



Digital Logistics in Flow Management in Tourism

Svitlana Bondarenko *

*Corresponding author, Department of Hotel, Restaurant and Tourist Business, Kyiv National University of Culture and Arts, Kyiv, Ukraine. Email: lana.bond@ukr.net

Valentyna Rusavska

Department of Hotel, Restaurant and Tourist Business, Kyiv National University of Culture and Arts, Kyiv, Ukraine. Email: rusavska18@gmail.com

Viktoriiia Niziaieva

Department of Regulatory Policy Problems and Entrepreneurship Development, Institute of Industrial Economics of the National Academy of Sciences in Ukraine, Kiev, Ukraine. Email: viktorianizjaeva@gmail.com

Tetiana Manushkina

Department of Agriculture, Geodesy and Land Management, Mykolayiv National Agrarian University, Mykolayiv, Ukraine. Email: latushkina2004@gmail.com

Tetiana Kachanova

Department of Agriculture, Geodesy and Land Management, Mykolayiv National Agrarian University, Mykolayiv, Ukraine. Email: kachanova0909@gmail.com

Ulana Ivaniuk

Department of Management of Organizations, Lviv Institute of Interregional Academy of Personnel Management, Lviv, Ukraine. E-mail: ivaniuk.ulana@gmail.com

Abstract

The article considers the main aspects of using the tools of the system organization of logistics flow management in the field of tourism, in terms of digitalization of logistics services. The research is based on experience in the transformation of the tourist product, it is perception by consumers, modern technologies, digital channels and logistics tools. The analysis showed that the organization of tourism based on a systematic approach, when service providers, tour operators, travel agencies and end users are elements of a single information system. The essential features of tourism logistics considered, basic

tactics and tools related to the concept of digital logistics service. It established that digital tools of logistics services implemented with the identification of the main tourist services: food, accommodation, transportation, sightseeing, shopping, recreation and entertainment, education, management and research.

Keywords: Tourism, Tourist logistics, Logistics system of tourism, Digital logistics service, Flows in the field of tourism.

Introduction

A travel restrictions, low customer confidence and the global fight against COVID-19 have made 2020 the most difficult year in tourism history. Tourism, as a service sector, has undergone significant changes in recent years as it faces new technologies, new consumers and their latest expectations (green energy, sustainability, etc.). Industry technologies need constant improvement, in accordance with the changing behavior of travelers and market demands. Covering all activities related to tourism, recreation and hospitality, this area is able to involve in the processes of active interaction not only many recreational resources, but also to provide appropriate conditions for more efficient use of production, scientific, technical, socio-cultural, environmental potential of a particular territory (Babenko, 2020). Improving the competitiveness of tourism in the world determined by indicators of the following main areas: air transport infrastructure, readiness for information and communication technologies, price competitiveness, international openness, prioritization of tourism, security and safety (International Tourism, 2020).

Modern tourism is highly dependent on information. The level of development of information programs is a determinant of the development of the tourism industry, which is currently experiencing an era of significant transformations, renewal and innovation, the creation of smart tourism based on digital technologies (Sudomyr et al., 2020). Communications and business processes in the tourism industry have almost completely automated. The tourism sector requires the development and further improvement of communication technologies in the development of the tourism business in the information society and globalization (Babenko, 2020). The tourism industry is actively implementing Industry 4.0 technologies, which affect the services of electronic payments and e-commerce, e-commerce and the Internet of Things, crowdfunding, Internet banking, etc. Smart tourism is a modern service sector based on the idea of Smart Growth (Bollier, 1998). The introduction of the concept of smart tourism, which has based on the concept of smart cities (Buhalis & Amaranggana, 2014) will facilitate the exchange of information between stakeholders, which could improve the decision-making process based on information and communication technologies (The Travel & Tourism Competitiveness Report

2017). Smart technologies, digitalization helps to increase the competitiveness of market participants in tourism services, improves the profitability of ancillary services for tourism products, optimizes the professional structure of tourism and improves the impression of travel. The digitalization of tourism includes cloud platforms, the use of service and service applications, digital marketing tools, integrated surveillance, competent services, and e-business using modern information technology (Bondarenko et al., 2020). The problem of modernity is the management of human (tourist) flows. After all, there is already the concept of excess tourism - the phenomenon of uncontrolled tourism impact on the ecosystem (Capocchi et al., 2019). Overtourism is a new term, to used to describe the negative effects of mass tourism. That is, it is tourism that has got out of control. The tools for solving these problems are modern digital technologies of logistics flow management in the field of tourism as a source of additional effects and benefits. Obviously, tourism closely linked to many other sectors. In order to meet the constant changes, there are innovations with a valuable opportunity to shape the future of tourism. The introduction of logistics is part of the system organization of the tourism sector. We are talking about all the "invisible" and virtualized processes in logistics and supply. In such conditions, only a systematic, coordinated approach to the application of digital technologies in the tourism industry, based on the principles and methods of logistics management will contribute to the holistic and purposeful development of tourism. The object of logistics in tourism are information flows and related material, human, financial and service flows associated with the formation of a tourist product and the provision of services to customers. The subject of research in tourism logistics is the design of new macro- and micrologistics systems of the tourism industry or the improvement of existing systems. The hypothesis of this study: to regulate the tourism sector requires the active implementation of instrumental logistics solutions to manage the flow of the tourism sector through modern digital channels and logistics tools. Thanks to this study, the main directions were identified balancing tourist flows with the tools of logistics service in the field of tourism.

Literature Review

Tourism logistics is the science of planning, control and management of operations performed in the process of preparing a tourist offer, delivery of finished goods to the customer, in accordance with his interests and requirements, as well as during the transfer, storage and processing of information related to tourism activities (Kochadze et al., 2013). Logistics, as a science of flow management, in the field of tourism has its own specific features (Fig. 1).

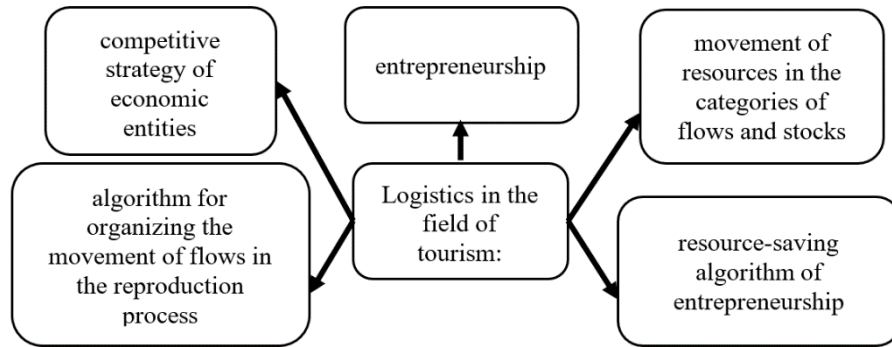


Figure 1. Essential characteristics of logistics in the field of tourism

Logistics in the field of tourism are:

- modern competitive strategy of all economic entities involved in the field of tourism;
- resource-saving and optimization algorithm of business activity;
- a systematic approach to traffic regulation and development of service, material, financial, information and labor resources in the categories of flows and stocks;
- rational algorithm for organizing the movement of material flows and accompanying flows of information, finance and services during all stages of the reproduction process;
- type of business activity that specializes in the purchase, storage and delivery of raw materials and finished products to the consumer, as well as the regulation of services in the field of tourism.

The functions of logistics concern strategic, operational and managerial activities (Fig. 2).

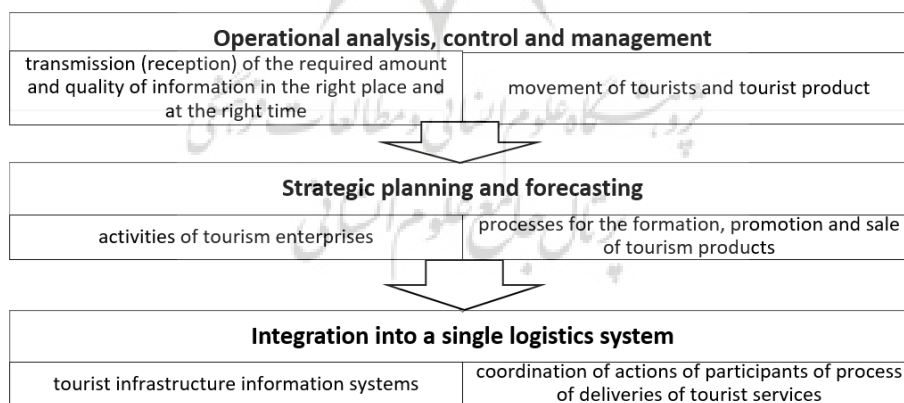


Figure 2. Logistics functions in the field of tourism

The main functions of logistics in the field of tourism are:

- operational analysis, control and management: (1) transmission (reception) of the required amount and quality of information in the right place and at the right time, (2) movement

(movement) of tourists and tourist product;

- logistical audit of service channels of tourist flows;
- logistical coordination of actions of participants in the process of providing tourist services, which provides a rapid response in case of increasing consumer demands to the level of logistics service, monitoring of logistics service guarantees;
- strategic planning of processes on (1) formation, advancement and realization of a tourist product and (2) forecasting of activity of the enterprises of sphere of tourism; (3) calculation and organization of the financial limit based on the analysis and forecasting of development of negative tendencies in the tourist sphere in case of force majeure;
- integration into a single logistics system of information systems of tourist infrastructure, operating separately (local, regional, transcontinental networks);
- ensuring the necessary meetings, symposia, videoconferences, etc. at the local, regional and global levels.

The organization of tourism requires the use of a systematic approach, when service providers, tour operators, travel agencies and end users are elements of a single information system. In addition, the infrastructure of tourism is important, the close relationship with transport organizations to provide tourists with services of appropriate quality.

The destination, as a territorial and recreational system, can be considered a macrological system of tourism. This is a tourist attractive area, which includes natural and socio-cultural complexes (attractions), engineering structures, service organizations and staff, as well as vacationers (vacationers), ie consumers of recreational services. In this system there are material flows (transport and human flows), information flows (between the participants in the logistics process), as well as financial and service flows.

Management of transport, human and information flows at the macro level is to organize the movement of vacationers from their places of residence to places of rest, from the station or airport to the sanatorium, the movement of vacationers within the territorial-recreational systems when organizing excursions, and creating competitive logistics systems in tourism improving information exchange between participants in the logistics process.

Value creation occurs in ecosystems in the field of tourism through networking and coordination of stakeholder interests, where different participants simultaneously contribute to the result (Bernd Kuhlenkötter et al., 2017). Digitization of logistics processes in the field of tourism allows us to consider the concept of supply chain management in terms of integration of business process management, the basis of which is the processing of information on the state of

tourist flows. The system of interaction between the participants called the value chain ecosystem of the Internet of Things projects (IoT ecosystem). The digital economy is a cyber-physical system of systems, most adapted to each other, for the most rational use of available resources, self-optimization of all components to best meet the needs of participants. Elements of the tourist system can be presented in the relationship of supply and demand (Var & Gunn, 2002). All objects of tourism, as a rule, have interconnected by differently directed, parallel tourist flows - arrival and departure of tourists within the tourist system in time intervals. Tourist flows are, on the one hand, quantitative indicators of tourist activity, and on the other hand, they reflect the qualitative characteristics of the tourist system - the cyclical nature and stage of its development.

To harmonize the tourism system, the issue of improving the management of tourist flows is relevant (Danylyshyn et al., 2020). To this end, digital tools of logistics services are being introduced, with the identification of the main tourist services: food, accommodation, transport, sightseeing, shopping, recreation and entertainment, education, management and research.

The main purpose of logistics in tourism is to manage the demand for relevant tourist products (services) of the tourist destination and to provide quality tourist services. Achieving this goal is possible through the use of the principles of integrated logistics, which unites all participants in the tourism market into a single logistics system, at the stages of formation, promotion and implementation of the tourist product (services) of the destination through end-to-end management of tourist flows at all levels. (Keller, 2017). Logistics system is a set of elements interconnected by functions to solve the main task of logistics - delivery of the desired goods at a certain time, in a certain place, in the right quantity and quality, with minimal costs. The product on the tourism market is a tourist product. Currently, the following criteria for tourism planning and regulation of the tourism sector identified:

- bandwidth, by definition According to the World Tourism Organization, there is a maximum number of people who can visit a tourist destination at the same time, without causing the destruction of the physical, economic and socio-cultural environment and an unacceptable reduction in the quality of visitor satisfaction (UNWTO). That is, the place's ability to support tourism without harming itself (estimating the maximum number of people a footpath can withstand before it fails, which will create risks for tourists; or the maximum number of tourists who can stay in the village without overloading the local water supply system, etc.); limits of permissible change - the degree to which local people are willing to accept changes in their hometown or district in exchange for a growing tourism economy (large hotels that overload traditional architecture or prevent buses from entering the city center, increasing pollution and congestion); Visitor flow management is the process of planning how tourists move to their destination (you can influence and direct tourist flows in such a way as to provide guests with a high quality of service and at the same time limit the pressure on the place, residents and

resources). Logistics management effectively increases the satisfaction of tourists, promotes the brand image of tourism from the standpoint of ensuring the quality of service within the country, city or attraction, which brings tangible social and economic benefits.

Figure 3 presents a model of the logistics system, which reflects the internal relationships between the elements within the tourism system.

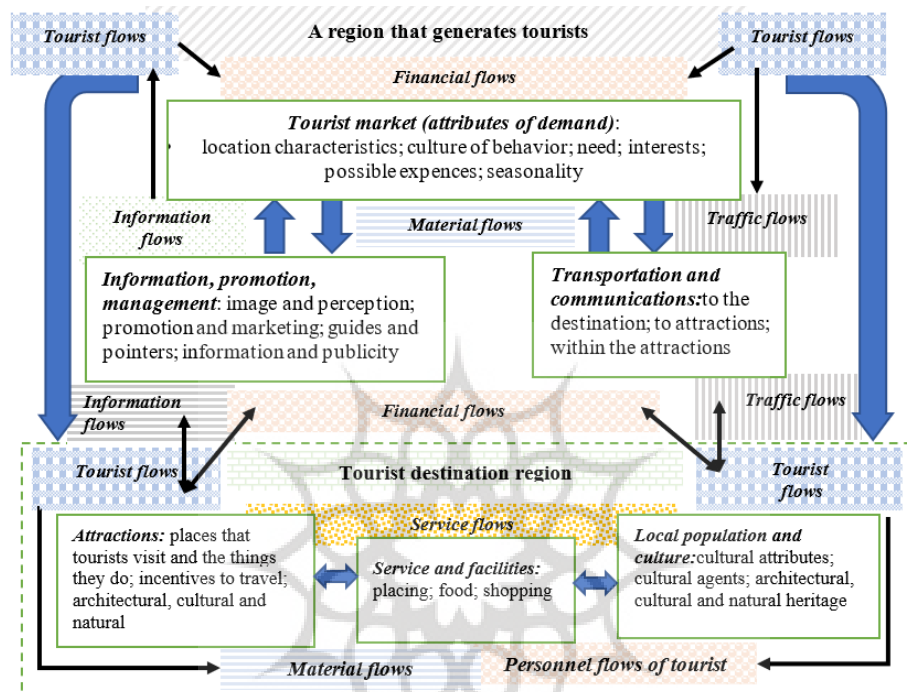


Figure 3. Logistics system in the field of tourism

The logistics system of tourism consists of the following elements:

- information - tour planning, promotion of a tourist product on the market, order processing, demand forecasting - information flows;
- material resources to meet the food and non-food needs of tourists - material flows;
- movement of tourists to the destination - tourist flows;
- transportation of tourists - the choice of mode of transport and the company-carrier - traffic flows;
- personnel that serve tourists are an important component of the logistics system - staff flows of tourism;
- flows of services aimed at satisfying the tourist impression, in accordance with the tourist interest, created by the logistics system to meet the demand of both external and internal consumers of tourist services - service flows;
- service production - logistics units that serve the process of forming a tour and providing

services to consumers, controlled movement of funds operating in tourism logistics systems, as well as between them and the external environment - the formation of financial flows from sold tourist products (services).

Service flows are most clearly reflected in tourism logistics. Logistics service provides the consumer with the opportunity to choose the best option for the purchase and consumption of a tourist product or tourist service using the principles of formation of the logistics system of tourist services. The tasks of the logistics service in the tourism sector are: optimization of tourism infrastructure; regulation of tourist flows to ensure the preservation of the ecosystem; management of rational distribution of tourist flows at the level of destinations; regulation of labor flows in the field of tourism, in accordance with the demand for tourist services; rational organization of inventory flows to ensure the proper quality of tourist services; monitoring of tourism flows. The presence of tourists - the most important source of tourism development, which depends on the interest of tourists to visit the region. Experience, hobbies, expectations, desires of potential travelers are the driving force of tourism. Traveler-generating Region (TGR) is a place (country, city, territory) where tourist demand formed due to motivating and stimulating a person to travel. In TGR a person finds the necessary information, makes a reservation and from there goes on a journey along a certain route (Leiper, 1979). The Tourist Destination Region (TDR) is essentially the ultimate destination of the trip. TDR is a tourist destination that has a decisive influence on demand, activates and provides the tourism system. The Transit Route Region (TRR) is the link between the region that generates tourists and the tourist destination, as well as the places that people visit by road. Information systems and means of communication are a necessary tool for the successful functioning of the destination in the tourist market. The quality and availability of information for potential consumers about the properties of tourism in the region is becoming relevant. Thus, the interest of tourists to visit the destination arises provided they are aware of its existence, specific recreational resources in such an area, the level of development of the tourism industry, as well as the availability of reliable information. The tourism sector forced to resort to more flexible technological infrastructures that promote the development of business networks at the local destination level.

Data and Methodology

The methodological basis of this article was a systematic approach to streamlining management and optimization of flow processes in the tourism and recreation industry as objects of research in logistics management. Specific features of the subject area of research are the identification and clarification of the basic essences of logistics in relation to tourism and, in particular, in terms of digitalization of logistics services. To a greater extent, this applies to key objects of logistics - the subjects and participants in the supply chains of the tourism industry, basic concepts, material and related flows in this area of research. The article uses a method of building a mathematical model that will optimally distribute financial investments in the

digitization of logistics services. The product of this study is a model for planning and optimizing the budget for digital logistics service programs. These developments are presented on the basis of the analysis and the identified problems in tourism, which arose as a result of the global crisis during the pandemic COVID-19. The study is based on the experience of countries around the world in the restoration and development of tourism, the transformation of the tourist product, the expectations of tourists and modern technologies and digital logistics service in the field of tourism.

Results

Modern trends, technologies and tools for tourism development

Tourism is one of the most affected by COVID-19 sectors of the economy: thousands of canceled flights, suspension of land transport, hotel closures. The experience of 2020, a global lockdown, was completely new, as a result of which one of the largest industries in the world was shut down for several months. Experts say that the pandemic has provoked a leap in the digitalization of the tourism business. It is becoming common to switch to digital communication using Zoom, Skype, digital tools (social networks, websites, messengers) and other tools. In general, digitalization includes not only the introduction of certain technologies. The most important is a comprehensive restructuring of business processes and corporate culture, changing the expectations of tourists and the perception of the tourist product, ways to offer it, methods of interaction with the market.

The trend of modern tourism has already become the active introduction of personalized service and mobility. The success and opportunity for business development in the travel industry depends on the willingness to implement technological innovations. The main goal is to build an effective system of recommendations and the formation of individual proposals, because the personalization of content significantly increases customer loyalty and reduces the time to find the right product.

Determinants of optimization of processes in the field of tourism are the ability to get instant access to content from anywhere. In this case, the navigation system on the travel agency's website should be so simple and convenient that the user spends a few seconds searching for the desired unit. Therefore, user-friendly, fast-acting and mobile gadget applications should become a mandatory part of the portfolio of travel companies. According to analysts, the generation of modern travelers increasingly prefer not text but voice: almost half of the surveyed tourists already use the services of voice assistants, are able to recognize natural language. According to the forecasts of Bloomberg (2019), traditional types of recreation and travel will be preserved, although they are in vogue for environmental friendliness and technology. Some resorts are beginning to attract customers with high-tech entertainment, using virtual reality technology. For example, the luxurious Hawaiian hotel Four Seasons Resort Oahu

offered a virtual reality spa service – for 20-80 minutes VR-headset «transports» guests into deep space, ocean bays or Zen gardens, while electronics produce similar sounds and even smells, simulating wind and air temperature. This evaluates the visitor's breathing and heart rate to ensure his rest and relaxation. Another trend is gaining popularity – subscription vacation. Hotel Inspirato Pass offers to issue a membership subscription for «endless annual travel» for 2020 for \$ 2.5 thousand per month. It will give unlimited access to hotels, yachts and the full range of entertainment venues.

The owners of Las Ventanas al Paraiso in Los Cabos (Mexico) offer to book a villa with a subscription. Making it out, the client's vacation begins before sending to the airport: the butlers will meet the traveler at the front door, take to the point of departure and along the way offer a personalized treat. The Blackberry Mountain Hotel also offers a subscription holiday with lunch, a pottery course, yoga classes, tree climbing, rowing and a seven-course dinner with a wine collection. Since 2019, the tour operator Natural Habitats offers routes with minimal impact on the environment, and has also developed a fundraising program for nature protection. Travelers are offered the opportunity to look at whale migration, visit the Amazon rainforest or observe polar bears in the Arctic with experts from the World Wildlife Fund. It is becoming commonplace to use the Internet of Things to meet the needs of travelers, allowing them to control, for example, an air conditioner, audio system or lighting in the room via a smartphone. Thus, the convergence of virtual and augmented reality contributes to the saturation of positive impressions with brighter emotions when choosing travel services and visiting attractions. With this technology, the traveler will be able not only to see the ruins of the Roman Forum, but also to see its 3D-reconstruction. The following examples of use already exist: Virgin Holidays (UK) uses VR-glasses when selling tours. And the blockchain, in turn, allows you to make a check-in in an automated mode and for one booking operation to sell a range of services from several local suppliers. The development of online travel is characterized by the transition beyond the involvement of the early majority to the use of innovation, and the market is evolving towards the involvement of the late majority (Bondarenko et al., 2020). The tourist product and its supply are significantly changed and complicated, given the transformation of tourists' requests for security. Thus, in terms of the spread of viral infections, the flight is considered safer, because the aircraft are equipped with modern air conditioning systems that carefully filter and completely renew the air in the cabin in three minutes. Of course, people's demand for safety is different, and here market players have a real field for creativity. It is possible that there will be some additional opportunities to choose seats on the plane or increase the demand for priority landing, so as not to stand in line with other passengers. As innovations at airports and aircraft, online agencies will launch new services to help you choose and compose your trip the safest. The transformation of established constructions of market relations is also forecasted, which will accelerate the already started processes (for example, the transition of the industry to the new NDC distribution standard), innovative models and products may appear. The crisis will

encourage tourism market players to reconsider how and with what technologies they work. One possible scenario is to change the pattern of interaction between service providers, global distribution systems (GDS) and agencies. The standard scheme of interaction will change, when airlines pay GDS conditionally \$ 5-15 for the flight segment, and agents receive a fee from GDS for booking this segment. Due to the crisis, the carrier will be able to pay no more than \$ 5 per segment, and then the agency fee becomes very meager. It is possible that the agency's earnings will no longer be from the technology provider, but from the end consumer. Another possible scenario is to review the cost of technology for companies. The cost of transactions will decrease, which will affect the final price of technology for consumers. Airlines will look for ways to minimize their costs, while storing and distributing content, and agencies will address access to this content in the most cost-effective way. Thus, proposals for new technologies are expected from leading technology players, which will be much cheaper, simpler and easier to integrate into the infrastructure of the tourism industry. According to experts, the tourism industry will recover in a U-shaped scenario, and this process will take time. To speed up, a single network must be created to make the traveler feel calm and safe again. The issue of their health and the health of loved ones becomes crucial. In order to gain the trust of these customers, airlines and hotels need not just to comply with the sanitary requirements proposed by regulators, but to show people their care in every possible way. Agencies can increase their value by providing the most complete and up-to-date information about the new travel rules and services aimed at travel safety. In this way, the importance of retail technologies that help to effectively promote and sell new tourism products in direct and indirect channels will grow.

World tourism trends

According to the World Tourism Organization, in the first ten months of 2020, the number of international tourist trips decreased by 72%, almost reaching the level of 1990. Tourist flow in the first half of 2020, compared to the same period last year, decreased by 65%. In total, about 120 million jobs directly in the tourism sector are at risk (UNWTO). In the period from January to October, the number of foreign tourists decreased by 900 million, compared to the same period in 2019. This means a loss of \$ 935 billion in revenue from international tourism, more than 10 times the loss of 2009 during the global economic crisis. Such a sharp drop in tourism revenues due to the pandemic could lead to economic losses of \$ 2 trillion in world GDP.

Data on international tourism expenditures indicate a decline in demand for foreign travel. In some large markets (USA, Germany and France) there is a gradual recovery of tourism. Demand for domestic tourism continues to grow in China and Russia. In the Asia-Pacific region with the highest level of tourist restrictions in the first ten months of 2020, the number of trips decreased by 82%. In the Middle East, there was a decline of 73%, and in Africa - by 69%. International travel in Europe and America decreased by 68%. Europe remains the most favorable region for tourism, as in most cases travel is still allowed (91% as of 1 November

2020), mainly among the Member States of the Schengen Agreement. There is an increase in interest in urban tourism (travel in cities, recreation in cities). Large cities are especially popular with tourists. Some cities are called tourist magnets. Moreover, the actual tourist flows in the cities far exceed the values specified in official statistics. For example, official statistics do not include day-trippers and those who rent private accommodation provided through Airbnb and similar online platforms. Statistics on the most visited countries in the world in 2019 are presented in Figure 4. The trend of recent years is the exacerbation of problems with excessive concentration of tourists in some cities / areas, which exceeds the capacity of tourism (*Overtourism*). *Overtourism* especially characteristic of "global cities", unique tourist areas and objects. The most dynamic tourist destinations in 2019 were Myanmar, where the increase in tourists, compared to 2018, was 40.2%.

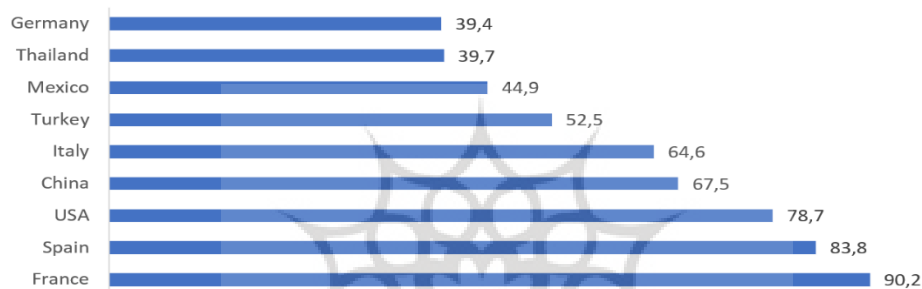


Figure 4. Countries most visited by tourists, million, persons, 2019 (Global and regional tourism performance)

Countries of the world: Puerto Rico, Iran, Uzbekistan, Montenegro, Egypt, Vietnam, the Philippines, etc. are also marked by a significant increase in tourist flows. The most dynamic tourist destinations in the world in 2019 are presented in Figure 5.

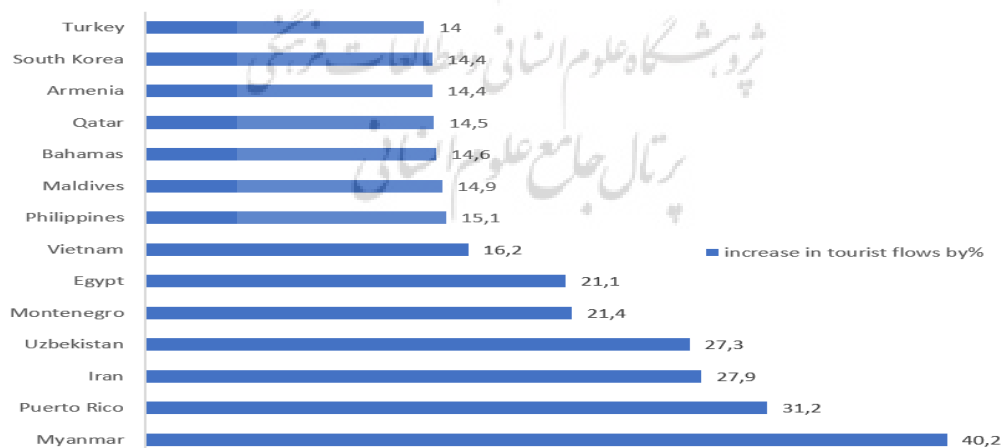


Figure 5. Countries with the largest increase in tourist flows, by %, 2019 (Global and regional tourism performance)

Thus, the main long-term factors of tourism development are changes: demographic indicators (emergence of new consumer groups), demand, climate; creation of a digital environment

("smart" cities and tourist destinations, "smart" tourist services), introduction of transport innovations and means of increasing passenger mobility, etc.

Analysis of tourist flows in Ukraine and their regulation by digital services

If we analyze the current state of exports of tourist services in Ukraine, we will have the following picture, as shown in Fig. 6. Since 2005, exports of travel services have fallen from \$ 3.125 billion. to 1.44-1.6 billion in 2018-2019. This indicates a decrease in foreign tourists to Ukraine. The peak of exports of tourist services was in 2013 - more than 5 billion dollars, and the lowest was in 2015. The reduction in revenues for the period was almost 50%. Over the past 6 years, Ukraine has lost \$ 1.5 billion. revenues in the group of CIS countries mainly due to the factor of the Russian Federation (1.28 billion dollars).

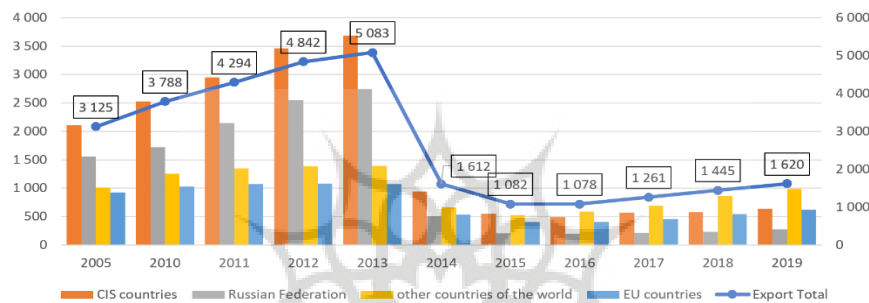


Figure 6. Dynamics of exports of tourist services of Ukraine, million US dollars, 2005-2019 (National Bank of Ukraine. Statistics)

With EU countries - revenues decreased compared to 2013 from one billion to six hundred million. Compared to 2013, the tourist flow from the EU in cash terms decreased by 42%. The main reason for the decline in inbound tourism is the annexation of the Autonomous Republic of Crimea and hostilities on the territory of Ukraine. However, there is an increase in flows from other countries. Thus, in 2005 the CIS and the EU accounted for 98% of tourists, and in 2019 - 78%. According to experts, this is more due to migration processes (from Asian countries to Europe). Indicators of imports of tourist services are presented in Figure 7.

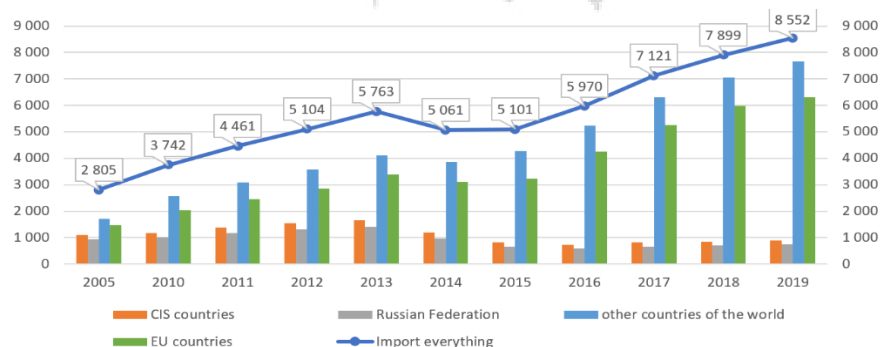


Figure 7. Dynamics of imports of tourist services of Ukraine, million US dollars, 2005-2019 (National Bank of Ukraine. Statistics)

Regarding the import of services, the expenditures of Ukrainians on foreign trips have increased since 2005 by 5.5 billion dollars. If in 2005 Ukrainians spent \$ 2.8 billion abroad, in 2019 it spent about \$ 8.5 billion. Almost 73% of these costs are accounted for by EU countries. At the same time, the costs of migrant workers in the host country increased to \$ 3.2 billion. in 2019, of which \$ 2.8 billion falls on EU countries. The balance of revenues from exports and imports of travel is presented in Fig. 8. From 2005 to 2009, the balance of tourist services was positive (from 46 million to 1.7 billion US dollars). Since 2010, a negative balance began to form, but its value was not critical: by 2012 it ranged from 167 to 680 million dollars USA. The rapid growth of negative values intensified in 2014, and in 2019 this figure is already 6.7 billion dollars USA. The reduction in tourist flows was a consequence of the unfavorable environment in Ukraine.

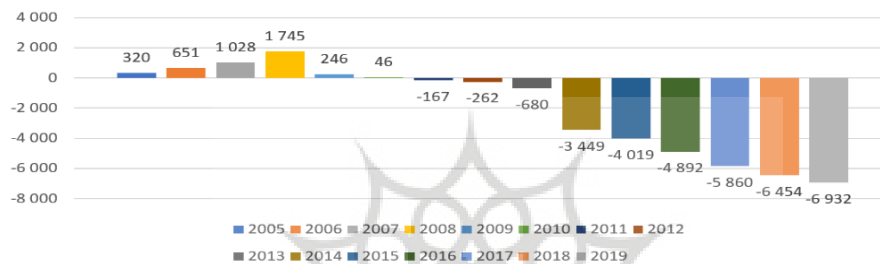


Figure 8. Dynamics of the balance of tourist services of Ukraine, million US dollars, 2005-2019 (National Bank of Ukraine. Statistics)

In addition, this indicator was significantly affected by the factors of visa-free travel, increased labor migration to Europe and the reformatting of tourist flows of Ukraine for recreation from the Crimea to Turkey and Egypt. The dynamics of incoming tourist flows (number of tourists) is presented in Figure 9.

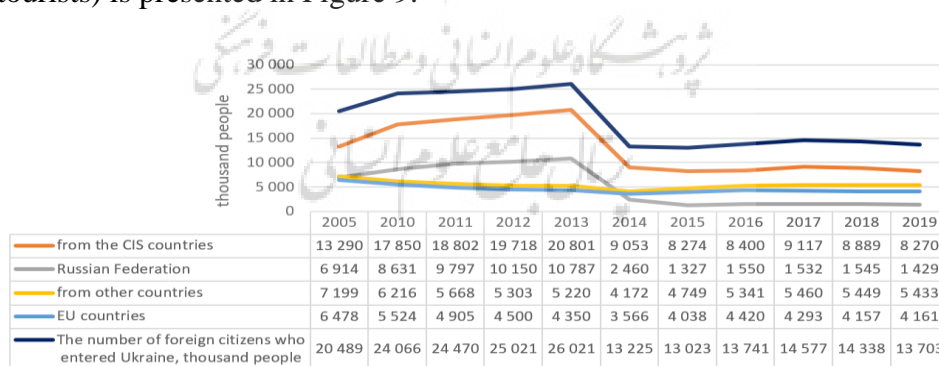


Figure 9. Dynamics of the number of foreign citizens who entered Ukraine, thousand people, 2005-2019 (National Bank of Ukraine. Statistics)

The number of foreign nationals entering Ukraine decreased from 28.8 million in 2008 to 14.4 million in 2018. You can also add statistics on medical tourism. Medical tourists in 2018 spent about 2.5 thousand US dollars for each trip. At the same time, this amount increased to 2.8

thousand dollars in 2019. Thus, in 2019, almost 65,000 foreign patients visited Ukraine. Their total cost of treatment and other services was nearly \$ 182 million. USA. As for the geography of visitors, citizens of Israel, Spain, Italy, Bahrain, Saudi Arabia, the UAE and Kazakhstan come to Ukraine. The dynamics of outbound tourist flows are presented in Figure 10.

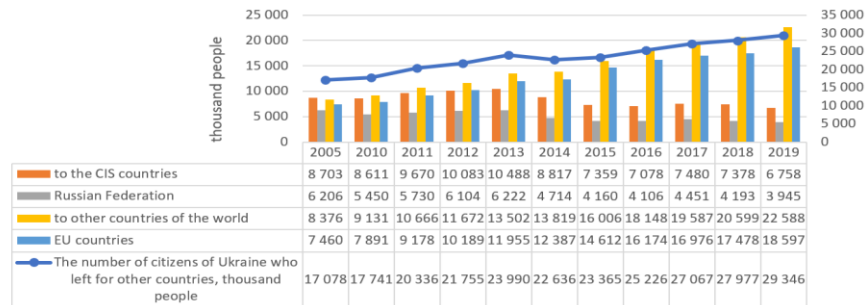


Figure 10. Dynamics of the number of foreign citizens who left Ukraine, thousand people, 2005-2019 (National Bank of Ukraine. Statistics)

The number of Ukrainian citizens who went abroad during the same period increased from 16.1 million to almost 28 million. The figure also fell in relation to the entry into Ukraine of citizens traveling from Belarus (13%), Hungary (10%), Slovakia (14%), Kazakhstan, the Netherlands (9%), Spain (13%) and Bangladesh (21%). In Ukraine, in 2020, a single information tourist portal was created. On the portal <https://visitukraine.today> the most up-to-date information on the rules of crossing the Ukrainian border is posted; rules of entry of Ukrainians to the countries of the world; list of countries of the "green" zone and "red" zone; rules of adaptation of quarantine, observation / self-isolation; rules of conduct at airports; rules of stay in cities, hotels, public places, catering establishments; assisting in the installation, authorization and use of the mobile application "Action at home". The portal has a hotline for tourists. You can also buy a medical insurance policy of Ukrainian companies on the page, which covers COVID-19 treatment and observation. All information on the resource is updated daily and is taught in three languages - Ukrainian, English and Russian. Also, at all bus and train stations, airports, checkpoints will be placed QR-codes, which will allow you to automatically go to the information portal and get advice and all the necessary information. The creation of local tourist information centers in the regions of Ukraine helps to build an effective tourism strategy. The following digital technologies are being introduced:

- Big Data. With the help of digital technologies, industry statistics formed, on the basis of which analytical research and identification of key trends conducted. This helps the region to build a tourism development strategy. Open data on the behavior of users in the digital environment collected: their feedback on sites and forums, behavior in search services and social networks related to tourist infrastructure.
- Content. It includes the creation of texts that promote the territory. This applies to applied texts

(such as reference books or guides) and fiction.

- IT solutions: websites, portals, aggregators, mobile applications, city navigation, ie interactive objects so that a tourist or a local could easily navigate in the city.
- Promotion: smart tourism solutions for the creation of tourist information infrastructures, providing tourists with high quality services and helping tourist destinations to create tourist brands that occupy leading positions in the world.
- Tourist service maps. By creating a universal tourist user system, all local tourist resources can be used by tourists together. For the convenience of tourists, as well as to centralize the collection and processing of tourist information, smart maps, one-year maps and two-dimensional codes used.
- Network of integration of tourist resources. Through the use of the Internet, 3G, GIS, electronic payments, radio frequency identification, smart terminals and other advanced technologies for tourism, a local service resource network can be created, including a local video network, wireless network, localization network, network of verification equipment, public episodes of city life, touch screen network, travel guide resources and environmental data monitoring network. The smart tourism solution covers all aspects of tourism, including food, accommodation, sightseeing, shopping, leisure and entertainment. It will significantly improve the impression of tourists and ensure the organizational and operational integration of tourist resources.
- Cloud service platform, which includes a single cloud service support platform and public service system, marketing platform, surveillance platform, tourism competence development and management system, as well as an e-business management platform.

Thus, the system of digital technologies used in the logistics of tourist services consists of a computer reservation system, teleconferencing system, video systems, computers, control information systems, electronic airline information systems, electronic payment services, telephone networks, mobile communications etc. Thus this system of technologies issued by all participants of a chain of formation of service simultaneously. The use of logistics services by each segment of the tourism sector is important for all participants in the chain.

The latest model of consumption of tourist services, the transformation of logistics services in tourism

The relationship and mutual development of tourism processes and information technology in the tourism market cause a consistent change in structures, players and tourism products in order to adapt to rapidly changing consumer behavior. The latest model of shopping behavior of travelers reflects the change in perception of the tourist product. This transformation of development is the result of the influence of means of communication and social platforms (Fig. 11).

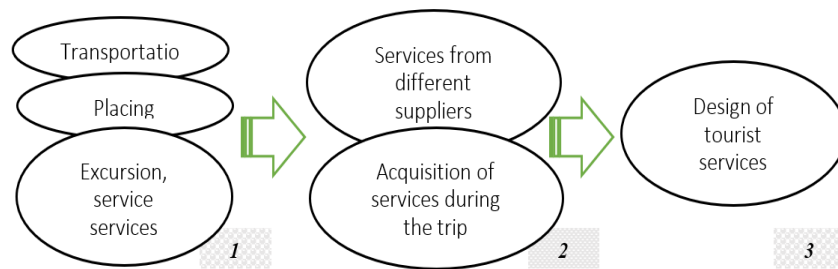


Figure 11. Logistics system in the field of tourism

1 - classical perception of a tourist product as a complex of basic and additional tourist services; 2 - planning a tourist trip depending on the availability of online and offline resources of tourist content; 3 - acquisition of a complex of tourist services and services under the condition of constant online access to the resources of tourist content, personalized service and mobility of the traveler.

Transformational changes in the shopping behavior of the traveler depend on his perception of the tourist product at each stage of the formation of a new model of relations with consumers in the market of tourist services:

1. Due to the use of information platforms and social networks, the nature of the relationship between the tourist enterprise and end users is changing - they are becoming permanent.
2. The tourist product acquires personalized qualities, is adjusted to inquiries of consumers, the data on which received on the basis of the data received from social networks thanks to the established contact with the client.
3. With the increasing online availability of tourist content, personalized consumer requests become part of the tourist product.
4. The design model of travel becomes the standard when the consumer designs all complex of a tourist product and in the mode of online interaction with the service provider controls and evaluates their quality.

The latest model of consumption of tourist services and the transformation of shopping behavior of travelers consider the tourist (consumer) as a partner, "cocreator" of the tourist product and the process of providing services (Romanenko, 2016). Such "inclusion" of the consumer should be taken into account by tourism enterprises in their product and communication policy.

There are the following stages of formation of the tourist product (Figure 12).

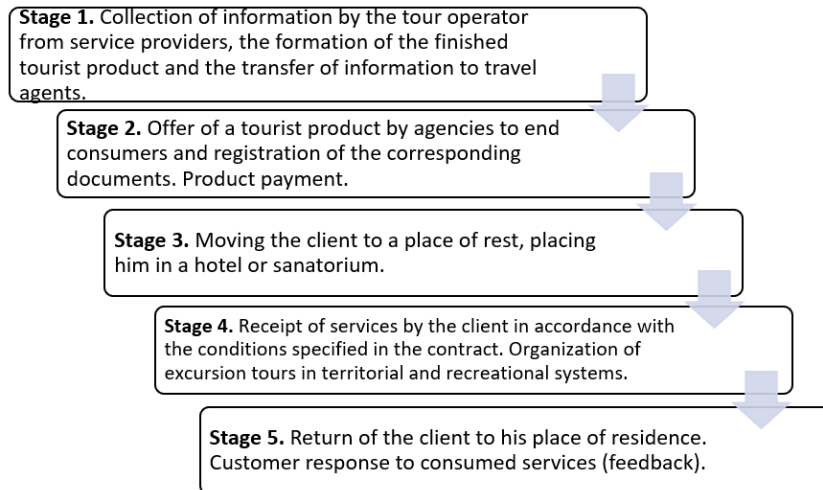


Figure 12. Stages of formation of a tourist product, according to the structure of the sphere of circulation

Thus, the first and the second stages of the formation of a tourist product have associated with the exchange of information between service providers, tour operators, agencies and customers. At these stages, the timeliness of information receipt and its availability are important. That is, information flows at the first stage are deterministic in their properties, as long-term economic ties established between service providers, tour operators and travel agencies. Information flows between end users and travel agencies characterized by discreteness, irregularity and unevenness, so at this stage it is advisable to attract customers through Internet technology.

A “data value chain” has already been created and commercialized, with companies involved in data collection, aggregation, storage, analysis, and modeling. The cost have created as a result of converting and monetizing data into "digital intelligence" (Digital Economy Report 2019). So, the future is for flexible intelligent platforms based on cloud technologies with distributed load. Their advantages are the following features:

- Flexible architecture that allows businesses to quickly adapt to changing market conditions. For example, to take-offs / declines in demand or to a sharp shift in the focus from sales to after-sales service, as happened with agencies and airlines at the time of the mass introduction of travel bans and flight cancellations.
- A single centralized environment for data collection and analysis (instead of the formerly disparate systems), which allows you to form a holistic picture of consumer behavior and demand in different channels.
- Cloud technologies developed by the world's leading companies demonstrate high rates of fault tolerance and protection against cyberattacks.

The set of digital logistics service tools used by tourism enterprises have presented in Table 1.

Table 1. Tools of digital logistics service in tourism

Digital technologies	Advantages for use by a travel company
IoT (Internet of Things Technology)	contributes to a more accurate analysis of the preferences of tourists, taking into account the places they visit and the time spent visiting tourist sites and places.
Virtual reality technologies	the opportunity to present their proposals to potential consumers, who create a sense of awareness of the proposed tourist services; thanks to virtual technologies the enterprise reduces the expenses, automates the activity, increases competitiveness
Mobile applications	personalization and monitoring of information about tourists, income levels of potential consumers of tourist services, their preferences, etc. ; the latest models of cooperation between tourism enterprises.
Blockchain technology	Being in a single digital space of data on the sale and purchase of travel services helps participants in the process of providing travel services to focus on real information about consumers and anticipate their needs, personalizing all processes, which increases the profitability of activities.
Cloud Technology	formation of new business models of interactions of tourist enterprises, which optimizes resources and business processes, provides their control, centralized management and constant monitoring of information in the market of tourist services.

That is, the level of development of Internet technologies is crucial for the digitization of processes and activities. Thus, the overall pervasive integration has a significant impact on the development of tourism. The success of teamwork lies in three main aspects:

- In a single sense of value for the end consumer, the chain of its creation and the importance of the role of each partner.
- In the flexibility, honesty and openness of partners. These qualities are especially important in a crisis. During the period of mass travel cancellations, an open dialogue with customers helped Saber to quickly launch the necessary technological solutions in the interests of all market players.
- In a corporate culture that stimulates partnership and encourages the team to perceive other players not as competitors but as possible allies.

Conclusion

In this study the main aspects of using the tools of the system organization of logistics flow management in the field of tourism, in terms of digitalization of logistics services have considered. It have established that the organization of tourist activity based on a systematic approach, when service producers, tour operators, travel agencies and end users are elements of a single information system. This makes it possible to interact with the target audience more efficiently and in a timely manner, thereby constantly increasing the number of new customers and audience loyalty to the brand. It established that the digitalization of logistics processes in the field of tourism allows us to consider the concept of supply chain management in terms of integration of business process management, the basis of which is the processing of information on the state of tourist flows.

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