

# НОВАЯ ЭКОНОМИКА

Специальный выпуск



№ 2



2024

**СПЕЦВЫПУСК ЖУРНАЛА «НОВАЯ ЭКОНОМИКА»,**

опубликованы избранные материалы  
международной научной конференции на английском языке совместно  
с Ташкентским государственным экономическим университетом

«Science, industrial and educational integration»

(3 октября 2024 г.)

г. Минск

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Приказом Высшей аттестационной комиссии Республики Беларусь от 31 января 2008 г. (№ 28) журнал НОВАЯ ЭКОНОМИКА включен в Перечень научных изданий Республики Беларусь для опубликования результатов диссертационных исследований по экономическим наукам.  
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ISSN 2224-2031

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# PROSPECTS FOR THE DEVELOPMENT OF ELECTRONIC COMMERCE IN UZBEKISTAN

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**RESUME.** The article highlights and analyzes the state of e-commerce in Uzbekistan, the relevance and importance of this process for the development of the country's economy. The connection between the digital transformation of the economy and the development of e-commerce is shown, attention is paid to future forecasts and interrelated financial indicators of this economic process.

**KEY WORDS:** e-commerce, digital economy, forecast, analysis, factors, importance and relevance, legal system

**Introduction.** Uzbekistan has made significant progress in integrating the digital economy into its national development plans, as outlined in the Digital Uzbekistan 2030 Strategy. In addition to the policy framework, cyber legislation reforms have been implemented, particularly in the areas of electronic transactions, data protection and consumer protection. Businesses, consumers, investors and international partners will benefit from the establishment of such a legal framework for e-commerce and the strengthening of the monitoring and enforcement capacity of relevant organizations. The above-mentioned digital transformation activities are a factor in the active growth of the digital economy and demonstrate Uzbekistan's increased openness, reflected in the resumption of World Trade Organization (WTO) accession negotiations and the restoration of bilateral and regional trade discussions with the Commonwealth of Independent States (CIS), the Organization of Turkic States, as well as Uzbekistan's desire to develop the private sector focused on small and medium enterprises (SMEs). All of this is part and parcel of Uzbekistan's ongoing transition from a state-run, import-substitution economy to an increasingly market- and private-sector-led growth model. [1]

**Main part.** Several elements have defined the contours of the policy framework for the country's e-commerce sector. These include the 2018 presidential decrees on e-commerce, as well as successive annual action plans linked to the National Action Strategy on Five Priority Development Areas for 2017–2021. [2] Uzbekistan's e-commerce ecosystem and digital econ-

omy as a whole are in the early stages of development. But there are a number of factors contributing to the optimistic growth of all indicators. Almost every country in the CIS region is beginning to develop a strategy for the development of its digital economy.

The government of the Republic of Uzbekistan has taken the development of the digital economy particularly seriously. Despite the fact that neither our country nor its neighboring countries have access to the sea, which usually leads to high transit costs for delivering high-speed Internet to the country, but nevertheless the government managed to establish a fairly liberalized regime for the provision of Internet services, in particular, the cost of Internet access, its reliability and speed have demonstrated good results. [2] Overall, the Internet infrastructure is quite well prepared to support digitalization initiatives. Thus, the country offers a significant domestic market for e-commerce companies, which is important since most Uzbek e-commerce companies will focus on the domestic market before embarking on cross-border e-commerce.

The payment services sector is also developing rapidly, as evidenced by the growth of companies such as PayMe, Click, UPay, PayNet, etc. National card solutions such as Uzcard and Humo, international payment cards Visa, Mastercard, UnionPay International and Mir, and Internet acquiring service of commercial banks are available. There is also access to international payment gateways (Payoneer, Atlas, Yandex Money, Checkout). Improving interoperability between payment solutions and growing financial technology ecosystems that

create new use cases contribute to the growth of e-commerce and increased consumer access to digital financial services. It should be noted that the Central Bank of the Republic of Uzbekistan (Central Bank) has adopted a forward-looking approach to stimulating innovation in the sector. This approach is implemented through ongoing initiatives such as unified QR code standards and a standardized facial recognition protocol that can be used for remote verification. Improving the financial literacy of the population is another area that can contribute to the development of the e-commerce ecosystem. The e-commerce sector in Uzbekistan faces multiple challenges and opportunities. The active policy changes taking place in the ecosystem, as well as the broader development of the digital economy, bode well for the future growth of the sector compared to its current level. Many favorable factors are driving the growth of the e-commerce ecosystem.

The growth of e-commerce in Uzbekistan will depend on the degree of digitalization of productive sectors such as tourism, agriculture, horticulture and light industry, which are also priority sectors in terms of exports, which will not only improve the efficiency of value chains but also help companies improve their level of readiness to work with electronic resources. The main priority to support the development of e-commerce in the next five years is to create a favorable business environment that allows

companies to trade online. The second priority is to complete the digital transformation of companies so that they can access new markets with minimal effort and financial costs. Another key element for the successful development of e-commerce is the legal framework, a stable tax system, improving skills and knowledge. The distribution of priority activities into short-term and medium-term stages allows for the gradual creation of the preconditions necessary for the future growth of e-commerce. Such priorities are structured around the following key areas: creating a favorable business environment and promoting the development of the sector and market entry. The pandemic has significantly increased the volume of online retail sales in many countries. Thus, according to the United Nations Conference on Trade and Development (UNCTAD), since 2018, the countries that rank first in terms of e-commerce (USA, China, Europe) have seen steady growth, and in some countries, e-commerce sales have almost doubled in value terms and as a percentage of retail sales. By 2025, global e-commerce revenue is expected to grow to US\$ 4,198.5 billion, with the fashion industry being the largest segment. Revenue is expected to grow at a compound annual growth rate (CAGR) of 8.2% through 2025, reaching \$1,996 billion in revenue and 4.9 billion users. In terms of market segments, the largest will be fashion, including apparel, footwear, bags, and accessories (Fig. 1).

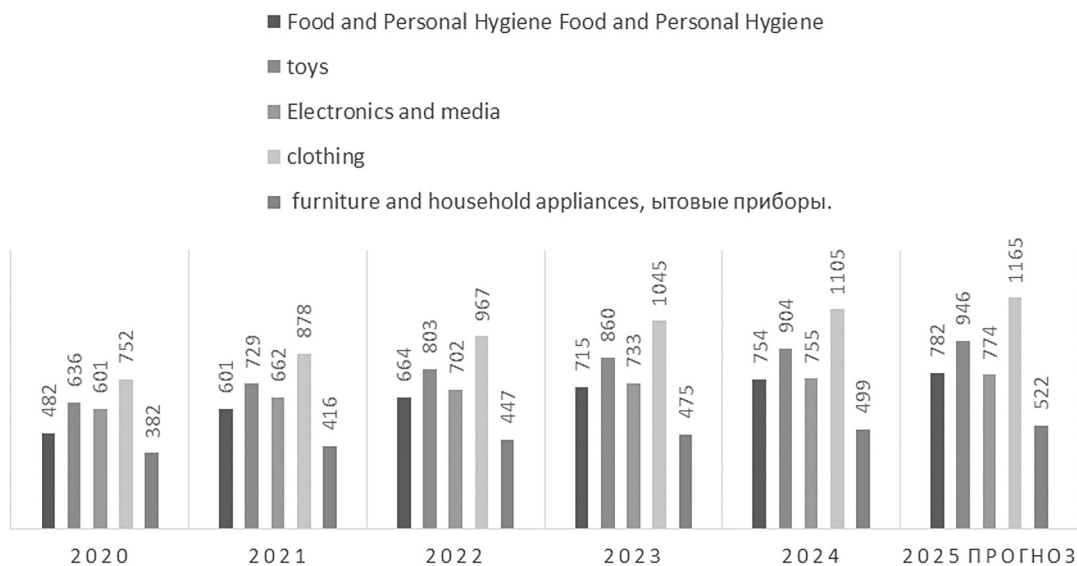


Figure 1. Global e-commerce revenue forecast, 2020–2025 (US\$ billion)

Note – Source: [3]

Countries are experiencing unprecedented transformations in production, resource management and distribution, as well as trade, innovation and even economic development itself.

These changes are driven by global digital transformation and rapidly evolving digital technologies such as the Internet of Things, data analytics, blockchain, artificial intelligence (AI), cloud computing, etc. Adequate tools and mechanisms are needed to embrace new technologies, adapt to requirements and respond to consumer demand. To achieve this, it is imperative that policymakers share a common understanding of how to implement such changes.

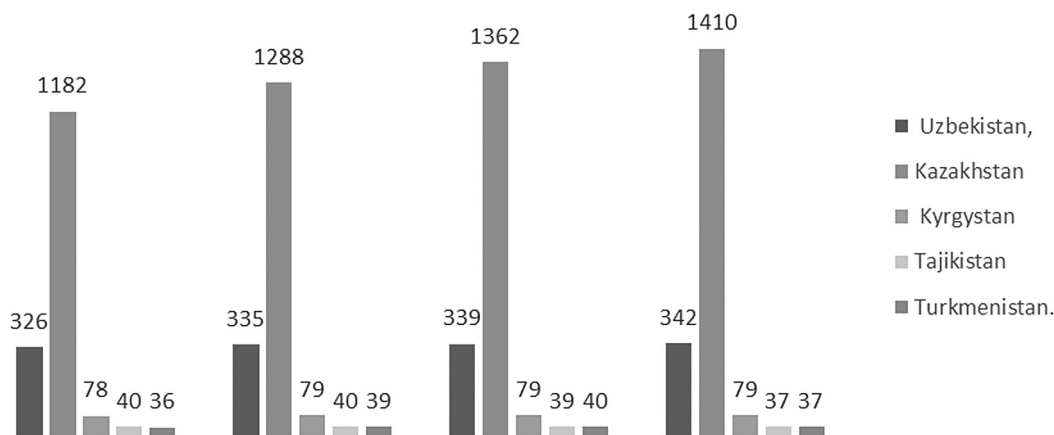
While the digital transformation is ongoing and the changes that may occur in the next few years are difficult to predict, policymakers and businesses should take several points into account to ensure that the right mechanisms are. Uzbekistan has made significant progress, especially in the last five years, driven by policies and infrastructure development in the sector. However, from a global perspective, Uzbekistan still has a lot of catching up to do in a number of technical areas, as reflected by its relatively weak rankings across all indicators. When looking at e-commerce trends in Central Asia in terms of volume and value, Uzbekistan follows Kazakhstan and is ahead of the other three countries. In terms of segments, fashion, furniture, home goods, appliances and electronics remain the leading products in the Central Asian e-commerce market (Fig. 2).

This is a young sector for Uzbekistan, although the first law on e-commerce was adopted back in 2004. Since then, the law has been

updated in 2015 and 2022. Today, there are more than 50 e-commerce marketplaces registered in Uzbekistan with an annual turnover of US\$300 million. We expect that their turnover will reach US\$1 billion by 2027. I would also like to note that to date, 57 companies have been registered, such as Meta (facebook), Google, Apple, Booking.com, Zoom, which have paid taxes in the amount of 70 billion soums over the past year. [4] The consulting company KPMG predicts that by 2027, the e-commerce market in Uzbekistan may grow 6-7 times. [5]

In 2022, the volume of the online trade market in Uzbekistan, according to international experts, amounted to about \$311 million, but by the end of 2027 it will grow from \$1.8 to \$2.2 billion, and the share of e-commerce in the total retail volume will increase from 2.2% to 9-11%. However, in this indicator, Uzbekistan is more than four times inferior to Kazakhstan, where an important role was played by the preferential policy pursued by the state and the provision of state support for retail and e-commerce at the level of state programs. Since January 1, 2018, the legislation provides for tax incentives in the form of a complete exemption from income tax until 2023. In addition, corporate income tax is reduced by 100% for e-commerce enterprises. This provision applies if the income from e-commerce is at least 90% of the total annual income.

To receive tax incentives, business entities must fulfill several conditions, in particular, the registration of transactions for the sale of goods must be carried out electronically, payment for goods must be made by bank transfer, and the entrepreneur must have his own deliv-



**Figure 2.** Total e-commerce revenue in Central Asia, by segment, 2017–2025 (US\$ million)

Note — Source: [3]



ery service or have an agreement with carriers or a courier / postal service.

In the structure of e-commerce in Uzbekistan, more than a third of purchases were for electronics and household appliances, and almost 20% were for fashion goods. The active growth of the industry is due to both government support measures and an increase in the share of Internet users, as well as the emergence of a large national player, the Uzum Market marketplace with its own fintech and logistics infrastructure. In the coming years, analysts predict an increase in the number of users of e-commerce platforms, due to both the growing penetration of the Internet (from 77% in 2022 to 87% in 2023) and a large share of the young population. At the same time, due to the growth of GDP and the trend towards urbanization, which directly affect people's habits, the frequency of online orders will also increase.

Government support plays a significant role in strengthening the position of e-commerce: as noted in the KPMG report, important milestones in the development of the industry were the adoption of the "Law on E-Commerce", the "Digital Uzbekistan 2030" strategy, the "Strategy for the Development of E-Commerce", as well as the creation of an IT park that allows IT companies to gain more opportunities and potential for growth.

In conclusion, it can be noted that digital transformation and rapidly developing digital technologies such as the Internet of Things, data analytics, blockchain, artificial intelligence, cloud computing, etc. are forcing the economy of Uzbekistan to undergo previously unprecedented changes. In place for the s Uzbekistan has made significant progress, especially in the last five years, driven by policies and infrastructure development in the sector. However, from a global perspective, Uzbekistan still has a lot of catching up to do in a number of technical areas, as reflected by its relatively weak rankings across all indicators. When looking at e-commerce trends in Central Asia in terms of volume and value, Uzbekistan follows Kazakhstan and is ahead of the other three countries. In terms of segments, fashion, furniture, home goods, appliances and electronics remain the leading products in the Central Asian e-commerce market.

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**Conclusion.** It can be noted that digital transformation and rapidly developing digital technologies such as the Internet of Things, data analytics, blockchain, artificial intelligence, cloud computing, etc. are forcing the economy of Uzbekistan to undergo previously unprecedented changes. This is reflected in the production, management and distribution of resources, as well as in trade, innovation and even economic development itself. To master new technologies, adapt to requirements and meet consumer demand, it is necessary to have the right tools and mechanisms. To achieve this, it is essential that policymakers have a common understanding of how to implement the necessary changes.

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# METHODOLOGICAL TOOLS FOR COMPARATIVE ANALYSIS OF COUNTRIES WITH DIFFERENT LEVELS OF TECHNICAL AND ECONOMIC DEVELOPMENT

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**RESUME.** Cross-country comparisons have traditionally been widely used in studies of socio-economic dynamics. Comparative study of socio-economic development processes is one of the most common methods for identifying general patterns of social production development. In modern economic research, cross-country comparisons are used to study economic growth, technological shifts, and modernization of socio-economic systems. The importance of cross-country comparisons in studies of general patterns of macroeconomic dynamics has led to the formation of a special scientific discipline in modern science — comparative studies, the main subject of which is the study of cross-country differences and the development of cross-country comparison methods. In economic science, the greatest progress has been achieved in comparisons of the level of economic and social development of different countries. Cross-country comparisons of economic dynamics, as well as its economic measurements in general, were constrained by the underdevelopment of a substantive theory of technical and economic development. Only in recent years, with the formation of an evolutionary paradigm in economic science and the accumulation of knowledge about the patterns of economic development, have the prerequisites been created for developing a methodology for measuring the processes of long-term technical and economic development, including the use of cross-country comparisons. The latter received a reliable theoretical basis in the form of general patterns of modern technical and economic development, invariant with respect to different countries.

**KEY WORDS:** economic dynamics, organizational and technical development, trajectory, technical level, industry, global economy.

**Introduction:** The scientific article examines the methodological support for cross-country comparisons for studying sustainable economic growth, technological shifts and modernization of the country's economy. A model of cross-country comparison in technical and economic development has been developed. It allows us to determine the level of advanced development and lag of individual sectors of the real sector of the economy from advanced global technologies. The use of the developed tools will make it possible to more accurately and accurately determine priorities in the development of strategies, programs, and forecasts for the socio-economic development of the Republic of Belarus.

**Main part:** Empirical studies of long waves have established the fundamental unidirectionality of technological changes occurring in dif-

ferent countries, the similarity of trajectories of technical and economic development (TED), as well as the tendency to synchronize macroeconomic fluctuations and technological changes. In particular, the same form of trajectories of technical and economic development in countries with both market and directive-controlled economies was revealed in the structure of energy consumption, in metallurgy, in the extractive industry, in the dynamics of transport infrastructure and in other sectors of the economy. The unidirectionality of technical and economic development in different countries, as well as the formation of a single rhythm of the world economic system, is due to the formation of a global market and the rapid expansion of international economic ties since the industrial revolution. Through international flows of goods, capital, information and labor, which

became possible with the formation of a global market economy, innovations generated in any country quickly gain global distribution. The formation of new production and technical systems, as well as the completion of their life cycle, occurs within the framework of the world market. Synchronization of technological shifts in different countries is higher, the more they are integrated with each other and with the global economy, and the fewer obstacles there are to the development of foreign economic relations. At the same time, the closer a country is economically connected with the center of generation of technological changes (which is located in the leading countries of the corresponding technological order), the higher the level of synchronization of its TED with the global technical and economic dynamics. Economic entities of the countries that were the first to begin developing the basic production of a new technological order, accumulating production experience, gain relative advantages and capture foreign markets, thereby extending the life cycle of the technological order for themselves. The growth of a new technological order begins only when the possibilities for profitable investment in expanding the production of the previous one are exhausted on the scale of the world economy. Due to this, the endless removal of leaders becomes impossible and synchronization of the spread of the technological order in different countries occurs at a late stage of the life cycle. In the pre-sanction conditions of the economic activity, the formation and replacement of technological modes acquired a global character — new production and technical systems spread from the leading countries to the periphery of the world market economy [1]. Each country that joins the international division of labor is forced to develop production and technical systems compatible with those that underlie the trajectory of the TED of the leading countries, generating technological shifts on the scale of the world economy. This applies not only to countries with a market economy, but also to countries with a command-driven economy. Due to the relative isolation of countries with a command-driven economy, their deviations from global trends were more significant than in countries with a market economy, linked by international flows of capital redistribution and competition in the world market. But these deviations are eventually extinguished under the threat of growing technological lag. Empir-

ical studies show that the integration of new countries into the number of technologically developed ones occurs, as a rule, in the growth phases of the next technological mode. This occurs in cases where the relevant countries succeed in creating competitive production in their national economies during the period of replacement of technological structures and structural reorganization of the world economy. This possibility itself is due to the fact that in backward countries, as a rule, there are no significant production capacities of the obsolete technological structure, and, accordingly, there is no resistance of socio-economic institutions to their destruction. The absence of the burden of significant investments in obsolete production allows these countries to avoid the depressing effect of the structural crisis of the world economy and facilitates the creation of production and technical systems of a new technological structure. Their subsequent reproduction with the establishment of a new technological structure in the world economy brings significant excess profits, the accumulation of which for the purpose of modernizing the national economy introduces the relevant country into the ranks of developed countries and the global rhythm of technical and economic development [2]. Of course, the inclusion of a particular country among developed countries presupposes the presence of appropriate internal socio-economic and scientific-technical prerequisites: a sufficiently developed industrial potential, a certain level of education of the population, a national technical and humanitarian intelligentsia, access to external sources of information, capital and resources. All these conditions are formed during the life cycle of the technological order preceding the “great leap”. After all, the reproduction of the latter creates the prerequisites for the formation of the next technological order, which cannot be created “from scratch”. At the same time, to form these prerequisites, it is not at all necessary to develop the production of the previous technological order to the level of developed countries. Technological shifts in developing countries before their inclusion among the developed states do not have a basis for internal reproduction and are only induced by the rhythm of the TED of the world economic system. It should be noted that although countries united by the international division of labor are developing in common TED directions, they differ significantly in the absolute level of tech-

nical and economic development indicators (measured in relative units — per capita or unit of gross domestic product), even if they are at the same TED level. This is explained by the historical, cultural-psychological, natural-climatic and other features of each country, which are reflected in its economic structure [3].

*Historical characteristics* are manifested in the fact that the greatest absolute scale of the distribution of production of a given technological order is achieved in the leading country (or a group of closely integrated leading countries). Having the advantage of the advanced development of basic technologies of the corresponding technological order in the early stages of its life cycle, the leading countries receive a considerable additional profit, which they capitalize on in the expanded reproduction of the said technologies within the framework of the world market. As a result of the long-term and significant expansion of production of a given technological order in the leading countries, stable socio-economic institutions and stereotypes of entrepreneurial and consumer behavior are formed, contributing to the over-accumulation of capital in the said production in excess of not only national, but also world needs. Thus, England, being the leader during the life cycle of the first and second technological orders, was simultaneously the largest manufacturer and consumer of weaving and spinning machines, as well as steam engines and cast iron of that time. The USA, which occupied a leading position during the life cycle of the third, fourth and fifth technological orders, were characterized by the highest level of production and consumption of electrical and power equipment, energy, including electrical energy, automobiles, and chemical products. At present, simultaneously with the shift of the center of the formation of the new technological order to the Far East, the highest concentration of its basic productions — electronic components and devices, etc. — is also observed there. At the same time, countries following the leaders in the development of technologies that have already received practical testing have less potential for their expansion, but at the same time greater opportunities for managing the level and rate of distribution of new productions. Having set themselves the goal of quickly achieving an advanced technical level, they can limit the distribution of certain productions to the minimum scale necessary for the development of the latest technologies. The less a coun-

try is connected to the leading country, which is the generator of the development of the corresponding technological order, the smaller the absolute scale, all other things being equal, of the dissemination of its constituent technologies — both in the sphere of production and in the sphere of consumption.

*Cultural and psychological characteristics* are manifested in the differences in consumer culture and work ethics of different countries, which are reflected in the peculiarities of their assimilation of technologies of a particular technological order. These characteristics are gradually leveled out during the life cycle of a technological order and the dissemination of the consumer culture associated with it. National characteristics of work ethics are more stable and are one of the important factors determining the relative advantages of a country in the development of production of a particular technological order.

*Natural and climatic features* are expressed in differences in the spatial extent of countries, reserves of natural resources, assimilation potential of the natural environment, climate, geographic structure, proximity to former and current centers of growth of the world economy and other factors that influence the structure of the national economy and are expressed in the absolute level of TED indicators. As follows from the above, the absolute values of TED indicators in themselves do not yet allow us to judge the level and pace of technical development of a particular country. Differences in the absolute values of TED indicators may be a consequence of unique features of the country that are not related to scientific and technological progress or the features of the historical period it is experiencing, determining the desired level of development of the corresponding technological structures. To assess the level and pace of TED of any country, it is necessary to measure the dynamics of this process in comparison with other countries and in the context of technological shifts in the world economy.

The unidirectionality of the TED on the scale of the entire world economy allows us to introduce the concept of a reference trajectory of technical and economic development, reflecting the average rates and form of this process on a global scale, the global rhythm of the TED. The reference trajectory, reflecting the general trends of the TED for all countries and describing the same directions of technical and economic development for all, can serve to deter-

mine the place of each country in the global economic dynamics, assessing the level and rates of technical development of national economies. The reference trajectory, reflecting the general directions and rhythm of technical and economic development for all countries, serves as a kind of reference point for assessing the technical development of national economies, setting the scale for measuring the processes of the TED. At the same time, it can in no way be used as a single template for all, describing the optimal trajectory of the TED: the main task of constructing a reference trajectory of the TED is to set a frame of reference in the space of global technical and economic development. Due to its unique features, each national economy has its own optimal trajectory of technical and economic resources. Its construction should be based on global trends in technical and economic development, taking into account the above-mentioned national features. The most important of these is the country's position in the inter-country hierarchy of technical and economic resources. Depending on whether it is among the leading countries of the current dominant technological order, is on the periphery of global technological shifts, or is not included in the global rhythm of technical and economic resources at all, there are different optimal strategies for national technical and economic development and the trajectories that describe them. At the same time, the standard trajectory of technical and economic resources, setting a common frame of reference and scale for all countries, serves as the basis for measuring the technical development of national economies. Global technological changes are generated by countries that are leaders in the life cycle of the corresponding technological orders. Although technological shifts that constitute the life cycle of each technological order occur on a global market scale, the economic structure of the leading countries most fully reflects the structure of the corresponding technological orders, and the dynamics of their TED reflects the evolution of these technological orders. Therefore, the trajectory of the actual TED of the leading countries of the corresponding technological orders can naturally be considered as a reference trajectory of TED. The disadvantage of such a choice of a reference trajectory is the bias in the estimates of national TED trajectories obtained when using it, due to the relatively higher level of expansion of the dominant technological order in the leading coun-

tries compared to the follower countries. However, this bias can be easily taken into account when interpreting the results obtained.

The unique features of national economies make it difficult to compare them. It should also be noted that, according to existing estimates, the error in the most important macroeconomic indicators calculated by statistical services of developed market countries reaches 10-18% [4]. It increases even more when reducing the indicators measured in different countries to a comparable form. This does not mean, however, that it is impossible to work with this kind of information. The experience of macroeconomic research indicates not only the possibility, but also the fruitfulness of using cross-country comparisons to obtain not only qualitative, but also fairly accurate quantitative conclusions, including those of a predictive nature. The use of the above-studied patterns of the TED allows us to achieve the reliability of cross-country comparisons based on a comparison of the dynamics of TED indicators. Accordingly, the reference trajectory of the TED sets not so much the absolute scale of technological shifts as the scale of their deployment in time, determined by the rhythm of the replacement of technological structures. For example, the growth period of each technological structure constitutes the content of the corresponding stage of the TED, determined on the scale of historical time by characteristic points of change of phases of its life cycle. They can be used for periodization of the TED and set the coordinate scale for assessing the level and rates of technical and economic development of each country.

**Conclusion.** In fact, when comparing the dynamics of the standard and national trajectories of the TED, the time required by a given country to pass the corresponding stage of technical development of the considered area or the economy as a whole is used as a unit of measurement. Note that the dimension of this value is inverse to the dimension of speed, defined as the amount of movement per unit of time. But it is precisely this scale of measurement that turns out to be the most illustrative when considering the dynamics of technological change. When assessing the speed of technical development, the ratio of this value to its standard value, which has the dimension of a relative value, is used as a measure. The rates of TED can also be expressed in an ordinal or nominal scale. The possibilities of measuring the TED

by time-extended indicators are determined in this case by the presence of a stable internal rhythm of this process, which allows introducing a time scale tied to its characteristic points. The moments of the beginning and end of technological shifts that determine the boundaries of the phases of the life cycle of technological structures can be used as such points. Their comparison on the reference and national TED trajectories allows obtaining a reliable assessment of not only the speed, but also the level of technical and economic development of each country. The expediency of measuring the TED by time-extended indicators does not mean, of course, that absolute TED indicators are not at all suitable for measuring this process. In many cases, it is possible to take into account and level out the peculiarities of national economies and use direct comparisons of the national and reference TED trajectories. It is also possible to normalize the absolute TED indicators to bring them to a form comparable for measuring this process, in fact moving to a comparison not of absolute levels, but of the dynamics of the reference and national TED trajectories. In all cases, the use of a reference trajectory of technical and economic

development, constructed on the basis of general patterns and content of global technical and economic development, serves as one of the key prerequisites for measuring the technical development of any national economy.

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# DECISION-MAKING AND DEVELOPMENT OF MECHANISMS BASED ON MANAGEMENT ACCOUNTING AND REPORTING

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**RESUME.** To get an objective picture of the state of financial and economic activity, the management of companies, as a rule, uses management accounting data. The management reporting of the company, as a rule, is seriously different from the financial statements, because it is prepared not for the inspection and control bodies, but for the management of the enterprise. If the information in the management reporting is inaccurate, then the management will not represent the real situation in the company. In this regard, the issue of organizing the accounting process of management information, formalizing the methods of conducting management accounting, reporting and monitoring, as well as formalizing the mechanisms of budgeting and decision-making based on management information comes to the fore.

**KEY WORDS:** budget, budgeting, planning, management accounting.

**Introduction.** Efficient activity of any economic entity is unthinkable without preliminary planning, building a budget of financial and economic operations, ensuring accounting and control over the compliance of established plans with actual performance results. As is known, the main goals of the system of planning, accounting and monitoring of financial and economic activities, in our opinion, are: formation of a centralized and interconnected enterprise management system adapted to changes in business conditions; providing the enterprise management with structured information on the current and planned state of financial and economic processes; streamlining the processes of distribution and movement of financial resources at the enterprise; creating conditions for minimizing uncontrolled spending of financial resources; increasing the manageability of financial and economic processes at the enterprise; setting prerequisites for organizing a system of material incentives for personnel. In this case, the main tasks of planning, accounting and monitoring the financial and economic activities of an economic entity will be: coordination and clear regulation of the interaction of departments in management processes; increasing manageability by involving all departments in the budgeting process; dividing responsibilities

by management levels; forming plans for the activities of departments for the coming periods; drawing up budgets for the main areas of activity and for the enterprise as a whole; forming consolidated forecast characteristics of the activities of an economic entity; forming reports on the implementation of planned and budget characteristics in a certain period of time; monitoring the implementation of plans and budgets; analysis of the causes of deviations from the approved values of planned and budget indicators.

**Main part.** From these numerous tasks, we propose to identify the main principles and aspects based on which it is necessary to build the following system of planning, accounting and monitoring of financial and economic activities (Table 1).

The functional aspect implies the division of plans by functional characteristics (physical and monetary indicators) and includes the function of forming plans that are quite strictly divided by functional content: a) operating budgets that characterize production and economic activities, namely: budget of production stocks; budget of direct costs for raw materials and supplies; production budget; budget of direct labor costs; budget of commercial expenses; sales budget; procurement budget. b) financial



**Table 1.** Basic principles of building a system of budgeting, accounting and monitoring of financial and economic activities of an enterprise

Principle	Explanation
Continuous improvement	The budgeting, accounting and monitoring system is designed to improve and «build on» the existing management structure
Manageability of the budgeting process	The budgeting process is managed by a special unit – a budget committee or a planning department
Distribution of responsibilities	For the purposes of budgeting at an enterprise, all departments are allocated to responsibility centers (RC) for the main areas of activity. At the same time, the management structure by RC does not replace the current management structure of the enterprise, it describes the functioning and interaction of departments only within the framework of the budgeting system
Preliminary budgeting at all levels	Plans included in the budgeting system are formed in each RC; completed plans are transferred to the planning and economic department (PED) for consolidation across the entire enterprise
Centralized budget formation	Budgets for departments are prepared centrally in the PED for each RC based on the plans they have prepared, taking into account the relationship between the areas of activity within the RC and between RCs. Only budgets related to the receipt of funds and expenses of the RC are transferred to each RC; budgets of expenses not related to this cost center are formed and accounted for centrally in the main accounting department
Completeness and unambiguity of cost distribution	All enterprise expenses are divided into budgets; overlapping cost accounting (i.e. parallel accounting of the same items in different budgets) or incomplete accounting (i.e. when some expense item is not accounted for anywhere) is not allowed;

budgets that characterize financial and investment activities: budget of investment activities; budget for taxes and mandatory payments; budget of credit and financial activities; budget of profits and losses; formation and use of financing; budget of cash flow; forecast balance.

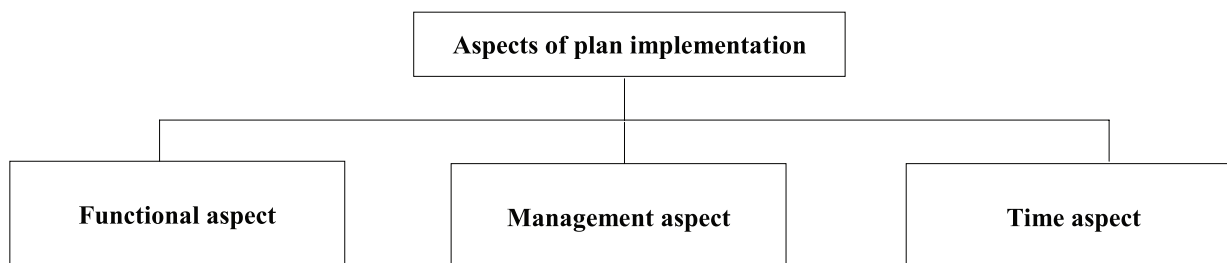
The system of budgeting the financial and economic activities of enterprises built on this principle is implemented in the following three aspects (see Figure 1).

The management aspect implies providing managers with the necessary information for making management decisions and includes two levels of users:

a) Level 1 – budgets, the users of which are the top management link: profit and loss budget; budget of financial resources; budget of

own and borrowed sources; budget of profit use; forecast balance.

b) 2 level – budgets, the users of which are the heads of structural divisions: sales budget; production budget; budget of production stocks; budget for materials; direct labor costs; budget of period expenses; procurement budget. The time aspect implies the coverage of three budgeting time horizons: strategic with a budgeting period of over one year (planning and control of key performance indicators is carried out); medium-term with a budgeting period from one quarter to one year (budgeting and control of tactical performance indicators is carried out); short-term with a budgeting period from one day to one quarter (budgeting and control of current operational activities is carried out).



**Figure 1.** Aspects of management planning

Within the framework of these aspects, the following is carried out: budgeting of the financial and economic activities of the economic entity and its structural divisions; control of plan execution; analysis of deviations of actual data from planned indicators; management reporting system; allocation of responsibility centers. Thus, the budgeting system usually implies the use of five groups of plans corresponding to five management subsystems: sales, purchases, production (costs), investments and finances: sales planning (sales budget, commercial expenses budget); purchase planning (budgets for purchasing raw materials, materials, components and equipment); production (cost) planning (material costs budget, labor costs budget, overhead costs budget, management expenses budget); investment planning (capital expenditure budget, investment plan); finance planning (forecast cash flow budget, forecast balance sheet, tax plan, credit plan, profit and loss plan, plan for the formation and use of own and borrowed sources);

The totality of the listed budgets constitutes the consolidated budget of the enterprise, which is drawn up for the year with detailing by quarters, the current quarter is detailed by months and days.

The budgeting execution control function in the system provides feedback from the enterprise management to the performers. The control process involves comparing actual results with budget indicators. If there are deviations, management makes decisions on adjusting budgets, and if the deviations are significant, on adjusting the strategy. Budget execution control in the system is carried out using management accounting, which should promptly provide managers with information on plan execution. Management accounting is a system of information support for the management process, that is, a system of methods for accounting, analysis and interpretation of data, using which the enterprise's management receives the information necessary for making operational management decisions and monitoring the enterprise's activities. The management accounting system can be based on accounting with an extended budget account, which allows for accounting of management information, to which additional requirements are put forward, expressed in analyticity and efficiency.

A special place in the budgeting system is occupied by the analysis of deviations of actual data from planned indicators, which allows

identifying the causes of discrepancies and assessing whether the plan will be implemented. If the set goals cannot be achieved, the data obtained in the control process are used to adjust the strategic budgets of the economic entity. It should be noted that the analysis of deviations of actual data from budget indicators also allows us to determine the areas of management action aimed at enhancing favorable trends and minimizing the negative impact of unfavorable trends. Such analysis also allows us to deepen the financial analysis by using accounting data, data on technical preparation of production, as well as regulatory, planning and other information, and to adequately assess the efficiency of the enterprise's economic activity. The features of management analysis are orientation of the analysis results to the immediate supervisor; use of all sources of information for analysis; comprehensiveness of the analysis, study of all aspects of the enterprise's activities; integration of accounting, analysis, budgeting and decision-making; maximum secrecy from unauthorized access to the analysis results in order to preserve commercial secrets.

Another main component of the budgeting, accounting and monitoring system is management reporting. Management reporting is a set of reporting forms of an enterprise that registers and summarizes all the facts of its economic activity and is an important source of information for decision-making. Management reporting contains information describing the general picture of the enterprise's work (current information on the amount of accounts receivable and payable, cash balances in accounts, payments made for the period, etc.); existing problems and the Enterprise's needs for any resources; potential problems that may arise soon.

The use of management reports by management allows: to make effective decisions daily and resolve emerging current problems. to make strategic decisions and prevent future problems (whether to continue selling a given product, whether to invest in promoting a new product); to identify weaknesses in the budgeting system and adjust sales forecasting techniques. In our opinion, the correct implementation of the management reporting system (adapted to the needs of the Enterprise) guarantees the accuracy, timeliness, brevity, regularity, and efficiency of the information received.

A modern approach to the management system involves the delimitation of the performance of the functions of strategic, tactical, and

operational management of the enterprise and the distribution of responsibility by management levels [1,2]. The issue of automation of the budgeting system [3] and control issues [4] are also important. Therefore, it should be noted that regardless of the level, the solution of management problems is inextricably linked with the performance of planning and control functions. According to the responsibility assigned to managers at different levels, each of them, within the framework of their authority, must solve specific planning and control problems.

One of the main problems of management at the functional (tactical) level is the transfer of responsibility for the implementation of specific financial and economic indicators to the heads of individual areas responsible for the purchase of raw materials and goods, sales of products, and a number of other functions. In accordance with the tasks assigned to the managers of the tactical level, management is carried out using a system of plans, budgets for areas and main divisions. The competence of these managers should also include the coordination of plans and budgets for both areas of activity and main divisions, as well as the implementation of tactical goals in accordance with the strategic and long-term goals of the economic entity. The tasks solved at the tactical level also include the preparation of proposals for investments, changes in the structure of working capital and the need to attract external sources of financing.

The system of plans and reports for operational management is designed to provide managers at all levels of the enterprise with information on the current activities of the enterprise, necessary for making decisions on compliance with the planned indicators set at the tactical level. Among the tasks solved within the framework of operational management, a special place is occupied by the coordination of financial plans and management reporting into a single integrated information system for planning, accounting and monitoring of the enterprise, which allows for control over the implementation of key performance indicators, both at all levels of management and within the established time intervals

At the first stage of preparing budgets for the upcoming period, budgets are formed, conditionally located at the fourth level of the presented hierarchy of forms. Each of the budgets is filled in by the corresponding

responsibility center. The information reflected in the entire set of 4th level forms reflects the “capabilities” and “needs” of the enterprise for the planning period, coming directly from the executors of the financial and economic process of the enterprise (or persons directly close to them). This approach allows for greater reliability and detail in planning the activities of the economic entity in the main functional areas. At the next stage, all budgets are transferred to a single consolidating center (for example, the planning and economic department of the enterprise), where they are processed, analyzed and integrated into the consolidated budget of the enterprise for the planning period (year, quarter). Budgets of the 4th level serve as the primary information for drawing up a consolidated budget, which summarizes information on upcoming income receipts and all expected expenses for the enterprise.

The consolidated budget is the main budget document, which achieves the maximum degree of consolidation and generalization of budget parameters. Its main task is the consolidated distribution of the budget (revenue and expenditure parts) among the corresponding responsibility centers (RC). In addition, when drawing up the consolidated budget, a positive balance of income and expenditure for the enterprise must be ensured, which in turn allows setting priorities in solving more detailed tasks. To achieve a positive balance, some plans related to the expenditure part of the budget can be reduced, which will be reflected in the preparation of level 1 documents and budgets by RC. Based on the results of drawing up the consolidated budget, other budget documents are formed, first consolidated by the Enterprise, then detailed by RC. It should be noted here that 3 sub-budgets for the expenses of the corresponding RC are allocated from the budget of expenses of the period. This is necessary for full detailing of all expenses and their binding to the place of their occurrence. Based on the consolidated data of the consolidated budget, the documents of the next (first) level are formed: investment plan, profit and loss forecast, cash flow budget and forecast balance.

The investment plan is formed based on the enterprise's need for investment projects and within the scope of the positive balance of the consolidated balance or the amount of attracted long-term credit resources. That is, it is recommended to plan investments after assessing the

volume of financing of expected and justified expenses. In addition to the consolidated budget data, an independently drawn up credit plan for attracting long-term resources also serves as input information for drawing up an investment plan. The investment plan specifies only those projects whose financing is planned not from cost.

The cash flow budget is drawn up based on information from the 4th level plans considering the changes (reductions) adopted when drawing up the consolidated budget, as well as data from the investment and credit plans. This forecast is a key document describing the financial component of the enterprise's functioning in the planning period. The forecast balance is compiled based on the planned values of the relevant balance parameters, received mainly from the 4th level plans, considering the changes adopted when drawing up the consolidated budget, investment and credit plans. The values of the parameters that are not planned to change in the upcoming period remain unchanged in the forecast balance.

To draw up the profit and loss forecast, the income and expense items of the consolidated budget are regrouped to a form close to Form No. 2. This forecast describes the formation of the financial result for the enterprise without dividing by the cost center, which allows identifying budget parameters for further detailing and subsequent operational control. To draw up the profit and loss forecast, information from the forecasts of operating and non-operating income and expenses is used.

For the cost of marketable products, as a key budget and control indicator, a separate form is provided: cost forecast, which lists the main items that make up the cost, indicating the cost center responsible for their control. To form the cost forecast, the 4th level is used, concerning the expenditure part included in the cost, adjusted during the formation of the consolidated budget. The production program is drawn up based on production, adjusted if necessary, during the preparation of the consolidated budget, in which the physical indicators of production volumes are supplemented by the financial component of the production cost, serves as a guideline to produce products and is taken into account when executing the procurement budget. At the next stage, budgets are formed for each of the RC. Budgets for the RC are accepted or reduced

applications of the RC in the context of the functionality performed by the divisions included in the RC. In accordance with the adopted consolidated budget, and, therefore, with the profit and loss forecast, each RC is granted the right to participate in the formation of that part of the budget that is allocated to the corresponding RC. Budgets for the RC reflect only such income and expenses that can be planned and changed by the RC itself, i.e. regulated income and expenses. As a detailing of some documents (in this case, sales plans and purchase plans), the following schedules are provided: receipt of payments, collection of accounts receivable, payment for raw materials and supplies, repayment of accounts payable. The specified schedules are operational documents, i.e. they disclose planned information for the near future. The schedules are intended to be transferred to the management of the enterprise as auxiliary material for making more effective tactical decisions. Thus, it is recommended to start budget formation with the preparation of the procurement and purchase budget, production budget, sales budget at the beginning of the month preceding the budget period, and end at the beginning of the first month of the budget period with the preparation and transfer of budgets for responsibility centers.

**Conclusion.** Summarizing the above, we note the fact that the modern approach to the corporate governance system involves the delimitation of the performance of the functions of strategic, tactical and operational management of the enterprise and the distribution of responsibility by management levels. However, regardless of the level, the solution of management problems is inextricably linked with the performance of the functions of planning, accounting and control. The quality of enterprise management directly depends on the quality of the formation and execution of budgets at all levels based on the use of management information and management reporting and the regulation of procedures for maintaining management accounting and monitoring. In this regard, the issue related to the organization of the accounting process of information for management activities, the formalization of methods for maintaining management accounting, reporting and monitoring, as well as the formalization of budgeting mechanisms and decision-making based on management information comes to the fore.

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# THE IMPACT OF EDUCATIONAL EXPORTS ON THE COMPETITIVENESS OF UNIVERSITIES: STRATEGIES AND OPPORTUNITIES FOR ENHANCEMENT

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*The research was carried out with the financial support  
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*(“BRFFR-MIRRU – 2023”: agreement dated November 20, 2023, No. G23UZB-110)*

**RESUME.** In the article, we distinguish several levels of educational services exports development in order to increase the volume of Belarusian educational export and solve multiple scientific and practical problems in the field of science, technology and education. Thus, we emphasize the necessity of fostering the expansion of bilateral ties with partner nations with the goal of enhancing the regulatory landscape in the realm of education and bolstering the marketing support for the «Education in Belarus» brand; establishing an efficient framework for enhancing the teaching staff’s capabilities; expanding the range of specialties in English-language education and assessing the relevance and practicality of disciplines offered to international students. We assume these steps can substantially boost the competitiveness of Belarusian higher education institutions in the international educational landscape, attracting a greater number of international students and contributing to the overall advancement of the nation’s educational system.

**KEY WORDS:** export of educational services, consumers, foreign, cooperation, development, education market.

**Introduction.** Today, all educational institutions are forced to flexibly respond to changes in international policy and economy. Modern tendency of globalization and internationalization of the labor market challenges universities and colleges to meet the following requirements: – opening of training programs in modern specialties that meet the expectations of future specialists and the requirements of potential employers; – prestige of the educational institution and the chosen profession; – the willingness of employees providing educational services to foreign students to communicate and teach subjects in international languages; – tolerance and knowledge of cultural peculiarities of interaction with representatives of different peoples and religions. In addition, the opening of international educational programs can be a strategically important moment for both the university and the country as a whole. John Aubrey Douglas, a researcher on the life of American universities [15] points out that such advantages of attracting foreign students

to universities, including at the regional level, as: increasing funding for public universities, obtaining a new source of knowledge through the exchange of cultures, the learning process becomes more efficient, the development of trade and business relationships: “The university should be a cosmopolitan organization in terms of the formation of the student body and developing a curriculum is the only way it can fulfill its function as a source of progressive change.”

Based on the above, the Belarusian education market is aimed at finding motivation and actively attracting foreign applicants to choose universities and colleges in our country. To date, the Republic of Belarus is a party to 112 agreements in the field of education, joint institutes have been established and are functioning, more than 20 Belarusian language learning centers have been established at universities in China and Central Asia, and a large number of events aimed at promoting educational services in Belarus are also being implemented. In ac-

cordance with the Decree of the President of the Republic of Belarus No. 292 dated July 29, 2021, an increase in exports of goods and services by more than 50 billion US dollars in 2025 [1]. It acts as the main task of the socio-economic development of the country for a five-year period. The solution to the task set by the president can be considered the “Concept for the development of services exports (promotion of the Education in Belarus brand)” developed and implemented in the country [2], the significant objective of it is to attract new consumers of educational services and promote Belarusian educational institutions for potential partner countries and the development of the brand ‘Education in Belarus’.

**The main part.** Choosing a university or college to study for a foreign student begins with determining the direction of the specialty, country, university. There is a huge selection of universities and colleges in the global education market. Participation in international rankings increases the attractiveness of a particular university for applicants, employers, and investors. International rankings reflect the quality of educational services and the reputation of the university in the academic environment. Of course, a high international rating helps attract talented students and teachers to the university, and improves financial security. However, the choice of the applicant in most cases is not absolute. This decision-making may be influenced by different circumstances, for example, regional peculiarities, national traditions, language barriers, religious beliefs, tuition and accommodation costs, conditions created at the university for the adaptation of students, educational compatibility of educational programs with national standards of different countries, political developments and restrictions.

The relevance of the issue of exporting educational services is confirmed by many studies of this issue. Thus, Ryazantsev S.V., Ros-tovskaya T.K. and Ryazantsev N.S. in their study consider the Japanese model of attracting foreign youth as part of the export of education and come to the conclusion that, ultimately, foreign students are suppliers of innovations [3].

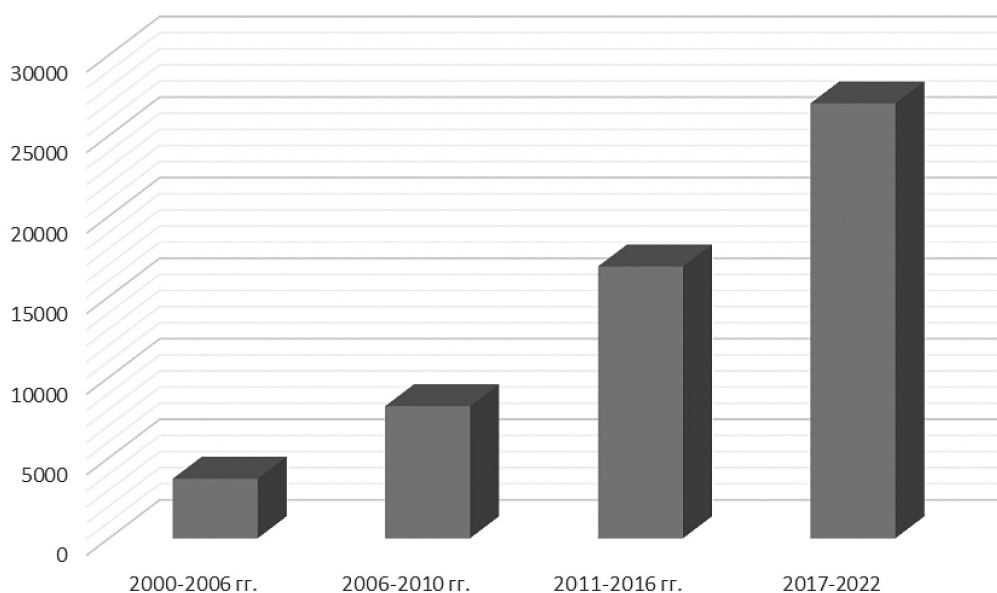
Another sphere of researching the problem of exporting higher education is the assessment of the quality level of educational services provided to foreign students. So, Zhdankina I., Ignatieva N. and Bykova D. rate the quality of exported educational services from the point of

view of modernization of higher education, the result of their research is a demonstration of new methods of improving the quality of education, through which the degree of attractiveness of the higher education system for foreigners increases [4]. The quality of educational services provided is the cornerstone of the effectiveness of promoting educational institutions to potential consumers. Lin W.C. and Chen C. The main criteria for evaluating the provided educational services are considered [5], while Tsygan-kova I.V., Vakhitova L.R., Reznikova O.S., etc. The quality of education was analyzed in accordance with modern requirements for the export of education on the world market [6]. In other articles, the authors explore the principles of compiling international university rankings in accordance with the quality of services provided. Having studied the system selection of criteria for evaluating the quality of education, the authors agree that there is a problem of choosing a single list of evaluation criteria that would meet the request of an impartial analysis [7, 8].

The study of the problems of the export of educational services involves the study of the reasons for the choice of the country and the direction of study by foreign students. The most important areas of research can be considered: ways to attract students to choose foreign educational institutions, factors and methods of assessment by applicants, students and graduates of education received abroad, the reasons for the choice of foreign institutions by young people [9, 10, 11].

As for the export of educational services in the Republic of Belarus, it has begun to develop actively in the last decade. Back in the early 2000s, the number of foreign students in educational institutions of the republics was about 3.5 thousand people. As follows from Fig. 1, since 2006 there has been a steady increase in the number of foreign students.

Thus, according to the UNESCO Institute of Statistics, by 2018 their number already amounted to 11,886 people [12], and in the 2019-2020 academic year — 18,441 people, which, in turn, demonstrates a doubling of this indicator over a ten-year period [13]. For the 2020-2021 academic year, more than 27,000 foreign citizens studied in educational institutions of the Republic of Belarus [14], in 2023 the number of foreign students was about 33 thousand. The share of the number of foreign students in the total number of students studying



**Figure 1.** The number of foreign students in the Republic of Belarus in 2000-2022.

at universities according to official statistics of various countries for 2023 is: in Spain 4.6%, in the USA – 5.6%, Russia – 8%, Poland – 8.7%, Germany – 11%, Sweden – 12%, France – 13%, Estonia – 13%, Belarus – 14%, Latvia – 14.6%, Great Britain – 23.8%. Since 2010, the number of foreign students in the Republic of Belarus has increased 7 times and has a level slightly higher than the average European level, which can be considered good dynamics, but the potential for the development of international education in our country isn't but the potential for the development of international education in our country has not been exhausted.

According to the analysis of the foreign contingent of educational institutions of the Republic of Belarus presented above, we can conclude that the “Concept of development of export of services (promotion of the brand “Education in Belarus”) implemented in the country is effective, and the market of educational services in Belarus is stable and demonstrates steady growth.

It is obvious that the promotion of the brand “Education of Belarus” will contribute to the growth of popularity of Belarusian educational institutions among foreign youth. In this regard, it is necessary to consider the positive effect of educational migration and the challenges that the country's educational institutions and government agencies will face.

Attracting foreign students to Belarus provides extra benefits for the national economy

by means of concomitant profits. The source of concomitant profits are the expenses that foreign students make on the territory of the country, for example: payment for medical services, housing, basic necessities, etc. Another one crucial aspect to mention is that eventually our country can receive new citizens through the transition of educational migration to immigration. This method of increasing the population is the most favorable, since the country's population is increasing due to young professionals with higher education, which they received in accordance with the educational standards of the Republic of Belarus and the requests of employers in various fields of economic activity of the country. Another important positive effect of educational migration is the promotion of Belarusian culture and learning technologies in the global education market, maintaining and promoting the country's image in countries that consume educational services.

However, along with the positive effect of exporting education, there are a number of problems faced by universities and colleges in the country in the process of educating foreign students. To date, the geography of the countries of migrant students is as follows: 65.7% are citizens of the CIS countries, 27.7% are from Asia, 4.5% are from Africa, 0.98% are from North and South America, 1.02% are from Europe [2]. In order to carry out the educational process, foreigners need to improve



the qualifications of the teaching staff, in particular, to strengthen the level of English language proficiency, the development of new disciplines and modern technologies in education. For the successful integration of foreigners into the educational process on the basis of Belarusian universities and partner universities, in addition to organizing Russian language courses, it is necessary to give an idea of the peculiarities of legislation, customs and traditions of Belarus. In addition to the language barrier, there is often a lack of motivation among foreign students, which is the reason for the differences between the educational systems and the requirements of the partner countries. Another negative effect may be the formation of ethnic groups of students of the same nationality in educational institutions and dormitories, who do not seek to integrate into the student community and often commit offenses.

**Conclusion.** In accordance with the “Concept for the development of services exports” (promotion of the brand “Education in Belarus”), “several levels of development and promotion of educational services exports can be distinguished:

- at the state level, it is necessary to stimulate the development of bilateral relations with partner countries in order to improve the regulatory framework in the field of education and increase the level of marketing support for the brand “Education of Belarus”, by increasing funding and attracting highly qualified marketers of the country.
- at the level of the Ministry of Education of the Republic of Belarus, it is necessary to organize an effective system for improving the staff of the teaching staff; increase the list of specialties for education in English; monitor the relevance and practical significance of disciplines taught to foreign students; develop the direction of distance education. — at the level of the Department of Citizenship and Migration of the Ministry of Internal Affairs of the Republic of Belarus, it is necessary to continue monitoring the flow of foreign citizens in order to prevent and prevent offenses.
- at the level of educational institutions, it is necessary to establish relationships with universities in other countries in various areas, create an understandable information system for possible programs and areas

of study, update and adapt training programs for foreign students to international and national standards; carry out continuous and timely retraining in the form of advanced training; improve educational materials of taught disciplines in accordance with the needs international students and their potential employers.

Undoubtedly, the state’s strategy to increase the export of education, aimed at attracting foreign youth to study in educational institutions in Belarus, makes it possible to increase the academic mobility of future specialists and is a solution to urgent scientific and practical problems in the field of high-tech fields of science and education.

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# PROSPECTS FOR THE DEVELOPMENT OF STAFF TRAINING AT JOINT UNIVERSITIES

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**RESUME.** The article discusses the issues of training specialists in universities of Uzbekistan.

**KEY WORDS:** international cooperation, internships, universities, education, master's degree.

**Introduction.** The interaction of universities from different countries allows national universities to make education prestigious, since international cooperation in the field of education is the most significant for improving the quality of professional training of students. Training according to the standards of two or more countries is more effective than a similar process organized within the same country. Successful completion of the study program at joint universities significantly increases the likelihood of finding a job both abroad and at home. This form of universal personnel training shows its effectiveness in practice, taking into account the trends of globalization in the educational process.

**Main part.** International cooperation in education is carried out in a wide variety of formats. The most common ones include the following: exchange programs, educational and scientific internships as the initial stage of interaction between universities in different countries is the most effective, as it provides for the training of students or advanced training of teachers at universities in another country. An important advantage of the exchange is the provisions on the Exchange Program and the solution of the issue of relocation and accommodation. Joint events of universities are the most common, since seminars, conferences, symposiums, competitions are relatively simple and affordable, but at the same time they are the most effective area of international cooperation. Their peculiarity is the absence of restrictions on the number of participating universities, stu-

dents and teachers, which allows for global forums. Professional training, retraining and advanced training of teachers is the most widespread. Unlike the exchange of students, this format of cooperation provides for a one-sided nature. It includes the provision of a variety of educational services to foreign students and teachers, sometimes on preferential terms or with the provision of other preferences. Obtaining new qualified specialists allows many to stay in the country and replenish the human resources potential of the state. Programs of parallel, continued study abroad are of interest. Such programs are an in-depth student exchange option. They provide for the development of full-fledged training courses, which are prepared in isolation from the basic training program. We have investigated the issues of developing joint international educational programs in the systematic professional development of teaching staff, including at foreign universities. In particular, we consider the issues of coordination of universities in Uzbekistan with foreign scientific centers and higher educational institutions of the republic. The experience of conducting educational activities at universities of the republic according to the educational standards approved by the Ministry of Higher Education of the Republic and the educational programs and curricula developed on their basis are used very effectively in the training of scientific personnel. It would be useful to introduce the so-called "integrated" master's degree (4+2) and obtain the right to award a master's degree for the first graduate of

undergraduates. For the sustainable development of universities, it would be useful to remove unnecessary administrative barriers. For example, to lift restrictions related to undergraduate enrollment in the regions of the republic. Such a decision will help ensure equal access to education for Uzbek citizens and an even “utilization” of educational capacities of universities.

To coordinate Uzbek-foreign scientific projects, it is advisable to create scientific councils at the leading universities of the republic. Such scientific councils could determine priorities for university research funding based on two criteria — the compliance of the scientific tasks being solved with the world level and their ability to contribute to the development of a particular province, city or country as a whole.

To do this, it is necessary: the world’s leading universities, subject to mutual dissemination of information about their educational programs; expand the organization of mutual exchanges and internships with credit offset; organization of long-term internships for international students at “mother” universities through exchange programs; development of the organization of library exchange of books, textbooks, methodological literature; to expand the access of teachers and students to electronic databases and libraries of joint universities. This was discussed in the spring of this year at the Annual Conference of Libraries of Joint Universities; to develop scientific cooperation between joint universities of leading countries of the world, including participation in common scientific projects, including in mathematics, materials science, biology, and other areas. In the modern international higher education market, the “parent” universities of Russia, the USA, Great Britain, Israel, and Hong Kong are competitors. But at the same time they can and should be partners. In 2023, Tomsk State University and Turon Zarmed Private University signed a memorandum of understanding. Universities are planning to launch a joint master’s degree program in the field of Management in the period from September 2023 to August 2025. It is planned that the launched joint educational programs will work in the “3.5 + 0.5” format: students will study in Uzbekistan for 7 semesters, and the last semester will be spent within the walls of our university. Among the areas being developed are economics, management and other socio-humanitarian profiles. In Samarkand, as

part of the implementation of the partnership memorandum, the opening of the Zarmed To’mar Russian Language Training Center was also held, where philologists from Tomsk State University will teach. The center was created jointly with the TSU Institute of Distance Education. IDO employees and an industrial partner, the Tomsk IT company Sigma, have developed a special proctoring system and an electronic educational portal. This will allow philologists from TSU to participate in the work of the center remotely.

The Zarmed Universiteti private University was opened in 2022, and the Samarkand campus has recently started its work. In addition to launching joint educational programs, other projects will be implemented within the framework of cooperation between TSU and Zarmed University. In particular, the specialists of the Higher IT School and the industrial partner of TSU will develop an electronic educational environment that will be introduced into the learning process. TSU and the Uzbek side also intend to expand scientific and academic cooperation in various fields. This includes, for example, the exchange of faculty and students, the organization of joint trainings, colloquiums and conferences. Uzbekistan is one of the priority partners for Tomsk State University, and the number of students from Uzbekistan has more than doubled in recent years. TSU cooperates with universities in Tashkent and other cities on educational programs and trains specialists necessary for the republic. There are also several joint research scientific groups, in particular, on big data, botany, and environmental orientation. Solving large-scale technological problems is impossible without universities. It is necessary to combine a fundamental level of education and practical skills.

**Conclusion.** The development of the higher education system should be built in partnership with the employer. It is important for employers that appropriate professional thinking is formed at the university so that the graduate can apply his knowledge independently in changing factual circumstances, and a very important request for the formation of a highly moral personality of a citizen of his homeland.

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# METHODOLOGY FOR EVALUATING LOGISTICS SMART BUSINESS USING ENGINEERING AND ECONOMIC ANALYSIS

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**RESUME.** In the scientific article, based on the assessment of theories and methodology for developing tools for economic policy of subjects of highly competitive logistics business, insufficient consideration of modern features of the development of smart economy (ecotronics) is revealed, which determine a new driver for increasing one of the subset of professions of the economic profile of engineering and economic competencies, derivatives of physical and “artificial” intelligence in the context of increasing uncertainty and turbulence of ecosystems. The necessity of theoretical and methodological complex accounting of dynamic interdisciplinary linear and nonlinear cross-proportional specificity of smart economy, generating collaboration of cognitive process of creation of smart competencies of engineers, economists, investors, entrepreneurs, managers, specialists of companies and adequate flexible approach to construction of configuration of their teams on the basis of optimization of aggregated network cross-interaction of their engineering and economic parts is scientifically substantiated.

**KEY WORDS:** logistics Smart Business, engineering economy, theories and methodology

**Introduction.** In modern scientific and empirical economic practice, the instruments of formation of professional economic competencies of investors, entrepreneurs, managers and specialists of economic profile in the conditions of traditional functioning of the company economy, based on the use of the existing paradigm of “effective economy”, dominate. This paradigm is based on the theory of proportionality of interaction of resources and exclusivity of economic justification and adoption of effective management decisions by stakeholders of the logistics business. This kind of construction of their economic competencies does not take into account the alternative, dynamic state of development of complex engineering business processes, which can be interpreted as “turbulent” in the conditions of increasing influence of the tools of synthesis of engineering and economic competencies, derivatives of physical and “artificial” intelligence.

**Main part.** In the process of research of the current practice of digitalization of the effective

use of the economic potential of logistics business companies in various countries it is shown that the key instruments for determining promising directions of its development are institutional, investment, technical and technological, marketing, functional digital engineering transformations (transformations) and mining of their quantitative parameters in order to achieve not so much sustainable growth, efficiency, as the best combinatorics of the market value of the potential of logistics companies, profitability and liquidity of their economic activities. The latter is due to the fundamental paradoxical structural and dynamic interactions of key variables of the engineering business in the context of increasing growth of uncertainty and turbulence of ecosystems [1, 2, 3, 4, 5]. At the same time, in scientific and expert practice, the interpretation of the concepts of “economics” and “engineering economics” is of a historical nature and its implementation in digital transformations (transformations) of the engineering business of logistics companies is very

problematic. Thus, the broadest interpretation of the definition of “economics” in the Russian-speaking economic community was found in the expression – “the art of managing a household (translation of the Greek word – oiko nomos)”. Engineering economics is translated as a mechanical unification of micro-economics with engineering practice with the aim of searching for and developing technical and technological solutions by engineers to improve production, followed by an assessment by economists of the economic usefulness, their feasibility, and the effectiveness of these solutions.

In the theory and practice of US management, an interpretation of the science of economics has been formed as a sphere of human intellectual activity, allowing it to more effectively solve three fundamental interrelated problems:

1. What should be produced?
2. How will goods or services be produced, that is, who will produce them, using what resources, what technology, in what country, etc.?
3. For whom should they be produced, that is, who will consume them to extract utility?

Engineering economics includes the formulation, evaluation and analysis using mathematical methods of the economic results of alternative engineering scenarios for achieving a specific goal. In Western Europe, along with the above methodological approaches to clarifying the essence of the economy, there is also such a practice as the science of decision-making regarding the use of limited resources to meet human needs. Engineering economics is called upon to perform analysis, synthesis and drawing conclusions, working on engineering projects of all sizes. Synthesizing the existing scientific and expert practice interpretations of the concepts of “economy”, “engineering economics” as one of the subsets of the economy, we can conclude that they are considered as a set of knowledge that allowed business stakeholders (investor, manager, engineer, etc.) to determine its sustainability, efficiency, profitability and which of several alternatives, including engineering, was economically the best – the least expensive or, perhaps, the most profitable. In logistics, the engineer is responsible for developing recommendations based on technical and analytical knowledge, including knowledge of engineering economics, and

then the manager decides what to do. Analysis of the practical application of the existing concepts of “economics” and “engineering economics” shows that the manager’s economic decisions may differ from the engineer’s recommendations, since the manager may take into account issues that are beyond the engineer’s competence, such as the impact of sanctions on the cost of importing components for a particular piece of technological equipment.

The presence of real differences between the manager’s economic decisions and the engineer’s recommendations generates the limitations of the existing traditional interpretation of the definitions of “economics”, “engineering economics”; it follows that “engaging in economics” means making decisions about the use of limited natural and other resources, technologies, equipment, relying on the technical and technological competencies of engineers, in a competitive environment to make a profit and meet customer demand.

And, as a consequence, in the conditions of increasing influence of the tools of synthesis of engineering and economic competencies, derivatives of physical and “artificial” intelligence, there are trends in the practice of managers increasingly not to rely on the technical, technological competencies of engineers, and the managers themselves become engineers, and engineers become managers. This is due to the fact that the industry of creation, sale, service of consumption of products and their disposal is becoming increasingly technologically complex and therefore even understanding its market requires analytical skills for an engineer. As a result, often only an engineer-economist has sufficiently deep knowledge to make a competent economic decision in a high-tech business. Consequently, an economic understanding of how to compare costs, although vital, is not the only skill in business necessary for making appropriate engineering decisions.

Therefore, in the conditions of increasing influence of the tools of synthesis of engineering and economic competencies, derivatives of physical and “artificial” intelligence, there is a transformation of professional competencies of traditional economics into engineering economics, which presupposes an understanding of econometrics, managing the combinatorics of the best use of technical resources, technology, personnel, physical and cost scale of industry, its logistics, time, cost of money based on the use of quantitative methods for assessing the

economic merits of various engineering projects and proposals, choosing the preferred alternative from a large number of technically viable engineering business projects. Therefore, engineering and economic analytics is quantitative in nature and most economic assessments are evaluative in order to focus the efforts of engineers-economists on determining the economically “best” alternative of business projects and engineering solutions for their successful implementation.

Engineering economics includes methods for quantitative calculation of present value (PW), future value (FW), annual value (AW), rate of return (ROR), capitalized value (CC), payback period (PP), economic value added (EVA), net present value (NPV), internal rate of return (IRR), life cycle cost (ICC) and others for step-by-step cost efficiency assessment, budgeting, risk assessment in several stages of making the right decision. At the first stage, it is determined whether the engineering solution to the business problem is technically unique and feasible in a certain period of time. This is one of the key roles of an engineer-economist, who has specialized training to make such technical judgments. At another stage, it is justified which engineering and economic solution from a large number of technically unique and feasible alternatives of business projects is economically “the best” of the technically viable ones being studied.

Consequently, in the digital surplus economy, every adopted not only economic, but also engineering-economic decision is based on the results of using quantitative methods (econometrics or mathematics) for measuring three factors: a) circumstances of the external linear, and non-linear network external environment; b) dynamic and distributed in time and space engineering-economic off- and on-line alternatives (off- and on-line choice possibilities); network engineering-economic motives, interests of producers, their partners and functional-emotional value goals of clients (network system of goals).

The above allows us to conclude that digital engineering economics is an area of human creative intellectual activity, a discipline, a profession, the task of which is to search, evaluate, select and practically apply the achievements of science, technology, “artificial” intelligence, the best experience of using the laws of natural sciences and natural processes in high demand by the market to create a competitive high-tech

economically “best” of the technically viable engineering and economic alternatives for the integrated use of electronic, mechatronic, control and computer engineering for the development and implementation of smart industry business projects with high productivity, ease of redesign and the ability to reprogram it in order to create a wide variety of high-tech and high-margin products and services throughout their entire business life cycle.

“Engineering and economics (engineering in business) is the field of human creative intellectual activity of designing, testing, developing, operating, servicing separately or in combination smart-technical and technological: machines, products, technological lines, processes, etc. and managing them with full knowledge of their business design; predicting their behavior in certain operational market regimes and regulations, implementing the paradigm “money invested in engineering and economics makes money.” People who constantly and professionally practice engineering in business, implementing the above paradigm, are called engineers.” The engineering business in logistics is mostly carried out by the most active, more competitive, predominantly proactive, ambitious and highly educated part of the population, capable of taking risks, having a certain intuitive sense of economic success, possessing some property or the opportunity to legally use it on favorable terms (rent, lease, outsourcing, sharing, factoring, franchising, etc., up to overdraft).

Businessmen in logistics are distinguished by the ability to show increased interest in searching, studying and researching new and new engineering and economic possibilities for their implementation, to notice some advantages and to use them profitably. They, as a rule, have the necessary amount of knowledge in the field of engineering, technology, technology, economics (especially in the field of startups, marketing, logistics, management, international economic relations, etc.), are ready to work intensively themselves (in other words, to give more than 100% of the generally accepted level of use of their physical and intellectual abilities) and can successfully organize others to achieve their economic goals.

Only a certain part of the population of each country can be most actively and intensively engaged in the engineering business in logistics, and, as a rule, they include entrepreneurs whose activities are called entrepreneurship,



which is translated as an independent initiative activity of citizens who own some property in whole or in part, carried out at their own economic risk and under their property liability for the purpose of organizing an engineering and economic business within the existing legislative framework. Comparing the two concepts of “business” and “entrepreneurship”, it should be recognized that they have both great similarities and semantic differences. The concept of “business” is, first of all, an economic category. While the concept of “entrepreneurship” can be interpreted in one case, if we are talking about business, as an economic category, and in the case of the legal regime of its implementation, as a legal term.

Comparing the relationship between business and entrepreneurship, we can figuratively construct the following diagram: business acts as a “locomotive”, and “entrepreneurship” as a “motor” of the engineering business. Engineering business, acting as an entrepreneurial system, characterized by the properties of expediency, integrity, discrepancy between economic interests and activity of not only entrepreneurs, but also its other participants, and, as a consequence, the key source of its effect is not the effect of synthesis, but the combinatorics of engineering and economic competencies of all stakeholders of smart business without exception, their competitors, including logistics, clients, their teams and technologies. The implementation of the described design of combinatorics and an adequate flexible approach to building a configuration of teams of all, without exception, stakeholders of smart business based on the optimization of the aggregated network cross-interaction of their engineering and economic parts calls into question the unambiguous translation of the fundamental postulate of the theory of effective economics by P. Samuelson – the “golden rule” of the traditional law of supply and demand in economics: you win in 1) price, 2) supply and lose in 1) demand and 2) volume of income and vice versa.

The “golden rule” of SMART economics (ZHUDRO) should be considered more valid: you win in 1) the dynamic combination of “smartly woven” price, 2) aggregate demand and 3) increasing volume of income and you lose in 1) the profitability of the supply unit and vice versa [6].

The key limitation of the use by managers and specialists of companies and government

agencies of the theory and practice of applying engineering and economic technologies and methods of implementing the traditional law of supply and demand in the economy (P. Samuelson), taking into account the influence of only balanced, as declared in scientific traditional scientific recommendations, is that they ignore the new conflict cross-interaction of key variables of smart business: a) cost, b) time and c) quality [7].

The proposed smart-construction of the smart-economy “Zhudro” differs from its traditional format (flow, rhythmic, continuous, proportional) in that it has two clearly distinguishable digital states: 1) proportionality (coherence) and 2) “smart-weaving” or disproportionality (entanglement, variability, uncertainty, complexity, turbulence and ambiguity), as well as aggregated conveyor-network interaction of producers/partners and their converged co-badging interaction with buyers of their goods and services, which can be successfully implemented through off- and on-line dynamic not two, but several dimensions.

Implementation of the described design of combinatorics and an adequate flexible approach to building a configuration of teams of all stakeholders of smart business without exception based on optimization of aggregated network cross-interaction of their engineering and economic parts and off- and on-line dynamic not two, but several dimensions of markets and derivatives of the practical application of “artificial” intelligence:

1. New and unpredictable in human life and business designs of off-, on-line business communications and digital management, based on the use of machine learning methods.
2. New theoretical, methodological and econometric tools for managing ecotronics (smart-economy).
3. Development of the foundation of smart technologies – mechatronics.
4. The key source of the effect – smart business in logistics is not only the volume or scale of business, fixed and variable costs, break-even point (the basis of marginal analysis), the effect of time.

**Conclusion.** Thus, it can be concluded that in the conditions of smart economy, an investor, entrepreneur, manager, technological employee of the company, buyer are free to justify and make an engineering and economic decision in choosing the “best” alternative and defining

their goals based on the synthesis of professional competencies of engineers, managers and “artificial” management, which allows “utilities” to diagnose the state of the economy of a logistics company and thereby support its vital activity based on the study of the flow of business processes. It ensures “smart” collaboration (cooperation) of the cognitive (connected) process of creating smart competencies (smart competencies) of engineering and economic specialists of companies and an adequate flexible approach to building the configuration of their teams based on the optimization of the aggregated network cross-interaction of engineering and economic.

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# SOCIAL AND TECHNOLOGICAL APPROACHES TO DEFINING AND ASSESSING THE COMPETITIVENESS OF SMALL BUSINESSES AND PRIVATE ENTREPRENEURSHIP

*PhD*

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**RESUME.** The article emphasizes the importance of developing the concept of competitiveness of small businesses and private entrepreneurship in the context of modern realities and economic conditions. It points out the need to revise the methods of assessing competitiveness, taking into account changes in the way many companies conduct business. The essence of the concept of competitiveness is described through the evolution of approaches to methods of its assessment, which allows us to offer recommendations for ensuring and increasing competitiveness. It also suggests directions for improving the elements that make up competitiveness in order to optimize the business processes of small businesses and private entrepreneurship. Both external and internal factors influencing competitiveness are highlighted. It is noted that at present there is no universal methodology capable of determining the level of performance of small businesses and private entrepreneurship in the context of changes in the economic space.

**KEY WORDS:** competitiveness, staffing, motivation, strategy, competitive balance

**Introduction.** In the context of economic transformations, it is becoming necessary for most small businesses and private entrepreneurship in the Republic of Uzbekistan to review the development directions and approaches to doing business and promoting products in the markets of almost all economic sectors. The current level of ensuring competitiveness within companies and enterprises is the main goal of their activities, since continuous and rapidly changing market conditions, increased competition, reorientation of cooperation areas and other factors require increased flexibility and adaptability of structures with a simultaneous increase in competitive advantages and opportunities. Such conditions emphasize the relevance of this problem, since many enterprises find themselves in conditions of economic instability and need to develop various methods and mechanisms to increase competitiveness.

**Main part.** In the scientific community, the problem of competitiveness of small businesses and private entrepreneurship is widely discussed by various scientists and specialists, offering many approaches to its solution. However, despite the variety of methods associated with the complexity of the very concept of competitiveness, there is still no single universal method for its assessment. This creates difficulties in choosing alternative solutions and slows down the development of small businesses and private

entrepreneurship in the field of business functioning. Usually, the level of competitiveness is assessed through the calculation of a set of various metrics. However, such calculations often omit the economic component, which can lead to erroneous and ineffective decisions, since economic characteristics are of great importance in the context of instability of organizations under the influence of various factors.

In such conditions, special attention is required to assess the competitive position of private entrepreneurship in the context of its development and strategic opportunities among competitors. Despite the universality of the concept of competitiveness, in Uzbekistan, given the many complexities in the external environment, the development of the import substitution course and reorientation in the world market, it is necessary to highlight the most significant provisions in the theory and practice of its assessment. On this basis, methods should be developed that meet the demands of modern realities in the country.

The economic category of competitiveness is a complex and multi-component concept that has been the focus of many scientists for many years. On the one hand, it is considered as the potential for increasing the organization's productivity through cost optimization and increasing the efficiency of product range policy, believing that the basis of any enterprise's ac-

tivity is its production capacity. On the other hand, this concept includes the level of quality of manufactured products, their comparison with reference products or substitute products, separating the quality category from the metrics characterizing the value and cost of products. Experts also emphasize that competitiveness should be at such a level as to satisfy the target audience significantly better than competitors.

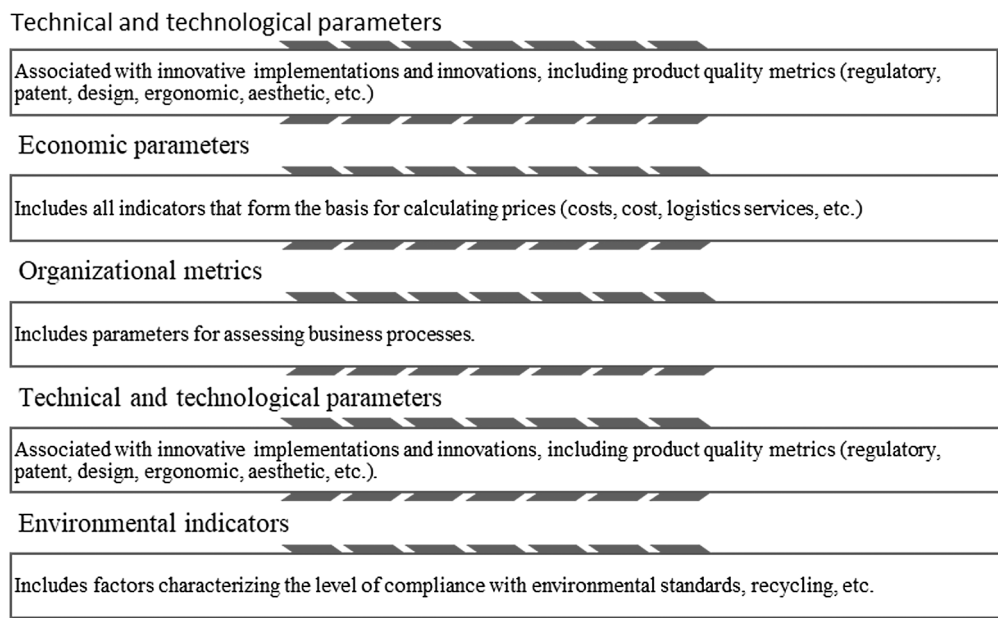
The authors note that such an interpretation of the competitiveness of an organization covers only commercial, production and, possibly, marketing aspects, ignoring the elements of business processes from the economic point of view of the systems approach. This means a step-by-step study of each process separately (for example, procurement, distribution, production, etc.), as well as organizational and environmental parameters that reflect the fullness of the economic category.

Some experts have expanded the concept of competitiveness, focusing on increasing the capabilities of small businesses and private entrepreneurship. They note that when assessing competitiveness, one should take into account not only the volume that the enterprise's capacity allows for, but also its potential capabilities. In this context, it is possible to use various forms of cooperation, such as outsourcing, which will ultimately increase the company's profitability given the growing demand.

In this context, the category of competitiveness, taking into account its dependence on the definition of the competitive advantages of the organization in various areas of its business processes, can be defined as a set of factors grouped according to various characteristics from the standpoint of a systems approach (Figure 1):

With the development of the theory of cycles and technological structures (N. D. Kondratiev, J. A. Schumpeter, etc.) [1], the category of competitiveness was expanded. According to the wave theory, each new wave on the market stimulates the growth of certain competitive advantages based on the absorption of innovations. The theory of crises substantiates possible directions for overcoming them based on the same innovations of various natures, including organizational and managerial innovations. In the theory of G. Mensch regarding waves, the results of studies are presented showing the interdependencies between innovative absorption and the activity of business entities, which has a positive effect on the level of competitiveness.

All these theoretical studies are really important for describing the essence of the economic concept of competitiveness, indicating its properties. However, they do not allow us to clearly understand the level of this indicator, taking into account dynamic changes and many different factors of the economic environment.



**Figure 1.** Factors influencing competitive advantages in various business processes.

In this regard, for a full assessment of the competitiveness indicator, determination of its criteria and allocation of additional metrics, some experts suggest using strategic planning methods. For example, the well-known BCG matrix is a method used for strategic assessment of the degree of market growth relative to the share occupied by the company. Within the framework of this approach, various types of the organization's proposals are divided into groups formed taking into account the nature of the strategic market coverage area. Such a matrix, in essence, reflects the stages of the life cycle of the economic entity and the goods offered to the market. However, unfortunately, this approach is limited to assessing the position of the enterprise at the current moment in time, without identifying the parameters of competitive advantages.

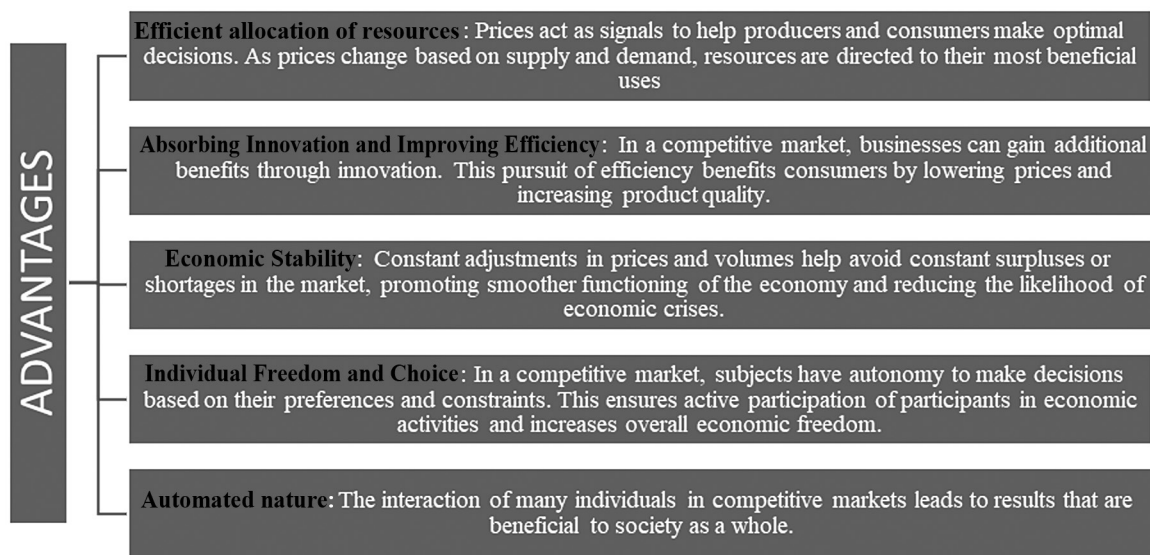
Another strategic planning approach often used in management is the McKinsey matrix, which was developed based on the BCG (Boston Consulting Group) matrix. This method takes into account a larger number of factors when assessing a company's competitive position. Also, specialists often use an evaluation approach based on price characteristics and comparative criteria for assessing profitability and cost, which ultimately leads to the calculation of a complex indicator for the enterprise.

Despite the variety of methods for strategic planning, economists invariably rely on the widely accepted theory of supply and demand, which describes highly competitive markets in

equilibrium. Competitive equilibrium is a fundamental concept in economics that involves the interaction of the forces of supply and demand in a market, resulting in a state of balance with stable prices and quantities. In this equilibrium, numerous buyers and sellers engage in transactions based on their individual preferences, constraints, and information. The market reaches equilibrium when the quantity supplied equals the quantity demanded at a given price level. This model implies that in a competitive market, no participant has an incentive to change their behavior, since they perceive the prevailing prices as fair and reflective of underlying market conditions. The pricing mechanism acts as a critical element in this equilibrium, functioning as a dynamic signal guiding the efficient allocation of resources. As supply or demand changes, market participants adjust their production and consumption decisions accordingly.

However, many markets in everyday life are far from static equilibrium, experiencing fluctuations caused by trends and price changes. In this context, it is possible to assume that network effects may be one such factor. Conventional wisdom holds that this is the result of technological progress or external events, and that the market will eventually balance itself. Long-term planning or market frictions may lead to constant fluctuations.

Among the advantages of competitive equilibrium models, the following can be highlighted (Figure 2):



**Figure 2.** Generalization of the advantages of various models of competitive equilibrium.

Experts often use point methods of evaluation, in which each parameter is assigned certain points, which are then averaged and compared with reference values. Qualimetric methods of competitiveness evaluation are also widely used, based on the principles of bringing parameters to equality of the characteristics of the organization and competitors in the market. The relationship between them is identified, the degree of influence on each other is calculated, and as a result, the competitiveness indicator is evaluated from the standpoint of total costs and quality in the context of consumer satisfaction of products. In the practical application of such a method, a survey is often used, the result of which is the ranking of consumers by groups.

Evaluation of the competitiveness of an organization based on marketing tools is also quite common and effective. The marketing approach is based on the algorithm of conducting marketing research, the results of which serve as the basis for developing the directions of development of the organization in the context of the current competitive situation on the market. This approach is the broadest compared to the previous ones, as it includes elements of all the above-described methods and is of a comprehensive systemic nature. As a result of its application, it is convenient to develop various strategies for increasing the competitiveness of the organization.

Thus, it can be stated that the competitiveness of an organization is a complex indicator. It implies a sufficient level of compliance with specific market conditions and changes, the ability to adapt to them, and the improvement of performance indicators in accordance with these conditions. This understanding of the category covers production and consumer characteristics that distinguish the results of the organization's business activities, as well as the degree of its adaptation and ability to flexibly respond to changing demands and the market environment as a whole.

As for approaches to developing an organization's strategy, the primary one is to identify a number of competitive advantages. The theory of competitive advantages suggests that a business has a certain advantage over its peers in terms of price, innovation, business strategy,

etc. This approach is not always related to price, while the second one mainly concerns price and cost price.

Within the framework of this approach, it is possible to identify the characteristics of the organization's competitive positions and evaluate its competitiveness according to various metrics of market activity. This is the process of identifying competitive advantages, or key success factors. In the modern economic context, such parameters are classified and have an applied nature.

Conclusion. In conclusion, we note that in the course of the study, the essence of the concept of ensuring the competitiveness of an organization in modern economic conditions was clarified. Existing assessment methods were analyzed and a definition was given based on the strategic orientation of the company with the identification of key factors of success in business activities. This allows us to more clearly understand the direction of strategic development of companies in a dynamic environment and transformational changes in the economy.

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# APPROACHES TO THE ASSESSMENT OF THE KNOWLEDGE ECONOMY AND ITS PRACTICAL IMPLEMENTATION ON THE EXAMPLE OF SCIENCE AND TECHNOLOGY PARKS

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**RESUME.** The article considers theoretical approaches to the traditional and authors' interpretation of the concept of "knowledge economy" and develops ideas of synergistic and interactive approaches to this category. According to the results of the study, two groups of knowledge-intensive services (accelerators and knowledge generators) have been identified, which indirectly characterize the level of development of the knowledge economy in techno park structures and a schematic model of its implementation has been proposed.

**KEY WORDS.** Knowledge economy; synergy; synergistic effect; education; science; science and technology parks; techno park structure; knowledge intensity; interaction, assessment.

**Introduction.** In economics, with all the variety of interpretations of the knowledge economy, there is no unified and generally recognized approach to the content of this concept, although most researchers traditionally associate it: 1) with human capital, that is interpreted as a carrier of knowledge, obtaining both physical and psychological inborn capacity and necessary skills; 2) with the investing in both education, as the main source of human capital, and science, as the field of applying and developing gained knowledge and experience, what eventually characterize the knowledge economy. Thus, one group of researches keeps their focus on science, another one consider them as a complex.

**The main part.** The evolution of human capital and the progress of formation of the knowledge economy brings the acceleration to both individual income of the human capital carrier and the national income of the society in general. In our own research, we develop the idea of using synergistic and interactive approaches to the knowledge economy [1, 2]. In our opinion, targeted investments in education and science do not fully characterize the level of development of the knowledge economy in terms of their share in gross domestic product, GDP, both individually and together, since they do not take into account the synergistic effects of

the interaction of education, science and social production, which have an impact through transfer mechanisms on all types of economic activity and increase competitiveness the national economy.

After all, close and mutually beneficial interaction between legal entities and individuals is the key to the knowledge economy by exchanging expertise, data, skills and competences, this kind of cooperation can result in intellectual resources development and growth. The knowledge economy can be characterized by exchanging and cooperation of new ideas, skills, expertise and background in close synergy with up to date technologies, which stands it out of the traditional economy [3]. Due to this interaction, the unique strengths of the participants in the research and production and innovation process are combined, a synergistic effect arises in which the result exceeds the sum of the individual parts. This, in turn, contributes to the creation of new knowledge, stimulating progress in science and technology. Thanks to the synergistic effect, the knowledge economy goes beyond the traditional economy, opening up new opportunities for economic development.

The concept of a knowledge economy based on human capital and innovation is currently being developed. The definition of this concept can be found in the papers of the United Na-

tions Development Program (2004), which is: 'The knowledge economy is a society that forms and releases human potential, opening people access to necessary tools and technologies through education and training in methods of their effective use' [4, pp. 17-22]. However, this definition is related only to the formation of human potential through investment in the field of vocational and additional education and training, but this potential should be realized in the creation of new knowledge in the field of science and their practical implementation in innovative new working technologies in public production. Only on the basis of this triad (human capital – knowledge – innovation), with sufficient investment from society and the creation of an appropriate institutional environment, can the essence of economic knowledge be revealed. Hence, the knowledge economy, a complex, evolutionary, and multidimensional phenomenon, is evolving in the context of the intellectualization of contemporary society. We consider the increasing prevalence of knowledge in diverse domains of economic activity, which is fostering the emergence of a forward-looking economic paradigm rooted in knowledge [5, pp. 44-53]. This paradigm encompasses:

- 1) the integration of artificial intelligence into the processes of generating, disseminating, and implementing various forms of knowledge;
- 2) an ongoing process of integrating research and development advancements into the production of goods, services, and works;
- 3) the operational process of developing and implementing innovative technologies, taking into account market demands and in the shortest possible time in public production.

Taking into account the above, the knowledge economy is understood as the newest stage of the institutional evolution of a post-industrial society, in which priority is given to knowledge and human intellectual capital as a key resource (cognitization) of the innovative development of social production. This is achieved as a result of the synergy of education, science and production, including: a) financing in the system of continuing education, as well as through personal self-realization and creative work (University 4.0), which is accompanied by an increase in human intellectual capital, b) investing in science to increment and generate new knowledge, c) the realization of knowledge in working people, implemented technologies

with an increase in the share of the knowledge-intensive component in goods, services and works. At the same time, the conditions for achieving these parameters are free access to information and knowledge based on advanced information and communication technologies and digital platforms of the present and future [6, pp. 79-85].

In this interpretation, traditional and the latest synergistic and interactive approaches to understanding the knowledge economy are integrated, the interdependence of the main components (knowledge, intelligence, investment, innovation) is determined, which at a certain historical stage of society become the dominants of the innovative development of social production.

The author's interpretation of the knowledge economy contains a number of characteristics and features, in particular:

1. Institutional evolution indicates that the knowledge economy is continuously being progressively formed and plays an increasing role in the development of modern society, and therefore it can be considered as an extreme stage of institutional evolution in a post-industrial society. This suggests that society is evolving from the classical industrial stage to a knowledge economy based on information, innovation, digital and creative components. All this underlines the relevance of research on the problems of the knowledge economy in the context of the stages of development of post-industrial society and modern forms of the new economy.
2. The value of knowledge. In the knowledge economy, knowledge is becoming the most important key resource for innovative development: the value of knowledge, information and intellectual assets for economic growth is increasing. Knowledge is no longer just a by-product, but a central factor of scientific, technical and economic progress.
3. The role of human intellectual capital. Human capital as a set of knowledge, skills and abilities acquired in the learning process, developed intellectual abilities, as well as experience and competencies realized in the course of work, plays a leading role as a factor of social production, repeatedly increasing labor productivity and business efficiency through the realization of human intellectual abilities.
4. Areas of knowledge formation: in the field of education, there is an accumulation of



knowledge and the growth of human potential, the increment of new knowledge occurs in the field of science, and new knowledge is realized thanks to intellectual capital and synergistic effects in the field of innovative production. This suggests that educational, scientific and innovative activities make a decisive contribution to the knowledge economy.

5. Freedom of access to information and knowledge through informatization and digitalization: Informatization refers to the widespread introduction and integration of information and communication technologies (ICT) in society and business. Interaction and decision-making are the processes that require applying modern tools and digital systems, so do effective knowledge and data sharing processes, and the knowledge economy and ICT sector provide the opportunity for both. And vice versa being a part of the knowledge economy and succeed supposes access to digital infrastructure and its limitation can influence the process negatively.

Based on our synergistic approach to researching the knowledge economy, we assume the key element of it – the core of the knowledge economy. Hence, we interpret the core of the knowledge economy as a result of cooperation between financial, material and intellectual resources between industries in order to generate and accommodate fresh knowledge. This obtained knowledge can result in using it in social production to create new scientific and knowledge-intensive products.

We consider this cooperation synergistic and nonlinear. The reason is that we can not get a classical arithmetic sum, but it has to exceed it by means of cumulative growth. However, this result can be obtained only in case of proper resources allocation. We assume we can reach this outcome only due to effective management.

Building on the results of our scientific research, we can conclude that the knowledge economy is predicated on a complex interplay of nonlinear phenomena, encompassing the irreversibility of knowledge transfer, its exponential growth through replication, and the synergistic outcomes arising from its application across diverse sectors of economic activity. Thus, the act of sharing and disseminating knowledge fosters its proliferation, with universities and the broader educational system serv-

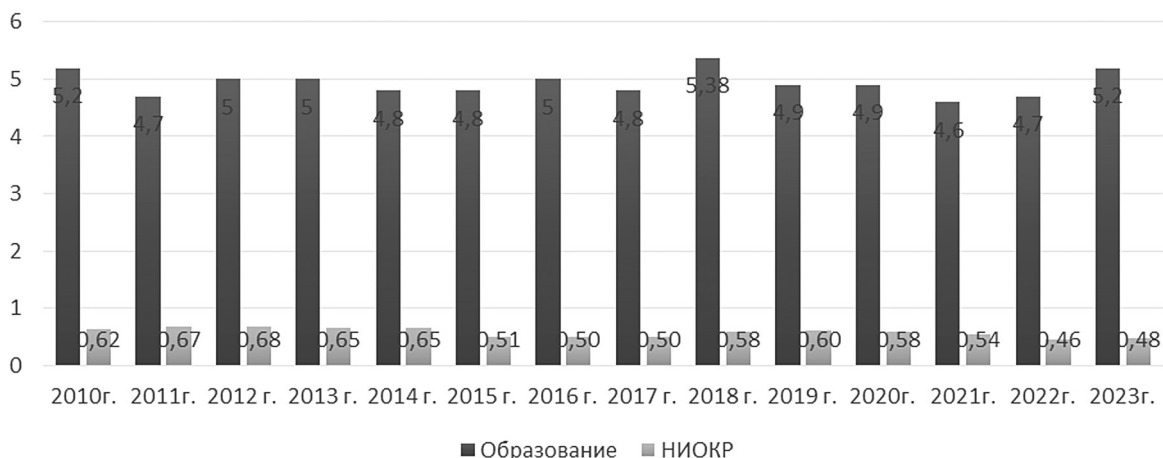
ing as instrumental vehicles for this process [6, 7, 8, 9].

The knowledge economy as a whole is based only on nonlinear phenomena related to the irreversibility of knowledge exchange, their multiplication and the emergence of synergistic effects from their application in various types of economic activity. As you know, the exchange and dissemination of knowledge contribute to their multiplication, and universities and the entire education system serve as a means for this.

Realizing the key role of the knowledge economy, the Republic of Belarus allocates significant funds, at the level of 5.5% of GDP, to finance primarily education, where human capital is being formed, and science, in which new knowledge is being incremented as a result of research activities (Figure 1).

The second element of the knowledge economy concept we are developing is the area of intersectoral knowledge synergy, within which there is an interactive interaction of intellectual, logistical and other resources of organizations of various branches of the knowledge economy core involved in the generation and practical implementation of knowledge. In the field of intersectoral synergy of knowledge (one of the forms of manifestation of which are clusters), a set of interested partner organizations is concentrated, both legal entities (universities, scientific organizations and innovative enterprises) and individuals (scientists and researchers, innovators and inventors, entrepreneurs and businessmen), as well as individuals with their complementary potentials and unique competencies who participate in cross-sectoral and organizational cooperation for the development of innovations and the introduction of new knowledge-intensive products and services to the market. Within the framework of the national innovation system, such specialized subjects of intersectoral knowledge synergy have identified science and technology parks in various forms (technoparks and their residents).

From a scientific point of view, it can be postulated that technoparks are a classic territorial and organizational form of manifestation and implementation of the knowledge economy at the microeconomic level, where various types of synergistic effects are formed from the interaction of education, science and production. The question arises how to assess the synergistic effects of their interaction within the framework of the overall performance of technoparks



**Figure 1.** State expenses on education and R&D (as a percentage of GDP)

Note — Source: own development based on <https://public.knoema.com/lftihvf/world-development-indicators-wdi?viewState=186718d89d5e152fb175d5183add95d4415541770a677a1fc497519781478789> [10]

as a whole, consisting of founders with their potentials, administration and residents.

In order to obtain accurate results in a comprehensive economic evaluation of the effectiveness of techno parks and their potential for fostering the growth of the knowledge-based economy, we suggest employing the method of calculating an integral coefficient for the knowledge economy of techno parks, based on a total of 14 key indicators. Our research indicates that the calculation should be conducted using the normalization method. This approach allows us to harmonize heterogeneous indicators expressed in various units of measurement through

a system of coefficients. Consequently, the resulting integral coefficient will reflect the dynamics of knowledge economy development within science and technology parks as a result of the interconnected network interactions between scientific, educational, research, technological, and innovative activities within these parks. (Table 1) [11, pp. 36-48].

The economic interpretation of the possible results from the point of view of the potential of the techno park structure for the development of the knowledge economy is as follows:

1. If the  $K_{ke}$  is  $<1$ , the main performance indicators show a negative trend. Low employee

**Table 1.** Constructive presentation of the methodology for evaluating the integral coefficient of the knowledge economy of the Science and Technology Park

Indicators characterizing the effectiveness of the functioning of techno parks ( $K_i$ )	Justification of the choice of indicators in the context of the knowledge economy concept
<p>The growth rate of the number of residents (<math>K_1</math>):</p> $K_1 = \frac{R_i}{R_{i-1}}$ <p><math>R_i</math> — number of residents in the reporting period;  <math>R_{i-1}</math> — the number of residents in the previous period.</p>	<p>The indicator reflects the development of the techno park structure at the expense of new residents. It characterizes the institutional readiness of educational, scientific and business institutions to develop innovative forms of production organization in techno park structures</p>
<p>The growth rate of the total area of the premises (<math>K_2</math>):</p> $K_2 = \frac{S_i}{S_{i-1}}$ <p><math>S_i</math> — the total area of the premises in the reporting period;  <math>S_{i-1}</math> — the total area of the premises in the previous period.</p>	<p>The indicator reflects the use of space for the implementation of innovative projects by techno park residents to accommodate equipment and employees</p>

Indicators characterizing the effectiveness of the functioning of techno parks ( $K_i$ )	Justification of the choice of indicators in the context of the knowledge economy concept
<p>The growth rate of the number of techno park employees with higher education of the techno park (<math>K_3</math>):</p> $K_3 = \frac{W_{hi}}{W_{hi-1}}$ <p><math>W_{hi}</math> – the number of employees with higher education in the reporting period;  <math>W_{hi-1}</math> – number of employees in the previous period.</p>	<p>The indicator reflects the development of the techno park's human resources, which has knowledge at the level of general, special and advanced higher education.</p>
<p>The growth rate of the number of techno park employees with a degree in techno park (<math>K_4</math>):</p> $K_4 = \frac{W_{adi}}{W_{adi-1}}$ <p><math>W_{adi}</math> – the number of employees with an academic degree in the reporting period;  <math>W_{adi-1}</math> – the number of employees with an academic degree in the previous period.</p>	<p>The indicator reflects the development of the human resources (intellectual capital) of the techno park, which has the knowledge and competencies to conduct scientific research and implement innovative developments.</p>
<p>The growth rate of the number of techno park trainees (<math>K_5</math>):</p> $K_5 = \frac{W_{si}}{W_{si-1}}$ <p><math>W_{si}</math> – number of interns in the reporting period;  <math>W_{si-1}</math> – the number of trainees in the previous period.</p>	<p>The indicator reflects the interaction of the technopark with educational institutions to attract students to practice and further employment</p>
<p>The growth rate of the total number of employees of technopark residents (<math>K_6</math>):</p> $K_6 = \frac{W_{pi}}{W_{pi-1}}$ <p><math>W_{pi}</math> – the total number of employees of techno park residents in the reporting period;  <math>W_{pi-1}</math> – the total number of employees of technopark residents in the previous period.</p>	<p>The indicator reflects the development of the human potential of residents and the possibility of placing employees in the industrial and office areas of the techno park</p>
<p>The growth rate of the total number of jobs created by the technopark and its residents (<math>K_7</math>):</p> $K_7 = \frac{M_i}{M_{i-1}}$ <p><math>M_i</math> – the total number of workers created by the techno park and its residents in the reporting period;  <math>M_{i-1}</math> – the total number of jobs created by the techno park and its residents in the previous period.</p>	<p>The indicator reflects the quantitative dynamics of human capital growth depending on the business activity of the techno park structure</p>
<p>The growth rate of the total volume of products (works, services), (<math>K_8</math>):</p> $K_8 = \frac{Q_i}{Q_{i-1}}$ <p><math>Q_i</math> – the volume of products (works, services) produced in the reporting period;  <math>Q_{i-1}</math> – the volume of products (works, services) produced in the previous period.</p>	<p>The indicator reflects the use of production capacities of the techno park structure</p>

Indicators characterizing the effectiveness of the functioning of techno parks ( $K_i$ )	Justification of the choice of indicators in the context of the knowledge economy concept
<p>The growth rate of innovative products (works, services) in the total volume (<math>K_9</math>):</p> $K_9 = \frac{Q_{ui}}{Q_{ui-1}}$ <p>где <math>Q_{ui}</math> – the volume of innovative products (works, services) in the total volume in the reporting period;  <math>Q_{ui-1}</math> – the volume of innovative products (works, services) in the total volume in the previous period.</p>	<p>The indicator reflects the realization of the innovative potential of the techno park structure in the production of high-tech products with unique properties/characteristics, including high manufacturability, low energy consumption, environmental friendliness and the possibility of recycling.</p>
<p>The average wage growth rate (<math>K_{10}</math>):</p> $K_{10} = \frac{W_i}{W_{i-1}}$ <p><math>W_i</math> – average salary in the reporting period;  <math>W_{i-1}</math> – the average salary in the previous period</p>	<p>The indicator reflects the capabilities of the techno park structure to attract highly qualified personnel and the level of competitiveness (in terms of remuneration) among similar structures</p>
<p>The growth rate of sales revenue (<math>K_{11}</math>):</p> $K_{11} = \frac{V_i}{V_{i-1}}$ <p><math>V_i</math> – revenue from sales in the reporting period;  <math>V_{i-1}</math> – revenue from sales in the previous period</p>	<p>The indicator reflects the economic business activity, efficiency and competitiveness of the techno park structure, as well as the ability to adapt to changing market conditions</p>
<p>The growth rate of the number of knowledge accelerator industries (<math>K_{12}</math>):</p> $K_{12} = \frac{A_{ki}}{A_{ki-1}}$ <p><math>A_{ki}</math> – the number of knowledge accelerator industries in the reporting period;  <math>A_{ki-1}</math> – the number of accelerator industries in the previous period.</p>	<p>The indicator reflects the growth potential of the techno park structure due to the development of innovative economic activities</p>
<p>The growth rate of the number of branches of knowledge generators (<math>K_{13}</math>):</p> $K_{13} = \frac{G_{ki}}{G_{ki-1}}$ <p><math>G_{ki}</math> – the number of knowledge generator industries in the reporting period;  <math>G_{ki-1}</math> – the number of generator industries in the previous period.</p>	<p>The indicator reflects the growth potential of the techno park structure due to the development of knowledge-intensive economic activities</p>
<p>The growth rate of R&amp;D expenses (<math>K_{14}</math>):</p> $K_{14} = \frac{I_i}{I_{i-1}}$ <p><math>I_i</math> – the amount of R&amp;D expenses in the reporting period;  <math>I_{i-1}</math> – the volume of R&amp;D expenditures in the previous period.</p>	<p>The indicator reflects the possibilities of developing the scientific and innovative potential of the techno park structure in obtaining new knowledge and innovative products at the expense of knowledge generators and accelerators</p>
<p>The coefficient of growth of own funds in R&amp;D expenses (<math>K_{15}</math>):</p> $K_{15} = \frac{I_{oi}}{I_{oi-1}}$ <p><math>I_{oi}</math> – the amount of own funds for research and development in the reporting period;  <math>I_{oi-1}</math> – the amount of own funds for research in the previous period.</p>	<p>The indicator reflects the possibilities of developing the scientific and innovative potential of the techno park structure through its own financing</p>

Indicators characterizing the effectiveness of the functioning of techno parks ( $K_i$ )	Justification of the choice of indicators in the context of the knowledge economy concept
<p>The growth rate of innovative products (<math>K_{16}</math>):</p> $K_{16} = \frac{P_i}{P_{i-1}}$ <p><math>P_i</math> – the range of innovative products in the reporting period;  <math>P_{i-1}</math> – the range of innovative products in the previous period.</p>	<p>The indicator reflects the opportunities for the development of the techno park structure by expanding the range of innovative products</p>
<p>The growth rate of the number of SPASR (<math>K_{17}</math>):</p> $K_{17} = \frac{D_i}{D_{i-1}}$ <p><math>D_i</math> – the number of SPASRS in the reporting period;  <math>D_{i-1}</math> – the number of SPASRS in the previous period.</p>	<p>The indicator reflects the opportunities for the development of the techno park structure through the implementation of state research programs</p>
<p><i>The integral coefficient of the knowledge economy of a specific scientific and technological structure (<math>K_{ke}</math>)</i>                      It allows a comprehensive assessment of the effectiveness of the functioning of technoparks and reflects the potential for the development of the knowledge economy as a result of the interaction of educational, scientific, technical and innovative activities and the resulting synergistic effect. This coefficient is calculated for a specific scientific and technological structure based on chain performance indicators of its functioning.</p> $K_{ke} = \sqrt[17]{\prod_{j=1}^{17} K_j}$ <p><math>K_j</math>, – performance coefficients of the techno park structure;  <math>j</math> – the ordinal number of the indicator forming the potential of the knowledge economy of the techno park structure <math>j=1, \dots, 17</math>.</p>	

interest, negatively affecting the development of the techno park structure, infrastructure is not developing, R&D is carried out insufficiently. Further investigation of the potential for the development of the knowledge economy in this structure does not make sense. There is no potential for the development of the knowledge economy, a low level of efficiency, and an intersectoral synergistic effect is not manifested.

2. If  $K_{ke} = 1$ , the main performance indicators show a short-term positive trend, but the infrastructure will not be able to ensure growth in the long term, as it does not keep pace with the development of production. There are prospects and an objective need for the development of the knowledge economy in this structure. The development of the knowledge economy will not be the main factor in the functioning of this structure, a short-term manifestation of an intersectoral synergistic effect.

3. If the  $K_{ke}$  is  $> 1$ , the main performance indicators show a positive trend. This structure has a high potential for the development of the knowledge economy and will demonstrate sus-

tainable growth in the long term. There is a high potential for the development of the knowledge economy, high innovation and competitiveness of this structure, and a stable intersectoral synergistic effect.

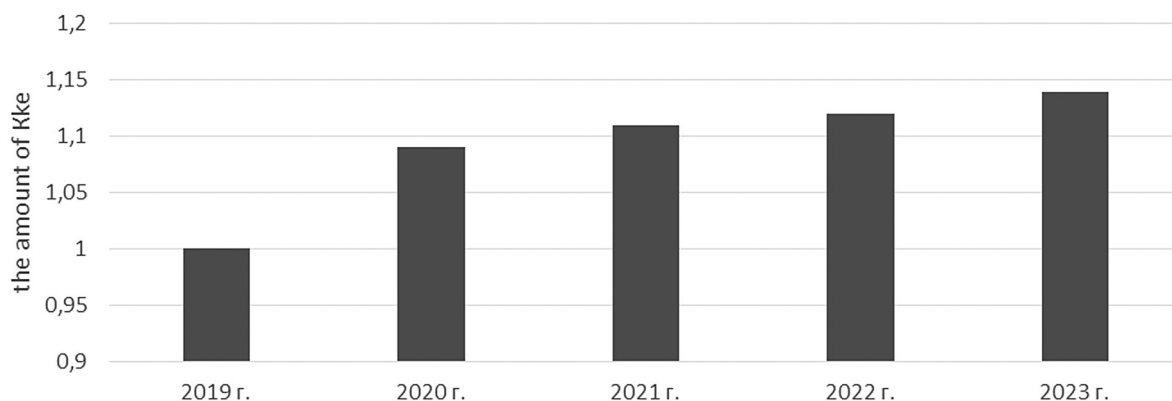
The proposed methodology is universal and can be applied to assess the potential for the development of the knowledge economy at various levels. In previous studies [1, 5, 7], we substantiated the ideas of forming two groups of knowledge-intensive services, called knowledge generators and accelerators. Knowledge generators create prerequisites for the production consumption of knowledge through the introduction of technological innovations, the creation of high-tech goods and the provision of knowledge-intensive services. Moreover, knowledge generators, as a rule, produce and distribute knowledge in a much smaller number to a much larger group of knowledge accelerators. As a result of the interaction of groups, synergistic effects arise and manifest themselves. This will ultimately indirectly characterize the level and degree of realization of the knowledge economy. Therefore, the development of know-

ledge generators in techno park structures, namely educational and research and development services, can become one of the priority areas contributing to the formation of the knowledge economy. For the first time in economic research, the idea of knowledge generators and accelerators was reflected in the methodology for evaluating the integral coefficient of the knowledge economy in paragraphs 12 and 13, when all resident organizations of the science and technology park are divided into groups of accelerators and knowledge generators.

From the perspective of promoting an economy based on knowledge, techno parks operating within the higher education system of the Republic of Belarus are of particular importance. Currently, a total of eight leading universities have techno parks in their structures. These higher education institutions, in their efforts to align with the concept of 'University 4.0', transcend the role of simply providing training and knowledge transfer. They develop innovative professionals with the necessary expertise to bridge the gap between scientific research, innovation, and commercialization within university science and technology centers. Intellectual capital is becoming a key growth factor. Its bearer is a trained, educated specialist who has been continuously improving since his student days throughout his professional career. To analyze the effectiveness of the functioning of individual techno park structures and their potential for the development of the knowledge economy, the calculation of the integral coefficient of the knowledge economy  $K_{ke}$  was carried out on the actual data of the State Enterprise "Scientific and Technological Park

BNTU "Polytechnic" for the period 2019-2023. (Figure 2).

The key performance indicator (KPI) for the Polytechnic Techno park over the entire period under review is greater than 1 and demonstrates a steady positive trend. This suggests that State Enterprise NTP BNTU "Polytechnic" is an exemplar of successful implementation of the knowledge economy concept with areas of cross-sectoral synergy, as interpreted by the author. At present, the NTP BNTU "Polytechnic" is the preeminent business incubator for innovative ventures, representing the largest and most effective innovative entity within the framework of the Ministry of Education in the Republic of Belarus. This techno park provides comprehensive support to scientific and innovative projects at the university, encompassing a wide spectrum of activities, from conducting fundamental and applied research to developing ready-to-use solutions and establishing independent innovative enterprises/organizations based at the Polytechnic, which produce state-of-the-art high-tech products. Techno parks and their resident companies are established in various legal forms, such as unitary enterprises, limited liability companies, and additional liability companies. This diversity in legal structures does not hinder their close collaboration and networking. As a result, a complex system of mutually beneficial industrial, organizational, and economic relationships emerges between the founders, the techno parks, their residents, and third-party partner organizations. Each resident company maintains its own unique financial and economic performance metrics through its production and innovation efforts. However, within the context of a techno park,



**Figure 2.** Dynamics of the integral coefficient of the knowledge economy of the BNTU Polytechnic Science and Technology Park for the period 2019-2023.

as a component of the innovation infrastructure, a synergistic effect is generated through cross-sectoral and organizational interactions. This synergy contributes to the realization of the knowledge-based economy. The dynamics of the integral coefficient of the knowledge economy of NTP BNTU "Polytechnic" indicates that it has a high, completely untapped potential in terms of forming advanced technological structures by improving the quality of education and the growth of intellectual capital and investments in academic and university science to generate new knowledge.

**Conclusion.** The use of the developed methodology makes it possible to analyze the effectiveness of the activities of science and technology parks based on the integral coefficient of the knowledge economy as a planned indicator for making managerial decisions. The introduction of developments into the practice of technology parks and knowledge-intensive enterprises will contribute to increasing the contribution of the knowledge economy to GDP growth. At the same time, the additional synergistic effect created due to intersectoral interaction will ensure an increase in the share of high-tech and knowledge-intensive goods and services in GDP. The implementation of the proposals will ensure the formation of the knowledge economy, and due to the synergistic effects of education and science, it will extend its influence to other types of economic activity, acting as a driver of innovative, economic and social development of the Republic of Belarus.

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# MODERN METHODOLOGICAL APPROACHES TO VALUATION ORGANIZATIONAL AND TECHNICAL LEVEL OF PRODUCTION

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**RESUME.** The purpose of this article is to analyze modern approaches to assessing the organizational and technical level, its impact on the efficiency and competitiveness of production. In this context, successful examples from various industries are analyzed, which helps to identify common trends and key factors contributing to the development of the manufacturing sector (может так называть) and increasing the organizational and technical level of production. Particular attention is paid to the introduction of digital technologies, the transition to sustainable production practices, as well as the improvement of organizational models that optimize the interaction between various links in the production process.

**KEY WORDS:** production level, organizational and technical level, competitiveness.

**Introduction:** Modern methods of assessing the organizational and technical level of production are an important part of the evolution of industrial processes aimed at improving efficiency, competitiveness and environmental sustainability. In the context of globalization and rapid technological progress, enterprises are forced to adapt to new challenges associated with increased productivity, the integration of digital technologies, and the creation of more flexible organizational and technical structures. These changes are taking place against the backdrop of the transition to Industry 4.0, which involves fully automated digital production, controlled by intelligent systems in real time, in constant interaction with the external environment, going beyond the boundaries of a single production sector, with the prospect of unification into a global industrial network of production and services. The idea behind Industry 4.0 is to create smart factories that can be controlled centrally and make decisions independently. It also includes the introduction of innovative approaches to production management, the use of artificial intelligence to forecast demand and optimize logistics, and the transition to network models that improve interaction between different links in the production chain. As a result of such transformations, the connection between suppliers, manufacturers, and end consumers will be strengthened, helping to reduce costs and improve product quality [1].

**Main part:** The organizational and technical level of production is determined by the de-

gree of development of machinery and equipment used at the enterprise, as well as the quality of technological processes, the organization of labor and production, the effectiveness of the management methods used, as well as the achievements of science and technology that affect the quality of manufactured products. The concept of the organizational and technical level includes technical and organizational aspects that contribute to the intensification of production processes. The analysis of individual intensification indicators, such as labor productivity, capital productivity, material intensity and turnover of working capital, should be carried out considering the factors of the organizational and technical level, which is important for planning the high-quality use of resources [2]. It is recommended to conduct a study of the organizational and technical level in three main areas: Study of indicators of scientific and technical progress in production. Analysis of the organization of labor and production processes. Evaluation of the organizational structure and methods of enterprise management. This level includes approaches and methods aimed at optimizing production processes, increasing overall efficiency, automation and introducing innovative technologies. In Europe, this issue has been in the spotlight for a long time, as European countries strive to be competitive in the global economy. One of the most important roles is played by modern methods of production process management, table 1.



**Table 1.** Modern methods of production process management

Methods	Description	Authors of the methodology
FMS (Flexible Manufacturing Systems)	Refers to technology that enables production lines to be quickly adapted to constantly changing market requirements and product ranges	British scientist Jack Harrison. Proposed a method for integrating robotic systems and automated control in factories
The concept of lean manufacturing Or Lean production	Lean manufacturing was originally developed in Japan (Toyota Production System). Toyota founder Kiichiro Toyoda developed the lean manufacturing methodology after World War II to save resources and eliminate waste.	Kiichiro Toyoda European researchers such as Danny Van Goye and Peter Hoffmann Their work focuses on minimizing waste and maximizing efficiency in European companies
ERP-системы (Enterprise Resource Planning)	Flexible management of production and financial processes Allows enterprises to monitor production processes in real time, optimize planning and improve coordination between departments	French researcher Jean-Paul Bouillot. His works describe the use of ERP to integrate all enterprise data and processes into a single system, which reduces decision-making time and increases operational transparency.
The Six Sigma Methodology (Six Sigma)	Used in European countries to improve product quality and minimize defects in production processes. Aimed at statistical control and analysis of processes, which allows identifying and eliminating the causes of defects and deviations in production. At large German enterprises such as Volkswagen and Siemens, Six Sigma plays a key role in ensuring high quality standards	The European researcher in this field is Ralf Möller

Note – Source: [3]

All parameters reflecting the level of production organization and technical equipment have a significant impact on the main indicators of the economic development of the enterprise, such as labor productivity, use of funds, cost of materials, quantity and quality of manufactured products, costs and profitability.

Improving the organizational and technical level is a complex and continuous process that includes scientific and technical progress, the level of production technologies and processes, the organizational structure of the enterprise, the level of production and labor management, as well as the level of economic mechanisms and management. Managing the social development of the team, environmental protection and rational use of natural resources – all this is included in the sphere of management activity. Factors such as social and natural conditions can be used both as independent objects of economic analysis and as components of the analysis of the organization of production and the level of technology. Together with external eco-

nomical factors, they play an important role in increasing the economic efficiency of production.

The transition to Industry 4.0 is actively developing in Europe and represents a new approach to organizing production based on digital technologies. A key aspect of Industry 4.0 is the full integration of digital technologies into production processes, including the Internet of Things (IoT), Big Data, robotics and artificial intelligence [4].

One of the leading authors in the field of digitalization of production is the German economist Klaus Schwab, who in his works emphasizes the importance of the new industrial revolution for Europe. Schwab notes that the use of digital technologies can significantly improve productivity, optimize resource management and reduce costs. Assessing the organizational and technical level of production based on foreign experience is one of the key aspects of understanding and applying best practices in production management. In today's world of in-

**Table 2.** Methods for assessing the organizational and technical level of production in European countries

A country	Approaches
USA	Focus on Lean and Six Sigma principles. Strive to achieve continuous improvement of production processes, supply chain optimization and cost reduction using Six Sigma quality management methods
Japan	Known for management methods such as Kaizen (continuous improvement), 5S (workplace order) and the principles of the Toyota Production System. They emphasize efficiency, elimination of waste and flexible production systems
Germany	The manufacturing industry places great emphasis on quality and environmental sustainability standards. ISO 9001, ISO 14001 and other quality and environmental certifications are widely used.
China	Implementing Internet of Things (IoT) technologies and digitalization of production, aiming to automate, improve processes and increase productivity
Sweden and other Scandinavian countries	The focus is on creating a positive working environment, innovation and change management
Great Britain	Use benchmarking and data analytics to find ways to improve manufacturing processes and optimize business

Note – Source: [5]

creasing global competition, leading foreign enterprises actively use various methods of assessing the organizational and technical level of production to ensure their competitiveness. These methods are becoming important tools for improving the efficiency and quality of products. Different countries use different methods depending on the industry and region, Table 2.

These different approaches reflect the adaptability of organizational and technical excellence assessment methods to the specific industries and cultures of different countries. The

key to successful application of these methods is their adaptation to the conditions and tasks of a specific production, as well as the ability to continuously learn and develop based on the results of assessments and analyses.

Foreign experience in assessing the level of organization and technical level of production contains valuable lessons and best practices that can have a significant impact on the development of production processes in various countries and regions. The application of this experience, taking into account regional and cultural

**Table 3.** Advantages and disadvantages of foreign experience in assessing the level of organization and technical production level

	Description	Characteristic features
Advantages	1 Efficiency of methods	Best management practices and technological solutions that can significantly improve production efficiency in other countries
	2 Accelerating Innovation	Can accelerate innovation and adoption of best practices, which is especially important for countries seeking to close the technological gap
	3 Exchange of knowledge and experience	Can help countries share knowledge and experience, thereby promoting global production
Disadvantages	1 Inability to take into account regional peculiarities	Sometimes does not take into account the unique regional conditions, laws, cultural characteristics and market characteristics of a particular country
	2 Adaptation and assimilation	Some approaches may require a long time to adapt to local conditions, which may make the implementation process difficult or slow.
	3 Risk of insufficient learning and understanding	Implementing methods that do not take into account local specifics may lead to incomplete understanding or inadequate training of employees and managers.

specifics, may have its advantages and disadvantages, Table 3.

Foreign experience in assessing the organizational and technical level of production is a valuable resource for development, but to achieve maximum efficiency it must be adapted and adjusted to the regional and cultural characteristics of a particular country. Combining best practices with local needs and taking into account local specifics are key factors in the successful application of foreign experience in various regions.

**Conclusion.** The organizational and technical level of industrial production in the conditions of an unstable and opaque ecological environment largely presupposes taking into account extraordinary cognitive-technological and structural-dynamic technical changes in all its spheres. Spatio-temporal production relations in industry are formed and implemented under the influence of constantly increasing and complex micro-, macroeconomic business processes in the global economy. Analysis and evaluation of these processes helps managers of industrial companies to ensure the highest level of technical progress, which allows them to be competitive in the world market [6]. Analysis and adoption of the best foreign experience contributes to the improvement of their own technical process and its organization. Modern methods of organizational and technical level of production in Europe demonstrate rapid development, reflected in the efficiency, sustainability and flexibility of production processes. Adaptation to the requirements of Industry 4.0 and the introduction of digital technologies such as automation, artificial intelligence and the Internet of Things allow enterprises not only to increase productivity, but also to better cope with global challenges related to sustainable development and minimizing the impact on the environment. The transition to such innovative solutions also stimulates the transformation of traditional management models, turning production into a more integrated and adaptive process.

European manufacturing is actively using the integration of digital and organizational innovations to create more competitive and sustainable production models. As a result, best practices are being implemented to optimize resources, reduce costs, and improve product quality. These changes help European companies meet global standards, provide higher levels of customer satisfaction, and compete successfully in

the global market. Examples of successful modernization demonstrate that a combination of organizational transformation and technological renewal can increase production flexibility, quickly respond to changes in market demand, and take into account individual customer requirements. The use of methods for assessing the level of organization and production technology by foreign enterprises reflects not only technological progress, but also management methods adapted to modern challenges and market demands. Thus, modern methods of the organizational and technical level of production in Europe play a key role in the formation of effective and sustainable development models. They contribute not only to increasing economic competitiveness, but also to the creation of a responsible approach to resources and the environment, which is especially important in the context of modern global trends. Successful cases of implementing such approaches confirm that innovations in the field of production organization are capable of not only changing the structure of business, but also creating value for all participants in the supply chain — from manufacturers to end consumers, as well as making a significant contribution to solving environmental problems and achieving sustainable economic growth.

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# FOSTERING THE DEVELOPMENT OF DIGITAL INNOVATION ECOSYSTEMS

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**RESUME.** The article describes the essence and main features of digital innovation ecosystems as well as strengthens the importance of ecosystem business models under the contemporary conditions. It is considered that a digital innovation ecosystem (DIE) encompasses digital innovations, innovation systems, and innovation ecology. Main structural elements of a DIE as well as crucial linkages between them are outlined. The role and special functions of ecosystem drivers and innovation hubs are highlighted in the context of the contemporary features of innovation processes are presented. Certain main theoretical assumptions in relation to digital innovation ecosystems (DIEs), namely their system and meso-institutional character, exaptation, complexity, transaction costs as well as innovation ecology, are analyzed. A special attention is given to the concepts of digital social capital and digital divides. Some recommendations are provided in order to ensure the transition to ecosystem business models and keeping up with the global leaders in terms of the creation of favorable conditions for DIEs development and functioning.

**KEY WORDS:** digital innovation ecosystem (DIE), ecosystem business model, ecosystem driver, innovation ecology, digital innovation, innovation system, innovation hub

Introduction. In the current rapidly changing environment, firms are forced to not only make minor adjustments to their processes, but rather boost the competitiveness of their business models to better correspond the conditions of digitalization. This trend is often called “creating the next-generation enterprise” [1, p. 7]. Therefore, the relevance of considering DIEs is related to the current opportunities in the sphere of innovative development. Hence, digital technologies together with innovations and inclusive sustainable development are the key factors of overall innovative growth and economic success under the contemporary conditions.

Main part. A DIE functions as a sophisticated social and economic structure created by collaborating businesses and individuals using digital technologies to encourage joint product and service innovations [2; 3, p. 78765]. It is also assumed that the complex of digital innovations together with an innovation ecosystem stakeholders under the framework of innovation ecology [3, p. 78765; 4] have the potential to be transformed into a DIE. DIEs take into consideration industry-wide cooperative and competitive dynamics between businesses in relation to innovations that merge digital and physical components [5, p. 1].

To sum up, a DIE is a system of various stakeholders' collaborative networking innova-

tion activities of digital nature that collectively contribute to the creation, development, deployment, and diffusion of innovations.

Hence, the concept of a DIE is “commonly used to acknowledge the interconnected nature of new digital industries” [6] and encompasses 3 main directions: “digital innovations”, “innovation systems”, and “innovation ecology” [3].

Firstly, a digital innovation assumes that current resources in goods and services are to be reorganized through the application of digital technologies. Nevertheless, since digital technologies are very specific, innovation processes evolve faster, and therefore become harder to predict and regulate [7]. Thus, the digital nature of modern innovation processes in contrast to the Industrial Era can be highlighted [8, p. 58].

Secondly, it is important to examine DIEs based on a system methodology in the context of, first and foremost, institutional theory, for example, under the framework of the formation of “meso-institutions by the ecosystem itself” [9, c. 77]. Despite the fact that ecosystems are generally formed “on the basis of a single company, they have certain features of the meso-level in economic research” [10, c. 68]. It is also essential to admit that one of the central issues of the system theory is “the exchange of

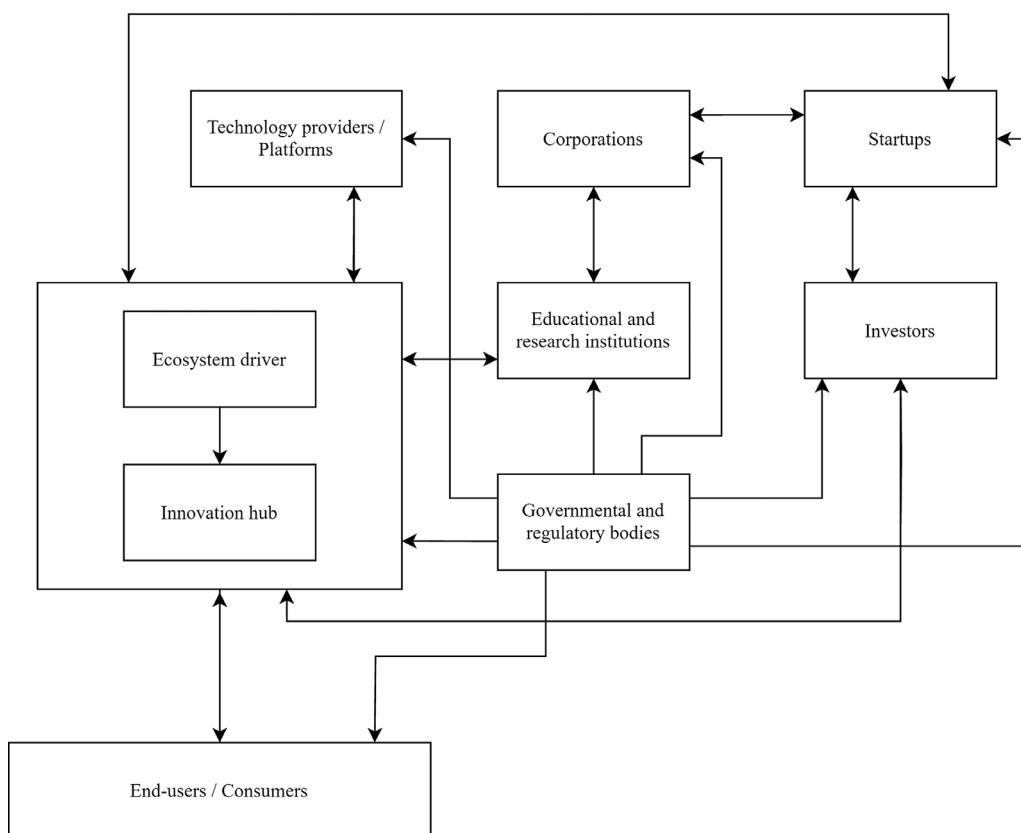
energy by open systems with the external environment in order to limit entropy” [10, c. 27–28] (therefore, the degree of disorganization) and, consequently, the growth of non-entropy [11, c. 46].

Thus, it is emphasized that open systems (which include DIEs) can become more complex and irreversible, which is the basis of their self-organization processes [11, c. 46]. Moreover, the above-mentioned system approach for the consideration of DIEs should be accompanied by network mechanisms as well as platform and cluster activities as the most important factors for value creation and capture (which are distinguished as the functional direction of any ecosystems).

At this stage it is possible to mark that contemporary innovation processes are based on the transformation of scientific knowledge into innovation (outlining just the results), and require a purposeful chain of actions, which include research and development (R&D), initiating, introduction to the market, and further diffusion of innovations. Largely, innovation

processes under the framework of DIEs stress the collaboration, integration, feedback, and have knowledge- and network-based, diversified as well as interactive character – consequently, experience sophisticated system nature.

Thirdly, innovation ecology starts with the “fundamental similarities between natural and business systems” [6]. Moreover, exaptation as one of the important basic principles related to the multi-functionality, sophisticated character, and evolution should be considered in relation to innovation ecosystems on the whole: “exaptation-driven innovation is the exploitation of latent functionality in existing artifacts for new contexts” [5]. Using the basics of complexity theory, it is possible to state that ecological phenomena are in many aspects similar to innovation ecosystems, especially in terms of “functioning and organization of their structures and processes” [6], related to the resources they use (including information) as well as establishing mutually beneficial relations and overall behavior principles. Similar to biological sphere, ecosystems flourish when all the ele-



**Figure 1.** The general structure of a DIE

Source: author’s development

ments are sustainable and could be destroyed if some of the components are cut off.

So, to understand main complex and multi-faceted structures in which many elements interact to produce a system performance in a DIE, it is necessary to outline principal elements as well as crucial linkages between them (see Figure 1).

An ecosystem driver serves as an “organizer of an ecosystem, a coordinated network of enterprises, devices, and customers to create value for all participants” [1, p. 8], as well as represents a general high-profit digital business model. Ecosystem drivers have contemporary features which help “outperform all other business models” [1, p. 10]. Their main goal and functions are “less about command and control and more about building, maintaining, and using networks” [1, p. 9], so it is possible to highlight that the activities are often based on establishing innovation hubs as well as ensuring the customer experience and matching consumer needs. An ecosystem driver “has the highest knowledge potential, and its innovation strategies directly affect the internal kinetic energy of knowledge innovation in the system” [3, p.78764].

*Innovation hubs* are multi-purpose centers (sometimes even large entities) that help firms create and grow businesses as well as improve the competitiveness of products or services based on digital technologies. Such hubs accelerate the emergence and commercialization of innovations in an innovation ecosystem as they positively influence stakeholder collaboration and could serve as orchestrators, which enable necessary favorable environment.

*Startups mainly* comprise new ventures focused on innovative digital solutions as well as serve as the primary drivers of innovations, bringing new ideas and disruptive technologies to the market. *Corporations* are large businesses, associations, and entrepreneurs that partner with startups and become engaged in innovation processes. Investors provide the necessary funding for startups to execute their innovation projects and may include venture capitalists, business angels, etc. In certain cases, a DIE is also enhanced by various intermediaries (including science and technology (S&T) parks, technology transfer centers, trade associations, innovation accelerators, etc.), which play a crucial role as facilitators, connectors, and enablers, bridging various stakeholders.

*Educational and research institutions* are primary the universities and research centers

that provide knowledge, conduct R&D as well as enhance talent creation. *Governmental and regulatory bodies* impose the policy measures as well as create the regulations, restrictions, and incentives that shape the digital landscape to support innovation activities.

*Digital platforms*, which form the foundations for technology providers, establish “networks and infrastructures that enable the exchange of products, services or information between different groups of users and provide a virtual space where they can interact, collaborate, and carry out various activities, bringing together supply and demand” [12, c. 5].

So, considering any DIE internal environment, it is vital to underline the necessity of sufficient *digital social capital*, “which today is largely created on the basis of online social media and networks due to low hierarchy” [13, c. 31]. In this relation, it is possible to talk about the reduction of transaction costs in connection with DIEs functioning, which is beneficial not only for the participants, but also for consumers who receive a smooth and unified access to main and complementary products. The level and quality of *social and economic institutions* as well as existing innovation infrastructure together with established trust [14, p. 499] (which is the main indicator of social capital) are important factors that influence DIEs.

In addition, it is also necessary to consider the external environment for any DIE formation, development and general functioning, which includes, for example, innovation culture, the overall level of innovative development and network readiness, innovation infrastructure, the extent of ICT development as well as “*digital divides*” [15]; the latter comprise: 1) Internet access; 2) Internet tools; 3) the results based on Internet resources application [13, c. 22].

Among the main advantages of DIEs lies the fact of their universal and often international character: such systems could function fully in the digital space using information and communication technologies (ICT), therefore sometimes cross regional and national boundaries. Overall, to enhance DIEs creation and development it is required to work out a multi-faceted approach. So, governmental and regulatory bodies are to play a crucial role in fostering an environment that promotes DIEs through establishing stimulating policies, ensuring incentives, infrastructure, and ICT development as well as favorable conditions for collaboration.

Taking the above-mentioned into consideration, a country’s digital transformation and creation of digital innovation ecosystems is assured on the basis of 3 main domains: *national innovation, entrepreneurial, and technology ecosystems*. These ecosystems form a country’s innovation landscape from ideation to market and could serve as a framework for the improvements in this sphere.

To evaluate the overall potential for DIES formation as well as their successful functioning and development, it is possible to analyze the conditions for the creation of innovation hubs (as they reflect the quality of innovation environment). The outcomes for some selected leading countries and cities / metropolitan areas as well as main sub-indexes and indicators are presented in Table 1.

So, based on the results presented in Global Innovation Hubs Index 2023 [16] that assesses 119 leading innovation centers by three sub-indexes (comprising 12 indicators), it is possible to outline that the United States dominate the ranking, but Asian and Western European innovation hubs gain some competitive advantage in certain directions.

Among the best Northern European cities / metropolitan areas Amsterdam (23), Dublin (25), Copenhagen (29), Helsinki (32), and Oslo (40) could be mentioned, while Central and Eastern European leaders include Moscow (65), Warsaw (77), and Prague (88) [16]. Supreme Asian cities / metropolitan areas are mainly situated in the People’s Republic of China, Japan, Malaysia, Israel, and the United Arab Emirates. Finally, the best global innova-

**Table 1.** 10 leading global innovation hubs in 2023

	Overall rank	Research innovation	Innovation economy	Innovation ecosystem	Country
		1. Science and technology human resources 2. Research institutions 3. Scientific infrastructure 4. Knowledge creation	1. Technological innovation capacity 2. Technological innovation capacity 3. Technological innovation capacity 4. Economic growth	1. Openness and collaboration 2. Support for startups 3. Public services 4. Innovation culture	
San Francisco – San Jose	1	4	1	1	United States of America
New York MA	2	1	3	3	United States of America
Beijing	3	2	4	11	People’s Republic of China
London MA	4	4	6	17	United Kingdom
Boston MA	5	3	7	8	United States of America
Guangdong – Hong Kong – Macao Greater Bay Area	6	7	5	6	People’s Republic of China
Tokyo MA	7	12	2	24	Japan
Baltimore – Washington	8	5	19	15	United States of America
Paris MA	9	8	14	4	France
Shanghai	10	9	15	13	People’s Republic of China

Source: developed by the author based on [16]



tion hubs are concentrated in North America, East Asia, and Western Europe.

**Conclusion.** To conclude, it is actually important to create favorable conditions for DIES development and functioning. These ecosystems are not only the source of a territory development, gaining competitive advantage (including the international level), and attracting investments, but to a large extent improve the market by, for example, better serving the consumers as well as increasing the effectiveness of firms.

The development of ecosystems (including DIES) and transition to ecosystem business models have already become the important global trends – therefore, it is topical to try to keep up with them. It is also necessary to gather the relevant data on the conditions of ecosystem functioning (as well as present the appropriate results in statistics) and include the corresponding provisions in the strategic documents on the innovative and digital development (for, example the State Program for Innovative Development of the Republic of Belarus and the State Program “Digital Development of Belarus”). The high level of ICT and digital infrastructure development in the Republic of Belarus should be complemented by the favorable conditions for ecosystems and ecosystem companies.

In general, traditional business models of large firms are especially vulnerable today. Nevertheless, these companies have more opportunities for ecosystem formation and development, especially in collaboration with entities from other partner countries, which requires appropriate regulatory provisions and cooperation agreements.

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# COMPREHENSIVE ASSESSMENT SCIENTIFIC AND INDUSTRIAL INTEGRATION: MODERN INNOVATION DEVELOPMENT TRENDS AND OPPORTUNITIES

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**RESUME.** This study proposes an approach to a comprehensive assessment of the effectiveness of public administration of the scientific and industrial sector, which consists of three parts. The first part assesses the level of achievement of strategic goals by the company, the second assesses the qualitative indicators of the effectiveness of public administration of the scientific and industrial complex, the third part quantifies the financial and economic indicators of the organizations of the scientific and industrial complex of the country. Depending on the data obtained at each stage, a conclusion is made about the overall level of efficiency of public administration of the scientific and industrial complex. The research was built on assuming the results of SPID of Republic of Belarus.

**KEY WORDS:** scientific and industrial complex, innovations, innovative development.

**Introduction.** Nowadays we face the situation of disintegration between the actions of industrial and scientific organizations. Industrial organizations are either not willing or not able to implement the achievements of the scientific organizations. Scientific organizations normally orientate their research to the topic that they are interested in and have the experience. There is a tool which is dedicated to solving the cases that the industrial enterprises are interested in, and it is called industry task book. But the scientific organizations are not eager to take such tasks. So, it is necessary to organize the work of industrial and scientific organizations in a complex. So, they gather their efforts in fostering the innovations as the main tool for increasing the value added in created products and services.

**Main part.** The general strategy of innovative development is determined by the following prerequisites: implementation of the concept of Industry 4.0; positive dynamics of the share of the high-tech sector in total industrial exports; increasing the share of the service sector in the structure of the gross domestic product; processes of deglobalization/regionalization, which lead to the restructuring of value chains. Innovative development implies a systemic renewal and restructuring of the economy through the development of new competitive goods and services. Regulatory legal acts on innovative development provide that it will be carried out through the creation and use of technologies of the 5-6 structure and the

improvement of public-private partnership, the commercialization of R&D. The innovative path of development is oriented towards the long-term perspective and corresponds to the realities of the “new economy”. With the current level of competition and the speed of technological change, it is innovation that is the main condition for economic growth. Innovation is an object (process) introduced into production and economic activity because of scientific research, qualitatively different from the previous analog. Innovation activity is a part of the enterprise’s scientific and technological development which consists in the production development of innovation. The table 1 provides information on three key innovation indexes over the years 2016 to 2023 (Input, Output, and Global Innovation).

From 2016 to 2023, the Input Index shows fluctuating values with a general upward trend towards the end. The lowest value in this series is 50 in 2019, and the highest value is 86 in 2022. The variability in the Input Index suggests differing levels of investment or effort put in over the years, with a sharp dip in 2019 followed by recovery and growth up to 2022. Output Index measures the results or outcomes achieved over the same period. It starts with a high of 110 in 2018 and then shows a noticeable decline by 2020, with recovery to 88 in 2023. The declining trend from 2018 to 2020 in the Output Index could indicate reduced efficiency or effectiveness in translating inputs to outputs, likely due to external factors or de-

**Table 1.** International comparisons

Index	2016	2017	2018	2019	2020	2021	2022	2023	average	Std. deviate	variation
Input	64	63	60	50	67	68	86	66	65	10	15
Output	103	109	110	95	61	62	63	88	86	21	25
Global Innovation	79	88	86	72	64	62	77	80	75	9	12

Note — Source: Author’s development based on global innovation index date

creased productivity. The Global Innovation Index remains relatively steady but reveals occasional dips and rebounds. This suggests periods of slower innovation followed by recoveries, reflecting the dynamic nature of innovation efforts.

Nevertheless, Belarus has achieved some success in implementing the Sustainable Development Goals. The table 2 provides data on the share of GDP (in percentage) contributed by a specific sector or economic activity in three countries: Belarus, Germany, and Czechia from 2015 to 2022. The data indicates a consistent growth in this sector’s contribution to the GDP over the years, reflecting either increased focus or greater investments in this sector within the Belarusian economy. Belarus shows a clear upward trend over the entire period, suggesting expansion or strategic growth in this sector.

Some publications already been devoted to interaction between industrial and scientific organisations of the Republic of Belarus [4]. Here we revealed that to further enhance its industrial and scientific capabilities, Belarus may consider diversifying its economy, strengthening innovation, fostering entrepreneurship, and engaging in international collaborations and partnerships. The authors propose the combined approach concerning some critical issues from the theory Industry 4.0 [5;6].

Fundamental differences of the State Program for 2021-2025 from the previous program

1. Formation of direct sources of financing of the State program due to centralization and adjustment of directions of innovative funds expenditure.
2. Increase of financing by the Belarusian Innovation Fund of the program activities, creation of a venture financing system.
3. Concentration of resources on innovative projects based on the developments of V and VI technological structures and having decisive importance for the innovative development of the Republic of Belarus.
4. Inclusion in the program of measures for the development of innovative infrastructure.
5. Creation a system of delivery, fulfillment and control of target indicators of innovative development of customers of the State Program

At the state level, multifaceted support for innovation activities is carried out, criteria for evaluating consolidated target indicators have been developed and their constant monitoring is carried out. However, the real sector of the economy is more in need of practical recommendations for the development of new products; still, only about 1% of all shipped innovative products correspond to the world level. The industry does not seek to develop innovations because of the high potential risks of its erroneous choice. Science is not in all cases focused on the real needs of the economy. At the same time, state bodies and the management of organiza-

**Table 2.** Dynamics of value added of the manufacturing industry in GDP

Country	2015	2016	2017	2018	2019	2020	2021	2022
	Share in GDP, %							
Belarus	20,6	21,1	22,0	22,4	22,4	22,6	23,4	23,3
Germany	20,4	20,7	20,9	20,9	20,4	19,4	19,9	20,0
Czechia	23,9	24,4	25,2	24,9	25,3	23,7	24,0	24,5

Notes. The table is based on data from the World Bank [1] and data from the Yearbook of Industrial Statistics [2] and UNECE [3]

**Table 3.** Factors influencing the success of the innovation development

Prevent	Promoting
lack of own funds	Availability of necessary investments for the development of scientific achievements
high cost of innovations	Availability of economic levers that stimulate the production of new products
lack of qualified personnel	Compliance of the level of the organization’s potential with the requirements for production in the release of new products
high economic risk	Rational ratio in the manufacture of new and already mastered products, ensuring the planned profitability
insensitivity of organizations to innovations	Close interaction and interconnection of specialists in the development of new products
Long payback periods and uncertainty of the timing of the innovation process	Availability of a comprehensive production plan and a developed information base for decision-making

Note – Source: Author’s development

tions need scientifically based methodological tools for managing the development of new products. So, to assess the qualitative indicator of the effectiveness of public administration of the scientific and industrial complex, it is proposed to use data on the satisfaction survey and the presence of obstacles to innovative development

So, we may say that the implementation of economic methods for managing the efficiency of the development of new products involves the creation of conditions that allow updating the existing assortment on the task. Table 3 presents the factors that, according to the opinion, hinder and contribute to the success of the organization in mastering the release of new products.

The interaction of state bodies, industrial and scientific organizations in the innovation de-

velopment process is a form of effective exchange of elements of innovative potential of subjects of innovative development; an element of the management mechanism for the development of new products; a factor contributing to the development of the aggregate innovation potential and indicators of innovation activity. However, each of them, pursuing its own goals (Table 4), contributes to the innovative development of the industry of the Republic of Belarus.

It is proposed to use data on the effectiveness of the scientific and industrial complex of the country. As a result of the analysis, the potential for direct interaction between scientific and industrial organizations was revealed.

An increase in the volume of research and development, scientific and technical services lead to an increase in labor productivity in industry

**Table 4.** Objectives of the participants in the management system for the development of new products

Industrial organizations	State bodies	Scientific organizations
<i>Implementation of new technologies</i>	<i>Commercialization of domestic developments</i>	
Launch of new products	Ensuring the competitiveness of the national economy	Increase in the number of contracts for R&D
Improving the image of the organization	Increasing the prestige of the country on the world stage	Development of business relations
<i>The need to implement state programs</i>		
Additional sources of innovative development	Growth of tax revenues	Attraction of additional financing
Risk sharing		

Note – Source: Author’s development

in terms of gross value added. Internal R&D costs have grown at an average rate of 111.9% over the relevant period (2016-2022). The standard deviation of 12.5 indicates some variability, with a maximum growth rate of 130.0% and a minimum of 100.8%. This suggests that internal investments in research and development have experienced notable fluctuations, but with a general upward trend. The share of high-tech industries within industrial production has grown at an average rate of 103.0%, with a standard deviation of 8.7. This indicates moderate variability, with the maximum and minimum values ranging from 117.9% to 93.3%, highlighting the variability in the contribution of high-tech industries to overall industrial output. As we observe the fluctuations in the science intensity of GDP, suggesting an evolving relationship between scientific advancements and economic output. The stability in the share of medium and high-tech industries within manufacturing value addition indicates a consistent role of technology-driven industries in contributing to economic growth.

The interpretation of the scientific and industrial complex implies the presence of organizations interconnected by economic relations regarding the production, distribution and consumption, exchange and processing of innovative industrial.

In conditions of instability, the challenges Belarus faces due to external pressures, such as sanctions, which have created economic instability. In these circumstances, the nation's economic security heavily relies on the efficient operation of its scientific and industrial complex. Sanctions have restricted access to traditional raw materials and foreign technologies, prompting Belarus to seek new suppliers or focus on substituting imports. Many Belarusian industries, which previously depended on exter-

nal technologies, are now prioritizing collaboration with scientific institutions to advance and adapt existing technologies and production capabilities.

There is a clear need to enhance the coordination between state bodies, industrial enterprises and scientific organizations. Strengthening these interactions is crucial to restoring previously established value chains and boosting the efficiency of the scientific and industrial complex. This approach would enable the country to foster self-reliance by leveraging domestic technological advancements and improving the synergy between research and industry. In essence, the evolving context calls for a re-evaluation of industrial strategies, focusing on integrating scientific expertise with industry requirements, while adapting to geopolitical and economic changes.

The role of the government in managing the interaction between scientific and industrial organizations involves three main models, each reflecting a different degree of intervention in the economy (table 5).

In its final version, the Belarusian model of sustainable socio-economic development assumes a balanced socially oriented, economically effective and environmentally protective development of the country based on meeting the necessary needs of the current and future generations of the country. The model of a socially-oriented market economy was adopted as promising, which is based on the principles of constitutional guarantees of personal rights and freedoms of citizens, freedom of enterprise, choice of profession and place of work, equality of all forms of property, guarantees of its inviolability and use in the interests of the individual and society, ensuring the interconnection of the well-being of the worker and the results of his work, social protection of the disabled and other socially vul-

**Table 5.** Government role in the processes of scientific and industrial integration

Liberal Model	Dirigiste Model	Social Market Economy Model
the policy of no direct state intervention in the functioning of the economy includes reduction of tax and administrative barriers, promoting private sector investment and innovation, as well as access to finance for startups and small businesses	external interference includes: the formation and implementation of programs to support and stimulate development; determination of strategic sectors and areas of development that are considered a priority for the state; Active participation of the government in the creation of infrastructure	belarusian model of socially-oriented market economy

Note — Source: Author's development

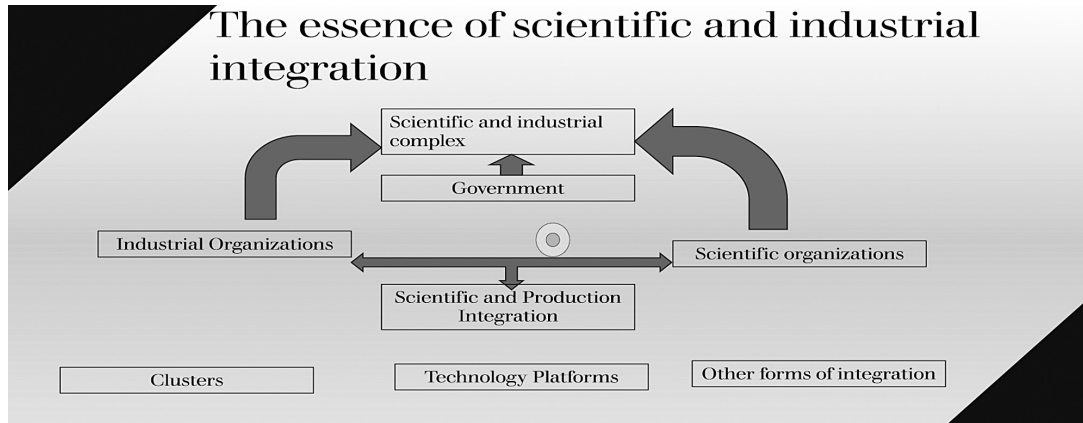


Figure 1. The essence of scientific and industrial integration

Note – Source: Author’s development

nerable groups population, social partnership. This allowed, on the one hand, to preserve the existing specific features of the Belarusian society ((high qualification of personnel, sufficiently developed scientific, technical and production potential, focus on the formation of ramified foreign economic activity), and on the other hand, to use market mechanisms to increase the efficiency of the economic system, its susceptibility to scientific and technological progress).

Some backgrounds of scientific and industrial complex formations were rewild: economic (industrialization, increased international competition and the need to increase the competitiveness of national industries, transformation processes in the economy); scientific and technical (growth in the number of scientific discoveries

and inventions requiring industrial implementation; innovative activity; strengthening of scientific and technical cooperation); socio-demographic (growth in the qualification of personnel, demand from society for new technologies and products, improvement of the quality of life); political and legal (state support for science and industry through the introduction of legislative acts and programs aimed at supporting scientific research and innovation; creation of a favorable political environment for long-term investments in science and industry; protection of intellectual property and support for the rights of researchers and inventors); regional and geographical (availability of raw materials and materials necessary for industrial production; advantageous location).

Table 6. Integration Subjects

Sign	Cluster	Technology Platform	Scientific and industrial complex
Consistency	<i>Integral education with the features of a system</i>		
Level of organization	Regional	Product	National
Predominant Affiliation Type	Territorial	Functional	Supra-industry
Institutional nature	Formalization of institutional relations	Informal institutional relations	A stable system with formal and informal institutional relations
Polystructure	A set of homogeneous organizations	Business, science and government	Includes not only organizations, but also infrastructure
Object/purpose of integration	Project/Innovation	Technology	Innovative development

Note – Source: Author’s development

Scientific and industrial complex is an institutional superstructure that includes a set of scientific and industrial organizations, as well as infrastructure entities, regulated by the state and creating new value chains of products, due to the redistribution of resource flows. The essence of scientific and industrial integration is presented (figure 1).

The differences and main characteristics of scientific and production integration is presented in table 6.

**Conclusion.** Methodological guidance for assessing the effectiveness of public administration of the scientific and industrial complex will highlight the most important management elements that contribute to the growth of the efficiency of scientific and industrial organization. It is proved that innovative development implies systemic renewal and restructuring of the economy through the development of new competitive goods and services. Regulatory legal acts on innovative development provide that it will be carried out through the creation and use of technologies of the 5-6 stage, commercialization of R&D and the development of new products. The development of new products as a process is characterized by a complex of various activities at all stages of its life cycle, starting from marketing research and ending with the serial production of new products, the feasibility of which is ensured by the optimal level of use of the total innovative potential of the organization.

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# THE ROLE OF HIGHER EDUCATION AND SCIENCE IN FORMING THE KNOWLEDGE ECONOMY

*The research was carried out with the financial support of the Belarusian Republican Foundation for Fundamental Research ("BRFFR-MIRRU – 2023": agreement dated November 20, 2023, No. G23UZB-110)*

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**RESUME.** In the modern era, the knowledge economy has emerged as a pivotal force driving economic growth and development. Characterized by the generation and exploitation of knowledge, this economy relies heavily on intellectual capabilities rather than physical inputs or natural resources. Central to the success of the knowledge economy are higher education and science, which serve as the primary engines for innovation, skill development, and knowledge dissemination. The article analyzes the role of these areas in the formation of the knowledge economy, and also presents proposals for their development in Belarus and Uzbekistan.

**KEY WORDS:** education, science, knowledge economy, economic growth, development, investment, modernization.

**Introduction.** The knowledge economy is defined by its emphasis on the production and utilization of knowledge as a primary driver of growth, competitiveness, and employment. Unlike traditional economies, which depend on tangible assets, the knowledge economy thrives on intangible assets such as information, expertise, and innovation.

In such conditions, the needs of the economy radically change the nature of the interaction of education, science and business and impose new requirements on the results of this interaction. Integration processes between the types of activity under consideration are, firstly, economically effective and efficient, secondly, they accelerate scientific and technical progress, and thirdly, they allow for the rational use of the intellectual potential of science and higher education not only of a single country, but also of the world community as a whole.

**Main part.** Knowledge and education are essential components of the successful development of society, promote social mobility and reduce poverty. A well-educated population makes an important contribution to the de-

velopment of a strong and competitive economy and contributes to the accumulation of human capital. A population with a higher level of education is also more likely to be creative and productive, which contributes to the economic development of the state. Higher education plays a central role in preparing qualified personnel who can adapt to rapidly changing labour market conditions. It provides:

1. Fostering innovation and research. Higher education institutions (HEIs) are hubs of research and innovation. By providing a conducive environment for academic inquiry and experimentation, universities and colleges contribute to the creation of new knowledge and technologies. Research conducted in HEIs often leads to technological advancements and innovations that drive economic growth;
2. Developing human capital. Higher education plays a crucial role in developing human capital by equipping individuals with advanced skills and knowledge. Graduates from these institutions are better prepared to meet the demands of the knowledge

economy, which requires a workforce proficient in critical thinking, problem-solving, and digital literacy;

3. Promoting lifelong learning. In a rapidly changing economic landscape, lifelong learning is essential. Higher education institutions offer opportunities for continuous learning and professional development, enabling individuals to adapt to new technologies and methodologies throughout their careers;
4. Facilitating knowledge transfer. Universities act as conduits for knowledge transfer between academia and industry. Through partnerships, collaborations, and technology transfer offices, HEIs facilitate the commercialization of research findings and innovations, contributing to economic development.

The role of science in the formation of the knowledge economy is as follows:

1. Advancing scientific research. Science is at the core of the knowledge economy, driving advancements across various fields. Scientific research leads to the development of new technologies, processes, and products that enhance productivity and create new market opportunities;
2. Encouraging interdisciplinary collaboration. The complexities of the knowledge economy require solutions that often span multiple disciplines. Science fosters interdisciplinary collaboration, bringing together experts from various fields to address complex challenges and drive innovation;
3. Supporting evidence-based policymaking. Science provides the evidence base for informed policymaking. In the knowledge economy, policies that support research and innovation, education, and technology adoption are crucial. Scientific insights help shape policies that foster an environment conducive to economic growth;
4. Enhancing global competitiveness. Scientific advancements contribute to a nation's global competitiveness. Countries that invest in science and technology are better positioned to lead in innovation, attract investment, and maintain a competitive edge in the global market.

Effective public policies in the field of education and science help to create a favourable environment for innovation and entrepreneurship. This includes support for start-ups, the creation of science parks and technology parks, and the

development of partnerships between universities and industry.

In recent decades, more and more attention has been paid to finding innovative solutions that can improve the quality of education, make it more accessible and effective. Domestic and foreign experience shows that only diversified structural, institutional and substantive modernization of education can provide a systemic effect of innovative development of the country [1].

Currently, a significant number of young specialists with sufficient knowledge and competencies are being trained for the national economy of the Republic of Belarus. In higher education, a practice-oriented approach is implemented in the training of specialists, which contributes to their rapid adaptation in the workplace.

The system of higher education in the Republic of Belarus is dynamically developing and improving taking into account international trends, among which the key ones are the focus on the individual student, continuity of education, a competence-based approach, the inseparability of learning from education, ensuring the accessibility and quality of education [2].

The key priorities for the development of the education system are defined in the National Strategy for Sustainable Socioeconomic Development until 2030, the Program for Socioeconomic Development of the Republic of Belarus for 2021-2025, the state program "Education and Youth Policy", as well as in the Conceptual Approaches to the Development of the Education System until 2020 and for the Perspective Until 2030. The development of the personnel training system in Uzbekistan is also a priority task. In recent decades, the Republic of Uzbekistan has been actively modernizing its educational system, striving to meet modern trends and requirements of the labor market [3]. The most popular specializations in the resumes of applicants in the production and technical sphere as of September 2023 in Uzbekistan were programmer, design engineer, construction design engineer, PTO engineer, etc. This is due to the fact that specialists in these areas are among the top highly paid in Uzbekistan [4]. The rapid development of technology and the digitalization of the modern world contribute to the growth of wages and, accordingly, interest in IT specialties. In the economic field, the most common specializations in resumes are

sales manager, customer service manager, accountant, and purchasing manager. Economic growth and development of the business sector in the country stimulate demand for specialists in these fields. In addition, the list of the highest paid specialists includes a financial manager and a digital marketer, which also determines the popularity of a number of economic specialties [5].

Despite the dominant popularity of technical and economic specialties, the humanities also remain an important component of the educational system of Uzbekistan. The list of the most common specializations in resumes includes pedagogy, and graphic design is among the top highly paid. These areas are also distinguished by their relevance and social significance. Universities in Uzbekistan strive to offer students a wide range of educational opportunities in order to effectively respond to the ever-changing demands of the labor market [3].

In recent years, a number of important measures have been taken in the field of education, including the approval of the Strategy for the Development of Science, Education and Production until 2030 in 2019, the establishment of the Fund for the Support of Innovations and the Development of Science and Technology in 2020 in accordance with the Decree of the President of the Republic of Uzbekistan «On measures for the further development of the system of support for innovation activities». Public investment in education is of strategic importance for the future development of the education sector in any country. By investing in education and research, governments and private companies create the foundation for sustainable economic growth. These investments ensure the training of qualified specialists and the development of innovative technologies.

Investments in education not only affect the development of creative skills, experience and the improvement of the social status of each person, but also the revival of the intellectual and spiritual potential of the entire society. These expenses are made once and yield positive results over several production cycles until the moment when workers need to be re-trained due to changing needs. Investments in education mean not only the construction of university buildings, their technical equipment and the organization of the educational process. These investments help to increase the availability of scientific knowledge and contribute to more effective implementation of in-

novative projects by specialists. In many places, economic prosperity is closely linked to education [6].

The primary tasks for the development of higher education in Belarus in the context of the formation of a knowledge economy are: development of the education system based on the introduction of modern communication and information technologies; optimization of the volumes and structures of training specialists with higher and secondary specialized education and workers in accordance with the needs of economic development; giving universities the functions of centers of scientific and innovative activity, creating and developing entities of innovative infrastructure under them; improving the system of educational and ideological work with students; integration of vocational education, science and production [7].

In Uzbekistan, the integration of science, education and production is one of the priority areas for the development of the education system. The government of Uzbekistan aims to create financial incentives and conduct public propaganda aimed at raising the social status of specialists engaged in scientific and research activities in the country. There are already tangible results from the initiatives being implemented, as rapidly growing numbers of young people are showing increasing interest in scientific research, and the number of degrees awarded has increased fivefold in the last five years [8]. A growing proportion of Uzbek youth are now involved in research projects at prestigious international universities or in industrial activities. These figures are expected to double over the next five years.

Suggestions for the development of science and education in Uzbekistan may include [9]: increasing the share of GDP allocated to science and education; creating target funds to support scientific research and educational programs; providing tax incentives to enterprises investing in science and education.

**Conclusion.** Higher education and science are integral to the development and sustainability of the knowledge economy. By fostering innovation, developing human capital, and facilitating knowledge transfer, these institutions drive economic growth and competitiveness. As the world continues to transition towards a knowledge-based economy, investing in education and science will be paramount to addressing global challenges and ensuring sustainable development.

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# QUANTITATIVE AND QUALITATIVE ASSESSMENT OF THE PREREQUISITES FOR THE DEVELOPMENT OF INTERNATIONAL TOURISM BETWEEN THE REPUBLIC OF BELARUS AND THE REPUBLIC OF UZBEKISTAN

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**RESUME.** The article presents a thorough comparative analysis of the circumstances, prospects, and preconditions for the expansion of tourism relations between Belarus and Uzbekistan, encompassing three key criteria. The analysis delves into the similarities and dissimilarities in the regulation of tourism, the economic development impact of tourism, and the cultural potential of both countries. The article also identifies several areas of concern in the bilateral cooperation, including the absence of a solid scientific basis for tourism collaboration, a lack of statistical data analysis, challenges in staffing the tourism industry, the similarity in tourist products, and the lack of clarity in marketing efforts. Based on these identified issues, the article proposes measures aimed at enhancing Belarusian-Uzbek tourism cooperation.

**KEY WORDS:** international tourism, countries' cooperation, analysis-based prerequisites, economic growth perspectives, Belarus, Uzbekistan

**Introduction.** The development of tourism, on particularly transnational travel, has undergone a paradigm shift and opened new horizons following the global crisis triggered by the COVID-19 pandemic. The tourism industry was one of the sectors that were most severely impacted by measures implemented to contain and combat the spread of the virus [9]. Consequently, tourism's contribution to global GDP declined by 48.4%, and the number of employment opportunities in the sector shrank by an astounding 69.5 MN jobs, representing a 20.8% decline from the total global workforce [15]. In response to this unprecedented economic downturn, there has been a need for a comprehensive reevaluation of the fundamental principles, methodologies, and trajectories of tourism development. One notable development in the post-pandemic landscape is the emergence of regionalization, driven by shifts in consumer behavior that have converged with other trends, such as a preference for domestic travel, proximity tourism, and shorter trips [7]. In the post-Soviet landscape, including the Republic

of Belarus, a reconfiguration of the pattern of tourist demand has emerged, particularly in the aftermath of military and political developments since 2022. These events have acted as a catalyst for the exploration of new partnerships, the revival of established connections, and the enhancement of collaboration among nations. This includes the development of international tourism, which serves as a barometer for socio-political dynamics in society. In this context, cooperation with Uzbekistan holds particular promise for Belarus. The two countries have already demonstrated their willingness to engage in tourism-related initiatives through governmental initiatives. However, from a scholarly perspective, these aspects remain underexplored and warrant further investigation. This paper delves into the preconditions and prospects for bilateral collaboration between Belarus and Uzbekistan within the realm of international tourism.

**The core text.** It would be prudent to delve into the intricacies of tourism collaboration between the two nations, examining it through

a lens of several critical parameters identified by us as pivotal. These includes institutional and legal dimensions, as well as economic facets, encompassing infrastructure, marketing, and socio-cultural aspects.

*The institutional and legal foundations* that lay the groundwork for tourism collaboration are rooted in an analysis of diplomatic endeavors, state-led initiatives, programmatic materials, and regulatory frameworks that underpin it.

It is worth noting that the development of economic collaboration between Uzbekistan and Belarus is predominantly driven by a top-down approach, where the impetus for integration is primarily initiated through political initiatives [8]. Despite the fact that diplomatic ties between the two nations have been established for three decades, notable progress in active and fruitful collaboration has yet to be achieved.

It was not until 2018 that a new phase in their relationship emerged, primarily driven by political and diplomatic initiatives on a bilateral level. The effectiveness of these efforts can be observed in the dynamic statistics of foreign trade in goods between the countries (there is currently no publicly available data on the dynamics of trade in services).

However, it is important to acknowledge the fragmented nature of the available statistical data, which limits the comprehensiveness and accuracy of our analysis. Nonetheless, the data presented in the graph indicates a steady rise in the proportion of Belarusian exports to Uzbekistan over the period from 2017 onwards (see Figure a).

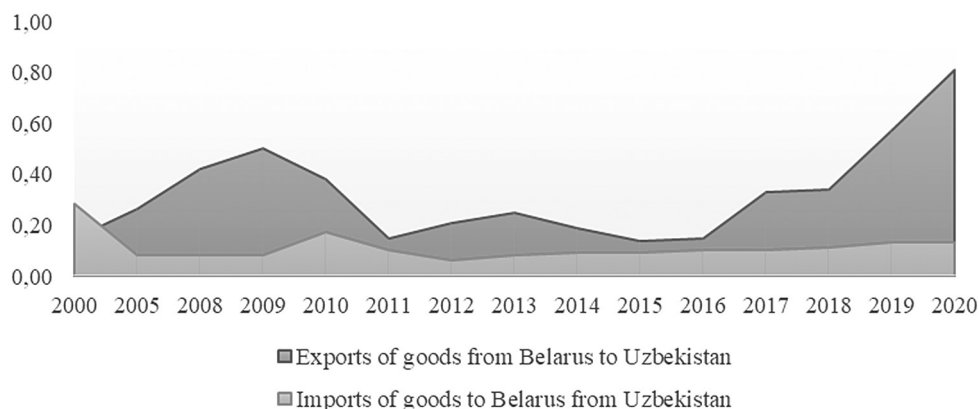
According to the experts of the Belarusian Institute for Strategic Studies, bilateral trade

between Belarus and Uzbekistan increased by 71 percent in 2021, amounting to \$301.9 MN. In 2022, this figure rose by 44 percent, reaching \$536 MN. The growth continued in 2023, with an increase of 15 percent to \$620 MN [13].

These positive trends can be attributed to a series of diplomatic events that have facilitated the opening of markets for both countries. These include the opening of the Embassy of the Republic of Uzbekistan in Minsk in 2018, mutual visits by the heads of state, and the organization of cultural events such as the Days of Culture in Uzbekistan and Belarus in 2018, 2021, and 2023, the Forum of Regions in 2019 and 2024, and Uzbek-Belarus Women's Business Forums in 2023 and 2024. Additionally, the upcoming Belarus-Uzbekistan Industry Tourism Forum is scheduled for September 2024, providing further opportunities for collaboration and exchange between business and government representatives from both countries' regions.

These events were underpinned by a series of programmatic documents. It is worth noting that both countries are committed to fostering tourism development, enhancing the competitiveness of their national tourism offerings, and enhancing the overall image of their respective tourism sectors. They perceive collaboration between nations as a means to achieve these objectives, albeit without explicitly identifying priority partners or specific areas of interaction (see Table 1).

This stance, on the one hand, reflects a willingness to engage in collaborative efforts, but on the other hand suggests a tendency towards a broad and indiscriminate approach, potentially diluting attention, resources, and efforts



**Figure a.** Share of trade of goods between Belarus and Uzbekistan in total foreign trade turnover of Belarus, %

**Table 1.** Regulatory and policy documents of Belarus and Uzbekistan that promote bilateral cooperation in the field of tourism

The Republic of Belarus	The Republic of Uzbekistan
<i>The Law on Tourism No. 129-Z of 11.11.2021, Article 7, paragraph 2 defines as a priority of state policy “creation of necessary conditions for foreign trade in tourist services” and “development of international cooperation”</i>	<i>Law on Tourism No. ZRU-549 dated 07/18/2019, Article 6: “the main directions of state policy in the field of tourism” are “development of this sphere as a strategic branch of the country’s economy”; “development of international cooperation”</i>
<i>The state program “Belarus Hospitable” for 2021-2025, Chapter 2: “the development of inbound and domestic tourism, increasing the competitiveness of tourist services and the promotion of national tourism brands on the world market are identified as priorities” The National Strategy for the Development of Tourism in the Republic of Belarus until 2035, Chapter 3: “increasing the share of the Republic of Belarus in world tourism revenues from 0.04% in 2016 to 0.1% in 2035”</i>	<i>The concept of tourism development in the Republic of Uzbekistan in 2019-2025, chapter 3, paragraph 6: “promotion of the tourist product of the Republic of Uzbekistan in the domestic and foreign tourist markets, strengthening the country’s image as safe for travel and recreation”</i>
<i>Agreement on cooperation in the field of tourism dated December 23, 1993, Article 1: “the parties will do their best to promote the development of equal and mutually beneficial cooperation in the field of tourism...”</i>	
<i>Agreement between the Government of the Republic of Uzbekistan and the Government of the Republic of Belarus “On interregional cooperation” dated 08/01/2019, Article 5 “competent authorities assist in organizing direct tourist exchange between regions, implementing joint programs and projects in the field of tourism aimed at increasing the attractiveness of regions”; “contribute to improving transport links and infrastructure development in order to increase business activity and increase of tourist flow to the regions”</i>	
<i>Agreement on the development of cooperation in the field of tourism between the Ministry of Sports and Tourism of the Republic of Belarus and the State Committee of the Republic of Uzbekistan for Tourism Development, 03/24/2021, Article 2: “The parties shall promote the development of close cooperation between organizations of states engaged in activities in the field of tourism in order to mutually increase the tourist flow between states”</i>	
<i>Joint Action Plan for the implementation of the Action Plan for the development of cooperation in the field of tourism between the Committee on Tourism under the Ministry of Ecology, Environmental Protection and Climate Change of the Republic of Uzbekistan and the Ministry of Sports and Tourism of the Republic of Belarus for 2024-2025, September 2024</i>	

Sources: compiled by the authors according to [4, 5].

across a global market with ill-defined parameters. The signing of bilateral agreements, however, appears to mitigate this ambiguity.

An indication of the seriousness with which a country approaches the development of its tourism industry, and its recognition as a priority national focus, is reflected in the presence of a dedicated sectoral agency within the executive branch. In both Belarus and Uzbekistan, *ministries* play a crucial role in shaping and implementing tourism policies, underscoring the high priority accorded to tourism at the highest levels of government. However, it is worth noting that in these countries, tourism is integrated with other strategic sectors of development. In Belarus, the *Ministry of Sports and Tourism* is responsible for overseeing tourism activities, while in Uzbekistan, the *Ministry of Tourism and Cultural Heritage* encompasses both tourism and cultural heritage sectors. The integration of various domains into a unified regula-

tory framework is not always a viable solution, as it may result in a skewed focus towards prioritization. The State Program “Physical Culture and Sport” for 2021–2025 is allocated a budget of 4.3 BN BYN, while the State program “Belarus Hospitable” for the same timeframe receives only 525 MN BYN — a ratio of 8.2 to 1.

Furthermore, collaboration with international industry associations significantly contributes to the advancement of the tourism sector. Uzbekistan boasts a unique advantage in this regard, with the establishment of the *Ipak Yo’li Ofisi* unitary enterprise, which serves as the technical bureau for the World Tourism Organization’s project aimed at promoting tourism along the Silk Road.

From the perspective of the *economic underpinnings* of international tourism development, the analysis of prospects is grounded in the volume of reciprocal tourist flows and the trade

in services categorized under the item “Travel” in the balance of payments for countries.

In this context, the evaluation of progress in inter-state cooperation is constrained either by a dearth of statistical data or its dispersal, rendering comparisons across countries difficult. For instance, in Uzbekistan, there is a lack of publicly available statistical information on international tourism and its evolution, and it is also absent from the international database maintained by the UNWTO.

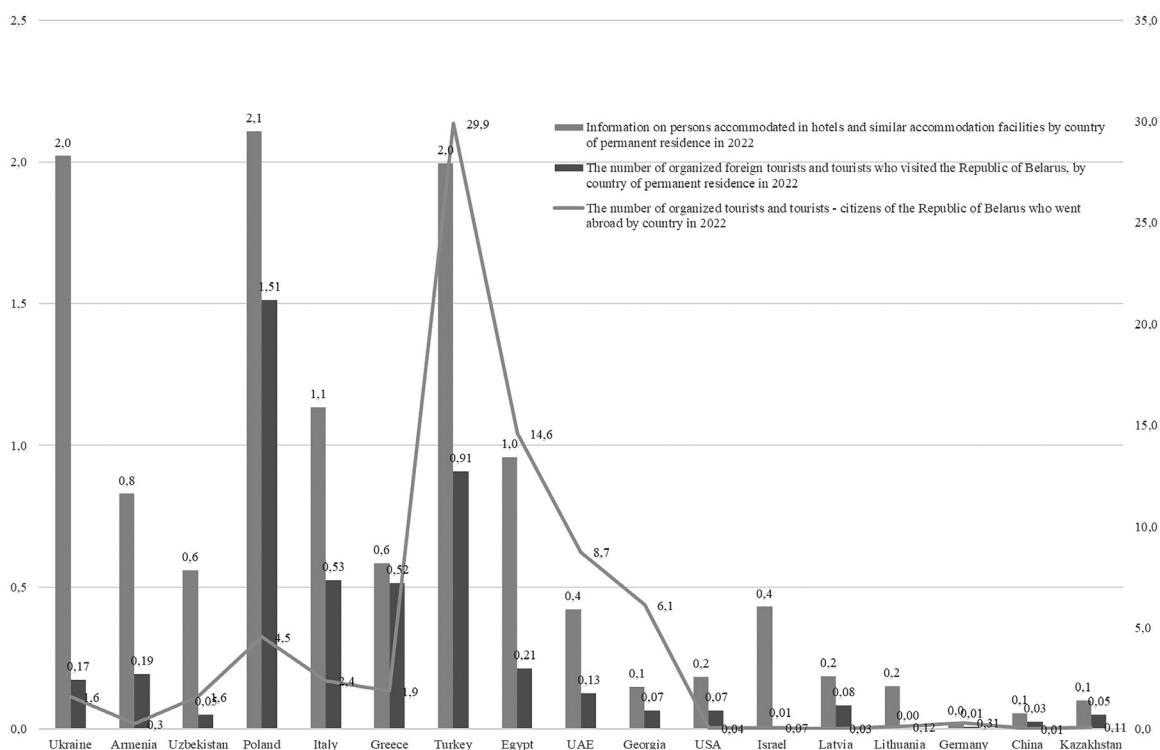
In Belarus, the indicators for international tourism development are likewise incomplete, with some data not being published annually, making it challenging to assess progress. Thus, the indicator of the number of tourists accommodated in hotels and other similar accommodation facilities, based on their country of permanent residence, does not account for trips that are undertaken without the involvement of tour operators or travel agents [14]. On the other hand, the indicator that reflects the number of organized foreign tourists and visitors in the countries of their permanent residence includes both tourists and individuals who are in these countries for other purposes unrelated to tourism. As a result, neither of these indicators provides

a comprehensive representation of the nature of tourist traffic.

Nonetheless, based on the statistical data available, it is noteworthy that Uzbek tourists represent a relatively small proportion of the overall tourist flow to Belarus. Travel arrangements through travel agencies contributed a statistically negligible 0.05 percent, and the number of registered accommodation facilities of the hotel type amounted to only 0.6 percent (Figure b). Meanwhile, the number of organized Belarusian visitors to Uzbekistan was 1.6 percent, equivalent to 78.8 individuals, compared to one Uzbek visitor.

The relatively modest indicators of the volume of international tourist traffic between the two nations can be attributed to a multitude of factors. From the perspective of historical and sociocultural development, Belarus’s orientation is multidirectional, encompassing both western and eastern influences, predominantly Russian. Conversely, Uzbekistan’s focus is predominantly on Central Asia.

The distance between the two countries, exceeding 4,000 kilometers, coupled with transportation costs, which can amount to approximately 2,000 Belarusian rubles for a one-way trip, undoubtedly constitute a substantial



**Figure b.** Amount of tourists traveling to and from Belarus, share in total flows, %



deterrent for countries characterized by relatively low income levels. According to World Bank estimations for 2022, the average income per capita in Uzbekistan was approximately 2,255 dollars, while in Belarus it stood at 7,905.

Along with the physical aspects of tourism development, economic indicators such as costs play a crucial role in the economic landscapes of nations. These indicators can be analyzed through the lens of balance of payments statistics. Belarus consistently experiences a surplus of outbound tourism, with a negative balance under the category of “Trips”, as evidenced in Table 2.

In contrast, Belarus earns export revenue from tourism services when it comes to Uzbekistan. This trend has been on the rise in recent years, with personal travel accounting for most exports, constituting 93% of the total.

Conducting a comparative analysis of the economic indicators of tourism development in these two countries, as assessed by international experts from Oxford University (see Table 3), reveals several noteworthy trends:

1. The significance of tourism for the economic growth of both nations is comparable in

terms of both its relative contribution and absolute value. However, this figure is relatively modest when compared to leading destinations, such as Greece, where tourism accounts for 20% of GDP, Tunisia with 13% and the Philippines with 18%.

2. Tourism generates jobs in an equal proportion to the total number of jobs in the countries in question, but in terms of absolute figures, for Uzbekistan, this number exceeds triple. Therefore, training must match this level.

According to some estimates, the concentration coefficient in the labor market of Uzbekistan is low in the field of tourism. There is a significant gap between the supply and demand for specialists in this area, with a surplus of demand [1].

Similarly, there is a shortage of qualified personnel in Belarus in various specialties, such as fare collectors, analysts in the field of tourism, air ticket sales managers, lawyers, and others [3]. Additionally, there is a lack of porters with knowledge of foreign languages, as well as maids and chefs [6].

At the same time, when comparing the number of employees for every 100 foreign tourists, it turns out that in Belarus, this ratio is ap-

**Table 2.** RIndicators of international trade in tourism services in Belarus

<b>The figures are in MN of US dollars</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Total export of services under the Travel item	883 240,7	901 372,6	358 860,9	426 970,1
some of them are business	107 769,0	98 668,9	31 602,0	35 034,9
personal	775 471,7	802 703,7	327 258,8	391 935,1
Total export of services under the article Travel to Uzbekistan, total	4 941,3	6 340,6	9 630,3	13 434,6
some of them are business	449,4	431,9	827,8	933,5
personal	4 492,0	5 908,7	8 802,5	12 501,1
Total import of services under the Travel item, total	1 069 369,5	1 122 439,6	469 285,1	561 840,1
some of them are business	254 274,0	262 966,4	162 044,6	154 663,1
personal	815 095,5	859 473,2	307 240,5	407 177,1
Total import of services under the Travel item from Uzbekistan, total	85,1	141,6	32,7	282,4
some of them are business	12,4	59,0	8,4	112,2
personal	72,7	82,6	24,3	170,3
The total balance of the Travel item	-186 128,8	-221 067,0	-110 424,3	-134 870,0
The total balance under the Travel item, personal	-146 505,0	-164 297,5	-130 442,6	-119 628,1
Total balance for Travel, business	-39 623,8	-56 769,5	20 018,3	-15 241,9
The balance under the article of Travel with Uzbekistan	4 856,2	6 199,0	9 597,6	13 152,1
Balance under Travel, business with Uzbekistan	437,0	372,9	819,4	821,3
The balance under the Travel item, personal with Uzbekistan	4 419,2	5 826,1	8 778,2	12 330,9

Based on official statistics offered by National Bank of the Republic of Belarus

proximately 5 people per 100, while in Uzbekistan it is twice as high. To illustrate, in the Czech Republic, for instance, 100 foreign visitors were served by a staff of 4.3 persons per annum, whereas in the Philippines, this figure was 165. Nonetheless, the efficiency of employment in the field of international tourism in Belarus has proven to be superior, with \$3,905 in foreign tourists' expenditures per employee, compared to \$2,937 in Uzbekistan. By contrast, in the Czech Republic, this figure is \$17,918 and, in the Philippines, it is \$1,257, which may suggest a higher productivity among the tourism workforce in Belarus.

3. The expenditures of international tourists represent the most substantial component in Uzbekistan in terms of absolute figures, accounting for a significant portion of the country's total exports. Furthermore, these expenditures have shown an upward trend following the post-pandemic recovery. This trend suggests that international tourism plays a crucial role in generating a substantial portion of Uzbekistan's export revenue, indicating a clear preference for the foreign market over the domestic market in terms of the orientation of the Uzbek tourism product (60:40 ratio).

In contrast, in Belarus, a number of geopolitical, socio-economic, and environmental factors

have led to a decline in international tourist spending, with the majority of tourism revenues coming from domestic sources (26:74 ratio). This development does not align with the desired objectives for the growth of Belarusian tourism, necessitating increased efforts to expand the export of tourism services.

4. Both countries lack access to the sea, which precludes them from benefiting from mass tourism. However, they are capable of developing forms of tourism that focus on leisure and recreation. Simultaneously, the promotion of MICE tourism proves advantageous for countries that welcome investment and partnering opportunities, as well as possess the necessary infrastructure in place. The substantial expenses associated with business tourism in Belarus serve as an indication of the demand for this particular sector.

A comparative analysis of the structural composition of the primary vectors of inbound tourist traffic (see Table 4) reveals a remarkable diversity within Belarus, indicating a lack of rigid market-specific focus and consequent dependency. With the exclusion of Russia as the primary source of consumer traffic, the remaining global market accounted for nearly 90 percent of the overall influx, with individual contributions below 2 percent.

**Table 3.** Main destinations of inbound and outbound flows in Belarus and Uzbekistan

Indicators	Belarus		Uzbekistan	
	2019	2023	2019	2023
Total GDP contribution	6,1% of total economy or USD 4,2BN (-30,6% to 2020)	5,9% or USD 4,2BN (+7,3% to 2022)	5,5% of total economy or USD 3,5BN (-61,6% to 2020)	5,2% or USD 3,8 BN (+20,9% to 2022)
Total Travel & Tourism jobs	5,9% of total jobs or 288,7 (000s) (-14,7% to 2020)	5,9% or 281,7 (000s) (+2,6% to 2022)	5,6% of total jobs or 0,76 MN (-24,5% to 2020)	5,3% of total jobs or 0,73 MN (+4,7% to 2022)
International Visitor Spending	3,0% of total exports (USD 1,4BN) or 30,5% of all tourists' spendings	USD 1,1BN, annual change – 9,7% or 25,8% of all tourists' spendings	8,9% of total exports (USD 1,7BN) or 60,2% of all tourists' spendings	USD 2,0BN, annual change – 26,5% or 61,0% of all tourists' spendings
Domestic Visitor Spending	USD 3,1BN or 69,5% of all tourists' spendings	USD 3,3BN or 74,2% of all tourists' spendings	USD 1,1BN or 39,8% of all tourists' spendings	USD 1,3BN or 39% of all tourists' spendings
Leisure Spending	67,9%	69,4%	85,1%	88,5%
Business Spending	32,1%	30,6%	14,9%	11,5%

Based on data of World Travel & Tourism Council Research Hub

**Table 4.** Main destinations of inbound and outbound flows in Belarus and Uzbekistan

Belarus			
Inbound Arrivals		Outbound Departures	
<b>2019</b>	<b>2023</b>	<b>2019</b>	<b>2023</b>
1. Russian Federation <b>10%</b>	1. Russian Federation <b>11%</b>	1. Ukraine <b>52%</b>	1. Poland <b>26%</b>
2. Lithuania <b>3%</b>	2. Poland <b>2%</b>	2. Poland <b>11%</b>	2. Türkiye <b>18%</b>
3. Poland <b>3%</b>	3. Lithuania <b>1%</b>	3. Egypt <b>7%</b>	3. Georgia <b>7%</b>
4. Latvia <b>0.5%</b>	4. Latvia <b>0.2%</b>	4. Türkiye <b>6%</b>	4. Lithuania <b>7%</b>
5. China <b>0.2%</b>	5. Iraq <b>0.1%</b>	5. Lithuania <b>4%</b>	5. Kazakhstan <b>6%</b>
<b>Rest of world 83%</b>	<b>Rest of world 86%</b>	<b>Rest of world 20%</b>	<b>Rest of world 36%</b>
Uzbekistan			
Inbound Arrivals		Outbound Departures	
<b>2019</b>	<b>2023</b>	<b>2019</b>	<b>2023</b>
1. Kazakhstan <b>34%</b>	1. Kazakhstan <b>27%</b>	1. Kazakhstan <b>58%</b>	1. Kazakhstan <b>32%</b>
2. Kyrgyzstan <b>22%</b>	2. Kyrgyzstan <b>24%</b>	2. Kyrgyzstan <b>15%</b>	2. Kyrgyzstan <b>21%</b>
3. Russian Federation <b>7%</b>	3. Russian Federation <b>16%</b>	3. Russian Federation <b>8%</b>	3. Saudi Arabia <b>15%</b>
4. Türkiye <b>0.9%</b>	4. Türkiye <b>1%</b>	4. Türkiye <b>6%</b>	4. Türkiye <b>13%</b>
5. China <b>0.8%</b>	5. South Korea <b>0.4%</b>	5. South Korea <b>2%</b>	5. United Arab Emirates <b>2%</b>
<b>Rest of world 36%</b>	<b>Rest of world 32%</b>	<b>Rest of world 11%</b>	<b>Rest of world 16%</b>

Based on World Travel & Tourism Council Research Hub

In contrast, outbound tourism has witnessed significant transformations following the onset of military operations, with Asian nations emerging as prominent destinations (Kazakhstan accounting for 6 percent of outbound travel). Nonetheless, the primary partners in tourism cooperation remain neighboring countries. Uzbekistan presents a distinct scenario, characterized by the absence of geopolitical influences on tourism development, thus precluding any rationale for alterations in tourist preferences. There is a significant concentration of inbound and outbound tourist markets, which consequently renders the sector highly reliant on them. Kazakhstan, Kyrgyzstan, and Russia serve as key partners in this regard.

It is worth noting that both countries have already established a certain infrastructure to accommodate tourist traffic. In Belarus, there are 1,062 collective accommodation facilities, including sanatoriums, while in Uzbekistan,

there are 5,526 hotels, hotels and other tourist accommodation facilities. The growth over the past six years has been 7.2 times higher. The number of organizations<sup>1</sup> engaged in tourism activities in Belarus is 1,108, while in Uzbekistan it is 5,276 [11, 14].

Both countries offer a wide variety of tourist activities [10], indicating that they possess the necessary resources for this purpose (see Table 5). Their focus areas largely overlap (cells are highlighted in dark colors), but there are certainly differences in content. Additionally, there are specific types of tourism that may be of interest to foreign tourists.

From a *cultural perspective*, such diversity can be seen as an indication of the rich cultural and historical legacy that these countries are willing to showcase to international visitors.

<sup>1</sup> The composition of the indicator may vary within countries

Among these treasures are UNESCO World Heritage sites, which number 7,400 in Uzbekistan, with 209 being part of the renowned museum cities such as Ichan Kala in Khiva, Historical Center of Bukhara, Historical Center of Shakhrisabz, and Samarkand.

Belarus boasts 5,600 historical and cultural assets, with four of them listed by UNESCO. These include 2,248 archaeological sites, 1,801 architectural monuments, 1,215 historical sites, and four protected areas, among others. Additionally, there are approximately 900 natural sites of significance [8, 12].

The process of establishing a national tourism brand in Uzbekistan is undertaken by the State-owned enterprise “National PR Centre”, while in Belarus, this responsibility falls on the State Agency for Tourism. The efficacy of their operations presents a subject for independent investigation, particularly in terms of targeting marketing efforts towards tourists from both countries.

**Conclusion.** After conducting a comparative analysis of the preconditions for international tourism development between these two nations, it becomes evident that there are several

avenues for strengthening cooperation between them. This collaboration not only fosters an increase in reciprocal tourist flows but also contributes to a greater economic impact.

1. Alongside the designation of these countries as destinations for tourism cooperation at the political level, it is advisable to conduct an in-depth study of the economic benefits and identify areas of potential growth. One of the factors significantly influencing the attractiveness of these countries for each other is the distance between Minsk and Tashkent, which amounts to 4,146.1 km, exceeding two days of travel by car or nearly eight hours by air.

This poses serious challenges in terms of time and transportation costs for mass tourists during the planning stage. Therefore, it is essential to develop concepts for tourism cooperation, including defining the positioning of tourist products, types of tourism (long-term trips, business tourism, health tourism, etc.), and offering joint tourist products within multi-country itineraries (for tourists from Belarus, visiting Uzbekistan, Kazakhstan, and Kyrgyzstan; for Uzbek tourists – traveling through Russia and Belarus).

**Table 5.** The priority types of tourism in Belarus and Uzbekistan

Belarus: Main Types of Tourism <sup>1</sup>	Uzbekistan: Main Types of Tourism <sup>2</sup>
Agroecotourism	Ethnic
Active	Shopping
Gastronomic	Geotourism
Business	Sports and Adventure (identical in description)
Cultural and educational	Industrial
Medical and wellness	Slow tourism
Medical	Literary
Nostalgic	Pilgrimage
Educational	MICE tourism
Hunting	Cultural
Industrial	Medical
Religious	Gastronomic
Event – based	Ecotourism
Environmental	Youth

Compiled by the authors

<sup>1</sup> They are enshrined as fundamental principles in the legal framework of the National Strategy for the Development of Tourism in the Republic of Belarus, which extends until the year 2035

<sup>2</sup> Highlighted on the official website of the State Unitary Enterprise “National PR-Center” in Russian. For users of the site in English, the variety of types is different. Some types are combined, while Shopping is excluded

2. The development of a comprehensive, comparable and most complete statistical toolkit is essential, allowing not only for an accurate assessment of current progress but also for the formulation of targets for the advancement of tourism relations between countries. Belarus should draw on Uzbekistan's expertise in conducting sample surveys of tourists and extrapolate the findings to broader contexts [2].

3. Efforts should be directed towards cultivating highly skilled professionals in the field of tourism across various specializations through the establishment of joint training programs, academic exchanges, and scientific advancements. This approach not only ensures a steady supply of competent workforce but also enhances their effectiveness, resulting in an increase in tourism expenditure per employee.

4. Within the realm of communication and marketing endeavors, a highly effective strategy for attracting tourists from the target countries may be the implementation of a comprehensive set of integrated communication initiatives, including targeted advertising campaigns tailored specifically for these markets.

To achieve this, it is crucial to conduct a meticulous market research on consumer preferences in the field of tourism among Belarusian and Uzbek tourists, as well as to identify their potential interests in specific areas.

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# STATE OF THE TRANSLATION INDUSTRY IN THE GLOBAL ECONOMY

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**RESUME.** The article presents the industry of language and translation services at the current stage of development of society and the global economy, also highlights the issues of the state and prospects for further development of this industry.

**KEY WORDS:** language services industry, translation services industry, the global economy.

**Introduction.** The reasons for the complication of the structure of the services industry are the modern development of society, the improvement of the infrastructure for processing and transmitting big data, the implementation of the concepts of the digital economy in the countries. The services acquired an export focus and began to be provided in a distance. One of the most important and promising areas of the development business services related to entrepreneurial activity is the formation and development of a competitive industry for translation services.

**Main part.** This industry is one of the fastest growing according to its characteristics, changeable and at the same time quite economically opaque. In modern scientific literature, certain aspects of the translation services industry are considered: one part of the work is devoted to the analysis of language policy (J. Marshak [3, c. 135], F. Grin [1, c. 50], A.O. Laletina [15, c. 158]), the other to the philological aspects of the development of translation services (E.V. Hilkanova [20, c.152]), the third to the economics of language (D.V. Kadochnikova [11, c. 128]). Recently, some works have begun to appear and in these works the economic processes of effective construction of the language and translation services industry and its structure are studied (T.I. Makarevich [16, c. 85], Y.P. Yakubuk [6, c.123], B.N. Panshin [18, c.45], N.A. Zamurueva [10, c. 62], N.K. Grabovsky [8, c. 3] etc.). At the same time, it is the interest to determine the state and prospects of development of the

translation industry from an economic point of view. Translation services as a result of the activities of an enterprise or translator who provide translation services into various languages to meet the relevant needs of the customer are characterized by properties that are inherent in all services: intangible, inseparable from the source or object of the services, etc.

According to the classifier of the World Trade Organization and the requirements of the GATS, as well as based on the document “Manual on Statistics of International Trade in Services 2010” of the United Nations, translation services are considered as business services related to entrepreneurial activity and having a high potential for foreign investment. In the national classifier of types of economic activity of the Republic of Belarus, these services are presented in the section “Provision of other types of services to consumers”. This service sector includes various types of: market research and identification of public opinion (OKVED code 7413); business and management consulting (7414); activities in the field of architecture, engineering surveys and provision of — technical advice in these areas (7420); technical tests and research (7430); advertising activities (7440); recruitment of personnel (7450); conducting investigations and ensuring security (7460); cleaning and cleaning of industrial and residential premises, equipment and vehicles (7470); activities in the field of photography (7481); packaging activities (7482); provision of secretarial and translation services (7485), etc.

In turn the subclass “Provision of secretarial and translation services” includes: translation and interpretation services; shorthand services; text typing and editing services; copying, photocopying and other reproduction of text that is not related to printing; sending letters, including labeling addresses on envelopes, folding envelopes, compiling lists of mail items; other secretarial services, such as decryption of data from magnetic tapes and disks; reading proofs.

One of the most important areas for the development of business services related to entrepreneurial activity is the formation and development of a highly competitive market of translation services that meets modern challenges. The arrival of translation services in the turnover is associated with an increase in the information capacity of material production. The arrival of translation services in the turnover is associated with an increase in the information capacity of material production. At the same time, information is a specific product. Today, the creation of national classifiers of business services and their harmonization within the EAEU is of great importance for the development of an effective business services infrastructure.

Based on the document “On approval of the list of sectors of services in which the single market of services within the framework of the Eurasian Economic Union operates” December 23, 2014 – 110, translation services operate in the mode of the single market of services of the EAEU (interpretation and translation related to the translation of texts from one language to another from SRS 83910). The main types of services in the mutual trade of the EAEU countries are transport, construction, telecommunications, computer and information services and other business services, which include translation services.

Together, the share of these services accounts for more than 88.4% of the total trade in services, or \$7.1 billion. In terms of transport and other business services, the volume of mutual trade exceeds \$ 1 billion, and it can be said that they have a decisive impact on the dynamics of mutual trade in services. More than 54.2% of the increase in the volume of mutual services in 2021 was accounted for transport services, 23.1% for travel, 11.3% for business services, 10.0% for telecommunications and 1.4% for all other services. Nevertheless, the theoretical and practical problems of the de-

velopment of the market of translation services in the EAEU and especially the foreign economic activity of organizations operating in this market, require further study [4, c.31].

It should be noted that translation services are classified into 3 segments: the first – “Type of service”: interpretation: simultaneous, sequential, by phone; translation: technical literature, information technology, legal documentation, medicine, notarization; linguistic services: analysis of the source text, interpretation of names and trademarks in another language; copywriting: writing and checking articles, including by native speakers; rewriting: processing of ready-made materials; terminological work: compilation of glossaries; “connotation check”: checking brand names and slogans for their adequate perception in the language environment; linguistic audit: assessment and verification of the quality of translation for stylistic compliance with the original; marketing adaptation of texts; personnel certification.

- the second – “Type of operation”: manual translation; automated translation; machine translation
- the third – “Scope of translation”: software, marketing materials, multimedia, websites, video games, legal, medical, financial, banking, etc. the participants of the translation services market are: translation companies (public/private); translation agencies and language service providers (LSP) is a term used for a company or partner that provides a wide range of translation or language services; self – employed translators; companies that provide localization services for software, websites, and games and provide support for companies entering foreign markets.

The translation services industry is a system of organizational and economic relations between consumers and producers of services (translation agencies/translators, etc.) that arise in the process of exchange, sale and consumption of translation services.

The structure of the translation services industry is a system of interaction of the following main elements: demand for translation services, supply for these services, competition, quality of services and prices. The translation services industry arises when people have information needs and the information that satisfies them becomes a valuable commodity. Thus, the translation services industry is developing and functioning under the influence of several fac-



tors. First of all, the law of matching supply and demand. The development of this industry is regulated by the demand for the translation of information into various languages. With the increasing information needs of certain social groups, the demand for products from this market also increases: a corresponding offer arises — new translation agencies appear offering consumers the translation of information. But a decrease in demand for the translation of information for a variety of reasons — economic, political and others — immediately leads to a weakening of supply.

The law of value plays an equally important role in the translation services industry. It largely determines the financial policy of translation agencies and companies, regulates translation prices.

The development of the translation services industry, the relations between producers and consumers are regulated by the laws of the so-called reproductive consumption. Consumption creates the need for new production and encourages its development. Without the need for any product, there is no production of it. But it is the consumption of the product that reproduces the need for it. Thus, the growing demand for information in various languages of its production and consumption forms and regulates the market of translation services. It is possible to imagine the sectoral structure of the global translation services industry: the sector of language services (provision of educational services for teaching a foreign language, training of highly qualified specialists: translators, teachers of foreign languages, guides); the sector of translation services (machine translation, hu-

man translation, copywriting); the sector of linguistic services (analysis and interpretation of texts).

The translation services industry plays an important role in helping various enterprises and companies to find and expand markets for goods and services in the international arena. According to a CSA Research study conducted among 8,709 consumers in 29 countries, 76% of online shoppers prefer to purchase products with information in their native language. According to Alexika, 65% of customers prefer to make purchases in their native language.

The graph below shows the forecast for the growth of the translation industry from 2024 to 2034. The global translation services industry is growing and in demand with a total volume of \$9-20 billion, and an average growth rate of 8% per year (figure 1).

According to the international organization Common Sense Advisory, the translation industry generated revenue of \$12 billion in 2020. The language services sector increased by 6.1% year-on-year in the fourth quarter of 2022, up from 7.9% growth in the previous quarter. Overall, the sector grew by 7.6% in 2022, which is faster than the 4.0% growth in 2021.

MarketStartsVille has carried out an analysis of the translation services industry until 2030, according to data, the volume of the translation services industry will grow by 6.7% during the period from 2021 to 2027, which will be due to the development of software, artificial intelligence, expansion of corporate geographical coverage and an increase in the base of foreign customers. The term Language Service is found in foreign reports, this term includes not only

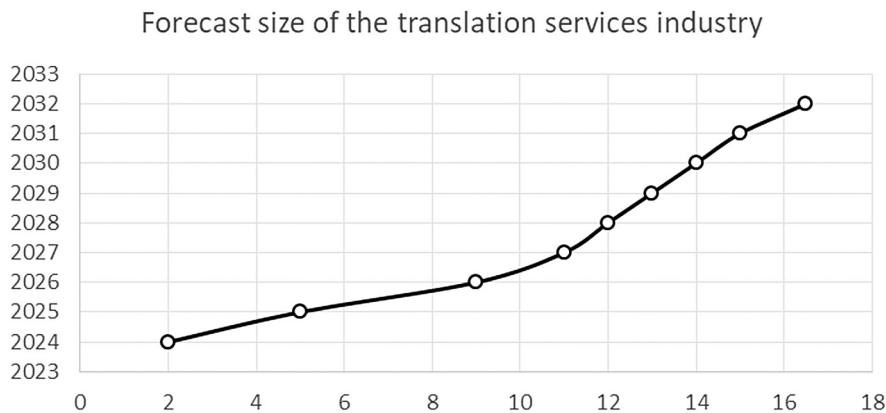
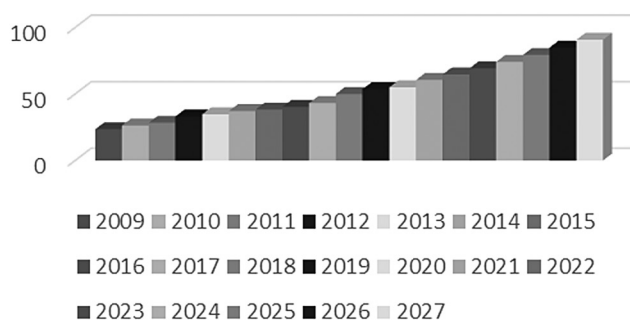


Figure 1. Forecast size of the translation services industry (2024-2034)

Note — Source: Author's development based on [22].



**Figure 2.** Language services: industry growth in 2009-2022 and forecast for 2023-2027.

Note — Source: Author’s development based on [23].

the provision of translation services, but also foreign language teaching, training of future specialists. It also indicates that the American linguistic culture is striving to generalize and expand the space of Internet communication in the designation of the entire range of services to overcome language barriers. According to the results of the annual report of research company Nimdzi Insights about the international translation services industry, the data show that annual growth among the 100 largest companies in the period from 2021-2022. Total revenues of companies increased by 17.3% compared to 2020 and the industry will grow at an average annual growth rate of 7.0% in the coming years and will reach 90.8 billion USD by 2028 (figure 2).

Globalization has determined the fact that there are only 100 leading companies in the world engaged in the language industry and the distribution of their income by region is as follows: USA — 62%, Great Britain — 15%, Scandinavia — 3%, the rest of Europe — 17%, Asia — 3%. It was revealed that the three largest markets for translation services include the United States, Great Britain, and China — this is due to the concept of integrating digital technologies with traditional industries, implementing a digital economy strategy, developing artificial intelligence and machine learning. Based on the results of the annual report of the international translation services market research company Nimdzi Insights, a rating has been compiled based on the revenues of companies providing language and translation services and contains a list of 30 of the 100 largest language service providers in the world (Table 1).

Based on the results of the report of the international language and translation services

industry research company Nimdzi Insights, it can be seen that the revenue of the 100 largest companies increased by 5.0% in the period from 2023 to 2024 compared with 17.1% in the previous period. The income of the companies that took the top 10 places in the rating in 2024 increased by 3.2% compared to the top 10 companies in 2023 (figure 3).

The most intensive growth was observed in the segment of companies occupying positions in the top 51-100, whose revenue increased by 11.3% compared to last year. The top 20 positions increased by 4.8%, and the income of the top 50 positions increased by 4.0% compared to last year’s ranking (figure 4).

The analysis of the problems of translation, which acts as a cost factor, is important from the point of view of an economic perspective. The cost of the transfer and its impact on the country’s economy are of strategic importance. If the global cost of translation is estimated at between 8 and 30 billion euros, then the situation with the financing of the European translation market looks like this: “Every year the European Parliament spends 300 million euros or 30% of its budget on translating all parliamentary debates and EU documents into 20 official European languages. The European Union spends 1.1 billion euros a year, or 1% of its budget, on translation and interpretation services. The EU spends 1.1 billion euros a year on translation services for Internet pages, which make up a significant part of the translation industry” [17, c.3]. The economic consequences of poor-quality translation are also great. According to statistics, the costs of the European Commission for reviewing and processing errors in the translation of documents amount to 547,500 euros annually, including 400,000 euros for the administration of error correction requests and

**Table 1.** Ranking of the top 30 companies

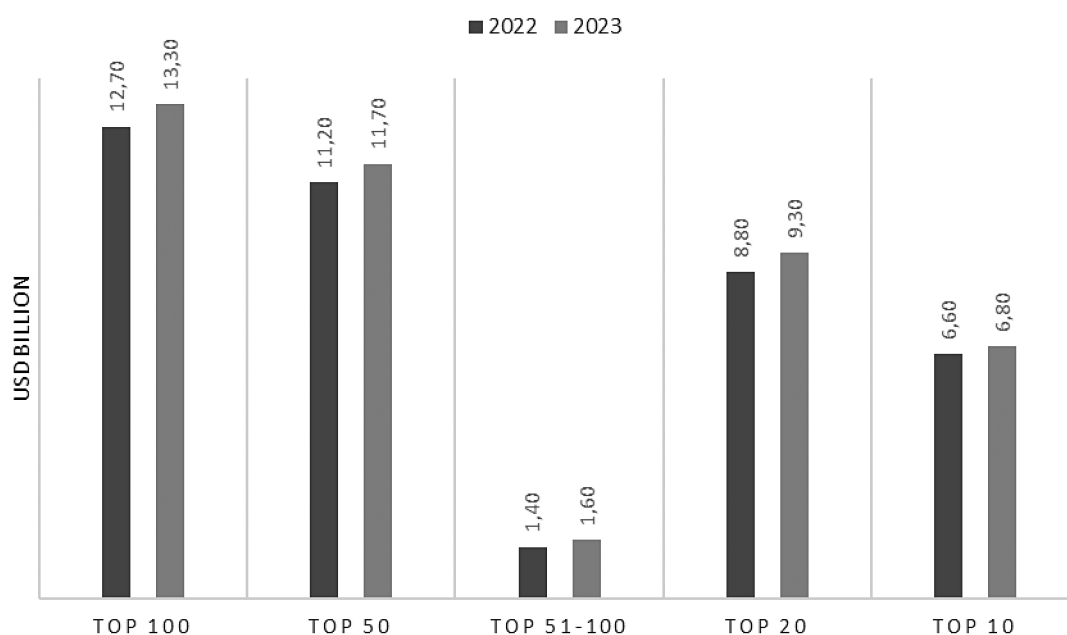
Rank	Company	Country	2023 Revenue (USD million)	Main business
1.	Trans Perfect	United States	1,200	translation, life sciences, legal
2.	LanguageLine Solutions	United States	963.0	interpreting, translation and localization, healthcare, government
3.	RWS	United Kingdom	912.7	translation, patents, life sciences, IT
4.	Sorenson Communications	United States	858.0	sign language interpreting
5.	Keywords Studios	Ireland	844.2	video game services
6.	Lionbridge	United States	599.5	translation, life sciences, technology, legal, games & entertainment
7.	Iyuno	United States	420.0	media localization
8.	Translate plus	United Kingdom	379.6	translation, dubbing, manufacturing, marketing
9.	President Translation Service Group International (PTSGI)	Taiwan	353.0	translation & localization, interpreting, healthcare, video games, financial & legal, life sciences
10.	Poletowin Pitcrew Holdings	Japan	323.2	translation, video game services
11.	Welocalize	United States	306.2	translation & localization, data & AI, technology, legal, life sciences
12.	Hogarth Worldwide	United Kingdom	298.0	communications company, localization
13.	Acolad Group	France	281.4	translation & localization, manufacturing, life sciences, government
14.	Appen	Australia	273.0	data company
15.	AMN Language Services	United States	260.0	interpreting, healthcare
16.	GienTech	China	241.7	translation & localization, language testing & QA, technology, IT & software
17.	Centific	United States	238.0	localization, data curation, global experiences
18.	STARGroup	Switzerland	213.6	translation & localization, platform licensing, automotive & aviation, manufacturing
19.	CyraCom International	United States	192,5	interpreting, translation, healthcare, insurance, government
20.	Translation Bureau	Canada	158.0	translation & localization, interpreting, government
21.	Pixelogic Media	United States	141.6	media localization
22.	Dubbing Brothers	France	132.0	dubbing & audio, subtitling, media & entertainment
23.	Propio Language Services	United States	125.0	healthcare, government
24.	STAR7	Italy	113.6	translation & localization services, manufacturing, IT

Rank	Company	Country	2023 Revenue (USD million)	Main business
25.	VSI	United Kingdom	108.2	media localization
26.	(GTCOM) Global Tone Communication Technology	China	104.1	language technology, translation, data & AI
27.	Visual Data Media Services	United States	102.7	media localization
28.	Datawords	France	93.1	translation, marketing
29.	thebigword	United Kingdom	91.1	interpreting, translation, government
30.	BIG Language Solutions	United States	90.0	translation, interpreting, education, legal, healthcare, life sciences, financial

*Note* — *Source*: Author’s development based on [24].

147,500 euros for error correction by translators. The director of one of the translation companies points out the annual uncontrolled and unaccounted for in accounting documents costs of companies for translation services, ranging from 0.5 to 2.5% of revenues and sometimes reaching 5%. These are millions of dollars that are spent on “translation projects covering product development, marketing, creation of international websites, human resources, administrative management and legal issues”.

Thus, today the industry of translation services sells products commensurate in volume with the branches of the traditional economy and which become the most important lever of accelerated economic development, integration of states into global economic processes and an instrument of political influence in the region and the world, for example machine translation, the use of artificial intelligence, post-editing and other services related to electronic translation, as well as audiovisual localization, translation



**Figure 3.** Growth of the rating companies in the period 2022-2023.

*Note* — *Source*: Author’s development based on [24].

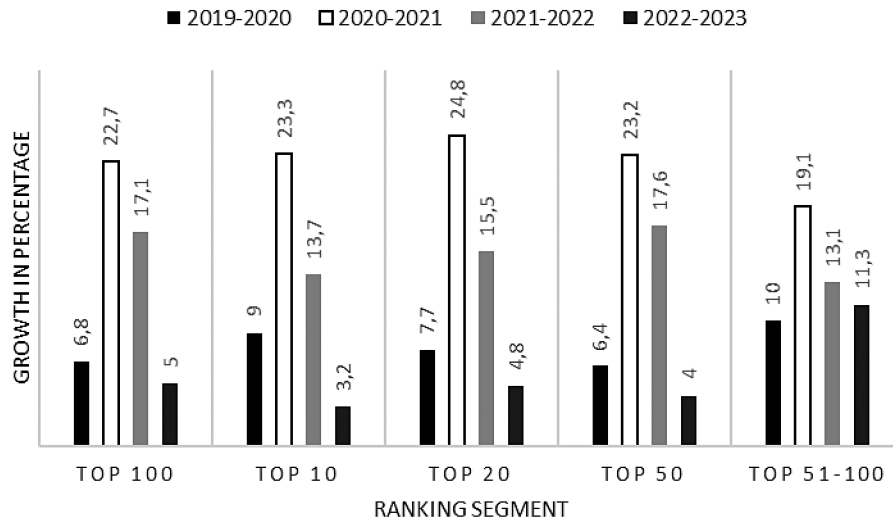


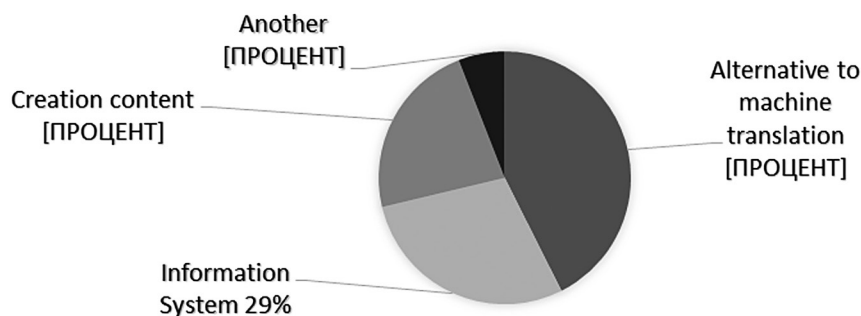
Figure 4. Growth of the rating companies in the period 2019-2023.

Note — Source: Author’s development based on [24].

of video games, websites, identified as the most promising areas for the growth of the translation services industry, in comparison with traditional translation (oral or written). The main trends in the development of the translation services industry are the following:

1. The increase in the number of business services in global trade, small businesses have increased the use of translation services, not only multinational corporations, all this is due to the growth of digitization of content and an increase in the level of customer service, which is becoming international.
2. The expansion and increase of international trade, led to an increase in the volume of international trade operations around the world, the use of the Internet against the background of the COVID-19 pandemic, combined with the trend towards content marketing, for example, advertising and marketing on social networks, aimed at a foreign audience, this led to the opening of new opportunities for the language industry which is one of the key factors stimulating the development of the industry. Thus, the translation services industry is estimated at 76.78 billion US dollars in 2024, it is expected to reach 104.31 billion US dollars by 2029. The improvement and further development of machine translation, artificial intelligence, all this will contribute to the further development of the translation services mar-

- ket, thus the volume of the global translation industry will reach 305.1 million US dollars by 2027, demonstrating a growth rate of 11.08% during 2021-2027. There are 4 popular machine translation systems in the translation services industry — Amazon Translate, DeepL, Google Translate and Microsoft Translator — have been evaluated based on BLEU ratings to determine the quality of translation. This trend is primarily due to the factors of scientific and technological progress that have made it possible to trade translation services using electronic systems. This trend is explained by the growing popularity and the need for companies around the world to use translation services in order to ensure stable growth, efficient business and improve their investment attractiveness.
3. According to the results of the European Language Industry Survey 2024 (ELIS), the use of artificial intelligence in the linguistic industry is currently still at the initial stage of development and growth, but the use of automated translation continues to grow. At the current rate, it is expected that by 2025, more than 50% of professional translations will use some form of machine translation. Since machine translation (MT) is increasingly using artificial intelligence to quickly translate material, with human translation support. The two most common machine translation systems are statistical machine translation (SMT)



**Figure 5.** Areas of artificial intelligence distribution

Note — Source: Author's development based on [23].

and the newer neural machine translation (NMT). Thus, according to translators, using machine translation software can increase their productivity by at least 30%. At the current rate of development, it is expected that by 2025 machine translation will be used in most professional translation work. The average revenue growth rate of companies using machine translation is estimated at \$800 million in 2022 and is expected to grow by more than 30% between 2023 and 2030.

Thus, artificial intelligence increases the efficiency of further development of machine translation, but most companies consider artificial intelligence to be a potential threat to the future of human translation than machine translation has ever been. The reason for this is the instant spread of artificial intelligence, thereby displacing companies and self-employed specialists from the market who offer only human translation (figure 5).

Machine translation and artificial intelligence-driven tools are revolutionizing the world of translation. As a result, trends in translation, as well as localization, indicate that in the near future there will be a closer integration of man and machine.

**Conclusion.** Thus, the existence and development of companies is directly dependent on the information flows circulating both in the internal and external environment. Consequently, the success of an organization in conditions of uncertainty and risk will depend on the completeness, efficiency and quality of the information provided and processed. The industry of translation services is developing as the main supplier of such a factor of production as the translation of information into various languages. Informatization combined

with the trend towards content marketing, for example, advertising and social media marketing, are aimed at a foreign audience, which leads to the opening of new opportunities for the translation industry, and the need for multilingual services is increasing. There are many factors that influence the growth dynamics of this industry, such as the development of technologies that not only improve the translation process, but also expand the boundaries of the availability of translation services.

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# AIRPORT HOTELS AS A SUBSEGMENT OF INTERNATIONAL HOTEL INDUSTRY

*Ph.D. in Economics*

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**RESUME.** The article identifies the factors contributing to the development of airport hotels; presents approaches to the classification of airport hotels and a description of the characteristic features of them; lists the main categories of consumers; provides practical aspects of the development process and the specifics of operation management at airport hotels. The conclusion is made about the high potential for the development of the airport hotels in the future, about the need to understand all the characteristic features of the functioning of this subsegment for its economically efficient functioning, as well as about the importance of considering its work not only at the hotel level, but also at the airport level as a whole, that is, to approach this issue comprehensively.

**KEY WORDS:** airport hotel, international hotel industry, airport infrastructure, capsule hotel.

**Introduction.** In 2023, the global number of air passengers amounted to about 4.5 billion people [1]; by the end of 2024 this figure is expected to reach just below 5 billion people [2], and the global number of air passengers was forecast to grow by 3.8 percent annually until 2043 [3]. There are more than 40 thousand airports in the world [4].

The high level of competition, accompanied by an increase in passenger traffic, which will continue to grow in the future, pushes airports to develop infrastructure, providing passengers with the most comfortable conditions during their travel. The creation of a multifunctional infrastructure at the airport, including hotels, increases the overall attractiveness of the airport, and also helps to attract more transit passengers.

In addition, due to the constantly growing number of air passengers, airports are striving to develop infrastructure and develop as urban planning entities in order to meet the need for mobility and the level of service of modern society at the proper level, which thus ensures the formation of non-aeronautical revenues in the airport budget structure. According to ACI World, in the period before the pandemic (2019), aeronautical income typically accounted for 54% of all revenues and non-aeronautical revenues for 40%. [5]. Diversification of income sources allows airports to ensure greater economic stability.

**Main part.** Until the 2000s, the main purpose of airport hotels was mainly to provide short-term accommodation. Since the mid-

2000s, the concept of airport hotels has begun to change. More sophisticated and design-focused, these properties offer amenities tailored to the savvy traveler, increasing their relevance to both business and leisure travelers. The rise of “bleisure” travel, in which business guests extend their stays to include a weekend, has fueled interest in airport hotels as conveniently located territory of hospitality.

An airport hotel is a collective accommodation facility located directly at the airport or on the territory adjacent to the airport, providing short-term accommodation, meals, as well as various additional services (transport, entertainment and leisure, conference rooms, sports and spa services, etc.) for transit, business travelers, airline crew and other consumers of hotel services.

Information on the total number of airport hotels in the world is not provided in open statistical sources. At the same time, it can be assumed that the annual development of airport hotels in the world has a positive trend, as evidenced by the following STR data: demand for rooms at airport hotels around the world increased from 55 million nights in 2010 to 65 million nights in 2016 (+18%) [6]

The target audience of airport hotels includes: mainly transit passengers who missed a flight or have a long connection between flights; business travelers; travelers with early departures; passengers whose flights were canceled due to weather conditions or whose flights are delayed; airline crew; families with children; tourists. The results of a study con-



ducted in 2015 by Hilton was shown that more than a half of the respondents stayed at an airport hotel during a business trip (China – 89%; USA – 72%; Great Britain – 66%; Netherlands – 64%; Germany – 61%); about 70% of respondents confirmed that being late for a flight or an inconvenient connection is the reason why they would prefer to stay at an airport hotel [7].

Event organizers and their participants represent another category of consumers, as airport hotels are becoming increasingly popular as venues for world-class conferences, meetings and corporate events.

In international practice, there is a wide variety of approaches used around the world to classify hotels. At the same time, airport hotels represent a somewhat specialized subsegment that has its own unique characteristics, which forms a number of criteria for classification, characteristic exclusively of airport hotels.

Depending on the location relative to the airport, hotels are divided into: hotels located on the airport territory (on-airport hotels); hotels located outside the airport (off-airport hotels); hotels on the airport campus (on-campus airport hotels); hotels in the airport service area (catchment airport hotels) [8].

Depending on the location relative to passport and customs control, airport hotels are divided into:

- landside hotels – hotels that are located before the transit territory (in the airport building or on the territory belonging to the airport, as well as outside it within a radius of 5 km), their services can be used by everyone;
- airside hotels – hotels that are located on the transit territory, i.e. after the border control zone, and only those passengers who have passed border control or transit passengers who have arrived at the airport and have not yet passed border control can use their services.

The main purpose of airside hotels is to provide the maximum level of comfort for transit travelers. As a rule, the cost of services in these hotels is much higher than in landside airport hotels or city hotels; they are available at larger airports with large passenger traffic, which are transport hubs and have numerous connecting flights; they provide the opportunity to book a room both for a day and for a certain number of hours, which is very con-

venient for travelers, those who want to refresh themselves and relax between flights; the short-term accommodation option includes access to necessary amenities such as a separate shower, bed, wireless Internet; a longer stay is of interest to passengers with long stops and includes a hotel room conveniently located near the boarding gate; rooms may be small in size, do not have a beautiful view from the window, at the same time be the most comfortable way to spend time between flights. A large number of transit passengers is a prerequisite for the successful operation of this type of hotel, so they are represented only in the busiest transit airports around the world. They are very often presented in the capsule hotel format.

Depending on the location relative to the terminal, hotels are divided into: in-terminal hotels (located directly on the territory of the airport terminal; can be either airside or land-side); terminal-linked or terminal adjacent hotel (located on the territory of the airport and have direct access to one or more terminals); hotels without access to the terminal (were built couple decades ago, at a time when there was no high demand on in-terminal or terminal-linked hotels).

Hotels that have a direct connection to the airport terminal definitely have a competitive advantage over other hotels. This is confirmed by international studies of airport hotels in some European countries, indicating an average annual occupancy rate of 80 to 95% and an average room rate (ADR), as a rule, 40% higher than that of competitors at the airport; other hotel departments, including catering and bars, will also generate a higher level of income in terminal-linked or in-terminal hotels [9, p.15].

Depending on the degree of accessibility, airport hotels are divided into walkable airport hotels and hotels, access to which is organized by shuttle bus or any other transport.

Capsule hotels are actively developing as infrastructure elements of airports. The most famous brands of capsule hotels are GoSleep, Nap Cabs, Sleep Pod, Snooze At My Space, Snoozecube, Yotel, Minute Suites. Capsule hotel format options at airports: cell (Gettsleep); pod (GoSleep); cabin (Nap Cabs, Sleep Pod); separate room (Yotel, Minute Suites, Air Express). According to Allied Market Research, the global capsule hotel market in 2023 amounted to \$216.5 million and is projected to

reach \$460.7 million by 2033; the growth rate between 2024 and 2033 will be 7.9%. As for the regional distribution, the highest level of development of capsule hotels is represented in the Asia-Pacific region [10].

Having studied the opinions of experts specializing in the construction and management of airport hotels, it is important to consider the following points:

- the number and types of airport hotels vary a lot depending on the market, and although airline passenger traffic is an important factor, this is not the only factor determining the demand for these hotels: distance from the city, the level of transport development, transportation patterns, infrastructure development near the airport, the availability of other hotels, weather conditions, nature disaster, etc.
- conducting a preliminary market demand study is a mandatory stage in the design and construction of an airport hotel;
- when choosing to build an in-terminal or terminal-adjacent hotel, it is important to understand the prospects for possible expansion of the airport in the future and the possibility of transformation of the hotel during reconstruction;
- ground leases assume that the airport continues to own the land and collect rent for the land, the developer owns the hotel; after the lease period, the land and the hotel are returned to the airport. The initial terms of the ground lease are usually long (at least 50 years), followed by several extension periods (up to 99 years in total). Options for extending the ground lease are discussed and implemented in advance; the developer needs certainty to maintain the competitiveness of his asset and the possibility of reselling it if necessary. An additional major renovation of the hotel may be a prerequisite when discussing the possibility of extending the rental period. The terms of the rent may vary: fixed or interest rate of rent. Rental benefits are possible, especially in the first years of operation. The ground lease contains requirements for the implementation of standards and requirements related to airport facilities, as well as a number of possible restrictions.
- hotel facilities that are located on the territory of the terminal or have direct access to the terminal are often owned by the air-

port, providing a number of advantages: long-term control over the asset and the absence of the possibility of payments to a third party for termination of the lease agreement on favorable terms if necessary to transfer the hotel; shorter duration of the hotel management agreement and/or franchise agreements than ground leases; potentially higher profitability.

- Hotel contracts are complex, and the consequences and risks associated with even seemingly innocuous provisions must be carefully assessed in the context of a long-term perspective (maintenance and operation standards, buy-out provisions if the hotel area is required for redevelopment, exclusivity zones, interpretation of rent adjustment provisions, restrictions on the construction of new hotels, etc.).

Due to the lack of competition, the quality of services provided in airport hotels may not be good enough, citing the large flow of guests, as well as the importance of optimizing the efficiency and capacity of the hotel facility. This is due to the fact that the growth rate of air passenger numbers in the last two decades before the pandemic significantly exceeded the rate of construction of hotel infrastructure at airports, and as a result, airports and airport hotel management companies tend to focus on managing the growth in the number of hotel consumers, i.e. on managing demand growth, not on creating it.

The economic effectiveness of the operation of the hotel on the territory of the airport or located near it depends both directly on the hotel itself and on the airport.

Airport hotels have their own specifics of functioning, which is reflected in the organization of operational processes: check-in and check-out of guests is carried out constantly throughout the day; responsible attitude to guests' requests to set an alarm clock, as well as make sure that guests do not miss their flight; round-the-clock room cleaning service; due to noise as an inevitable fact of airports, except for the presence of additional sound insulation in airport hotels, it is important that the staff take care of the guests (no noise from cleaning trolleys); the organization of a 24-hour free shuttle service on a strict schedule and many other issues. But in addition to specific operational tasks, it is extremely important to take responsibility for the quality of services provided, as this dir-

ectly affects the desire of guests to return to the hotel and the economic results of the hotel.

OR Tambo International Airport is the largest airport in Africa, located near Johannesburg, South Africa. Airport hotels and located near the airport had a hotel occupancy rate and a revenue per available room (RevPAR) lower than the industry average. In 2018, a study was conducted, the main purpose of which is to better understand the customers experiences and their intentions to return to hotels again. The results of this study showed that “reliability” (reliable and accurate provision of promised services), “empathy” (caring and individual approach to the client) and “assurance” (the presence of well-informed, polite and trustworthy employees) these are the attributes contributing to customers’ experiences in airport hotels of OR Tambo International Airport. Reliability and overall hotel experience were defined as important attributes for hotel customers’ decision to return to hotels in airports. Despite the convenience of staying in a hotel near the airport, non-compliance with the “reliability” will form negative impressions about the hotel and lack of desire to return again, which negatively affects the occupancy rates and RevPAR [11].

It is important to understand that the result of the operation of the hotel at or near the airport depends to some extent on the organization of the airport itself. Obviously, in recent decades, income from non-aeronautical activities (e.g. restaurants, shops, parking, hotels) has become a key source of income for airports, leading to fundamental changes in the way many airports operate. In order for the passengers to spend money at the airport, they must be set up for this. Achieving this goal is possible by ensuring a stable quality of passenger service throughout their entire journey (from the moment of arrival at the airport to the moment of takeoff).

Several studies have shown that increasing passenger satisfaction has a direct impact on the amount spent on restaurants and shops. Airports that were able to increase their satisfaction level by 0.1 (on a scale from 1 to 5), on average, benefited from an increase of \$0.8 in their non-aeronautical revenues per departing passenger. For a medium-sized airport, this represents an annual constant net revenue of \$10 million, which has a significant impact on their profits [12].

**Conclusion.** Despite the fact that the first airports, and, consequently, airport hotels, appeared almost a hundred years ago, the process of forming airport hotels into a separate subsegment of the global hotel industry dates back only a couple of decades; at the moment, it demonstrates high potential for development in the future. The most attractive for hotel investments are on-airport hotels, namely inter-terminal or terminal-linked and airside hotels. When developing an airport as a transit hub, it is advisable to develop airside hotels; when developing an airport and its nearby infrastructure to the level of a city, it is advisable to build landside hotels, accessible not only to air passengers. Economically efficient functioning of airport hotels requires the involving of professionals in this process who do understand all the characteristic features of the functioning of this subsegment. The exclusive location of airport hotels generates high demand from investors, but it is most rational from the airport’s point of view to retain ownership of such hotels, which will reduce the risks of additional costs in case of an airport reconstruction in future.

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Подписано в печать 26.12.2024.  
Формат 60×84/8. Бумага офсетная. Печать цифровая.  
Усл. печ. л. 55,8. Уч.-изд. л. 48,45.  
Тираж 30 экз.  
Заказ .



