Artificial Intelligence in Tourism: Opportunities and Challenges Seen by Travelers

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ABSTRACT

Integrating artificial intelligence (AI) into tourism becomes increasingly impactful for consumer behavior. We investigated the impact of AI on the tourism industry and the opportunities and challenges for travelers and service providers. Using a qualitative method, a structured questionnaire was created to explore the perceptions of travelers and industry stakeholders regarding AI integration. Data were collected through in-depth interviews with participants who had engaged with AI-enhanced services in tourism. The results revealed how AI technologies have reshaped travel experiences, service efficiency, and customer satisfaction. The results contribute to the understanding of AI's role in the tourism industry and provide a foundation for future research on effective strategies for AI implementation in tourism.

Keywords—Travelers; Artificial Intelligence; Opportunities; Challenge; Tourism

INTRODUCTION

Artificial intelligence (AI)is widely used in today's society, serving as the backbone and influencing daily routines and interactions. AI offers vast opportunities for the tourism industry. The tourism industry is transforming with the integration of AI. Advancements in AI facilitate the tourism industry's development into a smart system. In the hospitality and tourism industry, the Internet of Things (IoT), big data, and cloud computing [1,2] serve as essential technologies for data collection and analysis. By adopting such AI tools, environmental, social, and governance (ESG) goals can be achieved in a sustainable technology framework [3]. These technologies also allow companies to track and manage their resource consumption, energy use, and emissions, aligning their operational goals with sustainability objectives [3]. Moreover, virtual reality (VR) and augmented reality (AR) allow travelers to explore destinations before they arrive effectively [1,2].

AI technologies are easy for travelers to use. Travelers gather information, share, and recommend on social media using AI [4]. Social media and AI tools such as ChatGPT [5] and Chatbot provide recommendations for travelers for their needs. Travelers gain information to plan itinerary and budget [6].

ChatGPT and Chatbot are integrated with travel websites to provide real-time data and personalized information and suggestions for transportation, activities, restaurants, hotels, and attractions [5].

However, the overreliance of travelers on AI tools is a challenge due to privacy, data security, and ethical issues associated with AI utilization [7]. Negative impacts such as incorrect information are also observed when searching for travel information. Incorrect recommendations and travel information mislead reviews on accommodations and attractions which erodes trust in the AI system. When travelers encounter incorrect information, they doubt reliability, making them less use AI tools in the future. Trustworthiness is critical in

users' acceptance of AI tools, especially in the travel industry where accurate and up-to-date information is essential.

In this study, we researched how to integrate AI into the tourism industry by assessing travelers' trust in AI tools and identifying the opportunities and challenges of using AI in the tourism industry. The results provide a basis to enhance the profits of the hospitality and tourism industries through the introduction of AI.

LITERATURE REVIEW

AI in Tourism industry

AI has significantly impacted the tourism industry, enhancing customer experiences, streamlining operations and enabling business growth. AI is used to analyze customer preferences and suggest personalized destinations, accommodations, and activities. Virtual assistants or Chatbots offer round-the-clock assistance, answering queries and providing tailored advice on travel itineraries. AI-based recommendation systems analyze user preferences, browsing history, and previous bookings to provide personalized travel suggestions. The recommendation systems improve customer satisfaction by tailoring options to their interests. For instance, TripAdvisor and Expedia utilize machine learning to enhance customer engagement through relevant suggestions [8].

AI-powered Chatbots provide instant support on travel websites and apps, assisting with bookings and cancellations and answering frequently asked questions. AI enables customer service in multiple languages, broadening accessibility and enhancing the global customer experience. AI-powered customer support systems offer accessibility for non-native speakers and improve customer satisfaction across diverse regions [9]. Moreover, AI in tourism enables companies to adapt to new trends and customer needs effectively, boosting competitiveness and satisfaction across the industry.

AI for Travelers

AI is used to analyze preferences, past trips, and social media activity to recommend destinations, activities, and accommodations that fit travelers' needs. Platforms such as Expedia and TripAdvisor use AI to provide customized recommendations and reduce the time spent on planning. Google Travel suggests optimal itineraries based on the user's schedule, highlighting popular attractions, restaurants, and activities. AI-based itinerary planning reduces travel planning time [10]. Such AI tools adjust itineraries based on real-time factors including weather and local events. AI Chatbots provides real-time responses to questions for flight status updates, check-in procedures, and local tips. AI-powered translation tools such as Google Translate or Pock talk help travelers overcome language barriers. Multilingual AI improves customer support quality and increases accessibility for international travelers [11]. These tools enable smooth communication with locals and even translate signs, and menus using cameras [12].

Apps such as Google Maps use AI to recommend the best routes, factoring in traffic, local transportation options, and real-time conditions. AI-based apps suggest safer routes or notify travelers about areas with higher crime rates, enhancing their sense of security in unfamiliar environments. Augmented reality (AR) and AI-powered mapping tools assist travelers in navigating unfamiliar cities. AI-driven navigation significantly enhances tourist satisfaction by providing reliable, up-to-date information [13]. Apps such as Skyscanner show flights with lower carbon emissions, catering to eco-conscious travelers. Skyscanner recommends eco-friendly accommodations and transport options, too. Travelers who receive eco-conscious suggestions make sustainable choices for eco-friendly options [14]. Such functions of AI tools empower travelers by making journeys smoother, more sustainable, and tailored to individual preferences, elevating the travel experience while reducing costs and planning time. Travelers use AI tools for traveling due to their affordability, real-time convenience, and seamless language translation services (Figure 1).

Fig. 1. Function of AI
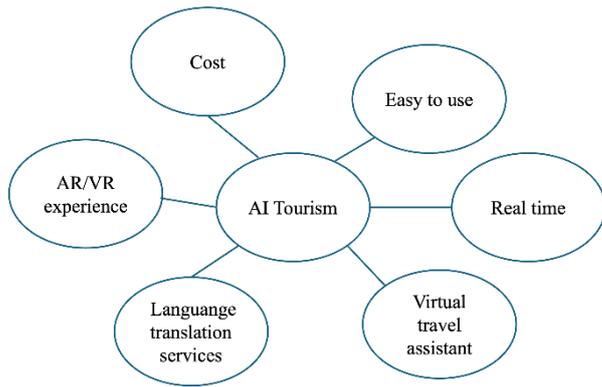
Challenges of Travelers

Despite such benefits, AI presents challenges for travelers including data privacy and limited accessibility. AI-based travel platforms collect a substantial amount of personal data, including travel habits, payment information, and even biometric data (e.g., facial recognition at airports). While this improves service personalization, it raises privacy concerns. Travelers are increasingly worried about how their data is stored, shared, and potentially misused, especially with facial recognition in airports and hotels. Travelers are more likely to use AI tools if they have options to control and understand data usage, yet this transparency is often lacking [15].

Many AI-driven apps and tools require a stable internet connection, which is challenging in remote or developing regions. Without reliable connectivity, travelers might be unable to access maps, translation tools, or chat support, potentially leaving them in challenging situations. Connectivity issues are frustrating barriers for travelers relying on AI tools for directions or local information in remote areas [16]. For international travelers, the need for connectivity requires high data roaming charges, making several AI tools costly. While dynamic pricing helps travelers find deals, it causes unpredictable price increases. AI algorithms adjust prices based on demand, leading to unfair pricing during peak seasons or last-minute searches [17]. Furthermore, reliance on AI reduces direct interaction with residents, limiting cultural immersion and authentic experiences.

Fig. 2. Challenges of AI tools reported by travelers
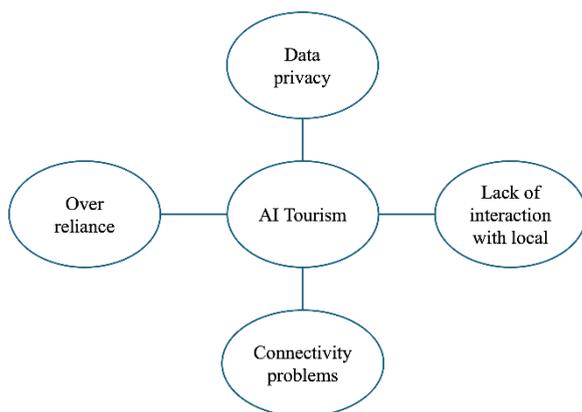
METHODS

In this study, a qualitative research approach was employed to gain an in-depth understanding of travelers' experiences and behaviors when using AI tools during their travel planning and decision-making processes. Open-ended questions were asked [18] to understand the processes and patterns of traveler behavior [19]. Semi-structured interviews are widely used in qualitative research with individuals or groups [20]. The participants were selected randomly to obtain credible information [21]. The agreement was obtained from 73 participants from various countries. This relatively large and diverse qualitative sample strengthened the robustness of the

data and increased the likelihood of identifying recurring themes and patterns across different traveler segments.

A. Discussion

After the interview, the experiences and perceptions of the participants were coded and compiled using AI tools. Table 1 presents an overview of the participants' demographic.

Table 1. Participants demographic.

Demographic variable	Category	Frequency
Gender	Female	59
	Male	14
Travel Experience (Using AI Tools)	Yes	69
	No	4
Age	Under 20 years old	9
	20-24 years old	30
	25-30 years old	24
	Above 30 years old	10
Country	Taiwan	17
	Indonesia	29
	Vietnam	5
	Malaysia	3
	Other	19
Marital Status	Married	11
	Single	62

Testimonies from the participants were as follows.

"AI tools are available and excellent offering immediate support for my queries related to bookings, itineraries, or travel tips. AI tools also can compare prices for flights, hotels, and activities in real-time, helping me when I want to travel to find the best deals and manage budgets more effectively."
  [Taiwanese, Interview, 26 Augustus 2024]

AI tools were available or retrievable easily and helpful. Many AI applications embedded in familiar digital environments such as booking platforms. Moreover, travelers found that AI tools and Chatbots provided quick responses, effective interaction, engagement, and an enjoyable experience [22]. AI tools making travelers easily discoverable and immediately usable.

"AI tools offer new experiences as a traveler by providing convenience, personalization, and efficiency."
  [Indonesian, Interview, 29 July 2024]

Travelers felt comfortable using AI tools. Travelers understood how to effectively interact with the AI tools and controlled AI tools [23]. Furthermore, travelers searched for information to book a hotel room via Chatbot [23]. Travelers' comfort, understanding, and perceived control over AI tools contribute to a positive user experience, which in turn encourages the use of AI-driven chatbots for information search and hotel booking. These factors collectively strengthen travelers' acceptance of AI technologies and support their integration into contemporary tourism and hospitality services.

"When I went traveler to the destination with the poor connectivity AI tools luck of function, so I need to interact with local which is suitable since AI tools cannot replace the empathy and nuanced understanding that a human travel agent or local guide can offer.

[Turkey, Interview, 26 July 2024]

Several travelers faced challenges accessing AI tools due to poor internet connectivity, a lack of technical skills, or language barriers. AI tools are not always accurate and potentially cause real-world harm [24].

CONCLUSION

AI is significantly transforming the tourism industry by enhancing customer experiences, streamlining operations, and promoting sustainability through personalized, data-driven tools and services. AI technologies, such as Chatbots, recommendation systems, and AR/VR applications, offer travelers convenience, efficiency, and tailored solutions, making their journeys seamless and enjoyable. However, challenges such as data privacy concerns, system inaccuracies, biases in recommendations, overreliance, and limited accessibility in remote areas pose barriers to its widespread acceptance. These findings emphasize the importance of ethical AI integration, transparency in data usage, and user education to enhance trust and reliability in AI applications.

This study's limitations lie in its qualitative method, which, while rich in detail, limits generalizability. The sample size of 73, though diverse, might not fully represent global traveler's demographics or experiences. Additionally, we did not address how differences in technological infrastructure or cultural contexts might influence perceptions of AI tools in tourism. Future research is necessary to expand the sample size and focus on quantitative analyses to validate the results of this study across diverse demographics. It is also necessary to investigate strategies for improving the accuracy of AI systems, address biases, and enhance accessibility in underdeveloped regions. Exploring how AI adoption differs across cultures and traveler types also can provide information on the global implementation of AI tools. Frameworks for ethical AI use are needed to balance innovation with fairness, privacy, and sustainability in the tourism industry.

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