic indicators. For example, it is quite difficult to determine that some of the new customers appeared due to the improvement of the quality characteristics of products and/or due to a successful advertising campaign.

It is much more difficult to predict in advance the economic effect that can be achieved by improving quality indicators. As a rule, this requires additional marketing research and analytical calculations. Thus, in order to assess how much a certain

improvement in the quality of a product or service can increase the volume of sales, the customer base, the market share of the company or the life cycle of a customer or product, it is necessary to assess the sensitivity (elasticity) of consumers to the quality of the product (service).

Significantly more significant economic effects can be achieved by the enterprise as a result of the orientation of the quality management system to improve the quality of the internal organization of activities, implying ensuring the compliance of the enterprise's activities with the standards and procedures established by the quality management systems. These effects include:

- Significant reduction in production costs (up to 20–40%) due to the elimination of losses from defects and reduction of the cost of control operations;
- increase in sales of products (services) due to an increase in labor productivity (in particular, an increase in the production rate or a reduction in the time standard);
- reduction in the number of personnel due to an increase in labor productivity (if there is no task to increase the volume of production);
- increase in production volumes without additional involvement of resources by improving the efficiency of labor and production processes;
- reduction of time for identification and solution of various production problems, and, as a result, an increase in the number of resolved problems due to the achievement of transparency of the company's processes. The economic effect in this case depends on the consequences of eliminating specific problems;
- ensuring the compliance of products with the requirements of the market (consumers) by optimizing the processes of the enterprise and, as a result, obtaining all the economic effects characteristic of the situation of improving the quality of products (considered earlier).

The high quality of products (services) can be effectively used to achieve high and, for the most part, short-term effects. To continue the effect over time, it is necessary to focus on ensuring the compliance of the main production, auxiliary and service processes with the internal standards of the enterprise.

In addition to the considered general economic effects from improving the quality of products (services) and processes, it is possible to distinguish a group of particular effects associated with the reduction of losses from the insufficient quality of products (services): reduction of production costs for correcting defects of manufactured products; prevention of the entry of low-quality material resources into the production process; reduction: losses from the final defect of finished products; the cost of control operations; costs for eliminating defects in consumer complaints (claims); the amount of fines for the supply of low-quality products and payments for complaints; expenses for warranty service and repairs; damage for breach of contract, etc.

The analysis of the indicators of economic evaluation of industrial enterprises allows us to draw a number of important conclusions. Firstly, the use of the system of financial ratios and integral indicators makes it possible to objectively assess the current state of the enterprise, identify its strengths and weaknesses, as well as identify potential threats and opportunities for development. This approach is especially important for strategic management, since it provides an information base for making informed decisions.

Secondly, a modern economic assessment of an enterprise should take into account not only traditional financial indicators, but also factors related to digitalization,

innovative activity and sustainable development. In the context of the fourth industrial revolution, the use of analytical tools based on big data, artificial intelligence and automated control systems plays an important role. This makes it possible to more accurately predict financial results, reduce operational risks and improve the efficiency of business processes.

Third, improving the quality of economic assessment of industrial enterprises requires constant improvement of methods for analyzing and taking into account industry specifics. An integrated approach is needed, including both traditional and innovative assessment methods, as well as the use of modern digital technologies for deeper analytics and forecasting.

Thus, indicators of economic evaluation of industrial enterprises are not only a tool for diagnosing the current state of business, but also the most important element of strategic management. Competent use of these indicators contributes to improving the efficiency of the enterprise, its financial stability and competitiveness. In the future, it is necessary to continue research in this area, focusing on the development of more accurate and adaptive assessment models that take into account the rapidly changing conditions of the modern economy.

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INFORMATION TECHNOLOGIES IN THE WORK OF THE MANAGER OF AN INDUSTRIAL ENTERPRISE

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In modern conditions of globalization and digital transformation, information technologies play a key role in the functioning of industrial enterprises. Growing competition, dynamic market development and the need for effective resource management force companies to actively implement the latest technological solutions. Managers of industrial enterprises are faced with the need to quickly make strategic and operational decisions based on the analysis of a large amount of data. The use of information technologies in this area allows not only to increase the efficiency of management, but also to optimize production processes, improve communication between departments and minimize costs.

Information systems, automated platforms and data analysis software allow managers to receive the necessary information in a timely manner, predict possible risks and develop effective strategies for the development of the enterprise. In addition, the widespread use of cloud technologies, artificial intelligence and big data contributes to increasing the competitiveness of companies, allowing them to quickly adapt to changes in the external environment.

This report considers the main information technologies used in the work of managers of industrial enterprises, their impact on the efficiency of management and prospects for further development in this area.

The use of modern electronic computing and information technology in economic processes, and especially in management, significantly improves the forms and methods, reliability and efficiency of management in general. Computer complexes united by a network are especially useful in the functioning of information systems in organizations and institutions.

The effective activity of a manager is impossible without high-quality information support, which includes the collection, processing, analysis and use of data for managerial decision-making. Information is a key resource in today's business environment, and its proper organization helps to increase productivity, optimize business processes, and ensure the competitiveness of the enterprise. The use of modern information systems and technologies allows managers to quickly respond to changes, analyze the market and effectively manage resources.

Information technologies play a key role in the modern management of industrial enterprises. They provide effective planning, control, analysis and optimization of production processes, which increases the competitiveness of the enterprise.

The main areas of application of information technology in industrial production primarily include the automation of business processes, in particular, the use of ERP systems (SAP, Oracle, 1C), which allows you to centrally manage resources, finances, production and personnel. Production management systems (MES) are an important direction of informatization of production processes at any enterprise. MES systems assist in real-time monitoring of production operations, allowing for flexibility and quick

response to changes.

Recently, a lot of attention has been paid to analytics and big data (Big Data). The use of analytics tools (Power BI, Tableau) allows managers to make informed decisions based on the processing of large amounts of data. The use of cloud services (AWS, Google Cloud, Azure) provides access to data from anywhere in the world, increasing the mobility and productivity of managers [3, 5, 9]. Internet of Things technologies help in automating accounting, diagnosing equipment, and predicting malfunctions.

Information technology plays a key role in improving management efficiency at all levels – from small businesses to large corporations and the public sector. They provide automation of processes, improve communication, facilitate quick decision-making and increase the transparency of managerial actions. IT systems allow you to automate routine tasks such as accounting, personnel management, document management, and logistics. This reduces the number of errors and speeds up the execution of operations. Modern information systems (ERP, CRM, corporate messengers) provide a quick exchange of information between employees, departments and partners. This contributes to operational management and more efficient allocation of resources. Information technology allows executives to use analytical tools, artificial intelligence, and big data to make informed decisions. This reduces the impact of the human factor and increases the accuracy of forecasts. Modern information technologies provide effective monitoring of the activities of organizations, which increases the responsibility of employees and reduces the risks of fraud. Information technologies contribute to a quick response to market changes, economic challenges and consumer needs. Cloud technologies, mobile applications, and online platforms allow companies to work efficiently even remotely.

The use of information technology in the activities of the manager of an industrial enterprise is a necessity to achieve efficiency, competitiveness and stable development. The use of modern IT solutions allows you to optimize business processes, improve control and analytics, which has a positive effect on the overall productivity of the enterprise. Information support is the basis of successful management, as it contributes to making informed decisions, increasing work efficiency, and achieving the company's strategic goals. The use of digital technologies, automated management systems, and analytical tools allows managers to quickly adapt to changes and improve business processes.

Thus, in the conditions of market relations, in the functioning of the system of automated collection and processing of information, within the framework of which the system of objective information support of management operates, there is an opportunity to significantly improve the quality and efficiency of development and adoption of managerial decisions, as well as:

- to apply new methods of management (management by deviations), aimed at simplifying it and improving the quality of management;
- to simplify the organizational structures of management objects due to the elimination of intermediate links, for example, the shop structure at industrial enterprises;
- to provide, in the rhythm of production, managers and specialists of different levels through the screens of their personal computers (or on other media) with objectively necessary information (by the method of automatic or automated informing), in accordance with their powers, functional duties and official rights and the degree of responsibility;
- use relevant initial (result) information for analysis, development and

management decision-making. At the same time, in the initial forms of the result information, there is already an elementary analysis of data (absolute and relative values — deviations, averages, comparison, grouping, application of the balance method and index analysis, etc.), which are necessary for the development and adoption of specific management decisions;

- to free managers and specialists of various levels from the routine work of collecting, storing and processing data and their elementary analysis, and to allow them to focus on creative work and control over the implementation of managerial decisions.

In addition, there is an opportunity to improve primary accounting, compile consolidated reporting due to its automation, etc. This:

- reduction by 80-85% of manual labor in the automated collection of primary factual information at the places of its mass occurrence. At the same time, it is possible to enter a minimum of necessary information into the primary document, and get the maximum when processing it;

- simplification of forms of primary documents when they are automatically filled out by excluding derived indicators, intermediate totals, etc.;

- to compile consolidated reports automatically on the basis of primary information, as well as to significantly improve its forms, the information of which is transmitted through communication channels to higher subordinate institutions;

- to combine three types of accounting (operational-technical, statistical and accounting) into a single economic one, since all primary information is collected at a time in the rhythm of production, from single sources, and therefore is unified and is also used in management processes.

There are other benefits from the use of computer and information technology in the process of management at an object where this or that automated information system operates. These systems with networks are constantly evolving, improving, etc.

The development of information technologies has become a determining factor in the successful activity of industrial enterprises in the XXI century. The use of modern digital solutions allows you to significantly increase management efficiency, optimize production processes and improve coordination between structural units. Managers who actively implement information technology in their activities receive significant benefits, including increased speed of decision-making, reduced operating costs, and the ability to respond flexibly to market challenges.

Cloud computing, big data, artificial intelligence, and automated management systems are becoming indispensable tools for managers, helping them increase the productivity of enterprises. At the same time, the effective use of these technologies requires appropriate qualifications and continuous improvement of knowledge in the field of digital innovation. In general, information technologies not only change approaches to the management of industrial enterprises, but also contribute to their sustainability and competitiveness in the modern economic environment. Further development of this area opens up new opportunities for optimizing business processes and ensuring the sustainable development of companies in the market.

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MANAGERIAL AND LEGAL ISSUES OF SUSTAINABLE DEVELOPMENT

EVOLUTION AND EFFECTIVENESS OF MECHANISMS FOR IMPLEMENTING STATE GENDER POLICY IN UKRAINE

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Gender policy is an important tool for democratic development and social justice, which is aimed at creating equal opportunities for men and women in all spheres of public life. It includes legal, economic, social and cultural mechanisms that ensure equal access to education, employment, politics, social protection and other aspects of public life. In Ukraine, the development of state gender policy is part of integration into European structures and the implementation of international human rights standards.

In Ukraine, the process of forming and implementing gender policy is complex and dynamic, driven by both external factors (European integration, international obligations) and internal challenges (gender stereotypes, imperfect legislation, weak institutional mechanisms). The evolution of mechanisms for implementing state gender policy in Ukraine demonstrates a gradual transition from declarative recognition of the principles of gender equality to the creation and implementation of specific mechanisms for control, monitoring and enforcement.

Table 1

Evolution of mechanisms for implementing state gender policy

Period	Main characteristics	Key events
1991–2005	Lack of clear state policy; high gender inequality; economic and social crises that negatively affected women	Accession to the Beijing Platform for Action (1995); ratification of CEDAW (1991); establishment of the Department of Family Policy
2005–2014	Adoption of the first special law on gender equality; establishment of state programs; introduction of gender quotas in politics	Adoption of the Law “On Ensuring Equal Rights and Opportunities of Women and Men” (2005); introduction of gender quotas (2013)
2014–2022	Expansion of gender legislation; introduction of gender-responsive budgeting; ratification of the Istanbul	Convention Adoption of the Law “On Preventing and Combating Domestic Violence” (2017); ratification of the Istanbul Convention (2022)
2022 – until now	present War and new challenges; activation of female leadership; population displacement; increase in cases of gender-based violence	Adoption of the State Strategy for Gender Equality by 2030; strengthening digital mechanisms to combat violence

The evolution of mechanisms for implementing state gender policy in Ukraine demonstrates a transition from declarative statements to the creation of effective mechanisms. However, problems remain:

- Low implementation of gender legislation due to the lack of control mechanisms.
- Financial constraints in implementing gender equality programs.
- Gender stereotypes, which remain a barrier to real equality.

The development of gender policy in Ukraine should become part of the country's strategic development on the path to integration with the European Union and the creation of an equal society.

Despite the presence of a regulatory framework and institutional mechanisms, the effectiveness of implementing state gender policy remains a challenge. The gender pay gap, low level of political representation of women, gender-based violence, limited access of women to leadership positions, and unequal distribution of household responsibilities indicate the need to improve mechanisms for implementing gender policy in Ukraine.

The legislative basis of the state gender policy of Ukraine consists of the following main documents:

1) The Constitution of Ukraine defines the principle of equality of all citizens regardless of sex (Article 24), which lays the foundation for the development and implementation of gender policy [1].

2) The Law of Ukraine “On Ensuring Equal Rights and Opportunities of Women and Men” (2005) establishes mechanisms for ensuring gender equality, in particular, the introduction of gender quotas in politics and in the workplace [2].

3) The Law of Ukraine “On Preventing and Combating Domestic Violence” (2017) creates a legal framework for combating gender-based violence, in particular, the introduction of protective orders and the creation of specialized support services for victims [3].

4) The Istanbul Convention, which Ukraine ratified in 2022, requires effective measures to combat violence against women and domestic violence [4].

5) The State Strategy for Ensuring Equal Rights and Opportunities for Women and Men by 2030 is a key document that defines the priorities of Ukraine's gender policy, including ensuring equal participation of women in political life and combating gender stereotypes [5].

Despite the existence of a regulatory framework, its implementation remains a challenge due to the lack of effective mechanisms for controlling and monitoring compliance with the legislation, as well as low awareness of citizens about gender rights and opportunities.

The system of state bodies responsible for implementing gender policy includes:

1) The Ministry of Social Policy of Ukraine, which coordinates the state gender policy and the implementation of relevant programs.

2) The Government Commissioner for Gender Policy, which is responsible for monitoring the implementation of Ukraine's international obligations in the field of gender equality.

3) The Parliamentary Committee on Gender Policy, which is engaged in the development of draft laws aimed at eliminating gender inequality.

4) Social service centers and crisis centers for victims of violence, which provide support to women and children who have become victims of domestic violence.

5) Civil society organizations and human rights initiatives, which play a key role in monitoring compliance with gender equality and providing assistance to vulnerable groups of the population.

Despite the functioning of these structures, their effectiveness is limited by insufficient funding, bureaucratic obstacles, and low interaction between state and civil society institutions.

Despite the legal recognition of equal rights and opportunities for women and men, their implementation in the political and economic spheres remains limited. Ukraine has a gender quota, according to which at least 40% of party lists must include representatives of one sex [6]. However, the actual participation of women in political life remains low. According to the results of the 2019 elections, the share of women in the Verkhovna Rada is only 20.5%, which is lower than the EU average (32%) [7].

Gender-responsive budgeting, which is successfully used in EU countries, contributes to the equal distribution of public resources between women and men. In Ukraine, this approach is only beginning to be implemented, in particular, within the framework of pilot projects implemented with the support of international organizations [9].

Stereotypes and traditional ideas about the roles of women and men remain a significant barrier to achieving gender equality. Social expectations for women, particularly with regard to household duties and childcare, limit their professional development and economic independence.

Recent sociological research shows that 65% of Ukrainians believe that a woman's primary responsibility is raising children and running the household, while only 25% of

respondents believe that both partners should bear equal responsibility in the family [10]. Education and awareness-raising campaigns can play a key role in changing these perceptions.

Therefore, to increase the effectiveness of the implementation of state gender policy, it is necessary to:

- 1) Strengthen monitoring of the implementation of gender legislation.
- 2) Introduce accountability mechanisms for state bodies regarding the achievement of gender equality goals.
- 3) Increase funding for gender-responsive budgeting programs.
- 4) Promote more active participation of women in political life by supporting women's leadership.
- 5) Eliminate gender discrimination in the labor market through reforming labor legislation.
- 6) Expand access to crisis centers for victims of violence.

The implementation of these measures will contribute to building a more equal and inclusive society in Ukraine.

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FACTORS OF MARKETING RISKS OF ENTERPRISES IN UKRAINE

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Radical changes in the geopolitical situation, the rapid development of information and communication technologies, the growth of globalization and competition, the penetration of digitalization into all spheres of world social life, as well as the protracted financial and economic crisis in Ukraine lead to an increase in the level of uncertainty and risks for all economic entities.

Therefore, the study of factors of marketing risks of enterprises is an urgent scientific task.

Domestic scientists (Voychak A. [3], Donets L. [1], Laburtseva O. [2], Pavlenko A. [3], Starostina A. [4] and others) have studied the causes and factors of risk situations.

But the analysis of the current situation and the systematization of modern risk factors of domestic enterprises require constant scientific research.

Thus, according to Donets L. I., the sources of risk are quite diverse: scientific and technological progress, market conditions, internal and external political situation, weather conditions, the presence of minerals, human nature, etc. [1, p. 35].

Laburtseva O. I. notes that the causes of risk would be more accurate to consider not uncertainty, but the influence of controlled and uncontrolled factors in the external and internal environments, as well as those that arise when the management entity chooses a certain solution option [2].

Donets L. I. includes the following factors that are the causes of a risk situation [1, p. 9]:

- unforeseen changes in internal and external conditions of activity;
- the presence of alternative solutions;
- the probability of losses;
- the probability of receiving additional profit.

Donets L. I. divides the entire set of conditions and circumstances that create risk situations and are actually the causes of risks into subjective and objective.

Therefore, the main factors of marketing risks of Ukrainian enterprises should include, first of all:

- the consequences of the war with the Russian Federation,
- global socio-economic processes,
- national characteristics (political, economic, social).

The systematization of factors will ensure further reasonable consideration of marketing risks of Ukrainian enterprises.

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LICENSE MARKET AS THE MAIN DIRECTION OF COMMERCIALIZATION OF INNOVATIONS

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In modern conditions of globalization and rapid technological progress, effective commercialization of innovations is becoming a key factor in economic growth and competitiveness of countries and companies. One of the most widespread and effective mechanisms for introducing innovations into production activities is the licensing market. Licensing agreements allow intellectual property owners to make a profit without the need for self-production, while licensees can use cutting-edge developments without significant R&D costs.

The licensing market covers various forms of transfer of rights to use inventions, utility models, industrial designs, trademarks, software and other intellectual property objects. Important advantages of licensing are the ability to accelerate the introduction of innovations, reduce risks for entrepreneurs and increase the efficiency of the use of intellectual resources.

In many countries of the world, the development of the license market is an integral part of the national innovation policy. State support, the creation of a favorable legal environment and the expansion of international cooperation contribute to the activation of this market. In view of this, the study of the mechanisms of functioning of the license market, its advantages and challenges is of particular relevance.

The purpose of this report is to analyze the license market as the main direction of commercialization of innovations, to identify its key trends, advantages and problems, as well as to form recommendations for its further development.

The licensing market plays a key role in the development of the innovation economy, contributing to the commercialization of intellectual property and international technology transfer. In Ukraine, this market is at the stage of active formation, reflecting both global trends and specific national challenges. The relevance of the study is due to the growing demand for licensing agreements in the context of digital transformation, the need to increase the competitiveness of domestic business and Ukraine's integration into the global economic space. However, there are barriers, such as imperfect legislative regulation, low legal culture of market participants, and insufficient state support for innovative projects.

The purpose of this report is to analyze the current state of the license market in Ukraine, identify key trends in its development and outline promising areas for improving licensing mechanisms. According to the State Intellectual Property Office, the number of registered agreements on the transfer of rights to intellectual property objects is steadily growing. This indicates the rapid formation of the national license market, which, of course, is a positive feature of the intellectual property market as a whole.

If we compare the state of the Ukrainian license market with the world market, we will find some specific features. As statistical data show, the Ukrainian license market is characterized by a high share of non-exclusive licenses (37%), which does not correspond to the practice of licensing in countries with developed market economies. This is explained by the desire of patent owners to sell their development many times, as well as due to the complexity of guaranteeing exclusive rights and therefore that a non-exclusive license is significantly cheaper. The Ukrainian license market differs from the Western one in its industry structure. Thus, most of the transactions were concluded in the field of medicine (17.4%), mechanical engineering (18.7%), instrumentation (12.5%), metallurgy (8.8%), construction (6.3%).

The above data show that the trade in licenses in Ukraine is not concentrated in high-tech industries. This significantly distinguishes the Ukrainian market from the license market of countries with developed market economies, which are mainly characterized by the development of licensed trade in such knowledge-intensive industries as electronics, pharmaceuticals, and the automotive industry.

The domestic market is dominated by licensing agreements for inventions, and contracts for utility models and industrial designs make up an insignificant part, but it is constantly increasing.

The geography of licensed trade in Ukraine has the following structure: agreements according to which the license is valid: throughout Ukraine 78%; in some regions, cities, 7%; on the territory of other countries 10%; in some firms it is 5%.

There are also license agreements that stipulate the use of the license object only in a specific area, for example, in aviation production.

In the context of the scientific and technological revolution in the international market, the tendency to reduce the validity of license agreements continues to continue. If before the 50s they were concluded for a period of 15-20 years, that is, in fact, for the validity of patents, now the main term of license agreements is 5-7 years, less often 8-10 and rarely more than 10 years. However, in the Ukrainian market, 34.7% of license agreements are concluded for the term of the patent, up to 5 years – 14.9%, for 5 years – 32.1%, for 10 years – 10.3%, from 10 to 15 years – 4%. Relatively short terms of license agreements are typical for those industries where products are rapidly renewed, for example, radio electronics, as well as for the production of consumer goods that depend on fashion.

In modern conditions, both in the international market of licenses and in the Ukrainian market, the share of agreements for the transfer of inventions together with know-how (more than 50%) or only know-how (30%) is growing. In terms of its level and importance, know-how is often not inferior to inventions that must be published, while know-how is kept secret, and without knowing it, it is impossible to industrially master inventions, reproduce new equipment and technology according to samples. Know-how can be kept secret for many years.

It should also be noted that in the modern international market, the sale of patents themselves is relatively rare. Basically, there are cases of sale of rights to use patents, i.e. license agreements are concluded. Hence the principled approach of Western specialists to assessing the value of a patent: "A patent costs only as much as it can be obtained for it, no more and no less." – to get the maximum possible effect from it. Thus, analyzing the data on the intellectual property market in Ukraine, we can draw the following conclusions.

There is a positive dynamics of increasing the activity of patent and licensing activities. Ukraine has a positive balance from the sale and purchase of licenses. But it is much lower than the average values of similar indicators in the EU countries and does not correspond to the potential capabilities of the scientific and production complex and inventive activities in Ukraine.

There is a positive dynamics of growth of innovation activity through the development of new types of products at industrial enterprises with a significant lag in the introduction of progressive technological processes, in particular resource-saving technologies. There are practically no innovations in the field of information and communication technologies, biotechnology, new materials, etc., and a small number of products that are fundamentally new. The vast majority of innovations are local in nature, their importance does not go beyond individual productions. For the most part, improving and often "borrowed" innovations are introduced.

According to the State Statistics Committee, only 12-15% of completed developments of new equipment and technologies are mastered. No innovations are carried out at 80% of enterprises. Only 4% of Ukrainian enterprises use the achievements of domestic science, and no more than 1% of GDP is invested in innovative development. In other words, the country's intellectual resources are used inefficiently, without providing the maximum possible profit that could be achieved from their commercial sale.

Thus, despite significant positive trends, the intellectual property market in Ukraine in its development has not yet reached the level of countries with an information economy, the mechanism of its functioning needs to be improved.

The analysis of the current state of the Ukrainian license market shows its gradual development in the context of global economic changes. The main factors influencing its dynamics are the growing interest in technological innovations, the strengthening of state control over the observance of intellectual property rights and the expansion of international cooperation.

Despite the positive developments, a number of problems remain, including:

- insufficient development of mechanisms for the protection of intellectual property rights;
- difficulties with concluding license agreements due to bureaucratic obstacles;
- insufficient level of awareness of entrepreneurs about the advantages of the licensed business.

To ensure sustainable market development, it is necessary to improve the legislative framework, stimulate the development of innovation clusters and create favorable conditions for small and medium-sized businesses in the field of licensing. Another important step is to strengthen international cooperation in the field of license exchange and attraction of foreign investors.

Thus, the implementation of comprehensive measures aimed at optimizing the license market in Ukraine will contribute to its integration into the global economy and increase the competitiveness of national business.

The license market plays a strategically important role in ensuring the effective commercialization of innovations, contributing to the diffusion of new technologies and optimizing the use of intellectual property. Through licensing agreements, companies can accelerate the adoption of innovative products, minimize development costs, and reduce the risks associated with entering new markets.

Among the main advantages of licensing are flexibility in doing business, reduction of financial risks, expansion of international cooperation and the possibility of obtaining additional sources of income. At the same time, the license market faces certain problems, including the complexity of assessing the cost of licenses, legal barriers, as well as the protection of intellectual property and the prevention of unfair use of technologies.

For the further development of the licensing market, it is necessary to improve regulatory framework, stimulate investment in scientific research and promote the formation of effective technology transfer mechanisms. In addition, an important area is to increase the level of awareness of entrepreneurs about licensing opportunities and create an infrastructure that would facilitate the establishment of interaction between developers of innovations and potential licensees.

Thus, the license market is a powerful tool for the commercialization of innovations, which allows you to effectively use scientific and technical potential, promotes economic growth and provides competitive advantages in the world market.

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MARKETING CONCEPTS OF PROMOTION TO THE MARKET OF EDUCATIONAL SERVICES

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Today's educational services market is undergoing significant transformations under the influence of globalization, digital technologies, and changing consumer preferences. Competition between educational institutions, the growing demand for innovative forms of education, the emergence of new players in the market, such as online platforms, create new challenges and opportunities for educational institutions. In such conditions, marketing concepts of promotion become critical to ensure the successful operation of educational organizations.

Education marketing is not just about advertising curricula or services. It is a holistic system of strategies and tactics aimed at attracting students, building long-term relationships with the target audience, increasing the competitiveness of the institution and creating its positive image. Given the variety of training services – from traditional universities to corporate training and online courses – marketing strategies need to be tailored to a specific target audience.

The purpose of this report is to investigate modern marketing concepts that are used to promote educational services, to determine their effectiveness and implementation features. The paper will consider key approaches such as digital marketing, branding of educational institutions, content marketing strategy, as well as the role of social networks and analytics in shaping successful marketing campaigns.

The relevance of the topic is due to the need to increase the competitiveness of educational institutions in the world, where information technologies are changing traditional approaches to learning. The effectiveness of marketing strategies determines the ability of an educational institution not only to attract new students, but also to retain them, creating loyalty and satisfying their educational needs.

Successful marketing decisions require a pre-designed marketing strategy to ensure that marketing plans are properly executed in the future. Marketing strategies help the firm develop logical and achievable marketing goals and prioritize them. Another important element of a marketing strategy is market selection. A good marketing strategy helps you understand the market and customers by helping in segmentation, positioning, and competition. The value proposition is another feature that deserves attention in a marketing strategy, since it is responsible for choosing the specific product or service that is offered to the market. A decision related to the value proposition, thus the degree of value offered to customers that managers consider sufficient to be demanded at the proposed price to allow the business to achieve its marketing objectives. A marketing strategy helps ensure that customers positively accept the value of a product or service offered at the appropriate price. Marketing strategy planning also helps to identify the need for specific resources and opportunities to communicate the value of the proposition, which subsequently leads to increased productivity of the firm. Thus, it is evident that a successful campaign requires a strong marketing strategy that aligns the firm's marketing efforts with its business objectives. Therefore, given that the market of

today is intensely saturated with a variety of products and services, the study of the process of creating a competitive marketing strategy becomes relevant.

In Ukraine, there are three types of formal higher (post-secondary) education: vocational and technical (TVET), professional pre-higher and higher education. TVET and vocational pre-higher education institutions accept students from both basic (9 grades) and complete (11 grades) secondary education. Those who enter after grade 9 will also master a slightly shorter curriculum, grades 10 and 11, along with a profession or specialty, receive a complete general education and a high school diploma. Higher educational institutions accept students with complete general secondary education. Bachelor's degree programs typically last four years, followed by master's programs lasting one and a half to two years. Exceptions to the "4+1.5 years" or "4+2 years" plans are veterinary and basic medical specialties where there is no bachelor's degree, and a high school graduate enrolls in a five- to six-year master's program. In addition, there are two-year short-cycle higher education programs that have recently been introduced in Ukraine, training junior bachelors. Now these apps are not very popular. Similar to most European countries, PhD programs in Ukraine last four years. According to the State Statistics Service of Ukraine, as of the end of 2021, there were 36 thousand. candidates of sciences, including 24 thousand. institutions and 2.4 thousand. in NDI13. The second research degree, Doctor of Science, is similar to the Doctor of Habilitation, which exists in some countries; However, recent changes in legislation have shifted the degree of Doctor of Science from higher education to the scientific field. There are four types of higher education institutions that offer higher education programs: universities, academies, institutes, and colleges. The first three types do not have much difference: universities, academies and institutes offer bachelor's, master's and doctoral programs. Colleges can only provide higher education through bachelor's and junior bachelor's degree programs; They may also offer vocational pre-tertiary education programs. A small number of future bachelors also study in professional pre-higher educational institutions — vocational colleges (Nikolaiev, Riy, Shemelynets, 2023). Individual HEIs may have branches and vocational colleges. The branches are located in a different city than the main HEI and offer higher education programs. Vocational colleges of higher education institutions provide professional pre-higher education. They can be located both in the same city as their higher education institution and in other places. As of January 1, 2022, according to EDEBO, there are about 320 independent universities, institutes, academies in Ukraine, as well as 45 independent colleges. Of these, 220 are state-owned, 32 municipal, and 113 private. HEIs also have 450 branches and vocational colleges in their structure. The state policy in the field of higher education is formed and implemented by the Ministry of Education and Science of Ukraine (MES). The Ministry of Education and Science manages 157 state universities. Other state-owned higher education institutions are under the jurisdiction of other ministries and departments. 37 As of the beginning of 2022, junior bachelor's, bachelor's and master's degrees were awarded to 984.1 thousand. students in Ukraine. Most of them (861.7 thousand) studied at state-owned universities, less (96.5 thousand) at private universities, and the smallest share of students (19.5 thousand). thousand) study at municipal universities. Higher education was received by 6.4 thousand. students of these levels in vocational colleges of various forms of ownership.

Under the conditions of military intervention and pandemic, the use of educational software services has become extremely popular. A number of online education (ed-tech)

platforms have emerged, such as Udacity, Coursera, Udemy, and EdX. These platforms are designed to adapt cultures of "lifelong learning," which is likely to become prevalent due to the acceleration of technological advances that require frequent updates and "replenishment" of skills through new models such as microlearning or nanolearning. One trend that has recently emerged in the field of online learning is courses taught by celebrities and famous practitioners. The Masterclass and Maestro platforms (the latter created by the BBC) offer opportunities such as learning children's writing from Julia Donaldson, making films from Martin Scorsese or business from Bob Iger (Zharova, 2024). Implementation of hybrid learning models. Due to the pandemic and military invasion by Russia, there has been an increase in the development of hybrid learning models, and the integration of online learning methods into 41 higher education institutions. It is important to note that unlike online learning caused by the COVID-19 pandemic, true hybrid learning is thoughtful and pre-planned – it is an adapted curriculum designed specifically for the hybrid model. It's much more than just submitting a daily curriculum online. Hybrid models are based on a combination of personal interaction with online flexibility, which allows teachers and students to improve the quality of the educational process and the effectiveness of communications. Hybrid learning can also be cost-effective. Some scientists believe that the development of "soft skills" and emotional intelligence is a very important trend in today's unpredictable conditions. Soft skills are typically interpersonal skills that help people interact with others. It is believed that with people who have skills, it is easy to work and spend time. "Soft skills" can be interpreted as a dynamic combination of cognitive and metaphysical cognitive skills, interpersonal, intellectual and practical skills. Soft skills help people adapt and behave positively so that they can effectively cope with the challenges of their professional and daily lives.

Theoretical analysis of the scientific literature on the disclosure of the essence of the marketing strategy made it possible to find out that the marketing strategy is one of the directions of organizational and planning work of the enterprise, which involves the development of a long-term action plan for the formation of competitive advantages. Definition of the essence of the marketing strategy should correspond to the following provisions: - strategic direction of the enterprise's activity for the implementation of important goals of the company; - a system of measures aimed at satisfying certain marketing tasks; - a comprehensive long-term model of marketing activities, which allows the formation of competitive advantages; - has a close connection with the development of separate strategies for target markets, positioning, marketing complex and the level of costs for marketing activities - it has a clear orientation - increasing the efficiency of marketing activities of the enterprise in the planned period. An important issue of the marketing strategy, which allows you to deeply reveal its essence, is the stages of its formation, which includes such stages as:

- definition of a broad strategic plan of the HEI;
- analysis of the market, competitors and higher education institutions;
- study and analysis of market segments;
- selection of market segments;
- market positioning;
- development of a marketing plan;
- maintaining mutually beneficial relationships with customers.

The implementation of a marketing strategy and ensuring the achievement of its

goals require compliance with scientifically based principles. Ignoring them or not taking them into account can lead to results that create difficulties in achieving the goals of the company and can lead to the cessation of its existence.

The main principles of developing a marketing strategy include:

- complexity and consistency;
- flexibility and adaptability;
- innovation;
- Sequence;
- periodicity.

Having analyzed the market of educational services in Ukraine, a growing trend was revealed. Every year, the market of educational services in Ukraine grew by an average of UAH 54 million. According to the average growth coefficient, it can be established that the average annual growth rate of service sales is 106%. This means that on average, the number of services sold in the educational sector increased annually by 106%. So, there is an upward trend. In the market of educational services of Ukraine, such trends were identified as:

- use of educational software services;
- implementation of hybrid learning models;
- development of emotional intelligence and "soft skills".

Marketing concepts in the field of education play a key role in ensuring the sustainable development of educational institutions and their competitiveness. The study showed that the successful promotion of educational services is based on the comprehensive use of innovative marketing strategies, including digital technologies, content personalization, social media, and analytical tools.

One of the important conclusions is the need to form a unique offer of an educational institution (UVP), which will distinguish it from competitors and emphasize the value of education for potential students. Branding in the field of education should be based on the principles of trust, professionalism and innovation.

Digital marketing has become an integral part of effective communication with the target audience. The use of SEO optimization, content marketing, social media, and personalized advertising allows you to increase the engagement of potential students and improve their experience with the educational institution. An important aspect is analytics and the use of Big Data in marketing campaigns. Monitoring user behavior, analyzing the effectiveness of advertising campaigns, and audience segmentation help educational institutions adapt their marketing strategies in accordance with changes in the market and consumer needs. Successful promotion of educational services requires an integrated approach that combines traditional and digital marketing methods focused on building long-term relationships with students and partners. Innovative marketing tools open up new opportunities for the development of educational institutions, increasing their reputation and expanding the target audience.

Therefore, the introduction of modern marketing concepts in the field of education is a prerequisite for increasing the competitiveness of educational institutions and creating a high-quality educational environment that will meet the requirements of the modern world.

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SOCIAL AND CULTURAL ISSUES OF SUSTAINABLE DEVELOPMENT

BOOSTING COMPETITIVENESS THROUGH SUSTAINABLE DEVELOPMENT IN POST-WAR REGIONS

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After the war, the regions had to deal with the devastation of infrastructure, the displacement of populations, and collapsed institutions as well as economic decline and the fragmentation of societies. However, these same areas have great potential to be transformed by strategic, sustainable development. Given the prevailing call for sustainability in all economic, environmental, and social dimensions within the global communities, post-conflict regions must develop their recovery programs in sync with the principles that facilitate long-term resilience, social integration, and economic competitiveness. Sustainable development serves as a framework for the reconstruction of societies, focusing not only once more, on physical aspects, but also on structural and institutional aspects, and setting the stage for new economic models, adoption of renewable energies, inclusive governance arrangements, and various forms of stewardship.

Importantly, competing in postwar regions should not be about the growth of GDP or having firms recover, but rather the ability to attract investment, retain human capital, increase productivity, and promote social cohesion. In recent years, however, international development agencies and national governments have increasingly recognized sustainability as an essential part of post-war reconstruction strategies (World Bank, 2022). Through investing in green infrastructure, digital transformation, renewable energy, and inclusive education, these regions can remove themselves from recovery and get into renewal, becoming resilient and competitive players both nationally and globally.

The three post-war regions where the assessment was conducted are Northern Iraq (Nineveh Governorate), South Sudan (Jonglei State), and Bosnia and Herzegovina (Sarajevo Canton). Five main sustainability-driven competitiveness indicators, namely, a) a renewable energy share in the mix of total energy, b) employment in the green sectors, c) access to quality education, d) the environmental quality index (air and water quality), and e) SME activity in the sector of sustainable industries, were analyzed.

Between 2020 to 2024, the employment in Nineveh Governorate green sectors - such as recycling, solar installation, organic agriculture, etc. - grew by 57%, helping to

reduce the regional unemployment rate from 28% to 19%. The number of such employment has been increased to 34% in urban sustainability programs in Sarajevo (UNDP, 2024). Renewable energy penetration in Sarajevo Canton during the same period rose from 7,1% to 15,9%, due to EU funded projects for the modernization of hydropower (IEA, 2023).

The first benefit, however, derives from standardized data on the EQI that were used; Sarajevo Canton displays the most dramatic change, with its EQI increasing from 49,3 to 68,7 on a 100-point scale from 2019 to 2024 as a result of successful implementation of waste management and clean air policies (EEA, 2024).

In South Sudan's Jonglei State, the total number of SMEs in sustainable industries (clean water provision, agroforestry and solar lighting) increased from 142 in 2019 to 487 by 2024. A mixture of microfinance incentives and NGO-subsidized entrepreneurship training programs allowed for this (World Bank, 2023).

It is clear from the data that areas adopted by sustainability frameworks recover from post-conflict economic loss faster and more inclusively, preparing them for increased competition. For instance, in such a process, renewable energy offers dual function: it enables access to modern energy services in remote or destroyed areas in addition to reducing reliance on costly imports of fossil fuel and thus enhancing trade balances and macroeconomic stability (IEA, 2023).

The employment in the green sector increases equally as observed earlier. But these jobs not only improve economic diversification and incomes but also shape the populations- especially youth and returnees- with vital 21st century skills. Green job creation has worked particularly well in Nineveh and Sarajevo, because, as a consequence of high initial unemployment rates, recovery had failed to take place, propelling migration.

Another issue of sustainable competitiveness has emerged as access to education. For example, programs have shown success in enabling local innovation and entrepreneurship: in regions like Jonglei, which have both linked vocational programs to infrastructure and environmental rehabilitation projects.

Although the improvements in environmental quality are not readily seen in the economic metrics, more favorable environmental quality increases overall livability, attracts investment, and also lessens health-related expenditures. The increase of Sarajevo's EQI illustrates that environmental investments have a cascading effect, increasing tourism, attracting skilled workers, and boosting the real estate markets, all highly important factors of regional competitiveness (EEA, 2024).

If properly supported, entrepreneurship can flourish even in fragile contexts, most evident of all with the growth of SMEs in sustainable industries, a concentration of which is seen in Jonglei state. The injection of local SMEs not only fuels local economies but also powers community ownership, reconstruction of trust in economic institutions, and stimulates innovation. Microfinancing schemes and training programs have proven the effectiveness of developing institutional capacity alongside direct economic investment (World Bank, 2023).

Nonetheless, challenges remain. Green infrastructure development comes with an initial high cost for which donor or state support is often mandatory. Secondly, there is fragmentation in coordination among stakeholders, government, civil society, the private sector, and international donors. In others - Nineveh, for instance - some successful pilots were left until the time when their momentum ran out. Hence a strong correlation exists

between sustainable development and competitiveness, but its implementation requires reforming the systemic mode of governance and inclusive planning processes.

The authors present some recommendations:

1. Reconstruction plans should prioritize green infrastructure and national governments and international donors need to allocate funding for it. These include but are not restricted to energy, transportation, water and waste management systems that relate to the goals of achieving climate resilience.

2. Set up specialized training centers in post-war areas specializing in green technologies and sustainability management. Including green skills in the mainstream curriculum starting from secondary to the tertiary level would create a workforce resilient enough to address future oriented jobs.

3. Microloans, however, are not the only such need of the post war economies, though they are important, because it is necessary to have a legal, institutional, and technological infrastructure for SMEs. These could mean business registration simplification, tax incentives to green innovation and the setting up of business incubators.

4. Reconstruction needs to be sustainable and it requires strong institutions that can coordinate with the process of reconstruction in the post war regions. International actors would need to encourage better movement towards governance training, reforms in public finance management, and putting things such as transparency and civic participation in decision making in place.

5. For urban planning, disaster prevention and health monitoring needs, and as indicators of regional recovery, there is a necessity in EQI improvements.

6. Design custom competitiveness indices to take into account sustainability factors of post war contexts. There would be these tools to help the policymakers benchmark their progress and adjust their strategies accordingly.

As with many things, post-war recovery is no longer about humanitarian imperative; it is the development opportunity to break and correct trajectories, and system inequalities, and the opportunity to build inclusive, resilient, and competitive regions. The study shows that based on embedding sustainable development at the core of reconstruction efforts, post-war areas can be changed from areas of despair into havens of innovation and development. Renewable energy, inclusive education, environmental rehabilitation, and promoting sustainable entrepreneurship represent what can be done not only to regain competitiveness but also to redefine it.

Some practical examples in Northern Iraq, South Sudan, and Bosnia and Herzegovina are shared to demonstrate that sustainability and competitiveness actually reinforce each other rather than being mutually exclusive. In this way, even the most ruined zones can become modern, diversified, and inclusive economies if economic reconstruction is aligned by environmental and social objectives, as they show.

But of course, it is not an automatic process. It is only done with visionary leadership, strategic planning, and persistent investment. What is more important, however, is that it requires the involvement of local communities, who must be given the power to not only be benefited but to be the architects of their own future. Wiping out regions after the war can only use the potential of sustainable development for the increase of competitiveness in an ever more interconnected and environmentally aware world.

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SOCIALIZATION OF THE INDIVIDUAL IN THE EDUCATIONAL SPACE

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Socialization of the individual is one of the most important processes of forming an individual as a full member of society. It covers a wide range of factors, including cultural, social, economic, and psychological aspects. In the educational space, socialization acquires special importance, since it is here that the active interaction of the individual with the social environment takes place, the formation of his worldview, moral and ethical principles, behavioral models and professional orientations.

Education plays a key role in the process of socialization, because educational institutions not only provide knowledge and develop intellectual abilities of the individual, but also create conditions for integration into society. Interaction with teachers, peers, involvement in extracurricular activities and participation in social projects contribute to the formation of social skills, communication competence and responsibility. In modern conditions of digital transformation, media socialization, which occurs through the use of information and communication technologies, is also of particular importance.

The study of socialization of the individual in the educational space is relevant and necessary for the development of effective approaches to the upbringing, training and support of the younger generation. It is important to take into account the influence of various agents of socialization, such as family, school, media, as well as to analyze the challenges facing modern education in the process of socialization of pupils and students.

Many changes are taking place in modern life: social, economic, political. In the conditions of the current socio-economic situation, the issues of preparing students with special needs for independent life are becoming more acute, which requires them to possess not only the knowledge and skills provided for by the school curriculum, but

also the ability to solve certain life problems, adapt to the difficult conditions of today, which are constantly changing and dictated by life itself and specific circumstances, to be competitive in the labor market, that is, to be able to fully exist in society. In this regard, in the process of national revival of Ukraine, democratization and significant changes in the entire social life, the problem of socialization of children with special needs, primarily with limited intellectual capabilities, in the conditions of market relations, most of whom experience significant difficulties in entering independent life and work, underestimate the role of vocational training at school, and cannot adequately respond to the needs of society, has become especially acute. The significance of socialization is also explained by the fact that both the self-renewal of social relations and the comfort of life of persons with special needs and the possibility of self-realization in new social conditions depend on its success. That is why the search for new models of education, new didactic approaches, modern ideas about the organization of the educational process in a special school, as well as the improvement of teaching subjects in the context of socialization of students with psychophysical disorders becomes so relevant. According to the concept of the personal approach, the task of maximum disclosure of the potential of each student, his formation as a subject of social life, preparation for self-development and self-realization comes to the fore. At the same time, in the context of the use of new pedagogical technologies, the issue of disclosure of psychological, pedagogical and methodological foundations of the problem of socialization of students and its provision in the conditions of a special educational institution is especially relevant. Of particular importance is also the search for ways to increase the socialization of schoolchildren, the disclosure of its methodological foundations, taking into account the peculiarities of the mental activity of students of a special school and the disclosure of modern views on the process of socialization as a system that includes interrelated elements: goals, methods, means and organizational forms

The problem of socialization should be considered primarily in the context of the formation and development of personality. A person is a person when he has his own position in life under the influence of a conscious understanding of social phenomena and communication, as well as work on himself. At the present stage, new parameters of the course of the socialization process are set, which set increased requirements for the personality to form adequate models of his social behavior and system of values, in accordance with new circumstances, assimilation of social experience, adequate reproduction of social relations, that is, emphasis is placed on the individual, on his socially determined characteristics, on the development of certain qualities in him as a result of social influence. The problem of personality is central in modern human science. Personality education can be safely called the most pressing task of the pedagogical theory and practical work of the school and other institutions of socialization. It is necessary to realize an important reality of our time: today the individual is becoming an increasingly significant social value.

To understand the essence of the problem, the stages of socialization, it is necessary to disclose the psychological content of the concept of personality: a person is a subject of conscious productive activity and social behavior, an individual with a socially determined system of mental properties, which is formed and manifested in activity, communication and mediates, regulates the interaction of a person with the surrounding world. In the process of socialization, as noted, an individual assimilates the social

experience accumulated by mankind in the form of knowledge about the norms of behavior, appropriate ways of acting and about environmental phenomena, without which he cannot form as a person. However, this is not enough for the formation of a unique, integral personality, since it is also defined as a carrier of consciousness and self-awareness.

The concept of personality includes the consideration of its socio-psychological essence, which is gradually formed and grows as a result of its assimilation of the social experience of mankind (socialization) and the formation of self-awareness. At the same time, special emphasis is placed on the development of the personality, which is provided by external determination - socialization and internal determination (self-determination) - the development of self-consciousness in the process of individualization. Thus, socialization is a necessary condition for the personal development of an individual, his formation and gradual growth in the society of people. This becomes possible due to the passage of all stages of this process by the individual: adaptation, individualization, integration, labor and post-labor stages.

As for childhood, these are the first four stages, which are presented to varying degrees in the conditions of schooling. The problem of forming the student's personality in special schools is of particular importance, since the difficulties of socialization of persons with intellectual disabilities are primarily associated with the uncertainty of special corrective influences on such children, the lack of interpersonal skills with normally developed peers, the lack of the need for such communication, inadequate self-esteem, negative perception of other people and peculiar features of the development of the psyche. Therefore, directing the process of formation of the individual, his responsibility to society is one of the most important tasks of the school for children with special needs. Positive development of the personality occurs only in the process of its formation under the influence of education and training. At the same time, one of the main tasks of teaching and educating children with intellectual disabilities is the formation of the personality of each as a whole, the optimal development of the potential of their cognitive activity, preparation and inclusion in the social environment as full members of society. Personality develops as a result of communication and participation only in the process of activity, first play, then educational and labor. In the formation of personality, it is important to take into account the child's ability to self-realization, which depends on the interaction of his internal natural forces and external social conditions.

In modern conditions, solving the issues of socialization of students with intellectual disabilities should be based on a fundamentally new concept – the concept of self-realization of each child in the process of gaining social experience, social creativity, the fulfillment of their own desires and the realization of their inclinations in the presence of the active assistance of a special educational institution, the main efforts of which should be aimed at the formation of an active life position and a positive image of "I" in the child. changing her social attitude to her atypicality and shortcomings in the immediate and wider environment of the child and family. In this regard, the issues of individualization and self-awareness, on the solution of which the effectiveness of socialization of students with intellectual disabilities depends, are of particular importance. In every society, a child must perform certain functions and social roles. What they will be and what they will be aimed at will depend on the content and nature of the activities of those infrastructures that have taken on the responsibility of helping

the younger generation enter the social structure of society. With regard to children with special needs, this can be done only if a special educational institution is functioning, which is able to help the child in his social formation, since personality formation cannot be carried out outside the pedagogical system. This pedagogical system must have components of its socializing influence: goal-setting (goals, tasks, functions); content, technologies (means, forms, methods); forms of management. This internal unity of all aspects of the socializing system creates conditions for the formation of a certain life position in children with special needs in society. At the same time, changes in the personality of students of a special school are considered not only as a result of external influence, but also as a result of their internal efforts. It should be emphasized that the provision of socialization in the pedagogical system has opportunities for implementation only under the condition of active activity of the subject of socialization, i.e. a student with special needs; Successful socialization of students of a special school can be in the presence of the following characteristics of their personality: the ability to change their value orientations; the ability to find a balance between one's values and the external requirements of the social environment; understanding of the universal moral norms of society. Thus, the process and result of socialization of a special child is the result of an internal contradiction between the degree of his/her identification with society and his/her isolation in society. That is why the stay of students with special needs in a special educational institution should be aimed at the implementation of planned pedagogical assistance, which will ensure the social formation of the child, the acquisition of social experience, and teach him to live independently. Therefore, in modern conditions, the main task of a special school is the formation of value orientations in schoolchildren with special needs and the development of a personality capable of independent adaptation in society. And this is possible only through changing the system of pedagogical influence on children in a special educational institution, determining and putting into practice its work psychological and pedagogical conditions for ensuring the socialization of students.

Socialization of the individual in the educational space is a multifaceted and dynamic process that determines the formation of the individual, his integration into society and the development of communicative, cognitive and emotional skills. Educational institutions perform not only an educational, but also a socializing function, helping pupils and students to adapt to social life, realize their rights and obligations, and learn moral and ethical norms.

The success of the socialization process largely depends on the effectiveness of pedagogical activities, the use of modern methods of teaching and upbringing, and the creation of a favorable psychological climate in educational institutions. An important role is played by the cooperation of school, family and society, which allows you to ensure the harmonious development of the individual and his readiness for independent life.

Modern challenges related to the digitalization of education, globalization and changes in the socio-cultural environment require new approaches to the socialization of the individual. The integration of traditional and digital teaching methods, the development of critical thinking, media literacy and social responsibility are key aspects that contribute to successful socialization in the twenty-first century. Taking into account all these factors, further research in this area will contribute to the improvement of educational processes and the formation of personalities capable of adapting to changes

in society and contributing to its development.

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LOGISTICS AND TRANSPORT ISSUES OF SUSTAINABLE DEVELOPMENT

CURRENT TRENDS IN THE DEVELOPMENT OF LOGISTICS IN UKRAINE

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Logistics plays an important role in the modern economy, providing effective management of the flows of goods, services, information, and finance. In the context of globalization and the active development of digital technologies, this industry is undergoing significant transformations. Ukraine, as one of the largest countries in Europe with a favorable geographical location, has significant potential for the development of logistics infrastructure.

An important factor influencing the development of logistics in Ukraine is economic and political changes, in particular integration into global markets, transport infrastructure reforms and digitalization of the industry. After 2022, significant transformations took place due to changes in logistics routes, expanded cooperation with international partners, and the growing role of multimodal transportation.

Today, the key trends in the development of logistics in Ukraine include the active introduction of innovative technologies, process automation, integration of transport systems, greening of transportation and expanding opportunities for international cooperation. The study of these trends is extremely important for forecasting the further development of the industry and increasing its competitiveness in the global market.

In the most general case, from the standpoint of logistics, the emergence, transformation or absorption of material and accompanying flows on a certain economic object that functions as a system, that is, that implements the goal that it faces and which is considered as a whole. Actions performed on the material (or concomitant) flow in such a system are called logistic operations (functions). The material flow of cargo transportation is a movement to which logistics operations or functions related to physical movement in space and time are applied.

In a narrow sense (from the point of view of an economic entity), logistics is an integral management tool that contributes to the achievement of the organization's goals through effective management of material and related flows. In this context, efficiency is determined in terms of the total cost of servicing flows and meeting the requirements of end users for the quality of international transportation and cargo services.

The concept of logistics is increasingly used, it is considered by decision-makers as an effective motivated approach to management in order to reduce both total costs and production costs. Logistics offers a different logic for managing aggregate resources and allows for close coordination of the logistics organization itself and the production strategy. The results of the implementation of this strategy are: the necessary assortment

of stocks in the right place at the right time; consistency of external and internal transport, which guarantees timely delivery in accordance with production requirements; synchronicity of warehousing and transport and compliance of packaging with transportation requirements, which minimizes the consumption of resources, reduces production stocks and stocks of finished products; synchronization of consumer orders and transport services.

In our opinion, logistics is a theory and practical activity for the organization and management of the processes of movement of a single set of material, financial, labor, information and legal flows in the system of a market economy.

Logistics is presented today:

- as a modern competitive strategy of economic entities, the main factor of which is the resource-saving algorithm of the enterprise;
- as a systematic approach representing the movement and development of material, informational, financial and labor resources in the categories of flows and stocks;
- as an algorithm for organizing the rational movement of material flows and accompanying flows of information and finance at all stages of the reproduction process;
- as a type of entrepreneurial activity specializing in the purchase, storage and delivery of raw materials, materials, products to the consumer.

Both marketing and logistics as sciences, as types of functional management, have an empirical nature: they owe their origin to the practical need to find ways out of situations that did not have classical solutions at that time. At this time, the question arises of the search for new solutions not only and not so much within these sciences, but at their junction, in the areas of their intersection. It is in this area that a systemic effect can be achieved. We define this area as marketing logistics and understand it as a section of entrepreneurial logistics, which includes the methodology, theory, methodology and algorithmizing of the process of optimizing flows of all types that accompany marketing activities, as well as a set of methods by which the marketing system analyzes, synthesizes and optimizes the flows accompanying the service from the enterprise to a specific consumer and the communication system of the subjects of the marketing system in the process of their Interaction.

In this regard, managers and business managers, in response to the question of what problems in the development and improvement of transport and warehouse facilities of enterprises should be given preference today, identified the following priorities:

- introduction of computers in transport and warehousing (70% of respondents);
- inventory reduction (60%);
- vehicle automation (60%);
- technology integration (30%);
- increasing the competence of heads of production departments in the organization of transport and warehouse facilities (30%).

At the enterprises of the former USSR, the following priorities were defined:

- new construction of warehouses (80%);
- mechanization of manual work (60%);
- improvement of labor organization (50%);
- introduction of new equipment (35%);
- introduction of automated control systems and mini-computers (15%).

As you can see, the "recipes" for eliminating the lag between the transport and warehouse facilities of enterprises and the requirements of the day are fundamentally

different. Logistics will help to change the outdated psychology in the attitude to solving these issues.

In order to develop it faster in Ukraine, it is necessary to find out the reasons that hinder its implementation in practice.

Firstly, it is the lack of a state approach to the problems of logistics, which is manifested in the lack of a legal framework, specialists and centers for their training.

Secondly, the general economic crisis with unresolved property issues and a decrease in production volumes, inflation, stagnation slow down any undertaking.

Thirdly, logistics involves comprehensive cost accounting, in which the growth of costs in the transport and warehousing industry is covered by the effect obtained outside this industry. At the same time, the existing accounting system, methods of intra-production self-sufficiency, which are used in practice, do not yet allow to fully assess the costs and results of the activities of departments and services of the enterprise.

Fourthly, the logistics approach involves quite drastic changes in the structure of the enterprise, the transition to more flexible organizational structures, the creation of specialized workshops and transport and warehouse services.

Fifthly, the development of logistics ideas is hampered by the shortcomings of professional training. There are many other reasons, the elimination of which would accelerate the implementation of logistics in practice.

Logistics as a scientific discipline and practice of management can become a reliable assistant in improving the activities of enterprises. Therefore, it is necessary to create an extensive network of logistics entities in Ukraine, which in the current crisis conditions will help enterprises to quickly establish new economic ties. Such formations, like no other, are able to quickly restore the production rhythm and remove barriers in economic relations.

The system of management of material flows, which has developed today in Ukraine, is more traditional. When developing logistics models focused on application in the general economic space from the territories of independent republics, it is necessary to take into account some of their features.

1. A large area, which complicates the design of logistics models, leads to an increase in the number of stocks and transportation and procurement costs.

2. Underdeveloped infrastructure (means of transport, communications, equipped warehouses, packaging equipment). Along with the slowdown in the turnover of material objects, this causes large losses, damage to material values. It should be taken into account that the percentage of their preservation will be significantly lower compared to the standards established in the West.

3. High concentration of production and consumption in large enterprises, on the one hand, it contributes to the intensification of material flows, and on the other hand, it slows down the reaction and flexibility due to changes in customer needs. Small enterprises and cooperatives have great advantages in this, since they operate mainly simple, universal equipment and tools, innovations do not cause them long and unprofitable downtime. Therefore, Applying the concept of logistics in the Ukrainian market, small enterprises should be considered as quite sensitive to the investments of suppliers of large enterprises.

4. High concentration of management. This reduces the ability of production to respond in time to changes in demand. Concentration of management is manifested in the limited independence of production and supply and sales enterprises and

organizations, in the need to coordinate the decisions made with higher management bodies documents, information.

5. Low degree of integration, specialization and cooperation of production. This is manifested in the combination of the maximum number of stages of the technological cycle, the achievement of the maximum possible degree of readiness of products for final consumption. At many enterprises, along with the main products, technological equipment, tools, etc. In the regulation of material flows, the leading role is played by production logistics, as the most complex link in the logistics model large enterprise.

6. Weak market saturation. This factor facilitates the design and operation of marketing logistics, but causes great difficulties for supply logistics.

7. Lack of reserves of production capacities. We have accumulated large reserves of material resources in the form of materials, raw materials, but this hinders the flexibility of production more than ensures the reliability of the functioning of the economic system, indicates a low intensity of material flows.

The concept of logistics in the management of material flows is just beginning to be applied in our country. A necessary condition for its successful development is the training of properly qualified specialists who are able to design automated logistics systems and apply them at enterprises and supply and sales organizations.

The strategic direction of logistics in Ukraine is due to several reasons:

- rapid increase in the cost of any transportation (caused by rising oil prices and the energy crisis);

- reorientation from the market for the provision of services to the consumer market and, as a result, reaching the limit of efficiency of the service and production system. For further promotion of services in the market, it became necessary, in particular, to improve work in the field of distribution, which allows you to reduce the price of services and deliver it exactly on time and of the required quality;

- the development of computer technologies, which allows processing huge amounts of information and exchanging data in real time at minimal cost.

As a result of such motivation, we can talk about the development and gradual introduction of logistics into economic practice. Hence, in contrast to the traditional management of material flows, carried out by people since ancient times, when using the logistics approach, the category of "end-to-end material flow" is distinguished, which becomes an object of management with controlled quality indicators.

The development of logistics in Ukraine is a dynamic process that depends on many internal and external factors. The main driving forces of modern changes are digitalization, automation, integration with international transport corridors, and greening of logistics processes. State reforms, including the modernization of transport infrastructure, the introduction of intelligent management systems, and the development of customs procedures, also play an important role.

In addition, the role of multimodal transportation is growing, which contributes to the optimization of logistics chains and increasing their efficiency. Investing in logistics centers and expanding the transport network will allow Ukraine not only to improve domestic logistics processes, but also to become an important node in global supply chains.

The prospects for the development of logistics in Ukraine are closely related to integration into the European transport system and the expansion of international cooperation. The introduction of modern technologies, strengthening the infrastructure

base and improving regulatory mechanisms will significantly improve logistics efficiency, which will contribute to the country's economic growth and international competitiveness. In the long term, the development of logistics will become an important factor in the stable economic development of Ukraine.

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WAYS TO IMPROVE THE EFFICIENCY OF THE FUNCTIONING OF THE STREET AND ROAD NETWORK OF KHARKIV

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Introduction

After the end of the war, Kharkiv, like other affected Ukrainian cities, will need a comprehensive approach to the restoration of road infrastructure. This provides an opportunity not only to return damaged facilities to working condition, but also to create new, modern and safe solutions for road traffic. The development of the Kharkiv road network after the war must take into account the latest standards of safety, convenience and sustainable development, as well as optimization opportunities to improve traffic on city roads.

The strategic directions for the development of road infrastructure in the city Kharkiv should have: integration of smart technologies for road traffic management; safe traffic interchanges and pedestrian infrastructure; priority of public transport; speed limit zones and calm traffic; development of bicycle infrastructure; increased resilience to emergency situations. The implementation of these measures in Kharkiv requires significant financial investments and professional expertise. However, these are investments in a safe and comfortable city of the future. Among the main challenges, one can highlight the need to adapt international experience to the specific conditions of the city, as well as ensuring long-term sustainability of the infrastructure in the face of possible future threats. Successful reconstruction of the road infrastructure taking into account these strategic directions will make the city safer and more modern. This will also contribute to the development of the local economy, improving business conditions and increasing the quality of life of Kharkiv residents.

The Department of Road Traffic Organization and Safety of the Kharkiv National Automobile and Road University plays an important role not only in training future engineers, but also in researching current problems of urban infrastructure and safety. The department not only has extensive practical experience, but also constantly improves its developments, preparing for the large-scale post-war reconstruction of the city. These well-founded solutions have the potential to become the basis for creating a new, safe and efficient transport system of the city.

Main part

The growth of motorization has led to serious transport problems, especially in large cities: excessive load on the street and road network (SRN), constant traffic jams, reduced capacity (RP) of roads. This causes traffic slowdowns, increased accident rates, increased fuel consumption and exacerbates environmental problems. Insufficient road density, inconsistency with modern transport volumes, lack of organized parking, weak development of public transport, imperfect traffic management (TM) and insufficient

road maintenance - all this leads to the ineffective functioning of the SRN. Solving these problems is possible only through a comprehensive approach and active cooperation of all stakeholders: local authorities, public organizations, scientific institutions, transport users and other participants in the process. Only through joint efforts can a significant improvement in the quality and efficiency of urban road infrastructure be achieved.

This study is an example of increasing the efficiency of the functioning of the SRN section (the section of the Industrial District of Kharkiv was selected (fig. 1)), which consists in reducing travel time along the entire section by optimizing traffic management schemes.

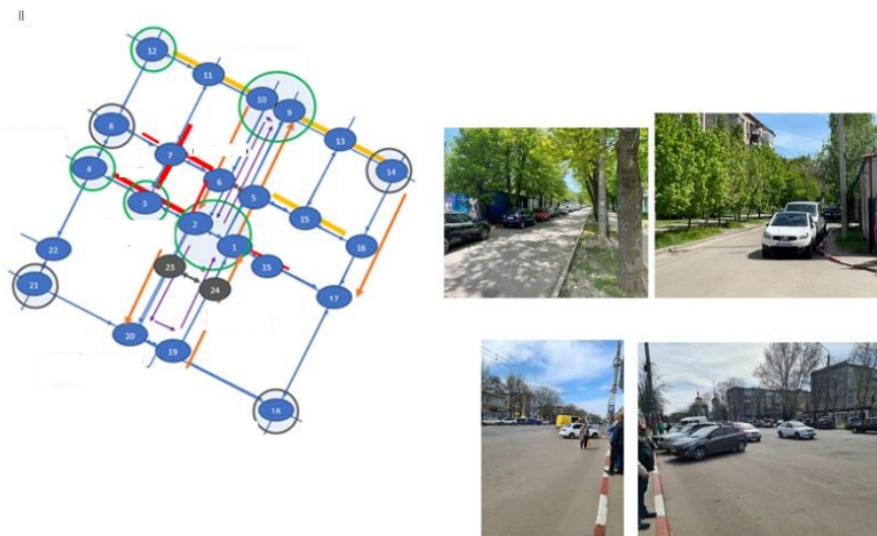


Fig. 1. Scheme of the site selected for research in the Industrial District of Kharkiv with justification for its choice

The reasons for choosing this particular area are the presence of a large number of TM problems : the main center of gravity - the KhtZ market, the boundaries of which are outlined by Beketova, Kosareva streets, Oleksandrivsky and Industrialny avenues, operates without equipped parking spaces for cars, which often occupy one of the lanes of the carriageway, parking along the roadside. In the photo Fig. 1, violations of several points of the traffic rules are noticeable. Clause.15.9 prohibits stopping at pedestrian crossings and within 10 m of them on both sides, as well as at intersections and closer than 10 m from the edge of the intersecting carriageway. It is forbidden to stop closer than 30 m from public transport landing areas (for example, on Oleksandrivskiy Avenue), in places where it makes it impossible to drive oncoming traffic or bypass a parked vehicle, as well as in a zone of 10 m from exits from adjacent territories and directly at the exit point (in particular, on Beketova, Kosareva Streets). Clause 15.5 allows parking vehicles at an angle to the edge of the carriageway only in places where this does not create obstacles for the movement of other vehicles. On Oleksandrivskiy Avenue, parking vehicles complicates the movement of trolleybuses, creating additional

inconveniences. According to the rules, stopping is allowed in places where the curb is painted red and white, but parking remains prohibited. Parks along Industrialny Avenue, in particular near the "DK KhTZ" Center and the Church of St. Oleksandra, attract a significant number of residents in warm weather, which makes pedestrian traffic quite intense. This requires increased vigilance of drivers when driving in these places. On Biblika Street, a tense situation arises when the bus of route No. 204 stops to drop off or pick up passengers. At this moment, the flow of traffic moving behind is forcibly stopped, since the roadway is narrow and does not have equipped pockets for safe stopping of public transport. This limitation of space forces drivers who want to bypass the bus to move into the oncoming lane, which significantly increases the risk of accidents. The situation is complicated by the fact that drivers of oncoming traffic often do not expect cars to suddenly move into their lane, which creates a dangerous scenario for all road users. Thus, the lack of infrastructure solutions, such as pockets for stopping, turns a regular public transport stop into a factor of increased accident rates on Biblika Street. At a number of unregulated intersections of the section, a significant number of conflict situations are observed (Frantyska Krala St. - Arkh. Alyoshin Ave., Kosareva St. - Arkh. Alyoshin Ave., 12 Kvitnya St. - Biblika St., Beketova St. - Kosareva St.). The reasons are the need to review the type of organization of regulation at the intersection or to ensure a visibility triangle. And most importantly, the presence of one-way traffic on Industrialny Ave. forces drivers to extend their route by up to one kilometer, which affects the efficiency of road traffic.

To assess the functioning of the transport section of the network, a key indicator of the quality of the system was selected - the time of implementation of transport correspondences, and to study the effectiveness of the implementation of the proposed measures, the creation of macro models in the PTV Vision Visum software was considered, which is a universal and flexible tool for modeling and analyzing transport systems, which allows objectively assessing the effectiveness of the proposed TM measures and ensures high quality and reliability of the results obtained. We modeled 9 variants of TM schemes on the network: 1 - current; 2 - complete ban on parking on the streets around the market; 3 - partial permission for parking on Oleksandrivskyi Avenue; 4 - creation of new roads between nodes 5–6 and 23–24 (60 m and 160 m long, 5.5 m wide), with two-way traffic; 5 - introduction of traffic light regulation at the intersections of Beketova St. - Kosareva St., 12 Kvitnya St. - Biblika St.; 6 - arrangement of road hills to calm traffic at the same intersections; 7 - provision of a visibility triangle at the same intersections; 8 - arrangement of pockets for public transport stops on Biblika St.; 9 - comprehensive implementation of all proposed measures in the study area. The modeling results are presented in Fig. 2.

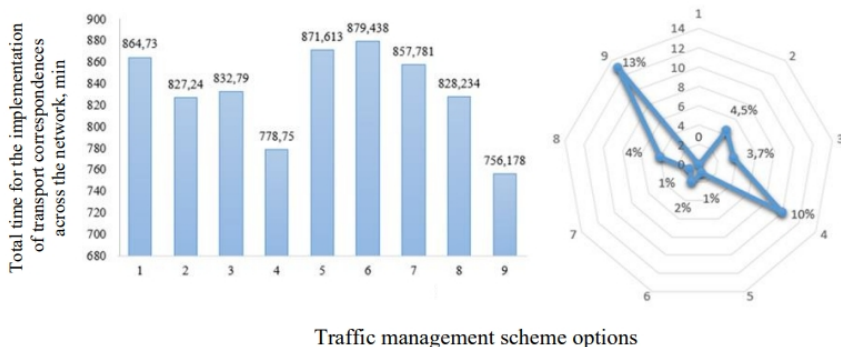


Fig. 2. Results of traffic modeling on the network

From the table we can see that laying new roads on the network reduces the time of movement on the network by 10%. The ban on parking vehicles along the sidewalks on Beketova St., Kosareva St. and Oleksandrivsky Ave. allows to reduce the time of implementation of transport correspondences by 4.5%. If parking is allowed on Oleksandrivsky Ave. parallel to the sidewalk, the time of movement on the network is reduced by 3.7%.

The introduction of traffic light regulation at two intersections does not actually worsen the situation, since the increase in travel time by less than 1% is very small. This means that the changes are almost imperceptible to road users, and such an increase in time is difficult to even feel in practice. On the contrary, traffic lights at these intersections will increase safety and orderliness of traffic, reducing the risk of accidents and making travel more predictable and safe for everyone.

The installation of road humps at the approaches to intersections increases the travel time on the network by 2%, and this is indeed more noticeable for road users. Unlike traffic light regulation, which adds only a small delay, road humps force drivers to regularly reduce their speed to avoid discomfort and potential damage to the vehicle. Such decelerations, repeated at each hump, can significantly affect the overall speed of movement on the network. However, it is worth noting that road humps also have important advantages, in particular in areas with high pedestrian traffic or near schools, hospitals and residential areas. They force drivers to drive more carefully, which reduces the risk of accidents and provides better protection for pedestrians. Therefore, despite the small increase in travel time, road humps often become an important element for improving safety. Thus, the decision to install road humps must take into account both the minor inconvenience for drivers and the significant positive impact on the safety of all road users. Moreover, the scientific developments of the Department of Road Traffic Organization and Safety of the KhNADU have proven that installing traffic lights at intersections is an appropriate method of TM [1]. At the same time, one should not ignore the possibility of additional measures that help limit speed on sections of transport infrastructure. For this, it is recommended to use traffic calming devices. The introduction of traffic lights and hills at two additional intersections (Architectural Alyoshin Avenue - Františka Krála Street and Architectural Alyoshin Avenue - Kosareva Street) under similar conditions will probably also not have a significant impact on travel

time on the network. Moreover, adding traffic lights at new intersections will contribute to further increasing the level of safety and organization of traffic in the urban network, reducing the likelihood of accidents and creating more favorable conditions for all participants - both pedestrians, cyclists and drivers. But as the number of traffic light-controlled intersections in a transport network increases, the time it takes to complete a traffic connection will increase. Each traffic light introduces additional stops and waits, which can ultimately increase the average travel time on the network. However, this effect is largely dependent on factors such as the traffic light settings and traffic volume. If the traffic lights are synchronized and optimally set, the delay time can be minimal. Conversely, if the number of traffic lights increases without proper synchronization, the overall delay can indeed significantly affect the speed of traffic on the network.

The 0.8% time saving effect of providing a sight triangle at two intersections is negligible, as this method has a limited impact on the overall transport network. Improving visibility at these locations facilitates manoeuvres, reduces delays and increases safety, but only affects local conditions. Most of the driving time is spent outside these intersections, so the overall savings are minimal. Although the sight triangle helps to navigate faster, especially on difficult turns, the overall effect will remain negligible until this practice is implemented at a significant number of intersections.

The arrangement of entry pockets for public transport stops on Biblika Street reduces the time of movement on the network by 4.2%. But we immediately rejected this measure, since it is impossible to do this due to lack of space. In this case, other measures are being tried to optimize the flow speed and reduce delays: regulate the intervals of public transport movement, which will reduce idle time at stops during peak hours; allocate public transport to a separate traffic light schedule; introduce stops "on demand", which can help public transport stop only when there are passengers to get off or on, and not at every stop, etc.

As a result, a combination of measures such as the construction of new road sections, a parking ban, together with the provision of a sight triangle at intersections of the network, can significantly improve the efficiency of transport solutions, especially in the market area (in our case, this is a time reduction of more than 12.5%). Each of these measures makes its own significant contribution: the construction of the road reduces the load on the existing network and improves traffic flow, while the parking ban frees up space for safe traffic and reduces the risk of congestion. However, two key aspects need to be taken into account for the full implementation of these solutions: 1. The parking ban near the market requires a carefully thought-out alternative for drivers. Convenient and accessible parking spaces need to be created to minimize inconvenience for people visiting the market, and to ensure that they do not return to their previous habits of random parking. This may involve the construction of new parking lots or the use of existing areas for temporary parking. Providing safe, understandable and convenient alternatives encourages drivers to follow the new rules. 2. The construction of a new road section requires significant financial resources for design, materials, labor and other infrastructure costs. Assessing the economic feasibility, as well as financing options, is a critical stage that will determine how quickly and efficiently the idea can be implemented. It is also important to consider the costs of maintaining the new road after its construction to ensure long-term efficiency and reliability. Thus, these measures not only increase the capacity of the transport network and reduce the risk of congestion, but also require a comprehensive approach to infrastructure planning. The implementation of

these solutions can improve conditions for all road users - pedestrians, drivers and market visitors - provided that parking issues and project financing are properly considered.

The selected area with the proposals developed for it to improve traffic is only a small part of the demonstration of the imperfection of the existing TM on the SRN of Ukrainian cities and the developments of the Department of Road Traffic Organization and Safety. In particular, we have proven the effectiveness of implementing one-way and channeled traffic on the SRN [2,3], optimizing the modes of operation of traffic lights [4], implementing circular traffic confirms its effectiveness and provides a scientific basis for expanding this practice, and proposed a methodology for forming a parking system in the central business districts of cities, organizing pedestrian and public transport traffic, etc. All proposals are necessarily aimed at reducing the environmental load in cities and can already be applied to the SRN for comfortable conditions of movement in the urban environment.

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