

**BUILDING THE
FUTURE OF TOURISM**

**VOL
02**

FUTURE TOURISM TRENDS

**TECHNOLOGY ADVANCEMENT,
TRENDS AND INNOVATIONS
FOR THE FUTURE IN TOURISM**

**CANAN TANRISEVER
HÜSEYİN PAMUKÇU
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Future Tourism Trends Volume 2

BUILDING THE FUTURE OF TOURISM

Series Editor: Anukrati Sharma

The world is entering the Third Millennium in which great changes are expected in all areas of human interest, life and activity. These changes have been brought on by past and present man-made events, which have had both positive and negative consequences. The coming millennium will be marked by significant social, political, demographic and technological changes, and will definitely differ from the last century. The future will bring more leisure time, a higher standard of living and a better quality of life for us all. This series examines recent and the most probable changes and gives a wide range of visionary insights, as well as operational takeaways

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Future Tourism Trends Volume 2: Technology Advancement, Trends and Innovations for the Future in Tourism

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INVESTOR IN PEOPLE

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Preface

In today's world, where the world is becoming a global village, and we are observing this more clearly with the Covid-19 epidemic, it is inevitable that tourism trends will differ. As the world entered a rapid digitalisation process with the epidemic, environmental concerns also came to the fore. Today's 'new tourists' are more seasoned travellers looking for untested vacation experiences. One of the main features of the new tourist is the need to get away from the monotony of daily life and achieve self-realisation in different ways. The tendency of 'self-actualisation' coincided with a period when technology was intense, causing a renewal in tourism as in every field. External environmental conditions heavily influence the international tourism market. The rise in the level of welfare in developed countries, the increase in leisure time, the experience of people in travel and the change in their socio-demographic structures have led to the emergence of new tourism trends in the travel market. The socio-demographic structure, in which changes such as the increase in the active youth population, the late marriage age, the increase in the number of families with multiple incomes, the increase in the number of families without children and the number of adults living alone are observed, causes significant changes in the demand for travel and leisure time. The resulting tourist types and needs reveal more specific travel types and activities. The active tourism concept has replaced the passive tourism concept. In this book, we tried to reveal future tourism trends by considering the current trends. In this context, Vol 1 is Tourism in Changing World and Vol 2 is Technology Advancement, Trends and Innovations for the Future in Tourism. We wish you a pleasant school.

Dr Canan Tanrisever
Dr Hüseyin Pamukçu
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Part 1

Artificial Intelligence in Tourism

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Chapter 1

Artificial Intelligence (AI) in Tourism

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Learning Objectives

After reading and studying this chapter, you should be able to:

- understand the definition and principles of AI;
- understand the usage of AI in the hospitality and tourism industry.

Abstract

Artificial Intelligence (AI) has revolutionised the tourism industry, offering personalised experiences and streamlining operations. AI provides customised recommendations for travellers through data analysis and machine learning, making their journeys more meaningful. It has also improved efficiency through automated processes, chatbots and enhanced security measures. AI's ability to analyse large volumes of data enables tourism organisations to make data-driven decisions and target their marketing strategies effectively. One of the most notable contributions of AI in tourism is its ability to offer personalised recommendations. By analysing vast travel history, preferences and online behaviour, AI systems can provide tailored suggestions for destinations, accommodations, activities and dining options. This level of customisation enhances the overall travel experience, making it more relevant and satisfying for individual travellers. AI has also greatly improved operational efficiency within the tourism sector. Chatbots, powered by natural language processing, are increasingly being deployed by hotels, airlines and travel agencies to provide instant customer support and assistance. These chatbots can answer queries, offer recommendations and handle booking processes, reducing waiting times and enhancing customer

satisfaction. In addition, facial recognition technology allows for quick and accurate identity verification at airports, hotels and other travel-related facilities. This improves security and provides travellers with a seamless and efficient experience. As technology advances, we expect AI to play a more prominent role in augmented reality, voice recognition and virtual assistants, further enhancing the travel experience and facilitating seamless interactions. In conclusion, AI has transformed the tourism industry by providing personalised recommendations, improving operational efficiency, enhancing security measures and enabling data-driven destination management.

Keywords: Artificial intelligence (AI) in tourism; AI in hotels; AI in restaurants; AI in travel organizations; AI in transportation organizations; AI in events

Introduction

Hospitality pertains to the act of warmly receiving and entertaining guests or customers. It involves providing services primarily offering food, beverages and accommodations. These services can be found in various establishments, both commercial and non-commercial. The hospitality industry encompasses hotels, tourism, food and beverage and meeting and event industries (Limna, 2022). On the other hand, the term artificial intelligence (AI) was initially introduced in 1956 by John McCarthy, an American computer scientist. AI can be described as the discipline that systematises and automates the process of intelligent thinking performed by computers (Cain et al., 2019). AI refers to machines that replicate cognitive functions typically associated with human intelligence, as they can perform tasks resembling human behaviour. A notable characteristic of these machines is their ability to learn autonomously from experience without requiring explicit programming (Mingotto et al., 2021).

With the advent of the Fourth Industrial Revolution, marked by the emergence of intelligent and autonomous systems fuelled by extensive data and machine learning (ML), AI techniques have experienced rapid advancement. AI can be categorised into seven subfields: knowledge representation, reasoning, planning, decision-making, optimisation, ML and metaheuristic algorithms (Lv, Shi, et al., 2022). As an innovative technology for service advancement, AI offers distinct advantages compared to other technologies. It can autonomously make decisions and act, ensuring efficient and effective service delivery. Additionally, AI enables enhanced customer engagement and interaction (Lv, Yang, et al., 2022). AI empowers technological devices to independently learn and function, enabling them to interact with human employees and customers during service encounters.

Furthermore, AI has been recognised as having significant potential to supplement or replace human workers' cognitive capabilities, encompassing managers and employees (Saydam et al., 2022). These capabilities are made possible

by utilising cognitive computing and ML technologies. For example, various solution-based or platform-based tools, such as recommender systems and chatbots, have been created in the travel and tourism industry to deliver personalised and contextually relevant information services and customer support. These tools offer various services, including personalised hotel recommendations, destination selection assistance, travel planning with alternative itinerary and route options and customer service and complaint management (Koo et al., 2021).

AI in Tourism

Technological advancements have significantly impacted the tourism and hospitality sectors. Over the past two decades, various information and communication technologies (ICTs) have been embraced to deliver value, improve service efficiency and enhance the overall travel experiences of tourists. The integration of ICTs is prevalent across all stages of a tourist's journey, from pre-travel planning to the actual trip and even post-travel activities. Furthermore, introducing AI has further enhanced ICT capabilities by enabling the seamless integration of physical and online/virtual components within the tourism and hospitality domains (Knani et al., 2022). As a result, the global hospitality industry is experiencing a significant rise in adopting AI technologies. Advancements in AI technology and its growing acceptance within the service sector have significantly changed the hospitality and tourism industries. These changes have impacted various aspects, including consumer demand, tourist experiences and perceptions, destination management and the ability to predict tourist behaviour.

Moreover, it has revolutionised the traditional models of tourism and hotel management. AI systems utilised in the tourism industry can be implemented independently or integrated into existing applications and systems. These systems encompass a variety of technologies, such as recommender systems, personalisation techniques, conversational systems like chatbots and voice assistants, forecasting tools, autonomous agents, language translation applications and intelligent tourism destinations (Bulchand-Gidumal, 2022).

The tourism industry employs two AI systems: pure digital systems and digital–physical hybrids, commonly known as robots. These systems are utilised in various aspects of the industry (Zlatanov & Popescu, 2019). Hospitality establishments are integrating AI into their fundamental service delivery models to provide seamless and enhanced service experiences. By leveraging this technological advancement, customers can access trustworthy and precise information, personalise their requests, book reservations and purchase hotel and tourism services and products through digital platforms. This eliminates the need for intermediaries such as hotels, booking agents or travel professionals. AI enables service innovation by facilitating the provision of personalised services. AI-powered devices are crucial in addressing customer inquiries, providing pertinent information and offering real-time recommendations. Furthermore, they empower guests to manipulate and control the physical ambience of their rooms, ensuring a customised experience. Overall, AI facilitates comprehensive

end-to-end customer services, bolstering the hospitality sector (Doborjeh et al., 2021; Roy et al., 2020; Ruel & Njoku, 2021).

AI in Hotels

Hotels are increasingly implementing AI technologies to upgrade their future services to help the quality of their services towards customers and managers. They are improving their service with the quality and accessibility that AI provides (Lv, Yang, et al., 2022). Seen as a profit-making service, AI needs to prove its economic worth by demonstrating how customers value and perceive it (Citak et al., 2021), and also it is important to understand how customers assess and interact with that kind of service (Nazir et al., 2023) because their perceptions and assessments play a significant role in determining the quality of the provided service and service outcomes (Prentice et al., 2020).

AI usage from a business angle, AI shows up for technology-based functions or systems that expedite operations or services, achieving cost savings and maximising profitability (Yang et al., 2019). From a customer or user angle, AI is a set of devices that enhance task performance for employees and brings resilience and accessibility to the customer (Sung et al., 2021). This business perspective perceives AI as a type of commercial service facilitated by information technologies, implemented by organisations and benefits taken by consumers (Yin et al., 2023). That is how customer service experience improvised and increased the engagement of AI (Li et al., 2021).

FlyZoo Hotel incorporates a range of AI-influenced services to establish a beneficial and seamless customer experience (Chang et al., 2022). As an example:

- Facial recognition technology is used instead of traditional keys or key cards, allowing guests to effortlessly access various areas of the hotel, including elevators and their rooms.
- During check-in, guest photos are captured and utilised for verification, ensuring only registered guests can access the hotel facilities.
- Each room at the hotel is equipped with a ‘Tmall Genie’ smart assistant, enabling guests to control various aspects such as temperature, lighting, curtains and television and even obtain answers to basic questions through voice commands.
- The intelligent Genie Tmall assistant also facilitates additional services, such as requesting fresh water or new pillows, which are then delivered to the room by an Alibaba-made robot.

These AI-powered amenities enhance the guest experience by offering convenience, efficiency and personalised assistance (Gunawan et al., 2023).

Hilton and IBM collaborated to develop Connie, the innovative first face-to-face customer service robot designed specifically for hotels (Kim et al., 2022). Connie, named after Conrad Hilton, uses AI to learn from guests and continuously improve its performance over time. The AI model embedded in Connie enables it to:

- interact with guests;
- answering their questions;
- assisting with simple booking tasks;
- enhancing its speech capabilities through ML.

Connie's ability to learn from guest interactions and adapt ensures a personalised and evolving customer service experience. Using AI technology, Hilton and IBM have introduced a strong solution that improves guest interactions, streamlines booking processes and continuously improves speech and service delivery (Paraman et al., 2023).

The Henn-na Hotel, meaning 'strange' in Japanese, opened its doors in Nagasaki in 2015 with a unique approach to staffing. Initially, the hotel employed a combination of 30 human staff members and 243 robot staff members to cater to the needs of its 140 rooms and accommodate up to 300 guests. Over time, as the hotel's operations proved successful, the number of human staff members was significantly reduced to only seven, creating an impressive staff-to-guest ratio (Reis et al., 2020).

The hotel features multilingual robots capable of speaking Japanese, English, Korean and Chinese, ensuring that travellers from various backgrounds have a memorable and inclusive experience. Robots, including an English-speaking dinosaur robot, handle check-in, while porter robots transport luggage to guest rooms. While robots form the primary workforce at the Henn-na Hotel, there is still a human staff available for around 24 hours, 7 days, to assist customers in case of any issues or concerns (Luo et al., 2021).

AI in Restaurants

Recently, a notable and intriguing trend has been in applying modern robotics, information technology and AI within the restaurant industry. Tablet computers have gained widespread adoption for food ordering purposes in numerous countries. Moreover, there has been a rise in the establishment of robotic restaurants that operate without human waitstaff, with notable examples in Canada, Japan and Singapore. Advancements in ML, AI and cloud computing technologies have also led to the development of intelligent food recommendation systems for customers. For instance, there have been reports of cloud-based smart restaurant management systems that offer user-friendly interfaces for food menu recommendations. By utilising advanced algorithms and services like Amazon Web Services (AWS), these systems enable consumers to easily find their preferred dishes and assist restaurants in enhancing their service quality, productivity and profitability (Li et al., 2018). AI can offer various advantages in three distinct categories of tasks and services. The first category encompasses mechanical tasks within transactional services, such as fast food ordering and delivery, where AI can streamline and automate processes. The second category involves thinking tasks within utilitarian services, like product recommendation systems, where AI can provide intelligent suggestions and enhance decision-making. Lastly, the third

category involves feeling tasks within hedonic services, such as sophisticated chatbots, where AI can simulate human-like interactions and enhance the emotional experience for users (Nozawa et al., 2022).

Restaurants are incorporating AI-driven kiosks to enhance their capacity and accelerate the food ordering, preparation and payment processes right from when customers enter the establishment. Additionally, some restaurants are exploring the use of virtual assistants to address customer queries, provide recommendations and handle customer orders. Voice ordering, facilitated by chatbots or AI-powered virtual assistants, allows customers to interact through voice commands, enabling them to ask questions, customise their orders and complete the transaction seamlessly. By leveraging voice-enabled devices, customers can conveniently place their orders over the phone or bypass long lines at drive-through. Moreover, voice-enabled technology enables restaurants to offer an elevated level of customer service by providing real-time updates on order preparation times, potential delays in food preparation and delivery statuses (Maroney, 2021).

For example, In China, restaurants have implemented intelligent management systems that utilise customer preference analysis and enable payment through QR codes or facial recognition. Moreover, the catering industry in China has prominently embraced AI by deploying robots, including robot chefs and robot waiters, in restaurants (Wei & Wu, 2019). Resy, established in 2014, is a search and booking platform designed to streamline restaurant management processes. It enables restaurant owners and staff to input operational details, such as table availability, occupancy and staff schedules. Through ML, the software accumulates knowledge over time, giving restaurants insights regarding their pacing, turnover rate and overall business performance.

On the other hand, Allset focuses not only on reservations but also food pre-ordering and prepayment services. By utilising ML, Allset analyses restaurants' peak hours and dining capacity to allocate orders effectively. Additionally, this engine can examine customer profiles and identify potential instances of transactional fraud. Tacobot enables customers to place their orders by sending text messages, and it responds in a distinctive and clever tone that aligns with the unique personality of Taco Bell. For example, Tacobot can comprehend requests expressed in casual and informal language. In 2017, Starbucks introduced their chatbot named My Starbucks Barista. This chatbot can understand both text and voice commands and facilitates personalised choices such as selecting cup sizes and preferences for toasting. In addition, subway, the renowned sandwich brand in the United States, launched its chatbot called the Subway Order Bot. This chatbot is integrated with Facebook Messenger and engages in friendly conversations with customers to process their food orders. What sets this chatbot apart from others in the same domain are two notable features: firstly, the pickup store is determined based on customers' zip code or current GPS location, and secondly, users have the option to input their order through text input or by selecting items from picture menus (Huang et al., 2022).