



THE IMPACT OF INFORMATION TECHNOLOGIES DEVELOPMENT ON TOURISM INDUSTRY

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Abstract:

Tourism has been a significant part of many people's lives for centuries. From the first trips, the first organized tours, and the development of the scientific concept of tourism, the importance of the tourism industry has stood out. The industry is rapidly changing, and keeping up with all the latest information and innovations is necessary. The highest impact on tourism changes has been brought by technological development. Hence, the subject of this paper is to determine significant moments of change in tourism influenced by new technological achievements, with special emphasis on the artificial intelligence development. The research is based on the secondary data analysis of various academic publications related to information technology usage in tourism. Research results indicate that technological changes have affected both offer and demand. Information is more available, and nowadays, it is easier to travel than ever before. On the other hand, demand influences constant changes in tourist offers. If the tourism industry does not listen to tourists' needs, many problems can arise. With this in mind, it is necessary to observe all changes in the market to ensure sustainability.

Keywords:

tourism industry, information technology, technological development, tourism, SWOT analysis.

INTRODUCTION

Technology represented both an opportunity and a challenge for the tourism industry from the beginning of development. The tourism industry was, and still is, part of a rapidly changing world, and it needs to adapt constantly to satisfy the demand and to remain competitive (Buhalis, 2000). For more than 25 years, the tourism industry cannot exist without technology, considering that all operational, structural, and marketing levels depend on the Internet and information technologies, connecting suppliers, consumers, and intermediaries (Lie *et al.*, 2023). The vital question for authors in the past was what future brought for the tourism industry, especially with technological advancement (Lewis *et al.*, 1998; Morgan *et al.*, 2001; Kubiak, 2002; Fodor & Werthner, 2005). The tourism industry is vulnerable, and it depends on the changing environment, hence, it needs to be ready to take timely actions to respond to the challenges (Chen & Ling, 2023).

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Kubiak (2002) emphasized that the main problem for the tourism industry at the beginning of the 21st century was that the product was intangible, unlike for most manufacturing industries. With that in mind, many decision-makers did not invest considerable financial resources, which gradually changed with the increasing number of international travelers. The Internet development significantly impacted the number growth, with the ease of obtaining information and online bookings without needing an intermediary. This advantage was also significant for the providers of tourist services, such as airlines and hotels, who were among the first to use Computerized Reservation Systems, depending on third parties (travel agencies and other suppliers). Excluding intermediaries reduced the fixed costs of service providers, enabling them to lower the price of their services to end users (Lewis *et al.*, 1998). With technological development, the international tourism system has become dependent on it for its future growth, competitiveness, and sustainable operation. The tourism industry had to embrace technology to create and sustain a competitive advantage, as it provided consumers with direct and easy access to information (Morgan *et al.*, 2001).

All the improvements in tourism are possible thanks to Information and Communication Technologies (ICTs) development, among which the importance of artificial intelligence (AI) stands out (Zsarnoczky, 2017; Zlatanov & Popesku, 2019; Kirtil & Aşkun, 2021; Solakis *et al.*, 2022; Wang & Uysal, 2023). The travel decision-making process as a complex one has become less complicated with AI development. The value of AI is reflected in fulfilling user requests and delivering responses almost immediately, at a pace practically impossible for human employees (Zlatanov & Popesku, 2019).

The view of technology relating to tourism management has changed a lot in the past years. From the decade of “digitization” to the decade known as “age of acceleration” (Xiang, 2018), information technology is now connected to tourism in many ways, giving people room for imagination. E-tourism represents an integration of Information and Communication Technologies in the tourism sector, meaning tourists can choose their travel destination, compare prices online and buy tickets at low prices. Furthermore, service providers can improve their marketing strategies according to the tourist demand (Koliouska & Andreopoulou, 2023). Consumers have become powerful, as they can easily determine elements of their tourism product. With the increased sophistication and experience, satisfying their expectations became much more difficult (Buhalis & Law, 2008).

The subject of this paper is to determine, through a review of the existing literature, the development process of the tourism industry under the influence of information technology and AI development.

The task of the paper is to explore the thinking process of the authors during the last decades and how they presented new technological innovations and imagined the future while comparing their work with the latest papers on the same topic.

LITERATURE REVIEW

The beginning of the twenty-first century was marked by AI development, which led to the question of its role in various industries (Filieri *et al.*, 2021). With the improvement of people’s living standards, tourism has become one of the fastest-growing industries in the world, which requires responding to numerous users quickly, emphasizing the importance of AI in this industry. It is considered that AI is one of the most important innovations, and in a short period, many significant results have been achieved in various fields (Zsarnoczky, 2021). Implementation of AI in the tourism industry can be seen in the form of applications such as smart travel agents, predictions, translation applications, personalization systems and user behavior prediction, which are constantly improving (Bulchand-Gidumal, 2022). The potential of AI in the tourism industry exceeds the capabilities of humans and traditional data searches, thanks to the ability to quickly review larger amounts of data, adapt them to a potential user and fulfill their requirements efficiently (Kazak *et al.*, 2020). Tsaih and Hsu (2018) point out that AI refers to human intelligence represented through computer programs. The problem in using AI applications focused on automating work and improving transactions is considered less acceptable in the tourism industry due to potential privacy issues (Huang *et al.*, 2022) causing negative psychological impressions as a result of reduced interpersonal interaction (Tussyadiah, 2020). Today, AI is used both by consumers and providers of tourism services (Tourism Organizations, DMOs, travel agencies, etc.) and everyone uses it to get the maximum benefit from new technologies (Ivanov & Umbrello, 2021).



Consumers use technology for various reasons. They use social networks, search for information, share opinions and experiences, and shop online. For travel, social networks play a crucial part, i.e., they are used at all stages of the holiday cycle: before, during and after the trip, seeing that people access travel information before and during their trip and share travel experiences during and after the trip (Cohen *et al.*, 2014). Customers share their thoughts and opinions online about the products and services they used during their trip by connecting directly with the service providers or by writing them on blogs (Jeong & Jang, 2011), which with social media today represent the primary sources of information (Dhiman, 2023). This way of getting information is known as Electronic Word-of-Mouth (eWOM), the common name for online reviews and recommendations, which has gained importance with new technology tools. EWOM led to new methods of communication and changes in companies' marketing strategies, as well as consumer behavior (Cantalops & Salvi, 2014).

For years, the tourism consumer market was focused on travel agencies, which today have limited service options and cannot fully meet the individual needs of tourists (Wang, 2020). However, users still place more trust in agencies and travel agents choosing personal contact and advice with the chance of getting answers to all potential questions, whereas many agencies still consider the printed catalogs the most effective on-site sales tool (Dini *et al.*, 2022). What particularly stands out in the technological development in travel agencies business is the emergence of an increasing number of Online Travel Agencies, which do not have a physical place of business like traditional travel agencies (Wicaksono & Maharani, 2020). Although online travel agencies represent a novelty in the tourism industry, technology development has allowed hotels to create a possibility to directly contact and make reservations, leaving out intermediaries (Lv *et al.*, 2020). It is the same when it comes to booking transportation directly, with the chance of buying cheap tickets several months before the actual trip (Gabor *et al.*, 2022). If consumers decide to travel a few days before the trip, travel agencies have an advantage thanks to numerous last-minute offers (Bunghez, 2020).

Hays *et al.* (2014) focused on to what extent Destination Marketing Organizations (DMOs) use social networks to interact with consumers, and that social media is still not widely recognized as a significant tool in marketing strategies. With technological advancement, DMOs are required to find the most effective communication strategies to connect with potential tourists, provide information, and promote service providers at the destination. Primary communication channels used are national and local destination websites, social networks, and TV ads, with printed brochures and postcards widely used in the past (Park & Stepchenkova, 2023). Consumers rely heavily on social media reviews and content. With this in mind, DMOs must monitor what content appears on networks related to their destination to react in time if there is a difference between what they promote and what visitors see (Unnikrishnan & Sibi, 2023).

However, the world changed in 2020 when the beginning of the COVID-19 pandemic was officially declared. With the pandemic outbreak, borders were closed, and cities were blocked. The tourism industry in 2020 declined by more than 70% compared to 2019, regressing to the size from 30 years ago, whereby the pandemic has increased the significance of information technology people use from the safety of their homes while enjoying attractions that they cannot visit in person (Lee, 2022). The author notes that virtual reality (VR) can help recover the tourism industry by bracing the travel desire and improving destination promotion. During the COVID-19 pandemic, tourism service providers had to find ways to stand out and control their resources. Through the information technology investment, applications could improve service quality and reduce operational costs while achieving efficiency and flexibility for service providers and customers (Choi *et al.*, 2023). Authors emphasize that this investment was profitable during the pandemic, considering people felt safer with a reduced level of interpersonal contact, but also remind that tourism is a human-oriented industry that should not rely overly on advanced technologies. Even though VR can help tourism recover, the tourism industry needs to explore practical ways to attract potential tourists before any significant financial investments. The problem is that tourists may not want to pay for it and may not accept virtual technology and adapt to virtual tourism (Li *et al.*, 2022).

As information technologies have become part of people's daily lives today, it is necessary to pay special attention to the safe use of technology. It is available to all age groups, which requires special attention, mainly when used by children. In this regard, while technology is very useful, it is necessary to use it in a safe way.



METHODOLOGY

The authors conducted desk research with an extensive literature review, to explore technological development's influence on tourism. To gather data, academic literature related to the tourism industry and technological development was analyzed. Extensive secondary data was collected from journals and conference papers to achieve this analysis's aim.

Search results were limited only to papers written in English. The main focus was to chronologically observe the changes in tourism development from the past to the present, particularly considering technology's impact on tourism and travel.

The reviews started with the definition of the research question that, for this study, is defined as follows:

RQ: How has information technology development affected the tourism industry?

The answer to this question allows a better understanding of the technological innovations used in the tourism industry, with an awareness of the advantages and disadvantages that could arise.

RESULTS AND DISCUSION

By reviewing the available literature, one can get an insight into all the changes that accompanied the development of the tourism industry under the influence of the technology development. Therefore, literature review is one of the best ways to acquire information, considering that scientists have been analyzing the advantages and problems caused by new technologies for decades.

The development of technology and AI has contributed to the advancement of the tourism industry to a great extent. People have the opportunity to visit museums and destinations from the comfort of their homes (Sousa *et al.*, 2023), to simultaneously translate into a foreign language during their travel (Bulchand-Gidumal, 2022), which removes barriers between locals and tourists, and to share their experiences with other people in real-time (Cohen *et al.*, 2014). Grundner and Neuhofer (2021) assume that many tourist destinations would be operated by a combination of destination-operated and AI solutions, leading to a distracting experience environment and reduced authentic experiences. With that in mind, it is necessary to address the ethical issues adequately regarding AI usage in the tourism industry by involving relevant stakeholders in the development to decrease the resistance against them (Ivanov & Umbrello, 2021). The authors point out that it is necessary to pay attention both to direct and indirect stakeholders, referring to those who are under the direct and indirect influence of the AI development in the tourism industry, such as tourism-related organizations (travel agencies, tourism organizations, DMOs), the local population, media, financial institutions, and many others, as they can influence the resolution of ethical issues when using AI in the industry.

Information technology has deep social and economic development implications. The crucial benefit is associated with access to information available to wider audiences through new technologies (Jadhav & Mundhe, 2011), while the decision-making process is risky and requires extensive information during the search phase. To reduce risk, travelers use various sources of information. However, tourists may not find reliable information on the Internet, hence they search for information from other travelers who have already visited their destination of interest (Paul *et al.*, 2019). The issue is that due to the massive amount of information, people fear that they will make wrong decisions (Wang, 2020). Accordingly, very present emotion today is the Fear of Missing Out (FoMO), whereby people are dissatisfied due to the belief that they cannot experience the same activities as people on social media, along with dissatisfaction with their personal activities (Bui *et al.*, 2022).

Changes in technology have contributed to the development of new generations of tourists. Pricope Vancia *et al.* (2023) point out that Generation Z heavily relies on social media as their primary search engine. This generation can be a connection between previous and future generations. Moreover, with the technology development and the creation of websites and applications, it is important to think about older users of tourist services, mainly pensioners, who today represent a considerable search area. These consumers appreciate functionality, quality and convenience concerning tourism information technology (Pesonen *et al.*, 2015). Authors emphasize that throughout the years, older consumers' focus shifted from traditional information channels, such as travel agents, to secure users of information and communication technologies.



The tourist offer can be promoted faster than before, attracting potential users and hoping to gain loyal consumers after the provided service (Gubíniová *et al.*, 2023). Consumers can effortlessly find the wanted information, check all doubts, and decide on the trip. After decision-making and while travelling, a person uses social networks to post pictures and videos and leave reviews for the services used. This supports the fact that social networks are threaded into all moments of travel - before, during and after (Damanik *et al.*, 2019). The effects of rapid technological change have been noticeable even before the COVID-19 pandemic. Technology development has contributed to the preservation of cultural heritage through the process of digitization, thus making it available to numerous people. Nowadays, digital technology is used to preserve cultural heritage, with a unique opportunity to create a virtual copy of the material objects that would enable its use for future generations (Paschalidou *et al.*, 2022). Digitalization opens up new possibilities for the promotion of cultural heritage, as well as some new challenges. Cultural heritage is distributed throughout the different states and managed by hundreds of institutions, representing a challenge for them. Institutions such as museums and libraries should be able to participate in the digital display of cultural heritage to add valuable and authentic information (Preuss, 2016).

Not only can technology help preserve existing heritage, but it can offer new experiences in a simulated environment using VR, as a part of online reality. It is possible to visit new places without physical travel, which blurs the boundary between the real world and VR (Pratisto *et al.*, 2022). People increasingly talk about the “Metaverse”, as a part of the new Internet generation known as “Web 3.0”, representing the new way of online reality - sharing experiences simulated in realistic, unrealistic and mixed environments. “Metaverse” represents online reality accessible via the internet, in which users can move around, share information, socialize with other avatars, travel, go to events and more (Monaco & Sacchi, 2023). In addition, VR can be of great importance to vulnerable groups who cannot physically travel, enabling them to visit places they would otherwise never be able to. At the end of the COVID-19 pandemic, managers had to decide whether they would implement VR in their organizations in the future, as for them VR was a way to stay competitive during the pandemic. It is noted that VR can provide personalized experiences for customers as an alternative to travel live, with reduced costs and carbon footprint, leading to a more sustainable tourism sector (Sousa *et al.*, 2023). The problem emerging with VR technology is the insufficiency of personal contact with locals, the impossibility of touching a product, smelling nature, and trying the food. Sensory aspects of the tourist experience can never be compensated for when using VR technology. VR technology could have a negative impact on the tourism industry by income reduction, resulting in job losses and business liquidation (Atsiz, 2021).

After the COVID-19 pandemic, the tourism industry needed innovative solutions to achieve sustainable recovery and restore people’s travel desire. Technology allows people to visit a location, even if they do not have the means to do it or they physically cannot travel (Xia, 2023). Virtual tours can provide certain benefits that authentic tours lack. The term used nowadays is “virtual tourism”, focusing on the use of VR applications in tourism. VR allows users to feel like they are in a real-world environment as an interpretation of an existing place or event (Polishchuk *et al.*, 2023).



SWOT analysis

The SWOT analysis is presented as an overview of the available literature on the development of information technologies and its impact on the tourism industry.

Table 1. SWOT analysis of the technology development impact on the tourism industry.

Strengths	Weaknesses
• Easier and faster information access • Employees in the tourism industry can complete tasks faster • No need for intermediaries • Cost reduction • Safety during use in times of crisis (e.g., COVID-19). • AI forms and recommends tourist experiences to potential service users more efficiently	• It is necessary to verify information by searching more sources • Digital applications show everyone identical information - no personalization regarding age, place of origin, level of education, etc. • Unequal (and sometimes insufficient) technology familiarity by employees in the tourism industry • Fear of Missing Out (FoMO)
Opportunities	Threats
• Better promotion of tourism businesses • VR technology allows people to visit a place even though they do not have the physical ability to do so (poor mobility, inability to travel, etc.) • Digitization of cultural heritage • Information available in different languages	• Information overload • Possible job losses • Confidence in available information • Information safety

Source: Author's.

Among the strengths of the information technologies development influence in the tourism industry, reducing costs and faster access to available information are possibly the most significant ones (Shanker, 2008). With the development of technology, employees have been allowed to access information faster and book accommodation or transportation more efficiently without using intermediaries. Furthermore, travelers also got the opportunity to book transportation and accommodation services (Verma & Shukla, 2019) themselves. The importance of technology was particularly highlighted during the COVID-19 virus pandemic, which has given people the necessary physical distance and the ability to work and communicate without significant issues in the safety of their homes (Kaur *et al.*, 2020).

With faster and easier obtaining of information, one of the main threats is the necessity of multiple checks of the quality of the available information so that it is the closest to reality (Buhalis & O'Connor, 2005). Digital applications have advanced enough to algorithmically offer people personalized experiences (Kokkalas *et al.*, 2022). However, the problem is that information about places is identical to every user to whom that experience is offered.

Tourism employs people of different age, education levels, and technology knowledge. Therefore, another threat is the varying degree of technology use by employees, which can cause various problems. With this in mind, it is necessary to organize training for employees in order to standardize business operations and avoid significant differences between employees (Kršák *et al.*, 2014). One of the threats occurring increasingly nowadays, affecting both the tourism industry and the psychological state of travelers, is FoMO (Fear of Missing out), whereby users of tourist services find it difficult to make travel decisions, fear of missing something potentially better, possibly still unknown to them (Wang, 2020).

Technology development has given the tourism industry great chances, and specific threats arise from it. A significant opportunity is the accelerated development of VR technology, thanks to which many people who do not have the possibilities to travel or are physically unable to, can experience a destination (Marasco & Balbi, 2019). In this way, better promotion of different destinations is achieved. Indeed, although the chances are noticeable, the existing threats must not be ignored. This especially applies to information security and trust in information, as well as the effect of information overload, which is assumed to be even more noticeable in the future (Sheng *et al.*, 2023).



CONCLUSION

Upon review of a significant body of literature on technological development's impact on the tourism industry, it is clear that technology has a significant role in tourism advancement, which answers our research question. Easier access to information and lower service prices are positive things technology has brought. The development of AI is considered among the most significant achievements of technological progress. Although AI has certain drawbacks in the tourism industry, the benefits cannot be overlooked. Among the most important advantages are economic benefits, as AI can work 24 hours a day, and a reduced percentage of errors lowers company costs (Tuo *et al.*, 2021). The authors point out that AI enables easier technical research of available tourist experiences, personalizing potential tourist wishes and contributing to the increased tourist satisfaction. Even though AI is considered an excellent tool to improve business in the tourism industry, it is recommended to conduct more detailed research on the types of AI used in different stages of the travel process to determine its impact on the overall experience (Grundner & Neuhofer, 2021). Tourism has functioned well for centuries without technology. However, its development has dramatically relieved the tourism industry's stakeholders, which, with wise implementation, can optimize their operation efficiency thanks to the new digital advancements (Ozdemir *et al.*, 2023). Considering that information is so easily available, travel service providers must do their best to satisfy their customers, as their business can decline due to bad online reviews. Consumers must carefully check the information available online, and the problem today is information overload, which will increase in the future (Sheng *et al.*, 2023). Information technologies have brought many improvements to the tourism industry, but information overload can make the decision-making process more complicated, with the occurrence of negative emotions (Bui *et al.*, 2022). With this in mind, service users should devote more time to check available information. At the same time, providers must work continuously to improve their services to stand out from the competition.

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