



EDITORIAL

Citation: Dávid, L. D., & Dadkhah, M. (2023). Artificial intelligence in the tourism sector: Its sustainability and innovation potential. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 18(3), 609–613. doi: 10.24136/eq.2023.019


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Article history: Received: 3.08.2023; Accepted: 5.09.2023; Published online: 30.09.2023

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Artificial intelligence in the tourism sector: Its sustainability and innovation potential

At the moment, human life has been tied with emerging and disruptive technologies such as artificial intelligence (AI), Blockchain, the Internet of Things, the Metaverse, etc. In the future, it may seem complicated to live without these technologies, even though they may be strange to us now. As these technologies grow, it is necessary to understand the effect of them on our field of research and even on our life. AI is one of the technologies that could take attention in various areas and is the point of attention of the news. The most recent advancement is ChatGPT (Sarrion, 2023), a chatbot that can answer questions based on pre-trained data and could gain widespread applications. However, there are many criticisms of the reliability of provided answers by this chatbot (Chavez, 2023; Dadkhah *et al.*, 2023; Wach *et al.*, 2023; Orduña-Malea & Cabezas-Clavijo, 2023).

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It may be hard to provide a unique definition about what AI is, but according to Zerilli and his colleagues' research; "*AI is the science of making computers produce behaviors that would be considered intelligent if done by humans*" (Zerilli *et al.*, 2021). However, at the moment, AI is used for both the ability to produce behaviour like humans and also for doing tasks that far exceed human abilities (Zerilli *et al.*, 2021). Nowadays, some cases of research and applications exist on the use of AI in the tourism sector, and there are many hypes in this regard. However, the extent of the research and applications is not clear. This editorial sheds light on the current status of AI in tourism from a technological progress perspective, research trends, the contribution of such research to the United Nations' sustainable development goals (SDGs), and future research.

To provide a picture of the state of the art of AI usage in tourism, the data of published papers (from Scopus.com) and patents (from Lens.org) has been used. The focus is on all of the publications that discuss AI in tourism regardless of their types, publication data, and even languages. There are about 1300 papers and 49 patents from the beginning till 2023. The annual growth of publications is about 18%, which shows the research is increasing year by year and the topic is of interest to both academia and industry. However, technological progress in the tourism industry is not impressive in terms of the number of patents in comparison to other industries (i.e., healthcare). So, most of the focus of AI usage in tourism is limited to research rather than the development of practical usage. The situation for research is vice versa, as there are good bodies of knowledge. However, most of the contribution comes from non-tourism journals.

The bibliometric analysis of available research indicates the main research trends in the area of AI and tourism (Aria & Cuccurullo, 2017). The majority of research contributions come from China, India, Spain, the USA, and Portugal. The main themes of publications focus on developing decision support systems for tourism planning and management, big data and its usage for marketing and demand forecasting, tourism sustainable development, metaverse and augmented reality applications in the tourism industry, natural language processing systems (i.e., chatbot, sentiment analysis of tourists' comments, destination branding, etc.), and COVID-19 effect on tourism. The publications in each year have been influenced by the technological and societal climate of that year. Starting in 2017, recommendation systems and forecasting started to be a trend, and sustainable development found its place in the literature in the next years. With the

emergence of COVID-19, virtual reality and COVID-19 can attract the attention of researchers. At the moment ChatGPT related research is trending. All of the mentioned trends are popular now, and there are extensive efforts on them.

By use of the SIRIS method, the SDGs that have been supported by publications can be identified (Rodenburg *et al.*, 2021). SDG-11 (sustainable cities and communities), SDG-9 (Industry, innovation, and infrastructure), and SDG-8 (Decent work and economic growth) are the most supported SDGs in the literature. Indeed, the mentioned SDGs can be supported better by the use of AI in tourism.

The analysis indicates that innovative technologies (i.e., AI, Blockchain, Metaverse, etc.) have good potential to support sustainable tourism, especially in decreasing the negative effect on environmental and cultural resources (Das *et al.*, 2022; Kashem *et al.*, 2023; Sharma & Sehrawat, 2019). However, the research in the field is limited; there is a need for widespread analysis of various disruptive technologies, especially AI, in order to understand how they can support sustainable tourism. The research should not be limited only to providing solutions and focusing on the benefits of the technical side, the human side also should be considered. At the moment, most of the contributions come from non-tourism journals. The acceptance of innovative technologies by both tourists and governments, especially for less developed regions should be explored by both quantitative and qualitative methods. There is also a need for deep research on the feasibility of innovative technologies and providing a timeline for practical usage of such technologies.

Even though there is hype regarding innovative technologies in tourism, it seems that the state of art is not clear. In such a situation, systematic reviews, bibliometrics, meta-analyses, and other review types are necessary to shed light on the state of the art in this area. The tourism sector needs studies to support both research and development area. It is only possible when the state of the art is clear, and innovative solutions are presented by both academic and industry experts.

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Ministry of Education and Science
Republic of Poland

The journal is co-financed in the years 2022–2024 by the Ministry of Education and Science of the Republic of Poland in the framework of the ministerial programme “Development of Scientific Journals” (RCN) on the basis of contract no. RCN/SN/0129/2021/1 concluded on 29 September 2022 and being in force until 28 September 2024.