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INTRODUCTION

We are happy to invite you to get acquainted with the first issue of the new scientific and practical publication "Intellectualization of Logistics and Supply Chain Management".

We strongly believe that the launch of this magazine indicates the objective need to rethink a wide range of issues related to the development of theory and practice in logistics and supply chain management, awareness of the need to unite the scientific community and logistics practitioners, dissemination of modern knowledge and best practices for innovative development of the logistics services market.

The first issue of the magazine is published at a difficult time. The global coronavirus pandemic and the deep economic crisis have significantly worsened business activity in the world. Currently, global supply chains are collapsing, international trade is declining, and competition between global and regional logistics operators is intensifying. The most common thesis is that the world will never be the same again. Industry experts predict the emergence of new, more flexible and adaptive supply chain management strategies and approaches to logistics business process management. The trend towards collaborations, cooperation and unification of services is emerging, comprehensive proposals for clients are being developed. There is increasing talk about the need to build bimodal supply chains, which involves the development of different decision-making scenarios: the traditional approach - cost-effective efficiency, low risk, high predictability; a new approach "second mode" - rapid recognition of opportunities, adaptability, willingness to solve unexpected problems and look for new opportunities.

Radical transformations of the global and national markets for logistics services require appropriate scientific support. Logistics science has a special role to play in this process. Initiating the emergence of a new journal, we decided to focus on its coverage of problematic aspects of the formation and development of logistics systems at the micro, mezo and macro levels, supply chain management, digitization of logistics, methods and tools for optimizing processes in logistics and supply chains, sociopsychology relations and network interaction of enterprises using cloud technologies, artificial intelligence, e-learning, neural business process management systems, etc.

Therefore, we invite scientists, researchers and business representatives, as well as our colleagues from abroad, to cooperate and present the results of scientific research, to discuss and debate on them, to work together to develop the scientific theory of logistics and promote mutual intellectual enrichment.

We hope that the new scientific publication will become a theoretical guide for young researchers and representatives of other fields.

HRYPHORAK Mariia
Chief Editor



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THE CONCEPT OF NATIONAL INTEGRATED RISK MANAGEMENT OF AIR TRANSPORT OF UKRAINE

Dmytro Bugayko, Yuliya Ierkovska, Fariz Aliyev, Mariia Bahrii. *"The concept of national integrated risk management of aviation transport of Ukraine". In the context of modern conditions of air transport development, the concept of the national air transport integrated risk management system is substantiated. The concept is based on the definition of risk as the probability of occurrence of events in a complex of hazards of different nature, manifestations of safety vulnerabilities, consequences of past negative phenomena and explains the danger of the threat due to determination "maximum potential energy". Its remaining part is subsequently converted into kinetic energy, which affects the safety management system of air transport and has a negative impact on the sustainable development of the national economy as a whole. At the same time, priority attention is paid to the list of hazards by the criterion of deviation from the point of sustainable development, the importance of the impact of threats on the coefficient of elasticity, which allows more adequate assessment of hazards and respond to them. The classification of the main risks in the functioning of Ukrainian air transport has been developed, which includes the negative consequences of the*

COVID-19 pandemic, reduction of export-import operations in the economic downturn, number of flights and air passenger traffic, low congestion of airports and air infrastructure. Risks are identified in the following areas of operation and development of air transport in Ukraine: export-import operations, aviation infrastructure, air cargo, airports, air navigation service providers and general aviation, which allows early detection of risks and response to them. The concept was implemented by the State Aviation Regulation Department of the Ministry of Defense of Ukraine, the State Civil Aviation Agency of Azerbaijan, Almaty International Airport (Kazakhstan), Ukraine-Air Alliance, ICAO NAU Institute, Georgian Aviation Training Center (Georgia).

Keywords: air transport, concept, national management of integrated risks, state regulation, aviation safety, hazards.

Дмитро Бугайко, Юлія Єрковська, Фаріз Алієв, Марія Багрій. "Концепція національного управління інтегрованими ризиками авіаційного транспорту України". У контексті сучасних умов розвитку авіаційного транспорту обґрунтовано концепцію національної системи управління інтегральними ризиками авіаційного транспорту. Концепція базується на визначенні ризику, як імовірності виникнення подій у результаті взаємодії в комплексі загроз різної природи, проявів вразливості системи безпеки, наслідків минулих негативних явищ, а також пояснює небезпечність впливу загрози поняттям «максимальна потенційна енергія», яка проникає скрізь різні ієрархічні системи захисту, а її залишкова частина в подальшому перетворюється на кінетичну енергію, що вражає систему безпеки авіаційного транспорту та має негативний вплив на сталий розвиток національної економіки загалом. При цьому першочергову увагу приділено переліку загроз за критерієм відхилення від точки сталого розвитку, вагомості впливу загроз за коефіцієнтом еластичності, що дозволяє більш адекватно оцінювати загрози та реагувати на них. Розроблено класифікацію основних ризиків у функціонуванні авіаційного транспорту України, яка включає негативні наслідки пандемії COVID-19, зменшення обсягу експортно-імпорتنних операцій в умовах спаду економіки, кількості рейсів та обсягів авіап перевезень пасажирів, низьку завантаженість аеропортів та авіаційної інфраструктури. Ризики визначено за такими напрямками функціонування та розвитку авіаційного транспорту України: експортно-імпорتنні операції, авіаційна інфраструктура, вантажні авіаційні перевезення, аеропорти, провайдери аеронавігаційного обслуговування та авіації загального призначення, що уможливорює випереджаюче виявлення ризиків і реагування на них. Концепцію впроваджено Управлінням регулювання діяльності державної авіації Міністерства оборони України, Державним агентством цивільної авіації Азербайджану, Міжнародним аеропортом Алмати (Казахстан), авіакомпанією «Україна-Аероальянс», Інститутом ІКАО НАУ, Грузинським авіаційним навчальним центром (Грузія).

Ключові слова: авіаційний транспорт, концепція, національне управління інтегрованими ризиками, державне регулювання, безпека авіації, загрози.

Дмитрий Бугайко, Юлия Ерковская, Фариз Алиев, Мария Багрий. "Концепция национального управления интегрированными рисками авиационного транспорта Украины". В контексте современных условий развития авиационного транспорта обоснована концепция национальной системы управления интегральными рисками авиационного транспорта. Концепция базируется на определении риска, как вероятности возникновения событий в результате взаимодействия в комплексе угроз различной природы, проявлений уязвимости системы безопасности, последствий прошлых негативных явлений, а также объясняет опасность влияния угрозы понятием «максимальная потенциальная энергия», проникающая везде в различные иерархические системы защиты, а ее остаточная часть в дальнейшем превращается в кинетическую энергию, что поражает систему безопасности авиационного транспорта и оказывает негативное влияние на устойчивое развитие национальной экономики в целом. При этом первоочередное внимание уделено перечню угроз по критерию отклонения от точки устойчивого развития, весу влияния угроз по коэффициенту эластичности, что позволяет более адекватно оценивать угрозы и реагировать на них. Разработана классификация основных рисков в функционировании авиационного транспорта Украины, которая включает негативные последствия пандемии COVID-19, уменьшение объема экспортно-импортных операций в условиях спада экономики, количества рейсов и объемов авиап перевозок пассажиров, низкую загрузженность

аэропортов и авиационной инфраструктуры. Риски определены по направлениям функционирования и развития авиационного транспорта Украины: экспортно-импортные операции, авиационная инфраструктура, грузовые авиационные перевозки, аэропорты, провайдеры аэронавигационного обслуживания и авиации общего назначения, что позволяет опережающее выявление рисков и реагирования на них. Концепция внедрена Управлением регулирования деятельности государственной авиации Министерства обороны Украины, Государственным агентством гражданской авиации Азербайджана, Международным аэропортом Алматы (Казахстан), авиакомпанией «Украина-Аэроальянс», Институтом ИКАО НАУ, Грузинским авиационным учебным центром (Грузия).

Ключевые слова: авиационный транспорт, концепция, национальное управление интегрированными рисками, государственное регулирование, безопасность авиации, угрозы.

Introduction. In the system of advanced risk management, the hazard has the maximum potential energy, which can directly damage the air transport system in particular and indirectly cause negative consequences for the sustainable development of the national economy as a whole.

With this view of the problem, an effective mechanism for anticipating risk management of hierarchical systems is to manage the degree of vulnerability of the system using the model of "Swiss cheese" J. Reason (Reason J. (1997)) [1] and structural analysis of deficiencies (GAP Analysis) at the level of active and passive systems of protection of the air transport system, namely: equipment and technologies, norms, rules and regulations and personnel training / retraining systems. Identifying vulnerable or under protected sites (GAPs) at the level of each protection system, as well as analyzing their interconnectedness or singularity with respect to the passage of a hazards through protection systems, makes it possible to identify hierarchical and complex vulnerabilities to identified threats.

In fact, the answer is what part of the potential energy will be lost due to the opposition of each of the systems of protection of air transport and due to the synergistic effect of their integrated use. All residual energy is converted into kinetic energy and affects air transport due to spontaneous fractalization of negative impact factors, which is assessed as negative consequences of the impact of the threat after its passage through different hierarchical

systems of active and passive protection. In this way, the risk can be assessed as a combination of hazard, vulnerability and consequences (Fig. 1).

The article is a logical continuation of a number of publications devoted to the introduction of a systematic approach to determining the level of sustainable development and development of advanced risk management system for air transport safety management of Ukrainian scientists D. Bugayko [2–4, 6], Y. Kharazishvili [2-5], A. Antonova [4], M. Hryhorak [3], Y. Ierkovska [6], Poland scientists (Z. Zamiar [3-4]) and scientists of other countries. Statistical data for aviation transport risk assessment are taken from the following statistical sources of the State Statistics Service [7], Ministry of Infrastructure [8], the Civil Aviation Authorities [9] and National Bureau for the Investigation of Aviation Accidents and Incidents with Civil Aircraft of Ukraine [10-16].

The purpose of the article is to develop the concept of national integrated risk management of aviation transport of Ukraine at the level of state regulation, which is actually a set of proactive risk reduction measures to support further sustainable development of the national economy.

Presentation of the main results. The concept of national aviation risk management includes:

- classification of the main hazards to air transport in the context of globalization, liberalization and sustainable economic development, taking into account changes in multilateral and bilateral regulation;

- mechanisms for the appointment of airlines, ensuring their national ownership and control, development of new forms of commercial activity and interaction of air transport market participants, commercialization of airports and air navigation service providers, significant growth in air freight and logistics development;
- formation of the list of hazards on the criterion of deviation from the point of sustainable development;
- determining the severity of the impact of hazards on the coefficient of elasticity;

assessment of the vulnerability of the air transport system of Ukraine;

- identifying the most serious negative consequences and using the tools of advanced risk management to counter them, which provides an opportunity to more adequately assess and respond to hazards.

The introduction of the concept of national risk management of air transport allows to increase the effectiveness of early detection and response to emerging risks in changing conditions (Change Management) and uncertainty.

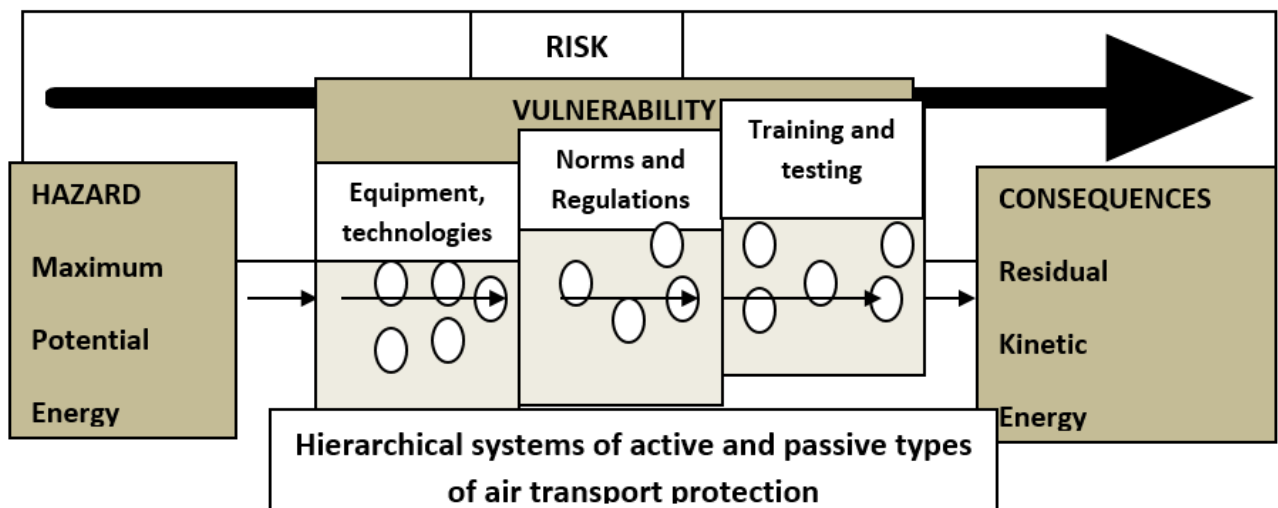


Figure 1. Using the model of "Swiss cheese" by J. Reason in the concept of national aviation risk management

Source: finalized by the authors[1].

Risk integration is carried out in the following areas: economic, environmental, social, technological, flight safety, aviation security and protection against terrorism, foreign policy, logistics and related sectors (Fig. 2). Advance management of integrated risks allows to obtain a positive synergetic effect at the level of sustainable national economy

Risks of the national air transport of Ukraine in the conditions of globalization of the world market of air transportation. For more than half a century, the international air

transport industry has been developing on the basis of clearly defined legal, economic, regulatory and organizational principles set out in the 1944 Chicago Convention (International Civil Aviation Convention). Convention covers issues of implementation of international air transport, propose standard intergovernmental agreements on "transit" and the Chicago type, which are chosen as the basis for all interstate agreements in the field of international air transport.

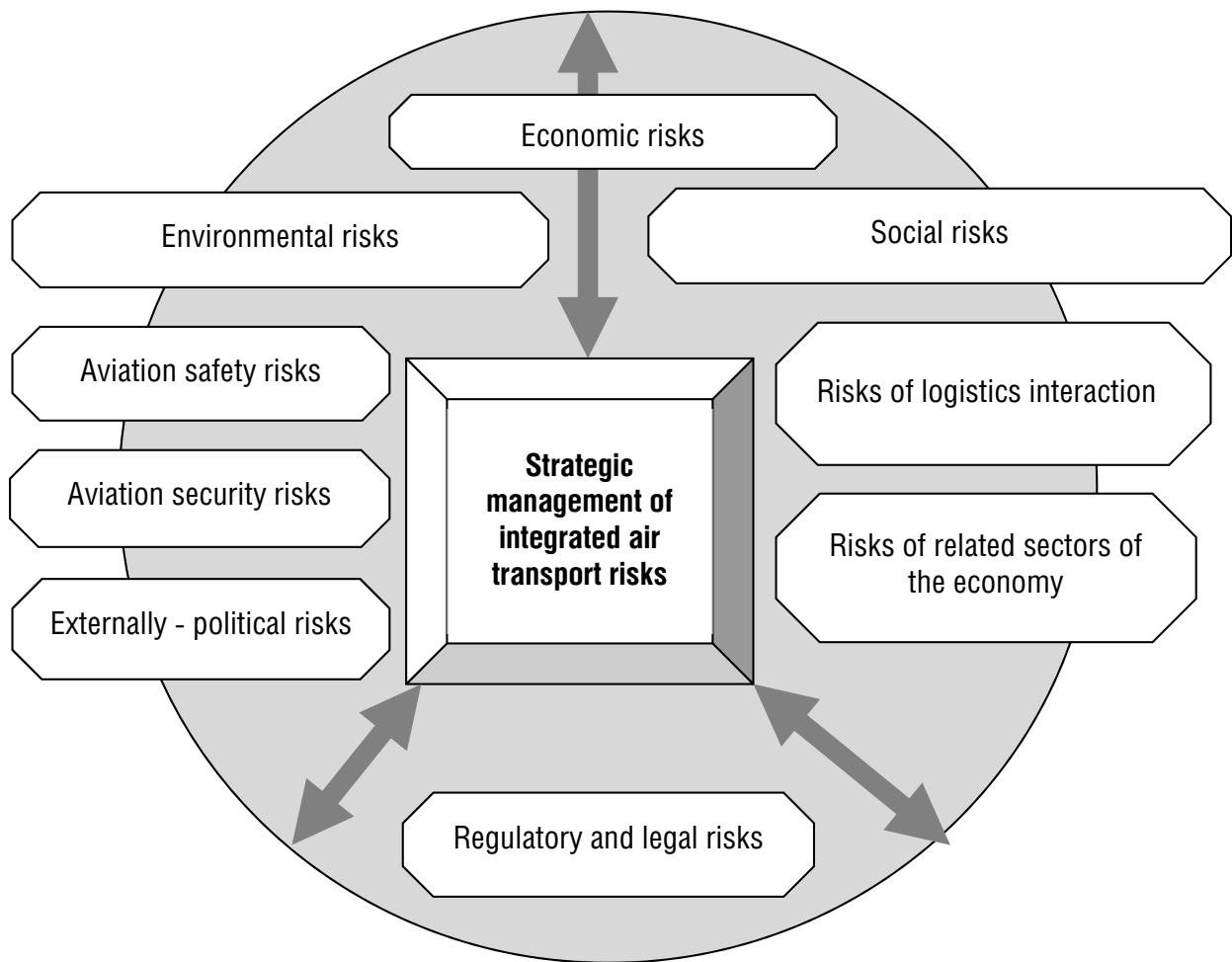


Figure 2. Integrated risks of air transport

Source: developed by the authors

The years of international air transport are characterized by the development and application of well-established mechanisms to protect their own air transport markets and national carriers through interstate agreements such as Bermuda 1 and Bermuda 2, which strictly stipulate commercial issues such as air freedoms, tariffs, capacities, points of sale, conditions of destination of air carriers, predominant ownership and actual control of countries over them, etc.

However, since the 1990s, the globalization of the world economy, on the one hand, and the steady increase in operating costs of air carriers - on the other led to qualitative changes not only commercial policy in civil aviation, but also the development of its international regulatory framework. Among the most

negative factors for air carriers are the destructive impact of the COVID-19 pandemic, the rampant rise in aviation fuel prices, dependence on the negative effects of global and regional financial crises, tragic events related to terrorist organizations (such as September 11, 2001 in the US), natural disasters (volcanic eruptions, tsunamis, earthquakes, etc.).

At the same time, while traditionally states have taken care of the development of their own national airlines, providing them in various ways overt or covert assistance, since the 1980s there has been a clear trend of states to withdraw from this practice. The introduction of this ideology was initiated in the United States, where for the first time state aid was refused in order to intensify competition between airlines.

Unfortunately, there is a very dangerous risk of excessive cost savings, which could potentially lead to a decrease in the level of security of the air carrier. The development of this ideology has led to the de facto refusal of many countries to finance their own airlines. A clear example of this is the de facto ban on financial support for air carriers from EU countries and the application of this principle to airlines operating in the EU air transport market. These trends could not but cause qualitative changes in the global air transport market. This period is marked by a series of high-profile bankruptcies not only of small airlines, but also leaders in the global air transport market. Powerful global airlines are actively using the latest forms of commercial cooperation - multilateral interline agreements, agreements on special rates, code-sharing agreements, which lay the legal basis for the creation of marketing, strategic and global alliances of airlines.

Recent years have been years of global financial transactions, with powerful airlines

from around the world buying up stakes in foreign airlines and de facto controlling foreign markets, leaving them to foreign airlines, despite existing intergovernmental agreements. On the other hand, the opening of markets and the development of regional cooperation opens up opportunities for open dumping in the field of tariff policy, which is successfully used by low-cost airlines, which are rapidly capturing dynamic market segments, such as the air transport market in the EU.

These globalization trends have outlined new requirements for the liberalization of air transport markets and the regulatory framework of interstate agreements. Liberalization at the present stage covers not only the two most powerful air transportation markets - the United States and the EU, but is also spreading rapidly in different regions of the world (Table 1).

Table 1. Types of intergovernmental agreements governing air transport

Trend	Period	Type of intergovernmental agreement	Contents of intergovernmental agreement
Protectionism ↓	1944	Chicago	Does not contain provisions on transportation capacity and tariffs
	1946	Bermuda I	Tariffs are set by airlines on the recommendation of IATA with the subsequent approval of both parties. The establishment of capacity is also the responsibility of airlines within the framework of certain principles with the possibility of joint review by the parties after a certain period of operation
	1977	Bermuda II	Strict restrictions on tariffs and capacity have been set
↓ ↓ ↓ Liberalization	from 1980	Liberal	The issues of commercial regulation are presented in an abbreviated version and provide for autonomous regulation by airlines.
	from 2005 (for Ukraine)	"Horizontal"	Eliminates flight restrictions - a prerequisite for "open skies"
	from 2011 (for Ukraine)	"Open sky"	The principles of free competition are defined - all restrictions on the main elements related to the provision of air transportation are abolished (from 1 to 6 freedom of air)
	2021 with EC		

Source: developed by the authors

It was during this period that regional, multilateral and bilateral agreements were developed with significant expansion of content, departure from traditional regulatory tools and the transition to the model of "open skies" and liberalization of access to national markets for international transport. This reduces or completely eliminates control over commercial issues of international aviation, such as air freedom, tariffs, capacity, frequency of traffic, points of traffic. The procedure for assigning an air carrier to an international airline is undergoing significant changes. Historically, states have generally not granted the right of destination to airlines to airlines that are not in the predominant possession and de facto control of the state or its citizens.

On October 12, 2021, Ukraine and the European Union signed the long-awaited Common Aviation Area Agreement, known as the Open Skies Agreement. bilateral agreements, facilitate the opening of new

routes between Ukrainian and European cities, and as a result - should reduce ticket prices. The EU emphasizes that one of the consequences of signing the agreement should be the entry of new low-cost airlines to Ukraine and increase the tourist attractiveness of Ukraine. The agreement was initialed in 2013, but has not yet been signed due to the British-Spanish dispute over Gibraltar's ownership. As a result of globalization and liberalization, the application of the criterion of national ownership and control has become increasingly impractical. Many carriers are no longer owned by the state, and some have transferred a controlling stake to citizens of their own countries. Some bilateral air service agreements have introduced certain expanded criteria for airline ownership and control. The classification of threats, vulnerabilities, consequences and risks of air transport of Ukraine at the level of its regulation is given in Table 2.

Table 2. Classification of threats, vulnerabilities, consequences and risks of Ukrainian air transport at the level of its regulation¹

Classification of hazards	Vulnerability of protection systems (GAP Analysis)	Consequences	Risks
1. Problems of air transport regulation: 1.1 Changes in aviation safety regulation at the global and regional levels. 1.2 Changes in multilateral and bilateral regulation of the air transportation market. 1.3 Changing the mechanisms of destination of air carriers	1. Imperfection of national aviation legislation: 1.1 Lack of program development and implementation of Safety State Program (SSP). 1.2 Imperfection of mechanisms of protectionism of national airlines by the state. 1.3 Lack of preferences for state and mixed airlines	1. Insufficiently effective national regulation of air transport safety: 1.1 Discretion of management actions and insufficient level of resource provision of air transport safety. 1.2 Financial imbalance of national airlines, complicated by conditions of fierce competition. 1.3 Redistribution of segmentation of the national air transportation market	1. Reducing the level of efficiency and safety of national air transport: 1.1 Problems with maintaining a nationally acceptable level of aviation safety. 1.2 Bankruptcy of national airlines. 1.3 Obtaining the national market by the airlines with 100% foreign capital and control

Source: Dmytro Bugayko, Yuliya Ierkovska.[6].

¹ The list of hazards, vulnerabilities, consequences and risks is not constant. The concept requires the introduction of a system of continuous monitoring of threats and the use of tools for change management (Change Management).

Thus, the globalization of international air transport is a global trend, which, on the one hand, gives airlines more opportunities to develop business, enter new international air transport markets, and on the other - there are many threats - from losing commercial control over their own air transport market to bankruptcy and destruction of national airlines due to fierce competition from financially powerful airlines, members of global airline alliances and low-cost airlines. In the conditions of the COVID-19 pandemic, the well-established mechanisms of economic security of air transport are losing their effectiveness and require integrated application of advanced risk management.

Risks of the national aviation transport of Ukraine in the conditions of the COVID-19 pandemic. One of the most threatening problems in the history of aviation is the spread of the new coronavirus infection COVID-19, which in fact leads to a quarantine blockade of entire regions and a sharp reduction in the number of air traffic or even their ban. Demand for air travel has declined sharply due to the spread of the coronavirus and flight restrictions in many countries. This creates big problems not only for air carriers, but also for airlines and their suppliers. As a result of the COVID-19 pandemic, air traffic

"fell" in a way that was not observed after the aftermath of the September 11, 2001 terrorist attacks in the United States. A significant reduction in the number of passengers has led to the flight of aircraft empty between airports and the cancellation of flights. Global demand for air travel has fallen by 70% compared to last year, and millions of jobs are at risk. Global airlines are even preparing for the possible voluntary termination of almost all international and domestic flights due to declining demand. In total, according to preliminary estimates of the International Air Transport Association (IATA), airlines could lose more than \$ 250 billion. because of the pandemic. Sydney-based consulting firm CAPA gives an even more pessimistic forecast. She predicts that a coronavirus pandemic could lead to the bankruptcy of most airlines around the world if the authorities refuse to agree on steps to avoid such a situation.

The COVID-19 pandemic has had a significant impact on the aviation industry due to the effects of travel restrictions as well as falling demand among travelers. In assessing the economic impact on civil aviation, ICAO is working with many different scenarios to reflect the very uncertain nature of the current situation and the rapidly changing environment (Fig. 3).

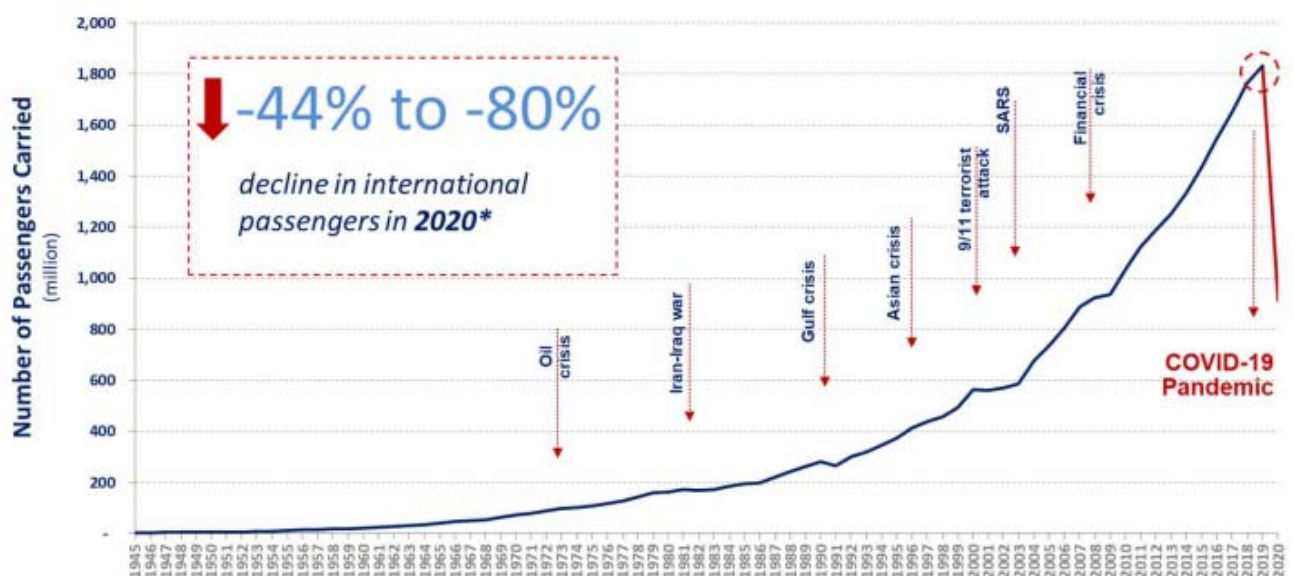


Figure 3 - The evolution of global air transport in the period up to 2020

Source: ICAO / Economic Development - Air Transport Bureau (2021) [17].

Therefore, according to the ICAO forecast, the global impact of COVID-19 on aviation, tourism, trade and the economy is expected, namely:

international air passenger traffic - total reduction of the number of international passengers in the range from 44 to 80% (ICAO);

airports - estimated losses of more than 50% of passenger traffic and 57%, or more than 97 billion dollars. USA, in revenue of airports (ACI);

airlines - reduction of passenger km revenue by 48% (RPK - both international and domestic) (IATA);

tourism - reduction of revenues from international tourism will be from 910 to 1170 billion dollars. US compared to 1.5 trillion in 2019, with 96% of the world's destinations have travel restrictions (UFTAA);

trade - a decrease in world trade in goods by 13-32% compared to 2019 (WTO);

the world economy - the projected reduction in world GDP by 3% in 2020 is much worse than during the financial crisis of 2008-2009 (IMF) (ICAO / Economic Development - Air Transport Bureau (2021)).

Global trends fully affect the economy of air transport in Ukraine. Operational statistics of the aviation industry of Ukraine in 2020 and 2021 allow us to assess the devastating impact of the pandemic on the functioning of the industry. The global pandemic situation associated with the COVID-19 outbreak and the restrictions imposed by states to counter its spread have directly affected the world's aviation industry, including Ukraine. In 2020, there is a significant reduction in the production performance of aviation enterprises compared to the previous year (Table 3) (CAA Ukraine (2021)) [18].

Table 3. Dynamics of production indicators of Ukrainian air transport enterprises in the conditions of the COVID-19 pandemic

Indicator	Total			Including international		
	2019	2020	% 2020/2019	2019	2020	% 2020/2019
Activities of airlines						
Passengers were transported, thousands of people	13705	4797,5	35,0	12547	4287,7	34,2
including on regular lines, thousand people	8267,8	1788,1	21,6	7122,6	1284,6	18,0
Passenger-kilometers, billion pass-kilometers are executed	30,2	10,1	33,5	29,7	9,8	33,0
including on regular lines, billion pass-km	17,5	3,1	17,7	17,0	2,9	17,1
Freight and mail transported, thousand tons	92,6	88,3	95,4	92,0	88,0	95,7
including on regular lines, thousand tons	19,6	5,7	29,1	19,4	5,6	28,9
Completed tonne-kilometers (cargo + mail), million tkm	295,6	316,2	107,0	295,2	316,1	107,1
including on regular flights, million tkm	93,0	18,4	19,8	92,9	18,4	19,8
Made commercial flights, thousand	103,3	45,3	43,9	86,7	35,3	40,7
including regular, thousand	66,6	20,4	30,6	51,7	11,8	22,8
Airport activities						
Sent and arrived aircraft, thousand units	201,2	94,0	46,7	162,7	69,0	42,4
including on regular flights, thousand units	153,6	58,6	38,2	124,9	41,7	33,4
Passenger traffic, thousand people	24334	8664,5	35,6	21994	7628,9	34,7
including on regular flights, thousand people	18833	5643,5	30,0	16530	4627,2	28,0
Mail and cargo flows, thousand tons	60,2	52,2	86,7	58,4	51,5	88,2
including on regular flights, thousand tons	54,1	40,8	75,4	53,0	40,4	76,2

Source: CAA Ukraine (2021) [18].

Activities of airlines. During 2020, passenger and cargo transportation was provided by 26 domestic airlines (in 2019 - 29), which performed a total of 45.3 thousand commercial flights (against 103.3 thousand flights in 2019). The aggravation of the epidemic situation in Ukraine and the world led to a decline in demand for air transportation and a decrease in commercial traffic at the end of the first quarter of 2020. As a result, airlines were forced to reduce frequency or cancel most flights. At the same time, due to the introduction of restrictive measures by the Government of Ukraine in the framework of combating the spread of COVID-19, both international (from March 17 to June 15) and domestic (from March 24 to June 5) passenger flights were almost suspended. In addition, temporary restrictions on crossing the Ukrainian border for foreign nationals were reintroduced (from August 28 to September 28), which, together with the extension of restrictions on entry of Ukrainian citizens to certain countries, significantly restrained demand in the air transport market (CAA Ukraine) 2021) [18].

These factors had a negative impact on the dynamics of passenger traffic of domestic airlines. Thus, for the first quarter of 2020, the reduction compared to the same period in 2019 was 17.7%, for the second quarter, which was the peak of restrictive measures - 98.3%. However, after the resumption of passenger flights in June, the rate of decline in traffic slowed down significantly and in the third and fourth quarters amounted to 61.4 and 66.2%, respectively. In general, during the reporting year the number of passengers who used the services of domestic airlines decreased compared to 2019 by 65% and amounted to 4797.5 thousand people. At the same time, the volume of passenger traffic by air transport of Ukraine returned to approximately the level of 2006-2007, when this figure was 4208.3 and 4928.6 thousand people, respectively. The largest decrease in the number of passengers carried by domestic airlines (82%) was observed in such a segment of the air transport market as

international scheduled flights. At the same time, 31 foreign airlines from 34 countries operated regular flights to Ukraine. During the reporting year, 3,323.5 thousand passengers used their services, which is 64.7% less than a year earlier and accounts for 72% of the total volume of regular passenger traffic between Ukraine and the world. The average employment rate of passenger seats on domestic scheduled flights decreased by 13.3 percentage points to 62.6% (CAA Ukraine (2021)) [18].

The system of airports of Ukraine has had significant negative consequences. The number of departing and arriving aircraft during 2020 amounted to 94 thousand (against 201.2 thousand in the previous year). At the same time, passenger traffic through the airports of Ukraine decreased by 64.4%, mail and freight traffic - by 13.3% and amounted to 8664.5 thousand people and 52.2 thousand tons, respectively. According to the results of the year, the number of passengers served by the country's main airport "Boryspil International Airport" decreased compared to the previous 2019 by 66.2%. Passenger traffic through Kyiv Airport (Zhuliany) decreased by 73.1%, Lviv - by 60.4%, Odessa - by 58.8, Kharkiv - by 50.8, Zaporizhia - by 24.9%. The number of flights in the airspace of Ukraine has sharply decreased. During the reporting year, the State Air Traffic Services Enterprise UKSATSE provided 142,000 flights for air navigation services, compared to 335.4 thousand a year earlier. The number of flights operated by aircraft and helicopters of Ukrainian airlines decreased by 54.7%, foreign airlines - by 59.1% CAA Ukraine (2021) [18]. The negative trend spread to 2021. In January-April 2021, the volume of passenger traffic of domestic airlines decreased compared to the same period last year by 16.2% and amounted to 1632.9 thousand people, including international - by 15.2 % and amounted to 1484.9 thousand people. Passenger traffic through the airports of Ukraine decreased by 33.2% and amounted to 2695.5 thousand people, including international traffic - by

34.2% and amounted to 2394.6 thousand people. During January-April 2021, Ukrainian airlines performed 14.9 thousand commercial flights (a decrease compared to the same

period last year was 11.8%), including international - 11.7 thousand (a decrease of 16.4%) CAA Ukraine (2021)) [18].

Table 4. Classification of threats, vulnerabilities, threats and risks of air transport of Ukraine that arose as a result of the COVID-19 pandemic¹

Classification of hazards	Vulnerability of protection systems (GAP Analysis)	Consequences	Risks
2. Challenges of the COVID-19 pandemic: 2.1 Reducing the volume of export-import operations in a recession. 2.2 Reducing the number of flights. 2.3 Reduction of air passenger traffic. 2.4 Under crowding of commercial activity level of airports and infrastructure	2. Vulnerabilities of the national aviation safety management system in a pandemic: 2.1 Imperfection of compensatory state mechanisms of air transport protection and national economy in the conditions of pandemic COVID-19. 2.2 Unprepared system of strategic financial management and economic security of air transport enterprises in conditions of the unpredictable impact of crisis phenomena	2. Total financial crisis at the general system level of air transport of Ukraine, as well as at the level of its hierarchical components: aviation infrastructure, airlines, airports, air navigation service provider and general aviation	2. Bankruptcy and destruction of the national air transport system at the general system level, as well as at the level of its hierarchical components: aviation infrastructure, airlines, airports, air navigation service provider and general aviation

Source: Dmytro Bugayko, Yuliya Ierkovska. *Institutional Measures of Air Transport Safety Strategic Management at the Level of State Regulation. Intellectualization of Logistics and Supply Chain Management. The electronic scientifically and practical journal v.9 (2021). P.6 – 19. ISSN 2708 -3195. <https://smart-scm.org>. [6].*

¹ The list of hazards, vulnerabilities, consequences and risks is not constant. The concept requires the introduction of a system of continuous monitoring of threats and the use of tools for change management (Change Management).

The classification of hazards, vulnerabilities, consequences and risks of air transport of Ukraine, identified as a result of the concept of national risk management of air transport within the integrated multifactor hierarchical model of describing the level of sustainable development in the safety dimension, resulting from the COVID-19 pandemic represented in Table 4.

Conclusions. In the context of modern conditions of air transport development, the concept of the national system of integrated risk management of air transport, based on the classification of the main hazards of air

transport in modern conditions, is substantiated. At the same time, priority attention is paid to the list of threats by the criterion of deviation from the point of sustainable development, the importance of the impact of hazards on the coefficient of elasticity, which allows more adequate assessment of threats and respond to them.

The classification of the main risks in the functioning of Ukrainian air transport has been developed, which includes the negative consequences of the COVID-19 pandemic, reduction of export-import operations in the economic downturn, number of flights and air

passenger traffic, low congestion of airports and air infrastructure. Risks are identified in the following areas of operation and development of air transport in Ukraine: export-import operations, aviation infrastructure, air cargo, airports, air navigation service providers and general aviation, which allows early detection of risks and response to them.

The concept was implemented by the State Aviation Regulation Department of the Ministry of Defense of Ukraine, the State Civil Aviation Agency of Azerbaijan, Almaty International Airport (Kazakhstan), Ukraine-Aeroalliance, ICAO NAU Institute, Georgian Aviation Training Center (Georgia).

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FORMATION OF THE OPTIMAL BUSINESS MODEL OF A LOGISTICS COMPANY

Oksana Pozniak, Yurchenko Kateryna. *"Formation of the optimal business model of a logistics company".* The article is devoted to the study of the main types of business models that a logistics company can use depending on its life cycle and development strategy. The main components of the business model are given, which determine the problems of formation and implementation of the selected business model of a logistics company. The author's approach to the concepts of "asset-light business model" and "asset-based business model" is proposed. The characteristic features of each business model, potential problems from their use, and the advantages that the implementation of the "asset-light business model" gives are determined. The evolution of business models and its modifications, which are determined by the stages of the life cycle of a logistics company and are determined by the influence of the main components of the business model, have been investigated. The structuring of logistics providers by types of business models has been carried out, which makes it possible to clearly determine the potential for logistics company's success and the content of the main components, in accordance with the chosen business model. Based on the theoretical developments of the authors, an analysis of logistics companies that use the "asset-light business model" and "asset-based business model" was carried out. The resource provision of each business model is analyzed. It has been substantiated that, despite the type of business model, the main problem is how, using own, leased or resources of other participants in the logistics services market, namely subcontractors, to form an optimal business model or adapt the existing one to the changing conditions of the external environment. To reach this goal, different strategic management tools are used, which include the canvas of the business model. The advantage of using this tool for visualizing the main components that determine the influence of external and internal spheres on the business model of a logistics company has been substantiated. A business model canvas was formed for each logistics company, with different types of business models, which made it possible to determine the competitive advantages of each company. The analysis of indicators (metrics) that are used to assess the effectiveness of business models made it possible to choose the DuPont model based on the return on investment capital. As a result, the influence of the main elements of the model on the final ROIC result was determined, which was confirmed by carrying out the corresponding calculations.

Keywords: business model, logistics company, asset-light, asset-based, outsourcing, business model canvas, return on investment capital.

Оксана Позняк, Катерина Юрченко. «Формування оптимальної бізнес-моделі логістичної компанії». Стаття присвячена дослідженню основних типів бізнес-моделей, які може використовувати логістична компанія залежно від її життєвого циклу та стратегії розвитку. Наведено основні компоненти бізнес-моделі, що визначають проблеми формування та запровадження обраної бізнес-моделі логістичної компанії. Запропоновано авторський підхід до понять «asset-light business model» та «asset-based business model». Визначено характерні риси кожної бізнес-моделі, потенційні проблеми від їхнього використання та переваги, які дає впровадження «asset-light business model». Досліджено еволюцію бізнес-моделей та її модифікацій, які обумовлені етапами життєвого циклу логістичної компанії та визначаються впливом основних компонентів бізнес-моделі. Проведено структурування логістичних провайдерів за типами бізнес-моделей, що дозволяє чітко визначити потенціал успіху логістичної компанії та зміст головних компонентів відповідно до обраної бізнес-моделі. На основі теоретичних розробок авторів, було проведено аналіз логістичних компаній, які використовують «asset-light business model» та «asset-based business model». Проаналізовано ресурсне забезпечення кожної бізнес-моделі. Обґрунтовано, що, незважаючи на тип бізнес-моделі, головна проблема полягає в тому, яким чином, використовуючи власні, залучені чи ресурси інших учасників ринку логістичних послуг, сформувати оптимальну модель ведення бізнесу або адаптувати існуючі до умов зовнішнього середовища. З даною метою використовують різні інструменти стратегічного менеджменту, до яких можна віднести канву бізнес-моделі. Обґрунтовано перевагу використання даного інструменту візуалізації основних компонентів, що визначають вплив зовнішньої та внутрішньої сфер на бізнес-модель логістичної компанії. Канва бізнес-моделі була сформована для кожної логістичної компанії з різними типами бізнес-моделей, що дозволило визначити конкурентні переваги кожної компанії. Проведений аналіз показників (метрик), які використовуються для оцінки ефективності бізнес-моделей, дозволив обрати модель Дюпона на основі рентабельності вкладеного капіталу. В результаті було визначено вплив основних елементів моделі на кінцевий результат ROIC, що було підтверджено проведенням відповідних розрахунків.

Ключові слова: бізнес-модель, логістична компанія, asset-light, asset-based, аутсорсинг, канва бізнес-моделі, рентабельність вкладеного капіталу.

Оксана Позняк, Екатерина Юрченко. «Формирование оптимальной бизнес-модели логистической компании». Статья посвящена исследованию основных типов бизнес-моделей, которые может использовать логистическая компания в зависимости от ее жизненного цикла и стратегии развития. Приведены основные компоненты бизнес-моделей, которые определяют проблемы формирования и внедрения избранной бизнес-модели логистической компании. Предложен авторский подход к понятиям «asset-light business model» и «asset-based business model». Определены характерные черты каждой бизнес-модели, потенциальные проблемы от их использования и преимущества, которые дает внедрение «asset-light business model». Исследована эволюция бизнес-моделей и ее модификаций, которые обусловлены этапами жизненного цикла логистической компании и определяются влиянием основных компонентов бизнес-модели. Проведена структуризация логистических провайдеров по типам бизнес-моделей, которая позволяет четко определить потенциал успеха логистической компании и содержание главных компонентов, в соответствии с выбранной бизнес-моделью. Основываясь на теоретических разработках авторов, был проведен анализ логистических компаний, которые используют «asset-light business model» и «asset-based business model». Проанализировано ресурсное обеспечение каждой бизнес-модели. Обосновано, что, несмотря на тип бизнес-модели, главная проблема состоит в том, каким образом, используя собственные, привлеченные или ресурсы других участников рынка логистических услуг, сформировать оптимальную модель ведения бизнеса или адаптировать существующую к изменяющимся условиям внешней среды. Для этого используют разные инструменты стратегического менеджмента, к которым можно отнести канву бизнес-модели. Обосновано преимущество использования данного инструмента визуализации основных компонентов, которые определяют влияние внешней и внутренней сфер на бизнес-модель логистической компании. Канва бизнес-модели была сформирована для каждой логистической компании, с разными типами бизнес-моделей, что позволило определить конкурентные преимущества каждой компании. Проведенный анализ показателей (метрик), которые используются для оценки

эффективности бизнес-моделей, позволил выбрать модель Дюпона на основе рентабельности вложенного капитала. В результате было определено влияние основных элементов модели на конечный результат ROIC, что было подтверждено проведением соответствующих расчетов.

Ключевые слова: бизнес-модель, логистическая компания, asset-light, asset-based, аутсорсинг, канва бизнес-модели, рентабельности вложенного капитала.

Introduction. Competition in the logistics services market requires companies to realize the need to find ways of gaining competitive advantages. The most effective way, from the point of view of practitioners, is the optimization of doing business by forming an optimal business model as a concept for the development of the company, which allows identifying priorities, eliminating discrepancies, optimizing the company's efforts in strategic areas of generating value, profitability, and efficiency. Interest in this issue is connected, firstly, with the fact that the business model determines the logic of the business, reveals the chain of cause-and-effect relationships between the key factors of the business model, forms the basis for rethinking the methods and mechanisms of business organization. As a result, ideas for the production of values come to the fore, not products, the proposal of a given value, and not sales. This principle of building a business in a fundamentally new way answers questions regarding the efficiency and effectiveness of a logistics company.

In addition, the rethinking of the management, owners, and employees of the business logic creates the potential for development, opens up new opportunities for qualitative transformations in the company, which serves as a powerful impetus for innovation in all areas of the company. The experience of successful companies shows that at the stage of designing a business model, the prerequisites for strengthening key competencies are formed, which, due to the unique combination of business processes, creates irreproducible competitive advantages.

Moreover, the business model briefly illuminates the multifaceted functioning of the company, through simple,

understandable things, it provides all stakeholders with information about the principles, mechanisms of functioning, and development priorities of the company. Therefore, the business model of an enterprise can be considered not only a strategic asset of the company but also an extremely effective means of communication.

Thus, a company can get certain advantages from the formation of an optimal business model at any stage of its life cycle, even by adapting and adjusting the existing model, taking into account the conditions of changes in the external and internal environment in order to meet the needs of customers and maintain competitive advantages. This determines the relevance of this topic and the increased interest of the heads of logistics companies in the problems of the optimal business model of the company, as a concept for the effective formation and use of internal sources to achieve the strategic goals of the company.

Analysis of recent research and publications. The theoretical and practical aspects of the problematics in the definition, structuring, and classification of business models, periodization of the main directions of their research are reflected in the works of famous scientists of our time, such as V. Revutskaya [14], Strekalova N.D. [18], Kharitonova G., Klimchuk A. [11], Pimenov S.A. [15], Tsvirkun Ya. [21] and other.

Particularly noteworthy is the article by the authors S. A. Pimenov and A. V. Pimenov [16], in which scientific approaches to the definition of the concept of "business model" are investigated, the stages of development and formation of business modeling since the 60s of the twentieth century are analyzed. To the present, the key elements of the business model of the enterprise have been identified, and the definition of the concept of "business

model" has been given. The authors define the business model of an enterprise as a way of organizing a business, reflecting the internal and external relationships of the enterprise, with the necessary detailing at a certain stage of the life cycle in a certain period of time, used by the owners to make a profit through meeting the needs and wishes of consumers.

Skril V.V. [18] summarizes the scientific provisions on understanding the essence of the "business model", gives the main

classifications of business processes by signs and types of processes at enterprises, distinguishes between the differences between a business model and a strategy, and systematizes methodological approaches to building a business model of an enterprise.

Other authors [12] summarized the views of scientists on the concept of "business model" to three types and identified the advantages and disadvantages of each type that were shown in table 1.

Table 1 – Attributes, strengths and weaknesses across the three typologies of business model definitions

Typology	Attributes	Possible strengths	Possible weaknesses
Generic business model definitions	<ul style="list-style-type: none"> - Components that constitute the business - General industry attributes - A meta model or ontology for business model 	The advantages of aggregation, i.e. gaining an understanding of the basic of the value creation in the company	Picture conveyed becomes too general to convey anything relevant about the specific business
Broad business model definitions	<ul style="list-style-type: none"> - The method of doing business - focus on the whole enterprise system - The architecture for generating value - Description of role and relationships 	Value creation must be understood across the whole value chain in which the company participates	<ul style="list-style-type: none"> - Not sufficiently focused on the core value creating processes - Includes factors not completely controlled by the company
Narrow business model definitions	<ul style="list-style-type: none"> - Describe the uniqueness of internal aspects - Infrastructure for generating value - Detailed accounts of links, processes, and networks of causes and effects 	<ul style="list-style-type: none"> - The level of detail regards the functioning of the specific firm - Precise and relevant descriptions 	<ul style="list-style-type: none"> - Accounts may become too specific to make sense - Loss of overall understanding

So, summarizing the views of scientists in defining the essence of the concept of "business model", two approaches can be distinguished. The first approach is focused on business processes/roles and is associated with considering the activities of the enterprise from the point of view of business processes and technologies, focused on optimizing the internal environment of the enterprise. The second approach focuses on the value/customer-generated by the enterprise for external customers.

In view of these approaches, the key elements of the business model of an enterprise that determine its content are [16]:

- a value proposition found in the products and services that the company offers to its customers;
- a system for creating a value proposition, including the relationship of the enterprise with suppliers, target customers, as well as value chains;
- the assets that the company uses to create a value proposition;

- the financial model of the enterprise, which determines the structure of income and expenses, as well as ways of making a profit.

Researchers define various types of business models, which are classified according to the following criteria: depending on the direction of business development, according to functional affiliation, and also depending on the degree of openness of the business model [18]. Another classification of business models is applicable to logistics companies, namely asset-based or asset-intensive, asset-light, integrated solutions, and outsourcing, corresponding to the specifics of the logistics business. Some aspects of these models are reflected in the research of scientists [ass], but there is a lack of fundamental research of these types of business models used by logistics companies, in terms of the concept, defining the characteristic features of each business model, the formation of evolution and combination of models.

Objectives statement. The purpose of this article is a theoretically study the economic nature of business models used by logistics companies to form the optimal business model, and evaluate their effectiveness based on the DuPont model.

Basic material and results. The business model determines the constituent elements of the company's competitive advantage, its potential, through the identification of key success factors, among which the main ones are:

1. Key processes associated with customer service. In every region of the world, a logistics company can provide those types of services that the client needs, taking into account the factors of the regional market (demand, competition, legislation, development of logistics infrastructure, etc.). It is necessary to determine the full list of services and, in accordance with the resource provision, distinguish between the processes that the company will perform independently, and those that the company can purchase from subcontractors, that is,

outsource. Accordingly, a base is being formed - the basis of a business model, which will be complemented by other key factors.

2. Consumer - the company must clearly define who are the consumers of various logistics services, choosing a model of interaction: B2B, B2C, eB2eB, B2G; conduct marketing research to establish the potential demand for logistics services and identify ways to attract new customers; conduct ABC - analysis of clients and, if necessary, develop programs for key clients of the company.

3. The value of logistics services. Depending on the definition of customer groups that are and maybe potential customers, the company must determine what logistics services, integrated logistics solutions the customer needs, to solve the customer's problems, logistics services are directed; what customer needs are satisfied by the logistics company; what list of logistics services the company can offer for each market segment by regions of the world.

4. Economic resources. Logistics companies use the same economic resources: material (most of which is the logistics infrastructure), intangible (software products - software, brands, strategic assets, etc.), personnel, and financial resources [17, p.122]. They can be rented, purchased from your own sources, or borrowed from partners. The problem of obtaining competitive advantages in the market is how to form and manage these types of economic resources in order to be competitive in the market, that is, how, using the same combination of economic resources, some logistics companies occupy top positions in the market, while others cannot reach the planned level. The economic resources generated and used by the logistics company determine the degree of resource support for the execution of business processes, as a result of which the client receives logistics services, and the company receives financial results of activities (income, expenses, profit).

5. Key partners. Depending on the type of business model used by the logistics company, it is necessary to form a "pool" of

partners: resource providers and service providers (subcontractors).

6. The financial results of activities are determined, firstly, by the cost structure (the cost of resources, outsourced services), and secondly, by the structure of revenue in accordance with the structure of the company's services, the company's financial policy in the field of interaction with customers and suppliers (management of accounts receivable and accounts payable) debt).

The concept of an enterprise business model is often confused with strategy, replacing one term with another, or referring to one of its components. To illustrate how the business model relates to strategy, consider the following formula presented by M. Levy [2]:

$$V=M*S, \quad (1)$$

where V – value, M – business-model, S – strategy.

Depending on the strategy that the logistics company chooses for itself, it forms a business model and, accordingly, determines all the constituent elements of the business model.

Analysis of annual reports as carriers of detailed information on the activities of a logistics company made it possible to establish two basic models asset-based or asset-intensive and asset-light and supplement them with modern modifications that were reflected in Fig. 1.

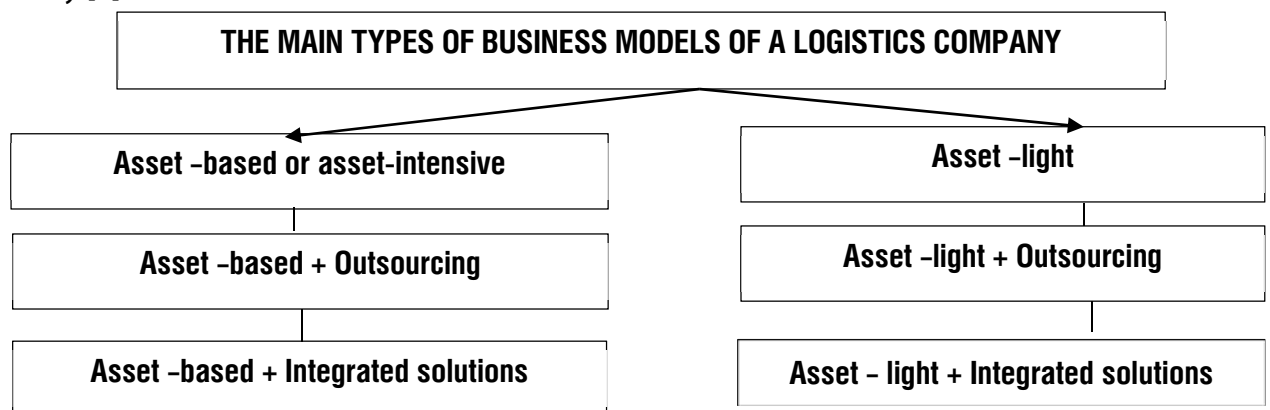


Figure 1 – The main types of business models of a logistics company

Source: compiled by the authors

Asset-based or asset-intensive - a business model based on the use of own or leasing resources to provide resources for the implementation of business processes of a logistics company. These are usually, firstly, tangible assets - buildings, structures, vehicles, warehouses, warehousing

equipment, handling equipment, computers, etc., and secondly, intangible assets - information systems. This also applies to staff.

Table 2 combines the main features of this model and the potential problems caused by its implementation in the logistics company..

Table 2- The main features of Asset-based business model

No	The main features of the model	Potential problems
1	Usage of own assets or assets acquired under leasing conditions (operational or financial) for provision business processes performance of logistics services	Determining the acceptable structure of own and leasing assets. The problem of efficient use of assets, generating revenue to cover leasing costs.

No	The main features of the model	Potential problems
2	The structure of non-current assets of the company is dominated by "heavy" assets - tangible assets.	Such a structure of non-current assets significantly reduces the flexibility and adaptability of the company to abrupt changes in the external environment, namely, reducing demand for services
3	Require significant investment in the formation, operation, maintenance and disposal of assets.	The formation of assets from borrowed sources of funding significantly reduces the financial stability and solvency of the company.
4	Less flexibility due to significant investments	Significant investments "freeze" money in assets, which makes it impossible for them to make alternative, more efficient investments.
5	Operations are carried out on their own and are therefore less dependent on service providers	Customers, in most cases, are interested in obtaining a comprehensive logistics service, which companies with this type of business model, are not able to provide without interaction with other market participants. This significantly narrows the range of customers.
6	In the event of bankruptcy, the company will be able to cover its liabilities by selling its own assets.	The structure of assets (current and non-current) determines the sources of their formation (own or borrowed funds) and maturities of liabilities (long-term and short-term). Funds from the sale of assets may not be enough to repay all liabilities.

Source: compiled by the authors

Asset-light is a business model based on the use of "light assets", which allows a logistics company to scale its activities and respond to changes in market demand, to choose suppliers of resources and services with the most suitable offer. In this model,

some staff can be involved in outsourcing and outstaffing.

Table 3 combines the main features of this model and the potential problems caused by its implementation in the logistics company and advantages of this business model.

Table 3 – Asset-light business model: main features, advantages and potential problems

No	The main features of the model	Potential problems	Advantages
1	Usage of leased assets (warehouses, office space, etc.) or ROU assets (right-of-use assets) and services of subcontractors to ensure the provision of logistics services	A logistics company is responsible to customers for the quality of services, regardless of who is involved in this process. Accordingly, it is necessary to constantly check the quality of subcontractors' services and cooperate only with those who meet the company's requirements.	In the event of a decrease in demand for logistics services, the company can reduce the volume of its activities with the least losses, or, in the event of a crisis, even exit the market.
2	Dependence on the level of development of logistics infrastructure and logistics market operators	As the logistics company leases logistics infrastructure elements to serve customers and buys services from subcontractors, this directly determines the ultimate quality of	Working in the developed market of logistics services, the company can choose the best participants as partners, and provide consulting services for the

No	The main features of the model	Potential problems	Advantages
		logistics services for which the company is responsible.	development of their business.
3	The structure of non-current assets of the company is dominated by "light" assets	The company's competitive advantages depend on the company's strategic assets, namely: customer relations, supplier relations, knowledge ownership, and management of fixed assets, each of which is associated with relevant financial initiatives.	Such a structure of non-current assets significantly increases the company's flexibility and adaptability to abrupt changes in the external environment, namely, reducing demand for services
4	In the structure of direct costs of the company, a significant share is made up of costs for the services of subcontractors.	With an increase in the price of subcontractor services, the amount of gross profit decreases	To optimize direct costs, the company can select subcontractors that meet the price/quality relation
5	Greater flexibility due to lack of significant capital investment	Significant investments "freeze" money in assets, which makes it impossible for them to make alternative, more efficient investments.	Use of financial resources for innovative development of the company
6	Dependence on service providers	Working as an integrator in the logistics services market, using the services of subcontractors, the logistics company is directly responsible for the quality of services to the client. In the event of negative situations, the company's reputation may be damaged	Customers, in most cases, are interested in obtaining a comprehensive logistics service that companies with this type of business model provide in cooperation with other market participants. This significantly expands the range of customers.

Source: compiled by the authors

The next evolution of business models can be identified, which is represented in Figure 2.

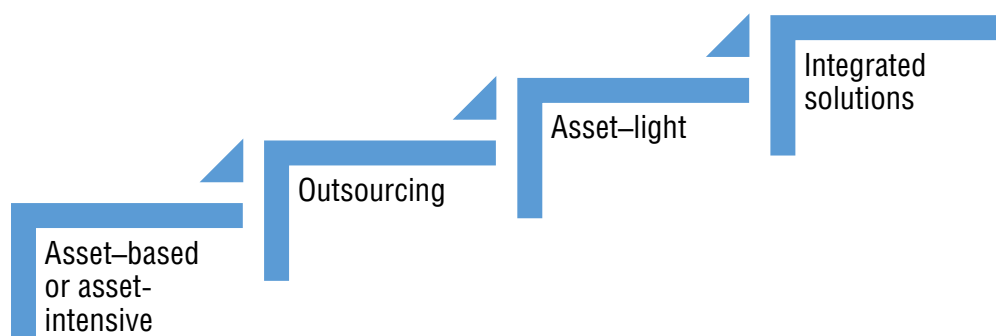


Figure 2 – Evolution of business models of a logistics company

Source: compiled by the authors

Companies supporting the Asset-based or asset-intensive business model begin to operate in the logistics services market as independent market operators, providing services to end customers, that is, they comply with the B2C model. If the company's resources allow it, it begins to increase its supply on the market, offering services to other operators of the logistics services market, who outsource the implementation of logistics services, that is, they are moving to the B2B model. The transition to the asset-light model occurs when the role of the logistics company changes from a service provider to a consumer of services of other participants in the logistics services market. A logistics company can start operating in the market on the basis of the asset-light model if it is provided for by the company's strategy.

Despite the evolution of business models reflected in Figure 2, it is considered that the main are two models, on the basis of which the combination of business models depicted in Figure 1 occurs, which depend on the life cycle of a logistics company and the regions of the world in which they are working.

The addition of the Outsourcing component to the base model expands the functionality of a logistics company in the field of logistics services by using the resources of partners - subcontractors.

Therefore, in deciding which services to outsource, the following components of the business model are combined: economic resources + key partners + key processes.

The addition to the basic model of the Integrated solutions component (integrated solutions), in addition to expanding the functionality of the company, also raises it to a qualitatively new level of provision of logistics services, since an individual integrated solution is developed for a specific client, which combines the following components of the business model. : economic resources + resource and service providers (key partners) + key processes + key services + key customers.

Structuring the logistics services market by types of logistics providers allows combining a specific provider level with possible types of business models that were summarized in Table 4.

The higher the level of the logistics provider, the less resource-intensive its business model is. This is due to the fact that from level 3 PL, a logistics provider begins to act as an integrator in the logistics services market, pooling the resources of other companies, usually of a lower level, supporting the asset-based model, to ensure the implementation of the entire range of logistics services in supply chains.

Table 4 – Structuring the logistics providers by business models

Type of logistics provider	Asset – based	Asset –based + Integrated solutions	Asset –based + Outsourcing	Asset – light	Asset –light + Integrated solutions	Asset – light + Outsourcing
2 PL	+					
3 PL		+	+			
4 PL		+	+	+	+	+
5 PL				+	+	+

Source: compiled by the authors

The place of a logistics company in the top 10 best companies in the world does not depend on what business model the logistics company adheres to. Thus, the rating [20] is topped by logistics operators - Amazon and DHL, which adhere to the asset –based business model with additional solutions.

Kuehne & Nagel (3d place in rating) and DSV Panalpina (6th place in rating) are representatives of another business model - asset –light. The business model of DSV Panalpina, taken from the company's annual report [4], is shown in Fig.3.



Figure 3 - Business model of DSV Panalpina [4]

DSV operates based on an asset-light business model which means that transportation of shipments is booked with subcontractors (carriers and hauliers). They transport customers' goods to, from and between our more than 1,400 offices, terminals and warehouses across the world, enabling company to be close to local markets while taking advantage of a global perspective and network. That way company secure the best possible service at highly competitive rates. DSV's international network consists of more than 200,000 suppliers, partners and agents. They cover strategic international hubs and important sea lanes. Road transport provides customers with trustworthy hauliers with knowledge of local market conditions [4].

DHL operates based on an asset-based business model which means that the company operates more than 84,000 offices, about 34,000 vehicles for the delivery of documents and cargo and more than 260 aircraft, 3 Global Hubs: Hong Kong, Leipzig, Cincinnati, and 15 Main Regional Hubs: Amsterdam, Bergamo, Brussels, Copenhagen, East Midlands (UK), Frankfurt, London, Paris, Vitoria (Spain), Bangkok, Singapore, Bahrain, Dubai, Lagos, Panama, Global IT Centers: IT centers in Cyberjaya (Malaysia) and Prague (Czech Republic), supporting the entire global network [8].

The provision by "real" resources of Post & Parcel Germany Division is shown in fig.4.

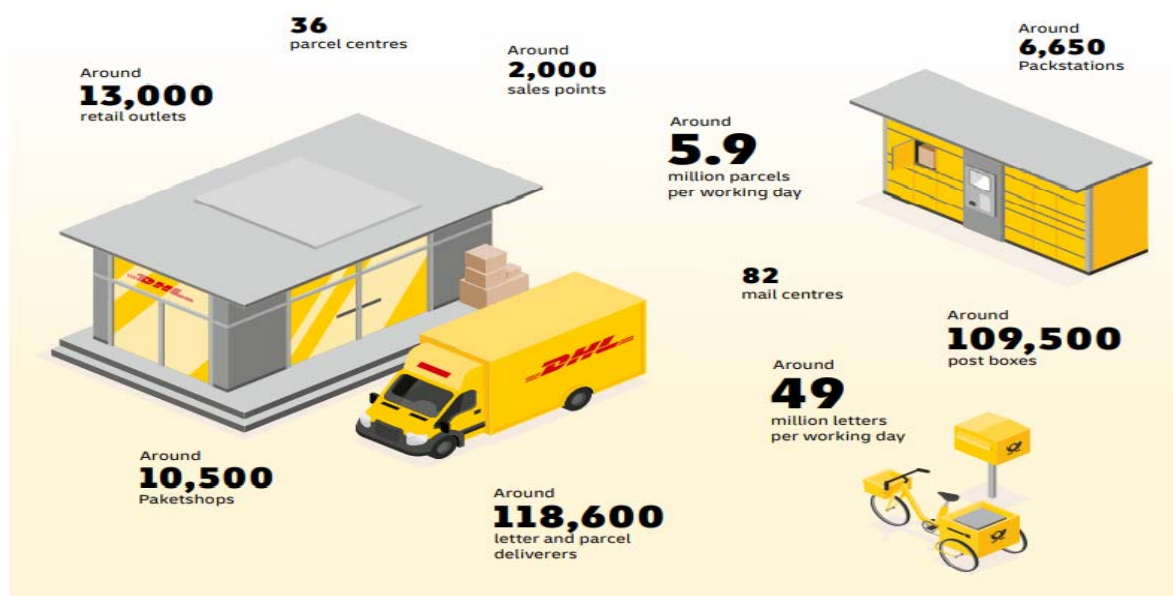


Figure 4- National wide transport and delivery network in Germany, 2020 [5]

Another confirmation of this model is resource provision of DHL Aviation that is a division of DHL (owned by Deutsche Post) responsible for providing air transport capacity. It is not a single airline, but refers to several airlines which are either owned, co owned or chartered by DHL Express [8]

Deutsche Post currently owns five main airlines, which provide services by region:

- European Air Transport Leipzig (EAT Leipzig) is responsible for the major part of the network for Europe, and for long haul services to the Middle East and Africa. From its hub at the Leipzig/Halle Airport it operates a fleet of Boeing and Airbus freighters.

- DHL Air UK (DHL Air) is based at East Midlands Airport, was purchased by DHL in August 1989 and has since July 2000 been operating a fleet of Boeing 757 Freighters on intra European services and a fleet of new built Boeing 767 freighters, primarily on transatlantic routes.

- DHL Aero Expreso is the subsidiary in Central and South America Hub in Tocumen, Panamá, operating a fleet of Boeing 737-400, 757-200 and 767-300 Freighters in Central and South America, as well as serving destinations in the Caribbean and Florida.

- SNAS/DHL (DHL International) handles Middle East destinations from its headquarters and main regional hub at Bahrain International Airport, operating a fleet of Boeing 767 Freighters.[6] The fleet is deployed throughout the Middle East and in Africa.

- Blue Dart Aviation is based at Chennai International Airport, India, with a fleet of Boeing 757 Freighters. It provides services for the Indian network of DHL and regional charters.

- DHL Air Austria is based at Vienna International Airport, Austria, with a fleet of Boeing 757 Freighters.

It also owns the following smaller airlines: DHL de Guatemala (Guatemala City), DHL Ecuador (Guayaquil, Ecuador) and Vensecar Internacional (Caracas, Venezuela) [].

The DHL Aviation aircraft fleet consists of Airbus A300-600RF (35 units), ASL Airlines Ireland (4 units), Airbus A330-300P2F (1 unit), ATR 42-300F (3 units), Vensecar Internacional (1 unit), Boeing 727-200F (6 units), Vensecar Internacional (3 units), Boeing 737-400SF (4 units), Southern Air (5 units), Boeing 747-400BCF (13 units), Kalitta Air (4 units), Boeing 747-8F (4 units), Boeing 757-200F (46 units), European Air Transport Leipzig (11 units), Boeing 767-200F (8 units), Atlas Air (5 units), Boeing 767-300ERF (6 units), DHL Air UK (4 units), Boeing 777F (12 units), Southern Air (4 units), Tupolev Tu-204-100C (1 unit).

In order to meet the growing demand for air cargo transportation, namely the growing demand for cross-border delivery of urgent cargo, DHL Express and Boeing announced a deal to acquire 8 new Boeing 777 Freighters. The Boeing B777F has a carrying capacity of 102 tons and a flight range of 9.2 thousand km. The new aircraft will enable DHL Express to reduce stops on long-haul routes [6]. DHL Express also ordered 12 electric cargo planes from the Eviation startup and plans to create the world's first emission-free electric cargo network. DHL plans to start operating the aircraft in 2024. The Alice can be operated by a single pilot and can carry over 1.2 tons of cargo. Full recharging of the aircraft's batteries is approximately 30 minutes, and the maximum flight range is 815 km at a speed of approximately 400 km/h. [7]

Consequently, DHL continues to evolve based on the model, investing in real assets and intelligent management systems based on artificial intelligence, which will continue to provide it with a competitive edge in the logistics market in the future (Fig.5).



Figure 5 – Applying AI in DHL [1]

Consequently, regardless of the type of business model, the main problem is how, using our own, attracted or resources of other participants in the logistics services market, to form an optimal business model or adapt the existing one to the changing conditions of the external environment. To do this, use various strategic management tools, which include the Business Model Canvas.

The Business Model Canvas is a strategic management template used for developing new business models and documenting existing ones. It offers a visual chart with elements describing a firm's or product's value proposition, infrastructure, customers,

and finances, assisting businesses to align their activities by illustrating potential trade-offs [3]. Osterwalder's canvas has nine boxes: customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure [13].

This model shows through which components a logistics company can obtain competitive advantages and provides an opportunity to adapt, adjust it if necessary.

Figure 5 shows the Business Model Canvas for DHL, and Figure 6 shows the Business Model for DSV Panalpina.

Key Partners	Key Activities	Value Propositions	Customer Relationship	Customer Segments
Logistics providers Packaging material manufacturers Retailers Acquisitions like UK Mail, Airborne Express Franchisees	Distribution Tracking systems Quality control Warehousing IT capabilities R&D Marketing Customer support E-commerce <i>Main divisions:</i> Express, Global Forwarding, Freight, Supply Chain,	DHL Warehousing Transportation & Distribution Solution Innovations in logistics E-communication Contract logistics DHL Logistics Consulting DHL Lead Logistics Partner DHL International Supply Chain (ISC)	Trust and reliability High reputation Partnerships Convenient customer assistance Automated solutions	Personal users <i>Industry Sectors</i> Auto-Mobility Chemicals Consumer Energy Engineering and Manufacturing Life Sciences and Healthcare Public Sector Retail Technology

	eCommerce Solutions, Post & Parcel Germany	DHL Industrial Projects DHL Trade Fairs & Events DHL Customs Services DHL Cargo Insurance DHL Security Services Green Logistics Solution DHL Smart Sensor Visibility & Risk Management Solution		
	Key Resources Distribution networks IT capabilities Warehouses Distributions centers DHL`s Airlines Innovation Center of DHL Acquisitions		Channels Production facilities and centers Post offices Sales and support teams Social media News and blogs	
Cost Structure <i>Material costs</i> (Cost of raw materials, consumable and supplies, and of goods purchased and held for resale; Cost of purchased services; Lease expenses) <i>Depreciation and Amortization</i> (Land and buildings, Technical equipment and machinery, Transport equipment, Aircraft, IT equipment, Operating and office equipment, ROU assets- Land and buildings, Technical equipment and machinery, Transport equipment, Aircraft, IT equipment, Operating and office equipment) <i>Assets repair and maintenance</i> <i>Other operating expenses</i> <i>Capital investments</i> (Capex) <i>Insurance</i> <i>Finance costs</i> <i>Taxes</i> <i>Staff costs</i> (Wages, salaries and compensation; Social security contributions; Retirement benefit expenses; expenses for other benefits) <i>Marketing</i> <i>Security costs</i> <i>Innovation research</i>		Revenue Streams Service fees Value-added services Commissions Costs of packages		

Figure 5 - Business Model Canvas of DHL

Source: compiled by the authors

Key Partners Subcontractors Carriers Sea lanes partners International hubs agents Logistics providers	Key Activities Trade Supply chain tracking 3D printing Warehousing Cargo consolidation	Value Propositions Shipment bookings Supply Chain Innovations Lead Logistics Blockchains Artificial intelligence	Customer Relationship Reliable customer support High service quality Valued brand name Trust	Customer Segments SME segment (small and mid-sized customers) Retailers Major companies in animal sector
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Warehouse providers Retailers	Bookings for transportations Distribution around the globe Labeling and packaging Documentation clearance e-commerce fulfilment Track-and-Trace	Cross-docking Secure documentation provision Carbon emission reports		Personal customers E-Shops Customers within Automotive, Industrial, Retail & Fashion, Healthcare, Technology and Renewable Energy.
	Key Resources People IT systems Industry know-how Standardized global workflows Carrier relations Global network with local presence		Channels Production centers Sales groups News and blogs Official site of the company	
Cost Structure <i>Direct costs</i> (include settlement of accounts with haulage contractors, shipping companies, airlines, etc.; staff costs relating to hourly workers used for fulfilling orders and other direct costs of operation, such as rental of logistics facilities and costs of property projects) <i>Amortization and depreciation</i> (Customer relationships, Software and other intangible assets, Buildings, ROU assets – Land and buildings, ROU assets – Other operating equipment) <i>Innovation investments</i> <i>Insurance</i> <i>Security costs</i> <i>Wages and salaries</i> <i>Financial expenses</i> (Interest expenses on lease liabilities) <i>Carbon emissions costs</i>			Revenue Streams <i>Sale of services</i> (Air services, Sea services, Road services, Solutions services) <i>Financial income</i> (Interest income)	

Figure 6 - Business Model Canvas of DSV Panalpina
 Source: compiled by the authors

The underestimation of this tool is precisely the insufficient elaboration of the outline of the business model that led to the closure of the business of small and medium-sized companies in conditions of quarantine [21]. This is due to the fact that the companies did not clearly define their business according to 9 blocks of the business model canvas: they did not clearly define the consumer groups, what value proposition is included in the

company's logistics service, what channels for promoting logistics services the company uses, and define relationships with customers, communication channels between the client and the company, customer loyalty model, work with customer complaints, etc. Searching for and establishing mutually beneficial cooperation with key partners is the most important area of work for a logistics company.

In February-March 2020, EY conducted the Global Capital Confidence Barometer survey, which included 46 countries and 14 sectors of the economy, including consumer goods and retail [10]. According to this report, international enterprises, in order to strengthen their competitive positions during the crisis, began to change the operating conditions, refine their business models, and plan new development steps, taking into account new development scenarios, and some are finalizing strategies for the post-crisis period. EY has identified the main areas of revision of business models in accordance with the canvas of the business model of O. Osterwalder and Yves Pignet in the studied enterprises:

- changes in the delivery system;
- implementation of a delivery system with digital support;
- expanding opportunities for online sales;
- making changes to value propositions;
- creating new partnerships and reallocating resources;
- building relationships with clients.

This includes both working out ways to retain existing customers, taking into account new requirements, and finding and building relationships with new customers.

Therefore, the use of this model allows to visualize the main components of each business model, and show their relationship, the interdependence between the internal and external spheres. An internal sphere is a system that includes a set of business model elements that are controlled and managed by a logistics company. These are value propositions, business processes,

technologies, organizational structure, employees, key resources. In the external sphere, a system of elements is considered with which a logistics company interacts and which affect its activities. These are consumer segments, partners, competitors, taxes, external resources, industry specifics, global and regional trends, society, and the state. The effectiveness of a particular business model depends on how the key components of the business model are organized, which determine the internal sphere, interact with the elements of the external sphere.

To assess the effectiveness of a business model, strategic analysis tools can be used, generalized into two groups: the first - with a focus on profit, the second - with a focus on the consumer [16], or the ROA model, which determines the effectiveness of the formation and use of assets depending on the type of business model. Implementation of ROA model for assessing efficiency of business model of DHL and Kuehne&Nagel was considered by author in the previous research [17]. In this research, we are interested in studying the practice of applying another DuPont model, namely ROIC models, to substantiate the effectiveness of using a certain business model of a logistics company.

The return on invested capital (ROIC) represents the observable competitive advantage of a firm, while the firm's performances are measured by the accounting items in the Du Pont identity [9]. ROIC is calculated as the net operating profits less adjusted taxes (NOPLAT), divided by invested capital (IC):

$$ROIC = \frac{NOPLAT}{IC} = \frac{NOPLAT}{S} \times \frac{S}{IC} = NOPM \times Capital\ Turnover = NOPM \times \frac{S}{Shareholder's\ Equity}, \quad (2)$$

where $NOPLAT = EBIT \times (1 - t)$;

EBIT = earnings before interest and tax;

S = sales; NOPM = net operating profit margin;

IC = (Fixed Assets + Current assets) – non-interest-bearing liabilities.

Return on invested capital can be further decomposed into several related financial ratios as follows:

$$ROIC = \frac{NOPLAT}{IC} = \frac{NOPLAT}{S} \times \frac{S}{IC} = \frac{(S - CGS - R\&D - Dep - SG\&A - Tax)/S}{(FA + AR + Inv - AP + Cash)/S}, \quad (3)$$

where CGS = cost of goods sold;

R&D = expenditures on research and development;

Dep = depreciation;

SG&A = selling, general and administration expenses;

FA = fixed assets;

AR = accounts receivable;

Inv = inventory;

AP = accounts payable.

In this model, the following components can be distinguished that have a significant impact on the ROIC value:

1) NOPLAT defines operating efficiency of specific business model and reflects the relationship between the main element in Business Model Canvas such as Costs structure and Revenue streams.

2) IC defines capital management and reflects the ability of a logistics company to manage the assets (current and non-current assets that the company forms according to a particular business model.

3) AR defines customer relationship between a logistics company external sphere in Business Model Canvas, namely, Customer segment and Customer relationship.

4) AP defines supplier relationship between a logistics company and Key partners as the main elements in Business Model Canvas.

5) R&D reflects the position of the logistics company in the field of investment and innovation, which is determined by the chosen business model. Namely, investments in real assets or light assets of the company, information or intelligent control systems, etc.

6) Depreciation reflects the recoverable amount in the financial statements over the useful life of a tangible asset, while Amortization reflects the same for intangible assets. Taking into account the chosen business model and, accordingly, the structure of non-current assets, the logistics company can manage the impact of depreciation charges on net income.

Within the framework of this work, to analyze the effectiveness of each business model and the corresponding logistics company, formula (2) was used, which gives an overall assessment of the effectiveness of the chosen model. The calculations are summarized in table 5.

Table 5- Analysis of business model efficiency based on Du Pont model ROIC

Items	DHL, €m		DSV Panalpina, DKKm	
	2019	2020	2019	2020
EBIT	4,128	4,847	6,654	9,520
t	0,2	0,23	0,26	0,24
Sales	63,341	66,806	94,701	115,932
Shareholder's Equity	14,392	14,078	49,430	47,385
NOPLAT	3,302	3,732	4,924	7,235
Capital Turnover	4,40	4,74	1,92	2,47
ROIC	14,532	17,690	9,454	17,870

According to our calculations, DSV Panalpina company using the light assets model performed better in 2020, increasing ROIC value by 89% to 17.87 than DHL company using the asset-based model. This was due to an increase in sales by 22%, operating profit (EBIT) by 43%, which led to an increase in NOPLAT by 47%. Consequently, the company's asset-light business model has responded better to changes in external and internal environmental factors caused by Covid-19. However, it is impossible, only on the basis of these calculations, to state about the unconditional effectiveness of one or another business model over another. For such a statement, it is necessary to conduct a detailed analysis of the business models of the logistics companies included in the TOP-20. In addition, in our opinion, the effectiveness of a business model directly depends on the knowledge, skills, and competencies of the main resource in logistics - a human resource that forms all the main elements of a business model, reacts to changes in the external and internal

environment, adapts the existing business model to the new business environment, develops and implements new elements in the basic business model.

Conclusions. Consequently, the business model is not an established category; it can change with a change in strategy, phases of the life cycle of a logistics company. Choosing a specific business model requires changing all its main components and adapting the company's internal environment to these changes, which can cause many problems. By reducing the number of real assets such as land and buildings, equipment, cars, and computers, companies will gain a significant advantage over their competitors with large assets. "Real" assets can burden a logistics company, but investing in new digital technologies and personnel as the main resource of a logistics company allows it to expand faster and compete with existing players in the logistics services market in a short period of time.

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POTENTIAL OF SECONDARY AIRPORTS' RENEWAL IN TERMS OF DEVELOPMENT OF THE NATIONAL ECONOMY

Olena Volovyk, Sophia Zhigula, Oleh Harmash. "Potential of secondary airports' renewal in terms of development of the national economy". The article outlines the classification of airports, the role of secondary airports in the infrastructure of the country, understanding the need of the secondary airports' renewal. The aviation industry plays a crucial role in the development of economy of the country and international economic relations, as it generates incomes, job places, and opportunities for growth. Every country has both primary and secondary airports, regional (secondary) airports are a vital part of the aviation infrastructure. They are engines of local development and allow accessibility to certain locations, in particular those that are remote or not well served by other forms of transportation. They are enablers of free movement of people, goods and services, as well as of social and territorial cohesion. Furthermore, regional airports stimulate incoming tourism and employment, as well as facilitate access to essential services. They can also help to reduce congestion at major hub airports. Unfortunately, in Ukraine secondary airports are not cultivated enough, thus the air transportation is the neck place in most cases, but this situation may be solved with renewal of secondary airports' work, the importance of which is described in this article.

Keywords: secondary airport, traffic, cargo, economy, infrastructure, aviation, airlines, modernization, transportation, development.

Олена Воловик, Софія Жигула, Олег Гармаш. «Потенціал відновлення другорядних аеропортів з точки зору розвитку національної економіки». У статті описано класифікацію аеропортів, роль другорядних аеропортів в інфраструктурі країни, розуміння необхідності оновлення другорядних аеропортів. Авіаційна промисловість відіграє вирішальну роль у розвитку економіки країни та міжнародних економічних відносин, оскільки збільшує доходи, генерує нові робочі

місця та можливості для зростання рівня держави у світовій економіці. У кожній країні є як первинні, так і вторинні аеропорти, регіональні (вторинні) аеропорти є важливою частиною авіаційної інфраструктури. Вони є двигунами розвитку та забезпечують доступ до тих місць, які є віддаленими або погано обслуговуються іншими видами транспорту. Вони сприяють вільному переміщенню людей, товарів і послуг, а також соціальної та територіальної єдності. Крім того, регіональні аеропорти стимулюють в'їзний туризм, а також полегшують доступ до основних послуг. Вони також можуть допомогти зменшити затори у великих аеропортах-вузлах. На жаль, в Україні вторинні аеропорти розвинені недостатньо, тому повітряні перевезення в більшості випадків є вузьким місцем, але цю ситуацію можна вирішити відновленням роботи вторинних аеропортів, важливість яких описана в цій статті.

Ключові слова: вторинний аеропорт, трафік, вантаж, економіка, інфраструктура, авіація, авіалінії, модернізація, транспорт, розвиток.

Елена Воловик, София Жигула, Олег Гармаш. «Потенциал обновления второстепенных аэропортов с точки зрения развития национальной экономики». В статье очерчена классификация аэропортов, роль второстепенных аэропортов в инфраструктуре страны, понимание необходимости обновления второстепенных аэропортов. Авиационная промышленность играет решающую роль в развитии экономики страны и международных экономических отношений, поскольку она генерирует доходы для государства, создает рабочие места, предоставляет возможности для роста страны в разрезе мировой экономики. В каждой стране есть как основные, так и второстепенные аэропорты, региональные (второстепенные) аэропорты являются неотъемлемой и особо важной частью авиационной инфраструктуры. Они являются локомотивами развития и обеспечивают доступ к определенным местам, в частности к тем, которые находятся в отдалении или плохо обслуживаются другими видами транспорта. Они способствуют свободному перемещению людей, товаров и услуг, а также социальной и территориальной сплоченности. Кроме того, региональные аэропорты стимулируют въездной туризм и занятость, а также облегчают доступ к основным услугам. Они также могут помочь уменьшить загруженность в крупных узловых аэропортах. К сожалению, в Украине развитие второстепенных аэропортов проходит медленными темпами, поэтому авиатранспорт в большинстве случаев является узким местом, но эту ситуацию можно решить, возобновив работу второстепенных аэропортов, важность которых описана в данной статье.

Ключевые слова: второстепенный аэропорт, движение, груз, экономика, инфраструктура, авиация, авиакомпания, модернизация, транспорт, развитие.

Introduction. Airport development has undergone a long history starting from simple airfields as sites and installations for take-offs and landings-on aircrafts up to complex contemporary mega-hubs providing a variety of services. The globalization has significantly affected the transportation system in general and aviation transportation specifically. With the development of new types of aircrafts that required technical modernization of existing airfields into airports, the concept of airports has changed too as well as general system of classification. With regard to their size and processed traffic flow, airports are categorized as primary and secondary both comprising a multi-airport system [1]. They complement each other meaning that large

metropolitan regions are served by several airports - one being the primary airport with the largest share of metropolitan traffic, and the rest are secondary, which absorb the traffic spill from the primary or focus on lower yielding or specific traffic categories, particularly when mandated by government regulations[2].

Ukraine inherited from the USSR fifty-plus airports and a broad network of runways that covered the entire territory of Ukraine linking both large cities and small towns [12]. However, in the 1990s, the system fell apart and the majority of local airfields and runway strips are abandoned and neglected as they have lost their importance in the country-wide transportation infrastructure.

The current research justifies the importance of reviving the long-lost airfields through their modernization into secondary airports and further including them into the regional multi-modal transportation infrastructure as well as finding new uses for former prosperous and currently neglected commercial structures.

Analysis of the latest research. The issues of rising demand for secondary airports have been justified by Richard de Neufville [1], Jimenez E., Claro J., Pinho de Sousa J. [2], Marcin Dziedzic [13], Graham A. [3], Knipp N. [6] and others. The majority of the previous research emphasizes that the rapid development of low-cost carriers has increased the demand in secondary airports, which nowadays have undergone significant modernizations compared to the past [6].

Graham A. states that secondary airports are currently thriving in most developed countries. In the past, smaller airports meant secondary services and facilities, but not today. Low-cost carriers (LCCs) are streaming into secondary airports, and they provide the latter with significant traffic flow [3]. Non – primary airports are included into the National Plan of Integrated Airport Systems (NPIAS) in the US and account more than 3300 public-use facilities which function according to their roles outlined in the report provided by US Federal Aviation Administration [6]. Changes to LCC business models are affecting secondary airports across Europe and their evolution increases competition between primary and secondary gateways [14]. However, the authors indicate that the tendency may vary from country to country and refers to the small airports which have undergone significant modifications and meet the requirements of the market.

Sara Favargiotti explores the problems of abandoned airports in Europe and stated that out of 2000 European airports, 750 ones are currently abandoned, uphold or underutilized [15]. The author admits that the conversion of an abandoned airfield is a complex design process and there are different ways of reviving such infrastructure apart of

converting into a secondary airport and including into general nation-wide air transportation infrastructure.

Formulation of the purpose of the study. The purpose of this article is to explore airport classification suggested by Federal Aviation Administration (USA) and International Civil Aviation Organization (ICAO) as related to their characteristics. The paper analyses the structure of air traffic in Ukraine in 2020 and 2019 in order to identify the perspectives of airport system loading in the nearest future. The importance of regional airports has been explained through identifying the services that they can provide. With the purpose of justifying the necessity of renewal of abandoned airports and their converting into secondary ones, the airport structure in Ukraine and the tendency in its development have been explored. The factors influencing the success of the implementation infrastructure projects are identified. The benefits of developing regional airports and their impact on the growth of the country's economy are specified.

To ensure the realization of these goals, the following research methods were used: empirical studies, data analysis and synthesis, expert assessments, and generalization.

The main research. The common understanding on the definition of airports as to primary and secondary categories has gradually evolved into the concept of multi-airport system. Such system acknowledges that large metropolitan regions are served by several airports, one being the primary airport with the largest share of metropolitan traffic, and the rest are secondary, which absorb the traffic spill from the primary or focus on lower yielding or specific traffic categories ([1]). Moving to those airports outside a multi-airport system is more complicated and depends on particular national perspectives or national institutional frameworks. For example, regional airports are sometimes associated with peripheral regions, or any airport not serving country capitals ([16]).

The importance of regional airports has grown in the last decades as they have become the main ones for low cost airlines, as the latter often prefer to use regional airports where airport fees are lower, turn-round times shorter and capacity higher, due to low traffic congestion. At the same time, low cost airlines may also establish themselves in major airports.

Then regional airports facilitate the daily operations of general aviation, which includes all aviation other than commercial and military flights, such as training flights, law enforcement flights, medical flights, private business flights, and recreational flights that fall under the category of general aviation.

The benefits of general aviation cannot be overstated. Regional airports facilitate air ambulance flights and medical evacuation flights for local patients and hospitals. Moreover, organs for local organ transplant candidates can be flown into a regional

airport located close to home. In addition, it can provide a base of operations for law enforcement search and rescue operations.

In international practice, the FAA (Federal Aviation Administration, USA) and ICAO (International Civil Aviation Organization) classification for airports is widely used [4].

The FAA classifies airports by their type of activity into the following categories:

1. Commercial airports - state-owned airports serving regular flights with the number of departing passengers of at least 2,500 people per year.

2. Airports of general aviation: all aviation, except military and commercial, operating on a regular basis.

In turn, commercial airports are divided into primary and secondary ones. Table 1 summarizes general characteristics of commercial airports.

Table 1 - Classification of commercial airports

Type of airport	Characteristic
Primary airports	more than 10,000 departing passengers per year
▪ Large	1% or more of the total number of departing passengers served
▪ Medium	from 0.25% to 1% of the total number of departing passengers served
▪ Small	from 0.05% to 0.25% of the total number of departing passengers served
▪ Not nodal (Nonhub)	less than 0.05% of the total number of departing passengers served
Secondary airports	from 2500 to 10,000 departing passengers per year
Minor airports	
▪ National airports	airports with an average of about 200 aircraft, including 30 jet aircraft
▪ Regional airports	airports with an average of about 90 aircraft, including 3 jet aircraft
▪ Local airports	airports with an average about 33 propeller-driven aircrafts
▪ Base airports	airports with an average about 10 propeller-driven aircrafts

The passenger traffic of Ukrainian airports in 2015 amounted to 10.7 million passengers, 98% of which was provided by the airports Boryspil, Zhulyany (Kyiv), Odessa, Lviv,

Dnipro, Kharkov and Zaporizhzhya. Almost all flights use primary airports as the place of departure or destination with the number of flights variation from 130000 to 335000 per

year (in the last 5 years). Table 2 summarizes the structure of air traffic in Ukraine as related to the year of 2020 (updated from [5]).

There is a significant decrease in the number of flights in 2020 and this trend is observed in the world-wide scope as the COVID-19 situation significantly affected the

transportation sector. However, the passenger demand for air travel is projected to double in the next 20 years and nowadays the national primary airports are clogged with increased traffic. In response, domestic and international LLCs are turning to secondary airports [6].

Table 2 - Structure of air traffic in 2020 versus 2019

Classification of flights	Number of flights			Deviations (in %) in 2020 versus 2019
	2019	2020	Share of the total number of flights in 2020	
Ukrainian airlines	109777	49733	35,0%	-54,7%
Foreign airlines	225630	92314	65,0%	-59,1 %
Internal flights	30790	21102	14,9%	-31,5%
Departure flights	162937	68870	48,5%	-57,7%
Transit flights	141680	52075	36,7%	-63,2 %
Total	335407	142047		-57,6%

The ACI Europe report on European regional airports indicates that, between 2005 and 2017, the number of flights (direct connectivity) at regional airports grew twice as fast (+39.1 %) as at major hub airports in Europe (+19.7 %). When looking further back in time, the overall traffic growth in regional airports is even more significant: between 1993 and 2015, air traffic at regional airports in Europe increased by +173 % [7].

To determine the required number of airports for the country, it is necessary to identify the factors that affect the success of such infrastructure projects.

Today almost every regional center of Ukraine has an airport at its disposal. Mostly, all the airport complexes were built in the Soviet Union and were inherited by Ukraine after the collapse of the latter. Though they have not been upgraded since then while the technologies have moved far beyond. However, a few of them were modernized for the final part of Euro 2012: the Boryspil airport, the Zhuliany airports (Kiev), Kharkov, Lvov and Donetsk.

According to the State Aviation Service, there are twenty-four (24) airports in Ukraine.

This figure is rather nominal and the subject to clarification [8].

The socio-political situation in the East of Ukraine disabled the airports of Donetsk and Lugansk. The airports of Simferopol and Belbek in Crimea operate under a different jurisdiction. At the same time, the airports of Mariupol, Nikolaev and Ternopil do not have a certificate of conformity from the aviation authorities of Ukraine and do not carry out operational activities. Thus, there are only seventeen (17) functioning airports in Ukraine.

Ukraine is striving to create a market economy; therefore, the strategic goal for an airport involves achieving competitive advantage through its successful development. Consequently, in order to determine the required number of airports for the country, it is necessary to determine the factors that ensure the success of the implementation of such infrastructure-related projects.

The cornerstone for airport development is the size and economic condition of its coverage area (the so-called catchment area), which determines the potential for passenger traffic and the number of aircraft takeoff and

landing operations. Typically, the airport coverage area is limited to a radius of 200-250 km, which corresponds to approximately 1.5-2.5 hours by car to the airport. This area can be expanded by combinations with other types of ground transport (bus and rail), the routes of which are designed to bring additional passengers from remote areas according to the aircraft schedule.

The economic condition of the airport's coverage area is influenced by the financial and economic potential of all types of business in the region, as well as the purchasing power of the population in the airport's coverage area. The laws of economics in aviation work very well. The tourist attractiveness of the region should be considered separately as a driving force for the development of passenger traffic at the airport [9].

The next factor for the successful development of the airport is the identification of potential air carriers that can operate flights to / from the airport or become base for it, as well as the constant creative work of the airport management aimed at attracting these carriers. The ideal development of the airport is the joint infrastructure projects with airlines, which form a synergy in the development of the aviation cluster in the region.

The third factor is the analysis of the degree of competition between airports, as well as other modes of transport. The role of an airport in a region depends on its technical condition and location in comparison with direct competitors.

These airports have strategic importance for the state and form the basis of the airport system in Ukraine. They are located in different parts of the country, have their own coverage areas, which practically do not overlap and form the full coverage area of the state territory. There is an obvious overlap of coverage areas at the airports "Boryspil" and "Zhulyany", as well as the airports "Dnepropetrovsk" and "Zaporizhzhya". The solution for the first couple of airports was the correct positioning in the market and their

orientation to different niches of passenger traffic: Boryspil successfully implements the hub strategy, focusing on transit passenger traffic and a large base carrier, and Zhulyany focuses on low-cost carriers and business aviation. Such approach creates real competition for the main air gates of the country and has convergent effects. The solution for the second couple of airports was the presence of basic airlines - Dniproavia for Dnipro and Motor Sich for Zaporizhzhya, which generate a small but stable passenger traffic. In addition, their relatively small distance from each other makes it possible to cover the existing demand for air transportation in the region, since they are separate subjects in the intergovernmental agreements of Ukraine.

The main constraints to the development of Ukrainian airports are the state of their infrastructure, which requires significant investments, and competition from land transport. Even the airports that were remodeled for the final part of Euro 2012 have controversial issues with the infrastructure and their solution requires additional investments. As for the airports of Odessa, Dnipro and Zaporozhzhya, the potential of their airfields has long been exhausted and they require major renovations.

In this situation, the solution may be to divide airports into two conditional groups: strategic airports and regional (the rest). The main task of the state should be the modernization of strategic airports, which will make it possible to develop passenger traffic at a rapid pace and attract new airlines operating modern types of aircraft. Further, the more passenger traffic will be generated by strategic airports, the greater the potential for the development of regional airports will be. The second stage in the development of the airport infrastructure should be the modernization of other airports, but only after a detailed analysis of the airport's potential in conjunction with the potential for economic development of the corresponding region, as well as the competitive environment.

At the same time, it is necessary to restore the airports of the eastern regions of Ukraine as soon as possible after the cessation of hostilities for their early integration into the country's transport system, which will contribute to the restoration of the region's economy.

An important indicator of the activity of airports is the number of regular routes (k_i)

and flights (s_i) served by these airports (in the theory of complex networks, these indicators are called the degree and strength of the node [10]). The characteristics of the runways and RFFCs determine the technical and operational constraints in the development of an airport and, accordingly, the need for additional investments.

Table 3 - Quantitative characteristics of Ukrainian airports

Rating	Airport	k_i	s_i	ICAO aerodrome code	RFFC
1	Kyiv (Borispyl)	86	24787	4E	8
2	Odesa	21	2888	4C	7
3	Donetsk	15	1663	4D	8
4	Lviv	13	1570	4D	8
5	Dnipro	8	1261	4C	6
6	Simferopol	8	551	4D	7
7	Ivano-Frankivsk	5	81	4C	7
8	Kharkiv	4	583	4C/4D	7
9	Chernivtsi	1	542	н/д	6
10	Mikolayiv	1	279	н/д	7
11	Luhansk	1	242	4C	6
12	Zaporizhzhia	1	237	4C	8
13	Sevastopol	1	59	4C	6
14	Krivoy Rog	1	12	4C	6

So, it is possible to make an assumption about the possibility of developing the route network and more intensive operation of the airport in Odessa, provided that the class of the runway and the fire rescue category is increased. When performing this upgrade, it will be possible to receive aircraft such as B757-300, B767-300, DC-8, DC-10, A300, A330-200 and others corresponding to class D, E and 8-10 RFFC categories.

Borispil International Airport has the prospect of raising the RFFC category to 9, 10, which will make it possible to receive the

corresponding aircrafts. However, the need for budgetary financing of the relevant activities should be justified by the presence of potential demand.

Borispil is the largest airport in Ukraine. Its freight traffic for 6 months in 2015 amounted about 13.5 thousand tons, which is 88% of the total freight traffic of the country.

The second place can refer to the Zaporozhye airport - 556.4 tons of freight traffic. Third place went to another airport in the capital - "Zhulyany" with 422 tons for the same period.

The largest amount of international cargo was handled in Boryspil (12.9 thousand tons), Odessa (246.8 tons) and Zhulyany (203.3 tons).

The Zaporizhzhia airport turned out to be the leader in handling domestic cargo (103.8 tons). The second and third places were shared by Boryspil (83.8 tons) and Dnepropetrovsk (46.6 tons).

In terms of growth dynamics, the highest rates were recorded in Kryvyi Rih (288%), Zhulyany (213.8%) and Lviv (205.4%).

It is noteworthy that the leader of the rating, Boryspil, showed a slight decline in volumes (2.6%). The largest drop was noted at the airports of Chernivtsi (94.4%), Poltava (78.8%) and Antonov (45.6%) [11].

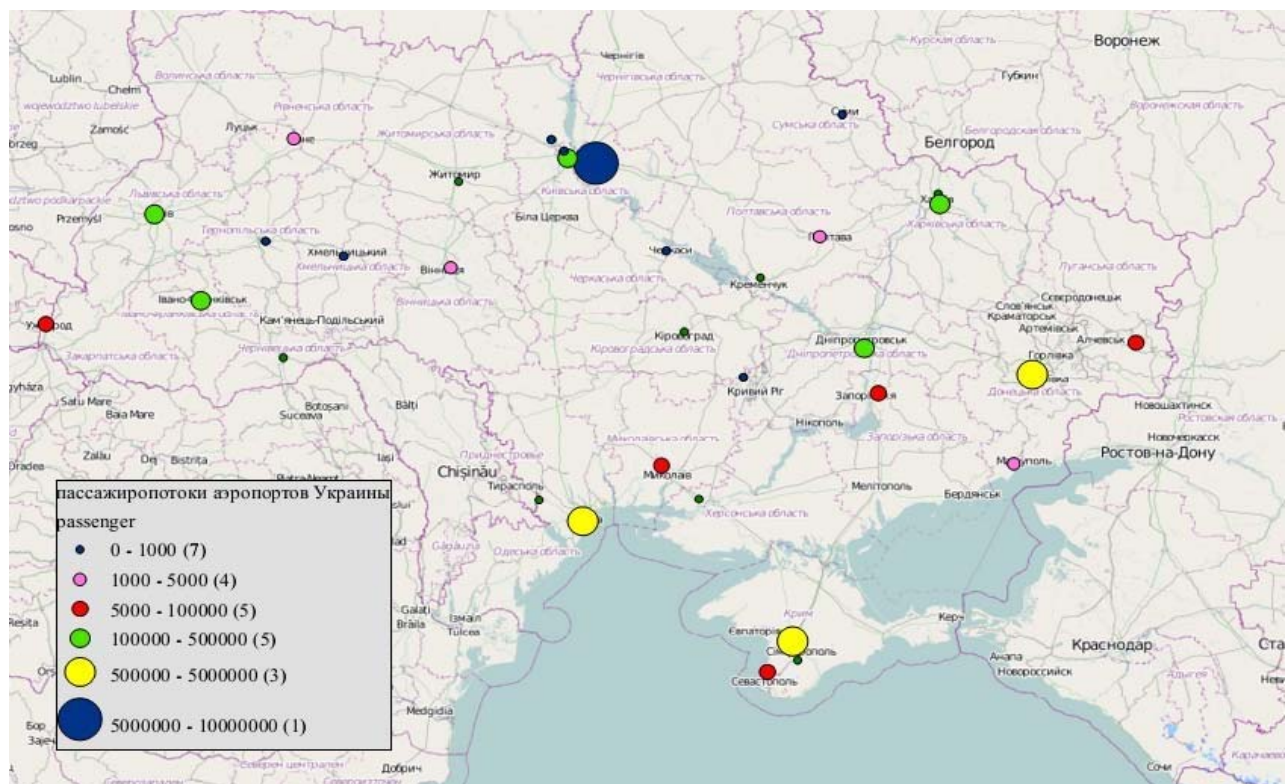


Figure 1 – Passenger traffic of Ukrainian airports

Renewal of secondary airports can lead to the development of airport infrastructure. Moreover, regional airports may bring following benefits for the growth of the country's economy as they:

- provide jobs - an average regional airport provides up to 200 jobs for airline employees, security personnel, and passenger services employees;
- provide freight transportation to markets throughout the country and around the world for locally produced goods;
- provide access to the local market for goods imported from around the country and around the world;

– enable local small business owners, contractors, and consultants to travel into and out of the local community for work, and saving valuable time that in turn can be used to conduct business;

– attract large business and major corporations to build local offices, factories, and distribution centers because of the readily accessible to air transportation.

To improve the airport infrastructure, the Government has assigned 8.6 bln UAH, out of which 5 bln UAH are the state budget funds and the rest of the amount is an investment, which is directly guaranteed by the Government. Another ambitious goal of the

Government is to restore all 50 airports in Ukraine till 2030.

Conclusions. A great number of abandoned and unutilised airfields as well as small airports have been inherited from the past worldwide and in Ukraine particularly. The classification of airports suggested by the FAA divides them into commercial ones and general aviation airports. The commercial airports, in turn, can be referred to as primary, secondary and minor. The latter includes regional airports which have a great potential to contribute into local and national economies through creating jobs in the local community; providing transportation for locally produced goods to the markets outside of the region and for externally produced goods to satisfy the demand of the

local consumers; ensuring passenger flow by small aircrafts for business representatives and tourists; attracting large business and major corporations to build local offices, factories, and distribution centers, etc. The regional airports have become the main ones for low cost airlines because of low airport fees, shorter turn-round times and higher capacity. Renewal of secondary airports can lead to the development of airport infrastructure. Secondary airports give passengers direct and easy connectivity to the 'last mile' of their journey. While implementing effective positioning of strategic and secondary airports in the market, they can cover different niches of passenger traffic and produce convergent effects.

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PROGRAM - TARGET PROJECT AS THE MOST IMPORTANT ASPECT OF PUBLIC ADMINISTRATION

Oksana Polishchuk. *«Program-target project as the most important aspect of public administration».* The article is devoted to the analysis of the possibilities of developing targeted programs and projects. The interrelation of the program-target management method with other management methods and its implementation at the regional level has been analyzed. When preparing targeted programs and projects, methodological errors are often made. In particular, the goal of solving the problem and the requirements for achieving it are not specifically formulated. This significantly complicates the assessment of the compliance of existing projects and program objectives, and also interferes with an objective perception of the current state of the solution to the problem. It is for this purpose that recommendations for further research have been provided.

Keywords: target programs, globalization, project, management method, strategic planning.

Оксана Поліщук *«Програмно-цільовий проект як найважливіший аспект державного управління».* Стаття присвячена аналізу можливостей розробки цільових програм та проектів. Проаналізовано взаємозв'язок програмно-цільового методу управління з іншими методами управління та його реалізацію на регіональному рівні. Під час підготовки цільових програм і проектів нерідко допускаються методичні похибки. Зокрема, недостатньо конкретно формулюється мета вирішення проблеми та вимоги до її досягнення. Це ускладнює оцінку відповідності наявних проектів та завдань програми, а також заважає об'єктивному сприйняттю поточного стану вирішення проблеми. Саме з цією метою надано рекомендації щодо подальших досліджень.

Ключові слова: цільові програми, глобалізація, проект, метод керування, стратегічне планування.

Оксана Полищук *«Програмно-целевой проект как важнейший аспект государственного управления».* Статья посвящена анализу возможностей разработки целевых программ и проектов. Проанализировано взаимосвязь программно-целевого метода управления с другими методами управления и его реализация на региональном уровне. При подготовке целевых программ и проектов нередко допускаются методические погрешности. В частности, недостаточно конкретно формулируется цель решения проблемы и требования к ее достижению. Это существенно затрудняет оценку соответствия имеющихся проектов и задач программы, а также мешает объективному восприятию текущего состояния решения проблемы. Именно с этой целью предоставлено рекомендации дальнейших исследований.

Ключевые слова: целевые программы, глобализация, проект, метод управления, стратегическое планирование.

Introduction. The globalization of economic activity is one of the main issues in

the development of the modern world, since it affects not only the economic life of the

country, but also entails political (domestic and international), as well as social consequences. A modern instrument of state influence on the processes of socio-economic development is the use of a program-targeted method of management. This method is a set of tactically interrelated measures of a technical, economic, social and organizational nature, aimed at achieving a specific goal in the development of the state. For program-targeted management at various regional levels, information on the further development of the region is of great importance, allowing, when making a decision, to comprehensively take into account long-term consequences, so that they do not contradict the interests of other regions and the state as a whole. Such participation, in turn, should be manifested in the formation of such a state policy that contributes to the equalization of the levels of socio-economic development of regions, their economic growth.

The main tasks of the analysis should be aimed at identifying the achieved level, disclosing the most important trends in the development of the economic complex, social sphere, reforming economic relations, social status of the population and the ecological situation, determining both individual shortcomings (imbalances) and positive phenomena, identifying reserves development and socio-economic potential.

Analysis of recent research and publications. A notable scientific contribution to this area of research was made by such famous scientists - economists as: G. Kerol, G. Atamanchuk, V. Abalkin, A. Granberg, V. Davidenko, N. Larina, N. Leksin, V. Tsvetkov, M. Fedorenko and others, whose works are devoted to the problems of development, program-target management. The improvement of the territorial organization of society is attracting more and more attention of practically all political forces of state authorities, public organizations, academic economists and businessmen. A significant revival of public interest in this issue is due to the

understanding that there cannot be a single approach to the concept of economy in every geographically diversified state, each region is distinguished by its historical, economic, ecological, geographic and demographic characteristics and has its own ethnic and cultural traditions. The issues of target-oriented management have not yet been fully investigated, therefore there is a need to pay attention to the issues of developing programs for a different target approach to economic directions.

The purpose and objectives of the study. The use of targeted programs in the practice of managing socio-economic development is caused by the need to preserve both external market relations (tariff agreements, mechanisms for correcting the tax system in the interests of market stability, etc.) and internal processes of state (regional) management.

The main incentive for the development of a program is due to the possibility of obtaining budgetary funds or guarantees from the bank and funds that lend to programs on terms of return. The programs that are submitted both at the regional and municipal levels are quite specific and focused on solving current problems. At the same time, there are also programs-directions of a regional or intersectoral nature, the scale and resource requirements of which significantly exceed the real possibilities of the investment potential. In addition, in the preparation of target programs, methodological errors are often made. In particular, the goal of solving the problem and the requirements for achieving it are not specifically formulated. This significantly complicates the assessment of the compliance of existing projects and program objectives, and also interferes with an objective perception of the current state of the solution to the problem.

The composition of the final sub-goals and projects included in the program do not always take into account the market situation and often do not correspond to the goal of solving the problem as a whole. Taking into

account the peculiarities of using program-targeted management in the process of solving problems of socio-economic development at the regional and municipal levels, it can be noted that its potential capabilities are realized only with an adequate assessment of a specific situation, with the correct implementation of the principles of the program-oriented approach.

This is of fundamental importance, since it is necessary to observe specific forms, methods and procedures of management. In turn, this is due to integration and corporate processes, an increase in the size of individual programs, and an increase in complexity. Increasingly, large programs go beyond the boundaries of one department, and, therefore, require coordinated activities and implementation at the interdepartmental level. In general, this does not contradict the rather broad concept of the target program, which is defined as a mutually agreed project on the use of resources, performers, and the deadlines for the implementation of a complex of research, design, production, socio-economic, economic and other tasks that provide an effective solution are open regulation in the state.

A more detailed approach includes the rationale for choosing a specific problem for software development and is characterized by the following points:

- formulation of the problem and analysis of the causes of its occurrence;

- assessment of the need for financial, budgetary and extra-budgetary, material and labor resources, and determination of possible sources of their provision; determination of the range of possible government bodies (customers), and developers (executors) of the program.

Generalization of theoretical conclusions and specific experience of researchers of this issue allows us to single out the following, more appropriate for the development of targeted programs, principles [1]:

- orientation of the program to the final result (formulated in the form of goals or a set

- of goals), the achievement of which becomes the main purpose of the program;

- building a program in the form of a group (complex) of ordered, interconnected activities of different levels that form its structure;

- definition of small elements of the program; understanding of the program as an integral control object, regardless of the belonging of its constituent elements; systematic consideration of the management process at all stages - from analyzing the problem and setting goals to monitoring the implementation of the program;

- creation of an appropriate organizational program management system either on the basis of a specially introduced body, or by redistributing the rights and responsibilities of existing units, as well as the use of different coordination forms of management.

The actualization of the use of the program-target form in management is facilitated by a new, market-oriented economic management mechanism. The tendency to improve the methods and forms of organization of management is to increase the independence of the primary level of management, as well as expand the competence of territorial regulation in the production and sale of goods and services. To organize an effective solution to socio-economic problems by methods of program-target planning and management, it is necessary to form bodies of program-target orientation, carry out problem-oriented assessments, information support of management. So in a democratic, legal, social society, the main place belongs to the interaction of various types of social mechanisms with the use of democratic social technologies (elections, negotiations, referendums, public opinion studies), the implementation of the principles of social partnership and joint responsibility.

At the same time, the main requirement is that social management should be focused on a person, on his all-round development. In modern dictionaries, this is described as the activities of the state and other political, social

institutions aimed at the progressive development of the social sphere of society, improving the conditions, lifestyle and quality of life of people, ensuring a certain part of their vital needs, providing citizens with social support, assistance and protection.

In the aggregate of subjects of social policy, the state plays a key role. Some scholars define social policy as a function of state responsibility for the use of public resources.

An important technology of modern social policy is, firstly, social forecasting. Social forecasts are carried out in at least two ways - through the search for possible states, determining certain tendencies and extrapolating the situation, and through the normative path - determining alternative or optimal possibilities and timing of achieving the desired state, i.e. ways of solving problems based on the specified optimum criteria.

The next technology is social design as a process of creating prototypes of social phenomena and processes, in the course of such design, both internal and external social resources are identified that can be activated to solve social problems.

Another technology is social planning - it is a scientifically grounded definition of goals, indicators, tasks, deadlines, rates, proportions of the development of social processes and the main means of their implementation. The objects of social planning are society as a whole, each of the spheres of social life, social processes that take place in various spheres of society, both territorially and functionally (in the service sector, etc.).

Tactical measures play an important role in the implementation of the strategy of socio-economic development, its implementation. In this case, tactics act as a tool that contributes to a long-term strategy. The lack of a clear delineation of powers between central and local bodies of executive power and self-government on the management of the socio-economic development of regions indicates that the state needs the development of the economy and legal framework. It should be noted that

over the years of the country's economic development, planning, being the main method of the rational and economic process, acquired new qualities, improved, reflecting the specific tasks of further development. That is why many scientists now defend positions on the continued use of planning (indicative, strategic, structural, programmatic) in the system of state regulation of the economy.

In modern economic science, there are two main approaches to the principles of state regulation and management of the economy of the country and its regions. On the one hand, this is the desire to improve the planned management mechanisms, on the other, it is the introduction of new, programmatic methods of regulation. The presence of shortcomings of market self-regulation and shortcomings of government intervention in the economy gives rise to complex socio-economic problems, the solution of which is associated with the use of the so-called program-targeted method of planning.

The use of the target-oriented planning method provides for:

- problem definition and formulation of goals;
- development and implementation of a program aimed at achieving goals;
- systematic control over the quality and results of the work stipulated by the program;
- adjustments of measures aimed at achieving the goals.

The application of the target-oriented approach is due to many factors:

- availability of demand for products (work, transportation services);
- excessive waste of resources and, as a consequence, the emergence of negative external effects;
- the need for deep structural transformations.

The target-oriented planning method is implemented through target programs. Target Comprehensive Program (PCP) is a document that contains the timing, funding, personnel to ensure the goals of the project.

The goals to which the CCU should be directed are noted in the strategy of the state's socio-economic policy. The classification of the CCU is carried out according to the following main features: by level, composition, sphere of influence and implementation, by the nature and specifics of tasks and goals, by deadlines.

According to the level, composition, spheres of influence and implementation, the following programs are distinguished: interstate, state, intersectoral, sectoral, interregional, regional, local.

By the nature and specifics of problems and goals, programs are distinguished: socio-economic, aimed at solving development problems and improving the way of life, increasing the material and cultural level of the population, improving industrial and social conditions of work and rest, etc.

Production, focused on increasing the production of certain types of products (work, services), the development of progressive industries, improving the quality characteristics of products, increasing the efficiency of resource use.

Scientific and technical, aimed at the development of scientific research, solving problems of the development and implementation of new equipment and technology in practice.

Environmental, aimed at resource conservation, the implementation of environmental projects.

Institutional, focused on improving the organization of management in the system of transformation of property relations.

Regional, aimed at the economic development of new areas.

According to the terms of implementation, the programs are divided into the following types: long-term (designed for a period of 5-10 years); medium-term (1-5 years); and short-term (up to 1 year). This classification is due to the nature of the goals that the program aims to achieve. Long-term programs are aimed at achieving strategic goals. As a rule, achieving a strategic goal is a long-term process that is associated with

different levels of economic development and cannot be carried out quickly. Medium-term programs unleash tactical challenges. Short-term programs are aimed at solving current problems (operational goals).

Programming as a way to solve economic problems is used in various parts of the organizational structure of the economy. The most important programs aimed at solving national and social problems, which are formed based on the strategic goals of the state, acquire the status of national programs. The development and implementation of the CKP requires the performance of a certain set of works (tasks) related to technical and economic planning, production, financing, etc. The set of tasks stipulated by the program can be grouped into two blocks: the main activity and its support.

The main activities include: pre-investment planning research, development of design and estimate documentation, conclusion of contracts, overhaul, construction and installation work, commissioning of facilities, etc.

Support activities include organizational, legal, personnel, financial, material and technical, marketing, information support. Each ICU, regardless of its amount of funding and work, is in various states: from the state when the program is not yet available to the state when the program is no longer there. The period of time from the moment the program was created until the moment of its liquidation is called the life cycle of the ICU. According to current practice, the state through which the ICT passes are called stages (phases, stages). In turn, each stage can be subdivided into sub-stages, sub-phases, etc.

According to the systematic approach and the basic principles of program-oriented planning (target orientation towards achieving final results, complexity, alternativeness, controllability), the MSC is carried out according to the following scheme:

1. Selection of the list of problems to be solved programmatically.

2. Formation and issuance of the initial problem for the development of the program.
3. Development of the draft program.
4. Program approval.
5. Implementation of the program.
6. Report on the implementation of the program.

As for the existing methods for determining the costs of the formation and implementation of targeted programs, they can be conditionally divided into two groups depending on whether the developed version has an analogue in the past, or the development has a fundamentally new character.

If the developed version has an analogue, the amount of expenses for using the target regional program has the property of

adaptability, and can be calculated as the sum of expenses for the implementation of software projects [3]:

$$N C = \sum C(1)_i = 1$$

where: C- is the cost of implementing the i-th software project, CKP.;

N - is the number of projects in the program.

The implementation of individual tasks, which are integral parts of a software project, is determined by the current standards by analogy with previously performed work. The implementation of software projects is determined based on the following formulas:

$$n m T_i = \sum_{j=1} T_{ji} - \sum_{i=1} t l_i (P l_i - 1)$$

where:

T_i - implementation time of the j-th software project;

T_{ji} - implementation of the j-th task included in the software project (and is determined by the current standards and analogy with previously performed robots);

$t l_i$ - the duration of the l-th time interval during which several tasks included in the i-th software project are implemented in parallel;

$P l_i$ - the number of tasks implemented in parallel and included in programs on the l-th time interval;

n - the number of tasks included in the software project;

m - the number of time intervals in which the parallel implementation of tasks included in software design is carried out.

The total duration of the program is determined based on the expression:

$$N L T = \sum T_i - \sum t r (r - 1) (3) i = 1 r = 1$$

where:

T_i - is the implementation time of the i-th software project;

$t r$ - is the duration of the r-th time interval during which several software projects are being implemented in parallel;

$r t$ - is the number of software projects on the r-th time interval, implemented in parallel;

N - is the number of projects in the program;

L - is the number of time intervals on which the parallel implementation of projects included in the program is carried out.

It should be noted that when calculating the time for the implementation of the program, there are three possible approaches to determining the priority of the implementation of software projects:

sequential - projects (tasks) that are included in the program are included in the work after the completion of the previous program income;

parallel - projects included in the program are executed simultaneously;

mixed - along with the sequential inclusion in the work of projects (tasks) that are included in the program, the possibility of parallel implementation of some of them is provided.

When designing and developing fundamentally new, original options for the implementation of program projects that have no analogues in the past, as well as in the case of insufficient statistical information for the application of calculation methods, the amount of expenses for the implementation of software projects and the time of their implementation are determined by the examination method.

Thus, when choosing a program and method for implementing a program-targeted project in the socio-economic sphere, one must proceed from:

a) the special importance of targeted programs for the implementation of major structural changes and increasing the efficiency of regional development;

b) the short time frame for solving priority problems and the need to concentrate resources;

c) the relationship of the relevant projects (tasks).

Conclusions. The use of program-targeted methods in territorial planning and management increases the efficiency of state influence on the socio-economic development of regions, ensures the relationship between the allocated budget resources and the results of their use in accordance with the established priorities

and should be accompanied by increased monitoring and control over the implementation of targeted programs in the region. and priority projects as the main tools for target program planning.

The procedure and methodology for the development and implementation of programs and development plans differ depending on their level and scope of action, factors of selection of problems for program-targeted solutions: the significance of the problem; the complexity of solving problems within an acceptable time frame due to the use of the existing market mechanism and state support for its solution; fundamental novelty and high efficiency of technical, organizational and other measures necessary for the large-scale dissemination of progressive scientific and technological achievements and on this basis increase the efficiency of social production; the need to coordinate the actions of technologically related industries and industries to solve the problem.

The role of program-targeted methods, targeted programs in the management of the national and regional economy will grow steadily. The processes of world economic integration, globalization, involving different countries, regions, organizations, social groups in their orbit, can be coordinated and ordered only on the basis of the application of the program methodology. The relevance of this work will increase every day. The prospect of researching a program-targeted project in the socio-economic sphere is very timely, therefore, these issues should be dealt with more actively in the future.

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EMOTIONAL ECONOMY IN DIGITAL TRANSFORMATIONS OF MODERN SOCIETY

Hrushchinska Natalia, Mikhalchenko Oleksii. *«Emotional economy in digital transformations of modern society».* The article reveals the issues of emotional economy in the conditions of modern transformation processes taking into account the development of digital economy, emotional management, artificial intelligence. The processes of transformation of modern society are under the influence of the network economy as a catalyst for geoeconomic processes with an emphasis on broad informatization, globalization, and opens up great opportunities for humanity to expand the exchange of goods, services, information, technology and capital, humanitarian cooperation and spiritual enrichment. Such trends are receiving special attention in the context of global processes caused by quarantine measures for David-19. Today, the goal of digital technologies is to meet the needs of the population, which are changing with the development of IT developments, in particular - to create a more comfortable and efficient interaction between the public and the management system.

Keywords: emotional economy, transformation processes, digital economy.

Грущинська Наталія, Михальченко Олексій. *«Емоційна економіка в цифровій трансформації сучасного соціуму».* В статті розкриваються питання емоційної економіки в умовах сучасних трансформаційних процесах з урахуванням розвитку цифрової економіки, емоційного менеджменту, штучного інтелекту. Процеси трансформації сучасного соціуму відбуваються під впливом становлення мережевої економіки як каталізатора геоекономічних процесів з акцентом на широкій інформатизації глобалізація, та відкриває перед людством величезні можливості для розширення масштабів обміну товарами, послугами, інформацією, технологіями і капіталом, взаємодії в гуманітарній сфері та духовного збагачення особистості. Такі тенденції набувають особливої уваги в умовах світових процесів викликаних карантинними заходами щодо Covid-19. На сьогодні метою цифрових технологій є, задоволення потреб населення, які змінюються разом з розвитком ІТ-розробок, зокрема – створення більш комфортної й оперативної взаємодії громадськості та системи управління.

Ключові слова: емоційна економіка, трансформаційні процеси, цифрова економіка.

Грущинская Наталия, Михальченко Алексей. *«Эмоциональная экономика в цифровой трансформации современного социума».* В статье раскрываются вопросы эмоциональной экономики в условиях современных трансформационных процессах с учетом развития цифровой экономики, эмоционального менеджмента, искусственного интеллекта. Процессы трансформации современного социума происходят под влиянием становления сетевой экономики в качестве катализатора геоэкономических процессов с акцентом на широкой информатизации глобализация, и открывает перед человечеством огромные возможности для расширения масштабов обмена товарами, услугами, информацией, технологиями и капиталом, взаимодействия в гуманитарной сфере и духовного обогащения личности. Такие тенденции приобретают особое внимания в условиях мировых процессов вызванных карантинными мерами по Covid-19. На сегодня целью цифровых технологий является, удовлетворение потребностей населения, меняются вместе с развитием ИТ-разработок, в том числе - создание более комфортной и оперативного взаимодействия общественности и системы управления.

Ключевые слова: слова: эмоциональная экономика, трансформационные процессы, цифровая экономика.

Introduction. Elements of economic thinking of modern society are the ability to optimize labor activity, to have a constant desire to master and implement information technology tools, with efficient use of economic and natural resources. The specifics of economic thinking of an employee of a particular specialty and profession depends on the scope of his activities, position and other factors. In today's world of technoglobalization, emotional intelligence, emotional management, and the development of the subconscious become especially important. A quote from the Israeli historian Yuval Noah Harari, author of *Sapiens: A Brief History of Mankind* and *Homo Deus: A Brief History of Tomorrow*, underscores the urgency of these issues: "We may be one of the last generations of Homo sapiens. In a century or two, the Earth will be inhabited by organisms that will be as different from us as we are from Neanderthals or chimpanzees. Because in the next generations we will learn to modify our body and mind, and this will be the main product of the economy of the XXI century" [14].

The aim of the article is to try to reveal the features of emotional economy and emotional intelligence in the context of modern digital transformations with an emphasis on behavioral economics.

Analysis of recent research and publications. Issues of behavioral economics

are studied in the works of foreign and domestic authors such as D. Kanneman, A. Tversky, R. Schiller, D. Arieli, M. Alle, A. Suvorov, V. Belyanin. In general, the authors consider the application of behavioral economics in such areas as microeconomics, financial market, investment market. It is the shortcomings of the traditional economy that draw the attention of the founders of the behavioral economy (Behavioral Economics). The founders of this modern branch of the economy are considered to be American psychologists, namely the winner of the Nobel Prize in Economics in 2002 Daniel Kahneman and Amos Tversky. Their article "Prospect Theory: Decision Making Under Risk" was published in 1979 in the journal *Econometrica*. The paper emphasizes that people mostly show a tendency to completely irrational behavior. Through a series of scientific studies, they have concluded that the economy, in particular the market, is the result of human decisions. People's decisions are usually risky. In modern science, the ideas of behavioral economics are explored in the works of Dan Ariely, who found that irrational behavior is not chaotic. It is subject to certain models, so it is quite predictable, at least in statistical terms. According to V. Belyanin, behavioral economics is a branch of economic theory that takes into account the psychological characteristics of human perception, judgment and action in different

economic situations. However, there remains a significant list of issues that need analysis and in-depth research in the field of behavioral economics, namely methods that can calculate the share of psychological impact on the formation and implementation of any economic model, positive and negative effects of human behavior on economic efficiency. object of economics. Particular attention in the context of the study of emotional economics deserves issues of emotional intelligence, revealed in the works of D. Goleman, P. Salovey, J. Meyer, D. Caruso, R. Bar-On, S. Heine, R. Cooper, W. Dax, etc. Theoretical and methodological approaches to the problem of the relationship between intellectual and emotional were considered in the works of B.G. Ananiev, LS Vygotsky, SL Rubinstein, O.M. Leontiev, VM Мясищев, O.K. Tikhomirov and others. In particular, the outstanding psychologist LS Vygotsky singled out the problem of the unity of affect and intellect among the most important questions of psychology. The topic of research on the development of emotional intelligence is becoming relevant around the world, and in Ukraine is also gaining special approaches. Management systems are changing not only at the level of enterprises and organizations, but also approaches to assessing the public administration system. The concept of emotional intelligence is characterized by the ability of the individual to recognize and interpret emotions, as well as productively use them for optimal problem solving. Examining emotional intelligence, it should be noted that of particular interest is the intelligence of the leader as the ability to recognize and interpret emotions, use them to solve management problems. Increasing the level of emotional intelligence of the head of the enterprise improves the efficiency of each individual employee and the enterprise as a whole. The generally accepted notion of economics is determined by a set of social scientific disciplines on the economy, namely the organization and management of material production, efficient use of

resources, distribution, exchange, sale and consumption of goods and services.

The generally accepted notion of economics is determined by a set of social scientific disciplines on the economy, namely the organization and management of material production, efficient use of resources, distribution, exchange, sale and consumption of goods and services. However, a deeper consideration of economics should add a number of factors that affect statistical, econometric, mathematical data, namely factors whose research is focused on aspects of psychology, history, politics.

Presentation of the main material.

Technological development of post-industrial civilization, and partly the current stage is defined as post-industrial civilization, and involves the formation of VI-VII technological systems, based on the development of emotional intelligence, subconscious, biotechnology, technology related to morality and responsibility. A person's reaction to social processes: migration, rising prices, fluctuations in the dollar, etc. is a manifestation of emotions that can cause panic or calm the population, influencing further economic processes. The higher the economic consciousness of society, the more difficult it is exposed to possible influences, including manipulation. Especially given the basic psychological law formulated by the English economist J. Case, according to which people tend to increase income consumption, but not to the same extent as income increases. The economic consciousness of society must be realized by the national economic idea. The formation of the national economic idea depends on the choice of model of socio-economic development of the country. The economic consciousness of society is based on the presence of economic awareness of the population, its emotional intelligence. Emotional intelligence (EQ) has several levels. The first is awareness of one's emotions; the second - the ability to manage their own emotions; third - awareness of other people's emotions; fourth - managing the emotions of others. In business, the ability to

manage the company's emotional resources is special, ie "emotional management". In today's world with active technological development, emotion control is a necessary component of a stable society. The cycle of changing types of economic sentiment, which in turn play an important role in changing cycles of business activity, is revealed in the scheme of SJ Lloyd, representative of the monetary school in political economy: , panic, stagnation, depression and calm again "[4]. What indicators can indicate the adequacy or emotional instability of the population? Let's try to assume that this is not just statistics of the mentally ill, but indicators of the effectiveness of social policy, namely the level and quality of life (a measure of material, spiritual and social needs of man, providing a set of material and social living conditions). Indicators are used to assess the living standards of the population: subsistence level; the value of the subsistence level; the value of the "consumer basket" of food; poverty line; minimum wage and minimum pension, etc. The following data can also testify to the state of emotional adequacy of society. Among people who can not control their emotions, natural mortality is 40% higher than in people who are emotionally stable, due to exacerbation of cardiovascular disease, diabetes, etc. [5]. In Ukraine, such negative trends are confirmed by high mortality rates, including due to the above diseases. According to the State Statistics Committee, the percentage of divorces in relation to registered marriages in the CIS countries, including Ukraine is about 60%, in most cases due to emotional problems. According to statistics, 90% of murders are committed in a state of affect, under the influence of alcohol and drugs. The world's statistics are 466078 murders per 100 thousand population, including the largest in Africa - 169,105 centuries., American countries are - 144648, Asian countries - 137120, European countries - 24025, including Ukraine, but , with one of the lowest results - 1551 murders. According to the WHO,

about 400 million people suffer from depression worldwide, in Ukraine such figures are more than 6% of the population. The number of suicides as a result of depression reaches up to three thousand people each year, and in Ukraine there are 20.1% of suicides per 100 thousand population. Statistical indicators of emotional intelligence of the population, which are interrelated with the economic assessment of the country, can be confirmed by the International Happiness Index [24].

Globalization opens up enormous opportunities for humanity to expand the exchange of goods, services, information, technology and capital, cooperation in the humanitarian sphere and the spiritual enrichment of the individual. At the same time, for a large part of the world, globalization poses significant threats, causing the division of countries into a "civilization center" and a "peripheral zone", deepening their differentiation in socio-economic and scientific and technological development.

Studying the processes taking place in the context of globalization, should take into account changes and globalization itself, its transformation, the catalysts of which include, above all, technological changes in society, leading to changes in economic, political, social, cultural spheres of life. The analysis of these areas can be considered effective and efficient in determining the research methodology.

If the XX century. was the era of industries based on the use of natural resources and efficient technologies, the XXI is dominated by "artificial intellectual industries", the economy of intellectual assets, the main factors of development of which are not production and implementation, but the idea, project, program. Globalization processes are characterized by a wide range of direct impact on the economy and its effectiveness. Large-scale social transformations are also related to global competition and competitiveness.

Technological development of the economy involves the development of the

economy through progressive changes, attracting investment, consistent growth of the scientific and technological sector, the knowledge economy. The lag in the development of the theory of technological systems, its non-use in the process of state forecasting and management lead to distortions in the development of the country. Technological systems are the leader of modern processes of post-industrial society.

The main problem of constructing the foundations of the new economic system in modern conditions is the factor of adaptation of its internal features to the national character of the industrial economy. New industries are specific elements of the national economy, as they are directly subject to the laws of global economic flows. Problems and prospects for their functioning - is a complex structural complex of the global and national economy. The main problem node of post-industrial design was the need to develop a model for the development of post-industrial humanitarian economy in a particular country.

In total, against the background of the rapid growth of the importance of the information component, the importance of industrial forms of economic organization is declining. The latest technologies provide a unique opportunity for countries with limited resources to "jump over" entire cycles of industrial development, which a few years ago had to go through to reach today's level of economic development of Western society.

The formation of post-industrial society involves a new historical phase of civilization, in which the main products of production are information and knowledge. Signs that distinguish the information society are: increasing the role of information and knowledge in society; increasing the share of information communications, products and services in gross domestic product; creating a global information space that provides effective information interaction of people, their access to global information resources and meet their needs for information products and services.

In modern society, information is becoming the most important value, and the industry of receiving, processing and transmitting information is a leading industry in which more and more significant capital is invested every year. According to leading scientists, information is becoming an important strategic resource, the lack of which leads to significant losses in the economy. Informatization of society is one of the decisive factors in modernizing the economy on market principles and the key to Ukraine's integration into the world community.

Attempts to measure information were first made in the early nineteenth century. However, the beginning of modern information theory was laid by the American cyberneticist K. Shannon in 1948, who defined information not as a social phenomenon, but in a technical aspect. After researching the characteristics and options for measuring information, philosophical scientific works on the qualitative nature of information begin to appear [20]. Thus, according to A. Ursul, information is part of such an attribute of materialism as reflection, which expresses diversity and can be objectified, transmitted and participate in all forms of movement in nature and society. In the 1980s, the number of philosophical publications on information decreased markedly, which can be explained by misconceptions about the development of the main theoretical principles of the problem. Simultaneously with the cessation of theoretical research of philosophers, information began to play an increasingly prominent role in socio-economic development and attract the attention of economists.

The main feature of the modern world is the use of artificial intelligence in almost every field of activity. Of course, the main world leaders in the artificial intelligence industry are the United States and China. According to financial indicators, the total volume of China's artificial intelligence technology industry by 2025 should reach \$ 60.3 billion, and by 2030 - to exceed \$ 150.8 billion. [21] In

general, the population of the world has a tendency to age, in particular, the population of China, in addition, the rapid decline of natural resources, the actualization of environmental problems. Much attention is increasingly being paid to the use of artificial intelligence, which should help create smart manufacturing, updated medicine, cities, agriculture and defense. In 2019, the G20 countries agreed on the principles of treatment of artificial intelligence, which provided the center for the use of artificial intelligence - man, and the basic legal principles, human rights and democratic values are aimed at supporting human values. By 2030, 400 to 800 million people worldwide are projected to lose their jobs through automation. A McKinsey & Company study found that about 30 percent of jobs in 60 percent of professions can be computerized, and 80 million jobs in the United States and 15 million in the United Kingdom. In 2013, a study by Oxford University academics entitled "The Future of Employment" was conducted, during which 702 common professions were studied. The study found that some professions, such as TV shopkeepers, tax clerks and referees, are at greater risk of extinction than others, such as recreational psychologists, dentists and doctors.

By 2020, the Fourth Industrial Revolution opened up the world of robotics and autonomous transport, artificial intelligence and machine learning, new materials, biotechnology and genomics. The strongest factors influencing the global economy are: the spread of the Internet, mobile communications, automation of routine intellectual work; cloud technologies and energy storage solutions; next generations of approaches to genome management; advanced robotics and driverless transport; 3D printing, etc. Accordingly, such processes will contribute to the destruction of professions that do not require high qualifications. Of course, among the negative consequences of the fourth industrial revolution are the following: the emergence of unemployment and the distribution of

world wealth - poor countries may still become poorer, but rich countries can expect significant shocks due to mass robotization of production; the flow of qualified personnel to rich countries, according to the possession of all new technologies. And the growing "significance" of the poor countries as raw materials and human resources for the rich; Rising cybersecurity threats - Many surveys around the world point to concerns about new threats of cyber attacks.

Conclusions. The analysis of the features of emotional economy and emotional intelligence in the conditions of modern digital transformations is carried out taking into account the processes taking place in the modern world space. The quarantine effects of COVID-19 have shown that digital skills that enable citizens to access information and services are crucial for the entire population. Harmonization of digital markets in Ukraine will lead to increased competition, which means improving online services at better prices and with more choice. This will attract investment, and stimulate trade and employment, contributing to the socio-economic development of countries. The EU's Digital Single Market is one of the European Commission's 10 policy priorities aimed at providing the best possible access to the online world for individuals and businesses. In order to bring the single market of the European Union into line with the digital age, it is necessary to remove unnecessary regulatory barriers and move from individual national markets to a single pan-European set of rules. Harmonization of digital markets is one of the key outcomes of EU policy to deliver tangible results to citizens in the Eastern Partnership. Regulatory tools, ways of implementation are through appropriate legislation and using financial, economic, administrative and political mechanisms of influence.

Digital markets, virtual economy, artificial intelligence require an appropriate response from the introduction of emotional intelligence as the ability of the individual to manage the emotional sphere on the basis of

intellectual analysis. The problem of emotional intelligence remains insufficiently studied both theoretically and experimentally, and requires a sound

scientific justification. The education system for the introduction of innovations and creative approaches is designed to find a balance between thinking and emotions.

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