

**KAPITEL 6 / CHAPTER 6⁶**
MANAGEMENT OF DIGITAL TECHNOLOGIES IN TOUR OPERATING**DOI: 10.30890/2709-2313.2024-28-00-025****Introduction.**

The study of tourism in modern conditions increasingly focuses on the practical business aspects of marketing and management. Tourism operators in the 2020s listen to and understand their consumers. For this reason, digital technologies are extensively utilized in management, primarily through CRM systems for establishing and monitoring customer relationships, as well as the implementation of automated tools - "user assistants," which in turn create a comfortable virtual sales sector for both parties involved in the sale of tour products.

The results of our research will contribute to a better understanding of the state of digitalization of business processes in contemporary tour operating and provide scholars and practitioners with tools for optimizing models of tour operating organization's current activities, along with examples of successful application of digitalization products. Additionally, through bibliometric analysis of data, we provide a brief yet concise overview of the history of reservation systems worldwide. Our research will further scientific discussions surrounding the importance of digital transformation not only at the micro but also at the macro level.

In the 21st century, the tour operating management system actively focuses on digitizing business processes, as managing a business becomes easier with control over key operational actions in a single automated database. This enables maintaining contact with consumers, intermediaries, and suppliers, swiftly processing sales, managing bookings from any device, and providing uninterrupted services to consumers online, expanding capabilities through timely updates.

The tour operating market is divided into two channels for accessing data for organizational activities. OTA (Online Travel Agency) or IDS (Internet Booking Systems), or ADS (Alternative Booking Systems), and GDS (Global Distribution

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Systems) are electronic (often cloud-based) solutions for booking tours and events, allowing tour operators and travel agents to organize business through integrated platforms, encompassing stages from sales, finance to multi-brand offer management. Examples of GDS include Amadeus, Galileo, Sabre, and Worldspan. Booking systems in their early stages of development were defined by demand for transportation services. In turn, from the 1960s-70s, the first GDS allowed system users to track flight schedules, availability of seats on regular flights, and dynamic ticket prices. One of the first internal booking systems was Sabre, the use of which increased agent productivity, significantly reducing time costs and increasing consumer satisfaction. In the 21st century, the GDS system expanded its capabilities and became useful for booking hotels, cruise trips, car rentals, and more.

In the 21st century, GDSs have evolved into booking portals with flexible itinerary builders for package deals, displaying alternative options, inventory management control, channel distribution management, and back-office operations (supplier, agent, client activity monitoring, and accounting) with customized real-time reporting and analytics, ensuring data confidentiality. However, for a long time, the GDS interface was cumbersome for users, requiring significant time for agents to adapt to its use. The demand for tourism services changed, and in the early 1990s, the world found an alternative to GDS in the form of ADS. The main difference lay in the access rights to bookings. While only tourism companies used global systems under license terms, ADS laid the foundation for Next-Door Tourism, allowing individuals to access tourism services at their fingertips, pushing for the active development of self-organized tourism. Each ADS user can independently choose a hotel (studying current and verified reviews) and room type for specific dates, book their request in real-time at flexible prices, utilize promotional offers, and instantly receive confirmation to their email address. Due to intense competition, ADSs always strive to stay one step ahead of market trends to differentiate themselves and focus on specific target groups. The biggest challenge for ADSs is marketing automation, as accommodation services are time-limited and can have very different pricing offers at different times. ADSs need to be fully automated in every business process, reducing commission costs and



increasing advertising budget opportunities to enhance brand loyalty, increase repeat bookings, and attract new users. The most popular among such online platforms are Expedia.com, HRS.com, Skyscanner, Booking.com, Hotels.com, and others [1].

These solutions created significant obstacles for tour operating companies, which, in turn, spurred the intensification of studying consumer demand and applying marketing to maintain and expand the client base, and later actively involving innovative technologies in organizing small and medium-sized businesses services. The main challenge for a modern tour operator is to offer a proposition to the client (agent or end-consumer), ensuring speed and accuracy of data, cost-effectiveness and quality of tour products, and support at all stages of providing tourist services. Therefore, considering the necessity of digital management tools in tour operating activities, we can identify 7 key aspects influencing business success (Figure. 1):

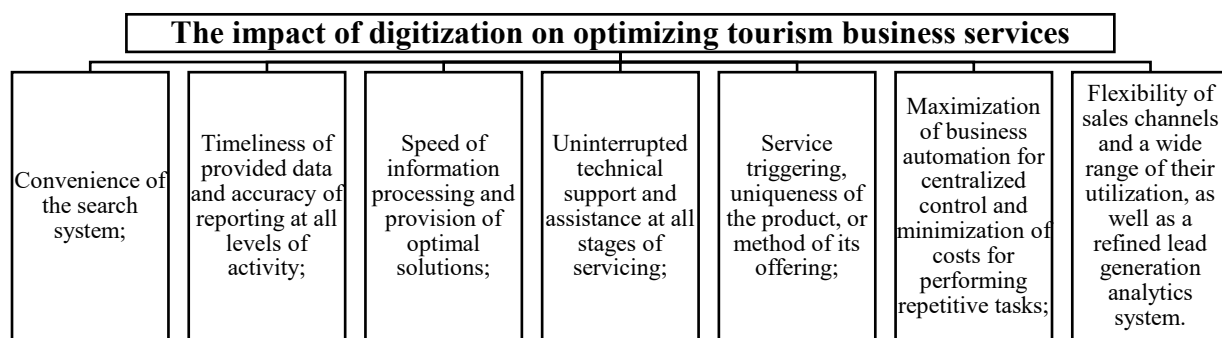


Figure 1 - The Impact of Digitization on Tourism Business

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The popularity of implementing digital technologies has encompassed numerous industries, yet the travel sector still remains relatively inert in its digital transformation. Productivity-enhancing technologies such as cloud processing and data analytics, revenue management software, are generally less widespread in tourism. However, innovative technologies like augmented reality and geocoding are generating, customizing, and delivering cutting-edge products for consumers. Thus, digital adaptation of business to consumer needs is pushing tourism in new and often unpredictable directions. Digital technologies hold significant importance for tourism businesses of any size, for the structure and functioning of tourism value chains, and for the sector as a whole. Therefore, fostering and accelerating digitization in tourism



is a key policy task. Modern types of tour operators adhere to available digitization levers. They digitize databases, offer catalogs with pricing parameters and special deals, actively monitor the life cycle of automated booking, and utilize B2B or B2C sales channels, ensuring reliability and confidentiality of collected information. Digital platforms, automation, artificial intelligence (AI), blockchain technology, and virtual reality (VR) are among the technologies shaping modern tourism and will continue to do so in the future. The ability of businesses to respond to changes is primarily associated with the flexibility, adaptability, and creativity of management. And digitization, in turn, involves steps toward utilizing business model elements used in this or other markets, focusing on improving the quality of customer experience [2].

The aim of business activity in previous generations was to satisfy consumer demand for travel. Today, the goal is repeat purchases, maintaining customer attention throughout the entire service journey, and creating an emotional component of tour services. This is the focus of digital transformation in tour operating. The foundation lies in collecting and analyzing consumer experience, studying trends, and actively interacting with potential consumers through channels such as surveys in sales channels to monitor demand fluctuations. Millennials and Generation Z have played a crucial role in advancing technological innovations in the tourism industry—they love traveling and are enthusiastic about technology [3]. Cutting-edge digital solutions have transformed the tourism industry, and tourism companies that do not respond to this call will sooner or later cease operations. Technological achievements enhance business efficiency and optimize various processes, reducing manual work and improving customer interaction. When it comes to the adaptability of different enterprises to digitization, small and medium-sized businesses are usually less bureaucratic and more ready to embrace the challenges of using new service tools. At the same time, large proactive enterprises embarking on global transformation projects face failures in 70% of cases, demonstrating how challenging change management is in practice. One study conducted in September 2022, exploring society's demands for digitization, revealed that 38% of travelers worldwide who participated in the survey said they would like the latest technologies to help reduce queues and congestion in

public places. At the same time, 29% of respondents believe that technologies should help predict and notify about flight delays in advance. However, only 26% of surveyed tourism organizations use a modern and convenient chatbot tool, significantly reducing touchpoints with consumers [4].

Digital technologies have the potential to effectively transform and optimize many business processes of tour operators, some of which we have summarized in the Table 1.

Table 1 -Transformation of Tour Operator Business Processes

Business process	Detailing the business process	Transformational changes in the business process
Development and offer of a tourist product	<ul style="list-style-type: none"> → Market analysis and identification of demand for various tourist destinations. → Selection and contracting with service providers (hotels, transportation, tour agencies, etc.). → Creation and development of tours, including routes, schedules, and other elements. → 	<ul style="list-style-type: none"> → Utilization of analytical tools and machine learning algorithms for data analysis, demand forecasting, and decision optimization. → Employment of virtual reality tools to create a virtual tour experience before selecting a travel destination. → Application of augmented reality tools to enhance interactive tours and travels. → Utilization of artificial intelligence for selecting and choosing optimal service providers (hotels, airlines, transportation companies). → Automated verification and assessment of the quality and reliability of suppliers. → Use of artificial intelligence to forecast expenses for tourist services and optimize prices based on market conditions. → Automated establishment of competitive prices to ensure attractiveness of offers. → Utilization of artificial intelligence to create personalized offers for clients based on their individual preferences, travel history, and demographic data. → Automatic adaptation of tours to accommodate individual needs and expectations.
Management of the sales chain	<ul style="list-style-type: none"> → Coordination and collaboration with various service providers. → Determination of optimal cooperation conditions and management of relationships with suppliers. 	<ul style="list-style-type: none"> → Integration of digital systems for supply chain management and interaction with service providers. → Utilization of intelligent supply chain management systems for effective control over all stages of the tourism product, from development to execution. → Implementation of blockchain technology to enhance transparency and reliability of the supply chain.
Logistics	<ul style="list-style-type: none"> → Planning and coordination of logistical aspects of tours, including transportation, accommodation, and excursions. → Ensuring high-quality service and responsiveness to customer needs. 	<ul style="list-style-type: none"> → Using electronic passports and documents for convenient registration, border crossing, and processing of tourist services. → Reducing the use of paper documentation, which promotes a faster and more environmentally friendly process.



Business process	Detailing the business process	Transformational changes in the business process
Booking	<ul style="list-style-type: none"> → Conducting bookings for clients on transportation, accommodations, excursions, and other services. → Managing and keeping track of room availability and resources. 	<ul style="list-style-type: none"> → Creating a user-friendly and intuitive website or application for clients. → Developing internet platforms for online booking of tours, hotels, transportation, and other services. → Integrating an electronic payment system for faster and convenient transactions. → Utilizing smart recommendation systems for personalized tour selection.
Marketing	<ul style="list-style-type: none"> → Developing marketing strategies to attract new clients. → Conducting advertising campaigns, participating in exhibitions, and other events. → Sales of tours through various channels, such as the internet, agencies, and others. 	<ul style="list-style-type: none"> → Utilizing digital marketing strategies to promote and advertise tours. → Engaging the audience through social media and other online channels.
Accounting and management accounting	<ul style="list-style-type: none"> → Financial management, including invoicing and payment processing. → Keeping track of income, expenses, and profits from tour sales. 	<ul style="list-style-type: none"> → Applying analytical tools to study customer behavior and optimize marketing strategies. → Generating reports based on sales data, revenue, and other key performance indicators. → Utilizing digital systems for automated financial transaction tracking and expense management. → Integrating electronic systems for invoicing and payment processing. → Making decisions based on data analysis and demand forecasting.
Customer support	<ul style="list-style-type: none"> → Providing consultations to clients and furnishing information about tours and services. → Responding to inquiries and resolving client issues during their travels. 	<ul style="list-style-type: none"> → Developing mobile applications for convenient real-time interaction with clients. → Utilizing IoT for tracking tourists' movements, health, and safety. → Implementing chatbots for automated online support and responding to client inquiries.

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Additionally, an effective solution already being utilized in telephony is virtual assistants (examples include Siri or Alexa). The travel industry is beginning to leverage this technology. Through it, consumers can quickly access up-to-date information or personalized virtual guides, which can also assist in booking, on-site navigation, and resolving common travel issues. Moreover, some small tourism businesses are starting to develop digital business models, including:

- Skydiving Kiwis: Software developed by skydivers for managing scheduling, safety, and accounts. It's designed to be flexible enough to evolve as the business grows and develops.



- TouristWise: A tourism app with scalable features that tourism organizations can use to develop, manage, and enhance visitor experiences, increase engagement through AR, gamification, language translation, promotion, and ticket sales. Data analysis and tracking also improve direction management and scale attractions and experiences for travelers on the journey.

- VenueLytics: A startup for mobile applications that has created software integrating guest engagement and a digital concierge platform using artificial intelligence. It acts as a hotel guest service platform through mobile communication, voice communication, chatbots, and processes guest requests for the hotel, supports two-way chat, provides hotel information, registration/check-out functions, and promotes hotel offerings.

The OECD report "Going Digital: Shaping Policies, Improving Lives" notes that digitization provides unprecedented access for tourism businesses to new markets, opportunities to develop new tourism products and services, adapt business models and processes, improve their positions in global tourism value chains, and integrate into the digital society. Digitization allows economic entities to become more efficient, free up time and various resources to focus on strategic tasks, and increase their potential for developing new business models, entering new markets, or internationalizing their activities. A recent study conducted by the European Commission revealed significant differences in the adoption of digital technologies in tourism across Europe. For example, Scandinavian countries demonstrated more advanced development of digital technologies than countries in Southern and Eastern Europe. The same study also showed that small and medium-sized enterprises (SMEs) in tourism lag behind large enterprises. Although basic electronic marketing and e-commerce were widely adopted, advanced technologies such as data analysis, cloud computing, and geotagging received limited diffusion. In the context of digitization, there is a challenge of data analytical processing and the correct application of results. Market research according to the report shows that on average, 56% of large companies have purchased cloud computing services compared to 27% of small companies. Privacy and data protection issues may also arise during data collection and use by companies



themselves. Data are particularly useful for businesses to improve revenue management practices and apply dynamic pricing, common in large companies. One of the problems for small tourism companies is accessing this data. This issue is on the political agenda of many countries, where some are exploring ways to collect and openly exchange data with tourism stakeholders, including:

- In Portugal, the business analytics tool TravelBI serves as a data hub for the tourism sector.

- In Denmark, the TourismTech Datalake initiative aims to support the development of new tourism business models by collecting and providing data to stakeholders in the tourism sector.

- In Poland, "Open Data Plus" aims to increase the quantity and improve the quality of open public data, as well as popularize their use [5].

Digital solutions are designed to optimize all processes not only for small and medium-sized businesses, but also at the meso- and macro-levels. The UNWTO (United Nations World Tourism Organization) actively supports digital initiatives in the travel sector, including innovation and technology in tourism (introduction of the latest technologies in tourism, such as artificial intelligence, blockchain, Internet of Things (IoT), which can be used to improve the quality of service delivery, security and research in the field of tourism), digital marketing campaigns (development and implementation of digital marketing strategies to promote the tourist destinations of UN member states), security and data protection (development of standards and recommendations for the protection of data). The most recent initiatives of the UNWTO include the following (Table 2):

Table 2 -UNWTO digitalization initiatives

UNWTO та MUST Travel & Tech	UNWTO та Telefónica Tech
<p>An agreement to host a digital application for the tourism service. MUST is an opportunity for the development of smart cities. It allows users to share their experiences, which contributes to the revitalization of the sector for sustainable development. Operating in 60 countries, MUST brings together all the information of interest to travelers in one place. Through the integration of key information and analysis from the UNWTO, it aims to</p>	<p>The UNWTO and the Spanish telecommunications company have created a new form of cooperation in the form of an Agreement valid until 2026, which aims to promote more digital, sustainable and inclusive tourism development. The agreement will be valid worldwide and will focus on three strategic areas of digital transformation: - development of global and regional innovation and entrepreneurship ecosystems; - stimulating the introduction of technologies in tourism;</p>



UNWTO ra MUST Travel & Tech	UNWTO ra Telefónica Tech
become the leading app for tourism and create opportunities for destinations. Visibility for business units is an opportunity to revitalize their operations [6].	- promoting capacity building for a more digital, sustainable and competitive tourism sector, On the other hand, learning processes (re-qualification and upskilling) will be addressed so that employees can develop and utilize the full potential that digitalization brings to an industry that is so important to the economies of many countries [7].

A source: [6, 7]

Summary and conclusions.

Thus, the knowledge about the development of online travel agencies and global reservation systems is systematized, their formation depending on user demand. Digital solutions include the introduction of the latest technologies, the development of digital marketing strategies, data protection, and the provision of online education for travel industry professionals. We have outlined the main areas of influence of digital tools for managing tour operator activities, the basic business processes of service providers and their transformational changes under the influence of digitalization. We also analyzed current research on the demand for tourism business transformation. Small tourism companies may have limited access to digital resources and data, which creates an inequality in competition. We can state that the Organization for Economic Cooperation and Development (OECD) and the World Tourism Organization (UNWTO) actively support digital initiatives in the tourism industry. Initiatives aimed at supporting access to digital tools and data for small tourism companies are important for stimulating their development and competitiveness.