

# Digital Technologies and Logistics in Tourism

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**Abstract**—The article examines the role of digital technologies in optimizing logistics within the tourism industry. Modern digital solutions, such as artificial intelligence, big data, the Internet of Things (IoT), and blockchain, significantly transform the management of transportation flows, bookings, and tourism services. These technologies provide a higher degree of travel personalization, reduce costs, and improve the quality of customer service. Key examples of the use of digital tools in tourism logistics and their impact on business process efficiency are analyzed. The article also discusses the prospects for implementing new technologies and their role in shaping a sustainable and competitive tourism industry.

**Keywords**— digital technologies, logistics, tourism mobile applications, digital platforms, automation resource management, booking, coordination, service providers

## I. INTRODUCTION

Data requirements and digital forms have become so integrated into the logistics operation of the industry that there is a merging of a paradigm shift being experienced in the tourism industry, determined greatly by the rapid evolution of digital technologies. Distribution management systems, mobile applications and real-time tracking have evolved how tourism stakeholders carrying out their logistics functions and have enabled the improvement of their operational efficiency and cost-benefit ratio. This is especially pertinent in an industry where guest expectations are high and the market is ever-evolving.

This is not only a truth about these systems, which must be constantly amended but this is also one of the deepest changes that affect tourism logistics due to digital technologies. News stocks, recycling online reserve, through the algorithm into a real-time inventory point system allows a hotel service providers, airlines and car rental companies can be in the dynamic and moving the local service management, to help them to do better resource allocation, reduce the waste. Thanks to electronic data exchange systems (EDI), companies can communicate perfectly with suppliers and partners, ensuring effectively kept inventory levels, shorter delivery times and reduced operating costs. Not only does this shift enhance efficiency, but it also minimizes the potential for human mistakes, a common problem with logistics processes in the past [1].

Digital technologies have a significant impact on customer experiences, tactically enhancing engagement along the travel journey. Travel apps and customized service platforms make it easier for travelers to access information and take well-informed decisions. In addition, the use of AI-oriented customer chatbots and customer tools can help companies provide around the clock help, responding to customer inquiries and fulfilling real time requests. Thus the travelers enjoy a more customized experience which ultimately results

in greater satisfaction and brand loyalty. For instance, recent studies claim that customer retention and positive revisions, which are being criticized for the competitive tourism scenario are significantly better in companies using these digital customer service enhancements [1].

Moreover, the principle of sustainability is more and more influenced field of logistics activities in tourism, applied and the more widely through incorporation of digital technologies. With the rise of eco conscious customers, tour companies are also adopting more sustainable logistics strategies to meet this need. Digital platforms enable tracking and aggregation of carbon footprint information across different means of transport and types of accommodation, allowing travelers to act ecologically. Thus, technology solutions and software that includes supply chain management solutions assist tour operators in minimizing waste and getting maximum use of the resources that they have, ultimately affixing down the entire effect on the environment.

## II. THE ROLE OF DIGITAL TECHNOLOGIES IN TOURISM

With the tourism industry spinning consistently to adapt for more and more digital environments, the advantage of efficient logistics solutions will become an essential element in the sustainability of businesses. Streamlined supply chain processes lessen the carbon footprint involved with logistics operations, minimizing resource usage and reducing transportation-related emissions. So adopting digital technologies not only prepares organizations to become excellent in efficiency, but represents an evolutionary ideology towards sustainability in the tourism industry. Embracing innovative solutions enables businesses to bridge the gap between operational strategies and among broader objectives such as the environment, which fosters a more responsible approach to any logistics of tourism at a time when efficiency and sustainability go hand in hand., The integration of digital technologies in the tourism sector is significantly reshaping the experiences of consumers. The core of this metamorphosis is the emergence of intelligent technologies like mobile applications and AI (artificial intelligence)-based customer service platforms. Furthermore, these digital solutions transform the service supply model and enable better customization, matching the shift in consumer behavior and taste for tailor -crafted experiences. Just like mobile applications that help travelers manage travels with recommendations suitable to tastes, preferences and travel behaviors [2].

To address digital technologies, there has been developed a system to enable independent and anonymous assessment of responses. High-speed scanners are utilized to convert all forms, regardless of size, into graphic format. Using predefined templates, the system identifies forms with questionably filled marker answers. Samples of these forms

are simultaneously presented on screens to independent experts, without revealing the examinee's identity. Based on the experts' evaluations, the system provides an objective assessment of the answers. Additionally, all expert actions are recorded and archived.

Transition to digital technologies in tourism is not limited to transactional relationships. It involves the development of immersive experience platforms. Virtual reality (VR) and augmented reality (AR) technologies allow would-be travelers to preview their destination, as well as accommodations and attractions, prior to booking. Such experiential tools facilitate dynamic interaction with content and contribute to more informed decision-making processes, which ultimately shape model their journey [2].

The ability to have real-time information is identified as major development in travel logistics. Customers now have access to critical information in real-time about the transport options, accommodation availability, local attractions and any delays or disruptions. This immediacy not only gives travelers the power to make informed decisions, but also instills an intense sense of control over the process of travel itself. The findings suggest that this Empowerment translate into higher customer satisfaction, as travelers feel more engaged and are less anxious about the travel risk potentially inherent in their travel agendas [3]. As a result, such engagement creates a kind of loyalty that drives customers to engage in recurring activities due to curated and enjoyable experiences.

Moreover, the transition to mobile applications and digital platforms is changing the way logistics activities are carried out in the tourism industry. The findings [4] show that these digital tools automate routine processes (such as booking confirmations, customer database management, and inventory chats), which not only enables efficient resource allocation but also complements the management system. Anticipating potential problems before they escalate into major disruptions in the workflow is just one of the many ways in which data analysis can benefit a business. Such technological advancements are aimed not only at improving internal efficiency but also at enhancing coordination between service providers, partners, and customers.

Among these interventions, the branches of these digitals are remarkable when it comes to the aspect of cost savings. Supply chain performance can be analyzed, and making informed decisions about purchasing and managing inventory has become possible [5]. With tools that help companies cut waste, lighten unnecessary inventories and ultimately avoid losses caused by inefficiencies, that approach is proactive. By translating these improvements into cost savings, or the "business end," these improvements become a strong argument for investment in the tourism business, given that logistics already contributes a large portion to the overall tourism operating costs.

Digital media has enhanced the interaction between customers and service companies. In the digital age, responsive channels of communication that anticipates customers' needs and expectations, despite the sheer volume of information, come to the fore. AI powered chatbots and virtual assistants are constantly operating 24/7, providing immediate assistance, catering to reservations and addressing queries ranging from general to complex [6]. These services contribute to increasing customer satisfaction by shortening

waiting times (when the user is in transit from one place to another), and build a relationship of trust meantime because the user can count on a consistent support and timely availability for your travel action.

Mobile platforms that ease the ride and hitchhiking process have also gained popularity, contributing to fewer people on the roads and decreasing emissions [7]. Systems like these provide travelers with more sustainable transportation options, enhancing the travel experience while lessening the environmental footprint of travel. Hence, digital technologies contribute to facilitate logistical efficiency, but also act as catalysts for consumer behavioral changes in the tourism sector, hence amplifying their impact on sustainability practices.

The emergence of personalization in marketing campaigns where data analysis has enabled suppliers to address and speak to prospective travelers. This enables highly relevant offers and information to be provided that resonate with users [3], as companies can analyze their consumers to identify their trends and preferences. This targeted utilization of digital technologies enhances both consumer experience as well as marketing optimization, leading to higher profitability for the industry.

### III. DIGITALIZATION OF LOGISTICS IN TOURISM

The findings of the research suggest that the digitalization of logistics in the tourism industry can not only contribute to the improvement of logistics processes but also correspond to the increasing pressure for sustainable development. As the above recent findings indicate, companies that can utilize digital tools to create value through logistics can achieve significant reductions in the ratio of production costs and environmental costs per unit of value creation [8]. Digital technologies are becoming a transformative force in the logistics of modern days tourism industry thanks to improved efficiency synergy, better customer satisfaction and sustainable practices. This article expands these interlinkages, emphasizing how the digital technologies contribute to assembling the future of tourism logistics. Digital technologies didn't only the transport modes and warehousing into the nexus of many tourism business logics but also serve as basic enablers of enhanced operational efficiency in tourism logistics domain. By harnessing new technologies like IoT and Blockchain, companies can drastically improve their supply chains. These technologies enable increased visibility throughout the logistics process, ensuring that all stakeholders have access to real-time data. One of the implementations could potentially lead to real-time analysis of inventory levels and conditions through IO devices during traffic which mitigates the risks with perishables and increases the efficiency of stock replenishment. As noted [9] real-time tracking features enabled by these technologies can significantly minimize delays tied to traditional logistics operations, fostering a setting of enhanced reliability and responsiveness.

And in addition, logistics efficiency is the heart beat of customer experience. A streamlined logistics operation allows travelers to get timely and reliable services at last that enhances greater satisfaction and loyalty.

In a nutshell, the digital wave of the tourism logistics plays an extensive role in customers' satisfaction following an extensive technological gush. A contemporary approach to digital solution keeps a proactive and reactive manner and

allows the customer to relish at the travel vista prioritizing the bliss and involvement of customers while ensuring to manage the pains of travel proposal today. Digital technologies shape a new standard of excellence in the tourism sector by improving interactions and personalization of experiences, showing that they are essential to travel logistics in modern times. The logistics in tourism sort of reflected the mechanism to increase sustainability by integrating digital technologies. New technology, like mobile apps, blockchain devices, and Internet of Things (IoT) not only increase the efficiency of operations, they also encourage both travelers and suppliers to practice sustainability. For example, electronic reserve systems help lessen the waste of resources even more through digital and itinerary confirmations [7]. As a direct result, stakeholders can witness concrete reductions in operational waste, thereby aligning themselves with larger goals of sustainability.

Sarfraz et al. state that digital transformation in logistics correlates directly with the improvement of resource allocation. By using data analytics and AI, tourism companies are in a much better position to forecast demand and manage inventory and optimize transportation routes. This adjustment improves the overall fuel consumption and greenhouse gas emissions therefore reducing the overall travel activity carbon footprint. Adoption of such technologies also supports the key ideals of sustainable tourism - that economic success should not come at the expense of the ecological system [9].

Furthermore, By introducing digital solutions into the domain of supply chain logistics, collaboration among different stakeholders can be achieved leading to a more unified approach to sustainability. Integration systems [10] help in sharing information in different nodes of the supply chain. For instance by utilizing blockchain technology, transactions can be recorded in a transparent manner, offering stakeholders up-to-date information to evaluate the environmental impact of their logistics decisions. This logic is needed to ensure accountability and helps participants to adopt more sustainable practices while investing into the united nations sustainable development goals.

This effort is further catalyzed by the increasing inclination of IoT in Logistics. Sensors integrated into transport units play a crucial role in monitoring factors crucial to keeping perishables supply chain assets to tourism in optimal conditions (food services or accommodation providers) — namely temperature and humidity. Thus, consumers are becoming more aware and they thank such sustainable practices, not just for enhancing their experiences but also following their values regarding the responsible trip [10].

Finally, the creation of digital logistics in tourism have a profound impact on the digital experience of the clients through a powerful integration of the technologies.

#### *A. The Convergence of Logistics and Digital Innovation:*

An Essential Transformation in the Way the Tourism Industry Navigates Sustainability Challenges With these digital solutions, the industry is not only prepared to address the current needs of customers but is also positioned to make a meaningful impact on eco-friendliness. Improving operational efficiency sustainable practices illustrates twofold a greater movement for the tourism industry towards more responsible operations leading to an economically

healthier and sound ecological future. Thus, such an interaction is between technology advancement and logistical optimization, is a key building block for contemporary tourist enterprises, which aim to possess a competitive advantage in the fast changing environment. A study [11] of management of the supply chain requires the analysis of data and it is important that this is targeted so that companies can rationalize their operations, optimize lead times and improve significantly the provision of services.

Similarly, the technologies such as Artificial Intelligence (AI) and the Internet of Things (IoT) enables monitoring and tracking of real-time goods and services in the travel supply chain. Not only do these innovations enhance operational transparency, but they also foster a proactive strategy for addressing potential disruptions. These technologies offer a logistical agility capacity that provides companies the flexibility to adjust to the shifting of consumer needs, generating greater satisfaction and customer loyalty. The supply chain also exhibits improved transparency, which is paralleled by an elevated customer experience, as tourists are let in on real-time updates pertaining their travel routes, their accommodation, and other logistical aspects of their upcoming visitors [12].

#### *B. Sustainability:*

Digitalization has the potential to significantly alleviate the environmental footprint of tourism logistics. Tools for route optimization can significantly reduce fuel consumption and greenhouse gas emissions, which aligns with the increasing demand among consumers for environmentally considerate travel alternatives. Enabling smarter energy [13] management systems, and thus facilitating the integration of renewable energy sources in logistics executives of tourism operations and promoting sustainable practices.

## IV. CONCLUSION

Yet, despite the bright horizon of the current trajectory of digitization in tourist logistics, many challenges subside. The industry's stakeholders need to respond to challenges including data security, the digital divide between companies of different scale and the demand for continuous training to keep pace with technological innovation. The tourism industry a will to adopt new digital trends, not just an adoption process technologies but also a cultural change to the innovation and adaptiveness [14].

It is essential to explore case studies of successful implementation of digital technologies in tourism logistics. Determining freshness based on best practices and their resultant effects leading to efficiency, customer experience and sustainability will be significant in helping guide other actors. Moreover, the investigation of such a partnership between technological businesses and tourism services will accelerate the creation of customized solutions that present specific issues in the tourism industry.

As moving into a future driven by a digital transformation, a multipartite approach will be kneaded into unleashing the potential of these technologies. Deciders, private firms, and university entities should work together to ensure that efforts to optimize the logistics of the tourism industry are innovative and equitable as well as sustainable. Exploring these synergies might soon define the future of tourism logistics and pave the way for a more efficient, friendly and eco-friendly industry.

## REFERENCES

- [1] M. Asif and H. Fazel. Digital technology in tourism: a bibliometric analysis of transformative trends and emerging research patterns. *Journal of Hospitality and Tourism Insights*, 7(3), 2024, pp. 1615-1635.
- [2] A. M. Ionescu and F. A. Sârbu. Exploring the impact of smart technologies on the tourism industry. *Sustainability*, 16(8), 2024, p. 3318.
- [3] K. K. S. Chon and F. Hao. Technological evolution in tourism: a Horizon 2050 perspective. *Tourism Review*, 80(1), 2025, pp. 313-325.
- [4] P. H. Trang, V. Nam, H. L. D. Nguyen, T. L. Le and D. Dang-Pham. Sustaining the Future of Tourism Logistics Through Digital Technologies: A Roadmap for Digital Transformation. In *Transforming Logistics in a Developing Nation: Vietnam's Technology Imperative*. 2024, pp. 387-413. Singapore: Springer Nature Singapore.
- [5] B. Z. Filipiak, M. Dylewski and M. Kalinowski. Economic development trends in the EU tourism industry. Towards the digitalization process and sustainability. *Quality & Quantity*, 57(Suppl 3), 2023, pp. 321-346.
- [6] A. Balabanyts, I. Kyianytsia, T. Bielialov, S. Mosiuk, O. Nedzvetska and O. Verbytska. The impact of tourism and digital media on the dynamics of the fashion industry in the global creative economy. *Multidisciplinary Reviews*, 7., 2024.
- [7] A. Polukhina, M. Sheresheva, D. Napolskikh and V. Lezhnin. Digital Solutions in Tourism as a Way to Boost Sustainable Development: Evidence from a Transition Economy. *Sustainability*, 17(3), 2025, p. 877.
- [8] P. Li, Y. Zhou and S. Huang. Role of information technology in the development of e-tourism marketing: A contextual suggestion. *Economic Analysis and Policy*, 78, 2023, pp.307-318.
- [9] M. Sarfraz, K. F. Khawaja, H. Han, A. Ariza-Montes and J. M. Arjona-Fuentes. Sustainable supply chain, digital transformation, and blockchain technology adoption in the tourism sector. *Humanities and Social Sciences Communications*, 10(1), 2023, pp. 1-13.
- [10] E. Ndhlovu, K. Dube and C. M. Kifworo. Tourism and Hospitality Trends and Sustainable Development: Emerging Issues in the Digital Era. In *Tourism and Hospitality for Sustainable Development: Volume Two: Emerging Trends and Global Issues*. 2024, pp. 1-21. Cham: Springer Nature Switzerland.
- [11] A. Omarova, A. Nurumov, A. Karipova, G. Kabdullina, B. Aimurzina and M. Kamenova. Analysis of the development of innovative activities of the tourism industry in the influence of pandemic. *Journal of Environmental Management & Tourism*, 12(6 (54)), 2021, pp. 1442-1453.
- [12] S. Ratna, S. Saide, A. M. Putri, R. E. Indrajit and D. Muwardi. Digital transformation in tourism and hospitality industry: a literature review of blockchain, financial technology, and knowledge. 2024.
- [13] N. Yakymenko-Tereshchenko, A. Kiziun, M. Hrabar, A. Brytvienko and L. Medvid. Digital tools for management of innovative activities of tourism enterprises: Ukrainian analysis of wartime challenges. *International Journal of Organizational Leadership*, 12(First Special Issue 2023), 2023, pp. 4-19.
- [14] E. C. Ku. Tourism digital transformation and future supply chain competition: an integrated perspective on real options theory and digital competencies. *Journal of Tourism Futures*. 2024.