

# CHALLENGES AND OPPORTUNITIES OF AI IMPLEMENTATION IN TOURISM: AN ETHICAL AND TECHNOLOGICAL PERSPECTIVE

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## Abstract

The worldwide tourist sector is undergoing a dramatic shift, driven by the integration of artificial intelligence (AI) technologies that promise extraordinary improvements in service personalization and operational efficiency. However, the adoption of AI raises substantial ethical concerns, notably those related to data protection and decision-making transparency. The main aim of this study is to investigate the transformative influence of AI in tourism, specifically emphasizing how AI-driven technologies improve service personalization and consumer experiences. The research aims to identify and assess the ethical and technological obstacles associated with AI integration in the sector, proposing strategies for its responsible and sustainable adoption. The study, based on a quantitative analysis of 142 participants surveyed in Albania between July and August 2024, focuses on tourists' perceptions of the benefits and risks associated with AI-driven services, with a focus on personalization, privacy, and technological barriers that may impede widespread adoption.

The findings indicate that AI-driven personalized services significantly enhance tourist satisfaction, with respondents reporting higher levels of contentment when utilizing tailored services. However, ethical dilemmas and data privacy concerns emerged as prominent issues, with many travelers expressing apprehension about the collection and use of personal data. This highlights the necessity for transparent data practices and ethical considerations in AI deployment. Additionally, the study reveals that while there are challenges related to technological readiness, tourists perceive considerable opportunities for AI to streamline processes and enhance their travel experiences.

This research underscores the importance of balancing technological advancements with ethical considerations in the tourism industry. To address the identified concerns, the sector must prioritize transparency in AI algorithms and robust data privacy measures, fostering responsible AI adoption that enhances consumer trust. These insights contribute to the ongoing discourse on AI's transformative potential in tourism and provide a foundation for future research aimed at understanding and addressing the ethical implications of AI integration.

**Keywords:** artificial intelligence in tourism, personalized experience, data privacy, ethical issues, technological challenges.

## Introduction

**Relevance of the topic.** Artificial intelligence (AI) is transforming the tourist sector, revolutionizing how travelers interact with services and dramatically improving experience customization (Fileri, D'Amico, Destefanis, Paolucci, & Raguseo, 2021; Zlatanov & Popesku, 2019). Machine learning, predictive analytics, and intelligent chatbots are allowing businesses to provide more personalized services, increase operational efficiency, and adapt to consumer preferences in real time (Samala, Katkam, Bellamkonda, & Rodriguez, 2022; Solakis, Katsoni, Mahmoud, & Grigoriou, 2024). However, AI's growing role raises serious concerns about data privacy and the transparency of AI-driven decision-making (Kim, So, Shin, & Li, 2024; Bulchand-Gidumal, William Secin, O'Connor, & Buhalis, 2023). The collection of large datasets to tailor services introduces privacy risks, raising concerns about customer trust and business responsibility (Bulchand-Gidumal, William Secin, O'Connor, & Buhalis, 2023). Furthermore, the rapid growth of AI technologies raises questions regarding the tourism industry's technological ability to adopt these advances on a large scale, as well as their implications for employment and societal impacts within the business (Zahidi, Kaluvilla, & Mulla, 2024). Addressing these issues is essential for the ethical and sustainable integration of AI, which will play a critical role in creating the tourist future.

**Research problem.** Despite AI's transformative potential, unresolved ethical and technological issues may hinder its wide-scale adoption in tourism (Bulchand-Gidumal, William Secin, O'Connor, & Buhalis, 2023). These challenges include data privacy breaches, algorithmic opacity, and fairness

concerns, which could erode consumer trust (Sousa, Cardoso, & Dias, 2024). If these challenges remain unaddressed, they could limit the responsible and long-term use of AI in tourism, affecting both the industry's growth and reputation. This study aims to investigate these crucial topics and provide a full analysis of the challenges and opportunities that AI brings in tourism.

**Subject matter of the research** – this paper investigates the disruptive impact of AI on tourism, focusing on its ability to offer personalized services via advanced technologies including machine learning, chatbots, and data analytics. It also covers AI's dual impact—improving service efficiency while raising ethical concerns about data privacy, algorithmic fairness, and decision-making transparency. The study identifies important technological and ethical impediments to the widespread deployment of AI in tourism by conducting an empirical investigation of travelers' experiences and perspectives. By integrating these insights to industry norms, the study provides ways for responsible and ethical AI integration into tourism services, ensuring that innovation is consistent with ethical standards.

**Research aim** – the main aim of this study is to investigate the transformative influence of AI in tourism, specifically emphasizing how AI-driven technologies improve service personalization and consumer experiences. The research aims to identify and assess the ethical and technological obstacles associated with AI integration in the sector, proposing strategies for its responsible and sustainable adoption.

**Research objectives:**

1. To evaluate the influence of AI-driven personalized services on tourist satisfaction and overall travel experiences.
2. To identify ethical dilemmas and data privacy concerns that tourists associate with the use of AI technologies in tourism.
3. To explore travelers' perceptions of the challenges and opportunities posed by AI in the tourism industry, particularly regarding technological readiness and ethical responsibility.

**Research methods:** this study applies a quantitative research approach to analyze tourists' perceptions and experiences regarding the use of Artificial Intelligence (AI) in the tourism sector. Data were collected through an online survey of 142 participants conducted in July and August 2024. The survey examined AI adoption, perceived benefits of tailored services, and privacy and transparency concerns. Statistical studies were used to investigate the correlations between AI usage, satisfaction, and ethical concerns, showing how these variables influence visitors' desire to use AI-driven services.

**Research Questions:**

1. How does the use of Artificial Intelligence enhance the overall travel experience for tourists?
2. What technological and ethical challenges do tourists perceive regarding AI applications in tourism?
3. How do concerns about data privacy influence travelers' acceptance of AI-driven services in the tourism industry?

**The study's hypotheses are:**

1. H1: The implementation of AI significantly improves customer satisfaction and engagement in the tourism sector ( $\alpha = 0.05$ ).
2. H2: Concerns regarding data privacy and transparency of AI algorithms significantly affect travelers' trust and willingness to use AI services in tourism ( $\alpha = 0.05$ ).
3. H3: The integration of AI-driven real-time data and predictive analytics significantly enhances operational efficiency and overall traveler experience in the tourism industry ( $\alpha = 0.05$ ).

## Literature review

The increasing integration of Artificial Intelligence (AI) technologies in the tourism industry has sparked a wide range of academic discourse, addressing both the opportunities for enhancing customer experiences and the challenges surrounding ethical concerns and technological limitations (Bulchand-Gidumal, William Secin, O'Connor, & Buhalis, 2023). AI's ability to personalize services has been widely recognized as one of its greatest strengths, particularly in industries where customer experience is paramount, such as tourism. Several studies have explored the positive impact of AI on enhancing

personalized travel experiences. Studies such as those by Filieri, D'Amico, Destefanis, Paolucci and Raguseo (2021) and Zlatanov and Popesku (2019) emphasized that the integration of AI technologies in tourism platforms enables businesses to offer highly tailored services by analyzing large datasets to predict customer preferences and behaviors. These technologies facilitate dynamic customization, making tourism services more responsive to individual needs. Tussyadiah (2020) highlights that AI-driven technologies, including machine learning and predictive analytics, allow tourism providers to deliver highly tailored services by analyzing vast amounts of customer data (Tussyadiah, 2020). Such technologies facilitate the delivery of customized travel recommendations and support, enhancing the overall travel experience for tourists. Moreover, the deployment of intelligent chatbots and virtual assistants has revolutionized customer interactions within the tourism sector. For instance, intelligent chatbots, virtual assistants, and recommendation systems can provide real-time, personalized recommendations based on travelers' preferences and previous behaviors (Samala, Katkam, Bellamkonda, & Rodriguez, 2022; Binns, 2018). These systems not only enable 24/7 customer engagement but also enhance customer trust by delivering accurate and context-aware information, thereby streamlining the travel booking process and reducing friction points (Samala, Katkam, Bellamkonda, & Rodriguez, 2022).

Furthermore, AI enables dynamic pricing and tailored marketing campaigns that align with consumer preferences, as shown in studies by Babatunde, Odejide, Edunjobi, and Ogundipe (2024). Leveraging AI insights can enable marketers to personalize narratives, creating compelling stories that resonate with target audiences (Babatunde, Odejide, Edunjobi, & Ogundipe, 2024). For example, when a customer engages with a brand's digital platform, AI can analyze historical data and user preferences, recommending relevant products and customizing the overall user experience. Such seamless and personalized interactions not only enhance customer satisfaction but also foster long-term loyalty to the brand. This unified approach is essential for delivering consistent and targeted messaging across all touchpoints, ultimately solidifying the brand experience (Babatunde, Odejide, Edunjobi, & Ogundipe, 2024). These advances not only increase customer satisfaction but also improve operational efficiency for tourism businesses. However, alongside these opportunities come significant ethical concerns, particularly regarding data privacy and security. The extensive data collection necessary for AI applications raises questions about the responsible use of personal information. Privacy issues are primarily related to the collection, storage, and use of personal data required to drive AI algorithms (Bulchand-Gidumal, William Secin, O'Connor, & Buhalis, 2023; Osasona, et al., 2024). This also presents new challenges in terms of algorithmic transparency, where customers may not fully understand how AI systems process their data or how these decisions impact their travel experience (Binns, 2018). The tourism industry must ensure that AI technologies are implemented in a manner that respects ethical standards and fosters trust among users (Mittelstadt, Allo, Taddeo, Wachter, & Floridi, 2016). They assert that businesses must ensure that their AI systems operate ethically and transparently to maintain long-term customer relationships and prevent reputational damage (Bulchand-Gidumal, William Secin, O'Connor, & Buhalis, 2023). While privacy issues have been examined in some studies (Sousa, Cardoso, & Dias, 2024), the specific link between privacy and trust in AI remains underexplored. This gap is especially significant given the growing use of AI-powered technologies in tourism, where trust is critical to adoption.

As Artificial Intelligence (AI) continues to permeate various industries, including tourism, the distinctive value of human skills is gaining recognition as a crucial competitive advantage. The growing prevalence of AI in the tourism industry also brings attention to its potential impact on employment. Schönberger (2023) discusses the benefits of AI for SMEs, such as improved efficiency and productivity, but also highlights challenges related to privacy concerns and the need for specialized skills (Schönberger, 2023). According to Eurostat (2023), 8% of enterprises in the European Union have adopted artificial intelligence (AI) technologies, revealing significant disparities based on enterprise size (Eurostat, 2024). Notably, 30.4% of large enterprises reported utilizing AI, in stark contrast to a mere 6.4% of small enterprises (Eurostat, 2024). This variation highlights the challenges that smaller businesses face in integrating AI solutions and underscores the need for targeted support to enhance AI adoption across the sector. As Huang and Rust (2018) argue, the advancement of AI will enable it to

undertake even the more nuanced aspects of service work traditionally associated with human interaction (Huang & Rust, 2018). This transition opens up innovative opportunities for human-machine integration in service delivery, enhancing efficiency and customer experience. However, this capability also raises significant concerns regarding employment, as AI's ability to perform these intuitive and empathetic tasks poses a fundamental threat to human jobs in the service sector. The challenge now lies in balancing the benefits of AI integration with the potential impacts on the workforce. While AI has the potential to displace certain jobs, it also opens up new opportunities for highly skilled workers who can manage and work alongside AI systems. According to a report by the World Economic Forum (2023), AI has the potential to create new job categories. A recent study involving 803 international companies found that more than 75% plan to integrate big data, cloud computing, and AI technologies within the next five years (World Economic Forum, 2023). Notably, 86% of these organizations are expected to incorporate online platforms and mobile applications into their operational frameworks. This wave of technological advancement is anticipated to have a significant positive effect on the job market, with AI, machine learning, big data, and cybersecurity identified as the leading catalysts for job growth in the coming years.

While AI applications such as virtual assistants and recommendation systems are becoming more prevalent, there is insufficient research in adopting these technologies. By addressing these gaps, this research aims to provide a more nuanced understanding of AI's impact, tourists' trust, and the ethical concerns surrounding data privacy in tourism.

### **Methodology**

This study employs a quantitative research methodology to investigate tourists' perceptions and experiences regarding the use of Artificial Intelligence (AI) in the tourism sector. A structured online questionnaire was conducted with 142 participants surveyed in Albania in July and August 2024, designed to capture a comprehensive understanding of AI adoption within this industry. The survey instrument is organized into several key sections. The first section gathers demographic data, including participants' travel frequency, and familiarity with AI technologies (figure 1-2). This demographic information is crucial for contextualizing the findings and ensuring diverse representation within the sample. The second section evaluates tourists' perceptions of AI-driven services, particularly focusing on the perceived benefits such as personalized recommendations, improved service efficiency, and enhanced overall travel experiences. Respondents rated their attitudes using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), enabling a quantitative assessment of sentiment towards various AI applications in tourism. The third section addresses ethical considerations associated with AI implementation, highlighting concerns related to data privacy, algorithmic transparency, and potential biases in AI systems. Understanding these ethical dimensions is essential, as they directly impact tourists' trust and willingness to engage with AI-enhanced services. This section aims to uncover the relationship between perceived ethical concerns and the adoption of AI technologies in the tourism context. The final section explores participants' openness to engaging with AI-related services and skills, emphasizing the necessity for industry stakeholders to address ethical concerns and enhance tourists' readiness for AI integration. This investigation provides valuable insights into tourists' willingness to embrace AI-driven innovations in their travel experiences, highlighting both challenges and opportunities for the industry.

The sample consists of 142 participants, ensuring a diverse representation across different demographics and travel experiences. The insights derived from this research contribute significantly to understanding the complex interplay between AI technologies and tourist experiences, offering a snapshot of current sentiments at a pivotal moment in technological advancement. Participation in the study was voluntary, and the confidentiality of respondents' answers was ensured. Prior to the study, participants were informed about its objectives and were granted the right to withdraw at any moment without any consequences. Data analysis was performed using advanced statistical methods, which allowed for an exploration of correlations between AI usage, tourist satisfaction, and ethical concerns. Data analysis was conducted using JASP version 0.19.1.0, which offers robust statistical capabilities for hypothesis testing. A 95% confidence interval was employed to determine the significance of the results, ensuring a rigorous examination of the relationships between variables. For statistical analysis, the

Spearman's rho correlation coefficient was utilized, chosen based on the characteristics of the collected data (Lovie, 1995). Spearman's rho was employed to measure the correlation between various factors influencing tourists' acceptance and usage of AI-driven services, such as satisfaction levels and ethical concerns regarding data privacy. This analysis allows for a comprehensive understanding of the correlations and impacts of Artificial Intelligence (AI) implementation in the tourism sector, thereby enhancing the validity and reliability of the findings.

To ensure the reliability of the questionnaire, Cronbach's alpha coefficient was calculated, resulting in a value of 0.935 (see table 1). This high coefficient indicates a robust level of reliability for the measurement instrument, suggesting that the questionnaire consistently evaluates the constructs it aims to measure. Such reliability is crucial in establishing confidence in the study's findings and providing valuable insights into tourists' perceptions of AI in the tourism sector.

Table 1. Frequentist Scale Reliability Statistics

Estimate	Cronbach's $\alpha$
Point estimate	0.935

Source: Author's creation

### Research findings

The survey results indicate that the majority of respondents (68 out of 142, approximately 47.9%) travel two times per year, followed by those who travel three to five times per year (41 respondents, approximately 28.9%). A smaller segment travels more than five times each year (25 respondents, 17.6%), and only a minimal number of participants (8 respondents, 5.6%) report traveling once per year. This data reveals that the surveyed group is composed largely of frequent travelers, with over 92% traveling more than once annually (figure 1). This suggests that the respondents have significant exposure to travel-related technologies and are likely familiar with innovations and services that enhance the travel experience. Frequent travelers are more likely to interact with AI-driven technologies in tourism, such as virtual assistants, smart booking systems, personalized recommendations, and real-time travel updates. Therefore, their experiences and insights provide a valuable basis for evaluating the current and potential role of AI in enhancing the travel experience. This pattern of frequent travel also highlights a technologically engaged group, making it easier to study AI adoption in tourism.

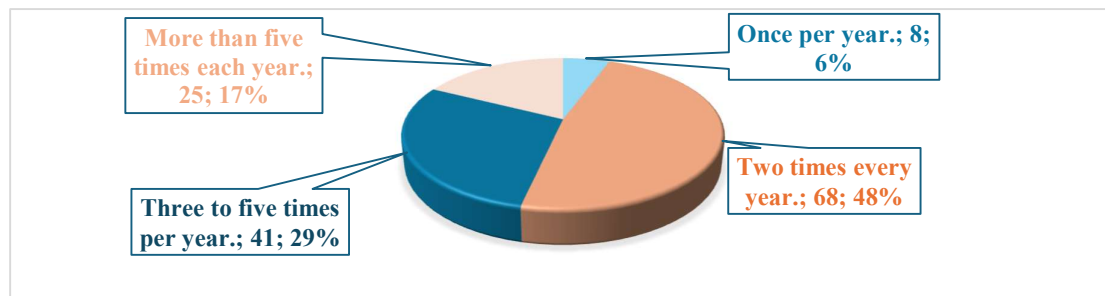


Figure 1. Travel frequency

Source: Author's creation

When it comes to familiarity with AI and ML technologies, the largest portion of respondents (82 out of 142, 57.7%) reported being "fairly familiar" with these concepts (see figure 2). An additional 27 respondents (19%) indicated that they are "very familiar" with AI and ML, while 23 respondents (16.2%) stated a neutral stance on their familiarity. A small minority of respondents (8 respondents, 5.6%) indicated that they have "very little" familiarity, and only 2 participants (1.4%) claimed to know "nothing at all" about AI and ML.

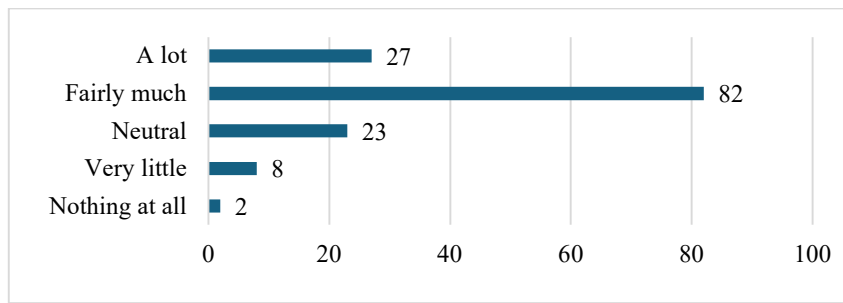


Figure 2. Familiarity with AI and ML

Source: Author's creation

How does the use of Artificial Intelligence enhance the overall travel experience for tourists? A significant portion of respondents (52.8% agreed, 22.5% strongly agreed) believe that AI improves their overall travel experience (see table 2). This finding suggests that AI tools, such as personalized services and automated support, positively influence tourists' satisfaction and experience quality. The low percentage of negative responses (2.1% strongly disagree, 0.7% disagree) indicates that AI is generally well-received among users, thus solidifying its role as an innovative disruptor in the tourism industry. With 59.9% agreeing and 11.9% strongly agreeing on the effectiveness of AI-driven platforms, it is evident that travelers increasingly rely on AI for optimizing travel arrangements. This data underlines the growing importance of personalized recommendations and decision-support tools powered by AI, which could redefine traditional booking systems and revolutionize how travelers plan their trips.

Table 2. AI and Overall travel experience

		Frequency	Percent
I believe that AI enhances the overall travel experience.	Strongly Disagree	3	2.113
	Disagree	1	0.704
	Neutral	31	21.831
	Agree	75	52.817
	Strongly Agree	32	22.535
	Total	142	100
AI-powered travel booking platforms (e.g., personalized recommendations for flights, hotels, or activities) are effective.	Strongly Disagree	2	1.408
	Disagree	3	2.113
	Neutral	35	24.648
	Agree	85	59.859
	Strongly Agree	17	11.972
	Total	142	100
Chatbots or virtual assistants provide good customer support.	Strongly Disagree	3	2.113
	Disagree	6	4.225
	Neutral	55	38.732
	Agree	56	39.437
	Strongly Agree	22	15.493
	Total	142	100
AI services save me time in organizing and booking my trips.	Strongly Disagree	2	1.408
	Disagree	5	3.521
	Neutral	36	25.352
	Agree	76	53.521
	Strongly Agree	23	16.197
	Total	142	100
AI improves the personalization of my travel experience (e.g., tailored recommendations based on preferences).	Strongly Disagree	1	0.704
	Disagree	4	2.817
	Neutral	41	28.873
	Agree	76	53.521
	Strongly Agree	20	14.085
	Total	142	100

Source: Author's creation

The support for AI-powered chatbots (39.4% agree, 15.5% strongly agree) reflects the growing dependence on AI-driven customer service. However, the considerable neutral stance (38.7%) signals potential gaps in current AI customer service tools, such as perceived limitations in handling complex issues or lack of human-like interaction. This presents an opportunity for the further development of AI-based virtual assistants. Most respondents (53.5% agree, 16.2% strongly agree) acknowledge the time-saving benefits of AI services, underscoring efficiency as one of AI's most impactful contributions. This emphasizes how automation and streamlined processes can elevate tourists' overall satisfaction, offering businesses in tourism a competitive edge through AI-powered services. With 53.5% agreeing and 14.1% strongly agreeing that AI enhances travel personalization, tourists highly value AI's ability to tailor experiences based on preferences. This finding reinforces the strategic importance of AI in offering hyper-personalized services, which can lead to increased customer retention and higher satisfaction levels.

The results illustrate that AI is playing an increasingly influential role in reshaping the travel experience, particularly through personalized services and time-saving benefits. For future research, this provides a basis for further exploration of the economic and operational impact of AI-driven innovations in tourism. Research on how to improve AI-based customer service and address the neutral attitudes toward chatbots will enhance the value of AI in this sector.

The most frequently reported area of improvement (66 respondents) is faster booking processes. AI's ability to streamline and speed up booking for flights, accommodations, and activities reflects one of its most impactful benefits. This data suggests that AI technologies are successfully enhancing operational efficiency, saving travelers time and simplifying trip planning, thus creating a competitive advantage for tourism businesses that implement these systems. With 56 respondents highlighting personalized recommendations for hotels, restaurants, or activities, it is clear that tourists highly value the ability of AI to provide tailored suggestions. This aligns with broader trends in AI, which emphasize customization as a means of improving user satisfaction. However, given the earlier finding that some users reported dissatisfaction with personalization (see figure 3), there is a need for continuous refinement of recommendation algorithms to meet and exceed user expectations. AI's role in improving customer service, particularly through chatbots and virtual assistants, was recognized by 41 respondents. This emphasizes that while automation in customer support is appreciated, it also ties into the challenge of human interaction mentioned earlier. Tourism providers could benefit from enhancing these AI tools to offer more dynamic, context-aware interactions that more closely mimic human communication. Forty-eight respondents appreciated AI's contributions to improved navigation or translation during travel. This showcases how AI enhances the in-destination experience by helping travelers navigate foreign environments and overcome language barriers. Such capabilities are particularly valuable for international tourists, reflecting AI's potential to improve inclusivity and accessibility in travel. Real-time travel updates, such as information on flight delays or route changes, were reported by 45 respondents as an important improvement brought about by AI. This finding highlights the utility of AI in delivering timely, relevant information to travelers, reducing stress and uncertainty during trips. Real-time updates contribute to a smoother travel experience, enhancing satisfaction. While only 9 respondents mentioned virtual tours as an area of improvement, this reflects a niche yet growing application of AI in pre-trip planning and virtual exploration. As virtual reality (VR) and AI technologies evolve, virtual tours may become a more prominent feature, especially in the context of sustainable travel and accessibility. The 15 respondents who indicated no notable improvements suggest that while AI can significantly enhance certain aspects of travel, its benefits may not be universally felt. This could be due to specific travel preferences or a lack of exposure to advanced AI features.

The data points to AI's transformative role in improving the travel experience, particularly in booking efficiency, personalization, and real-time updates. Future research could explore the development of more sophisticated recommendation algorithms, hybrid AI-human customer service models, and the expansion of AI technologies into emerging areas such as virtual tours and augmented reality-driven travel experiences. Such studies would provide practical insights for enhancing AI-driven tools, ultimately helping the tourism industry deliver more seamless, efficient, and personalized services.

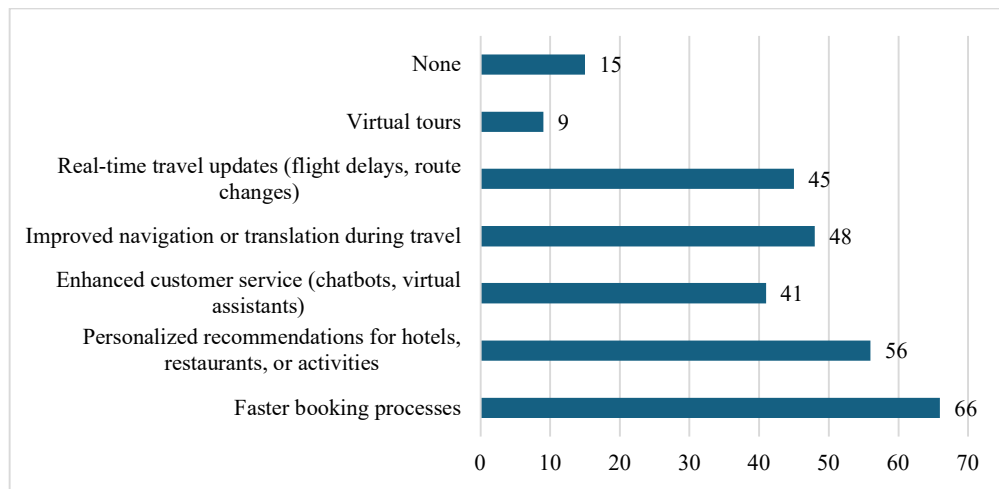


Figure 3. Areas of Travel Improvement Driven by Artificial Intelligence

Source: Author's creation

What technological and ethical challenges do tourists perceive regarding AI applications in tourism?

Nearly half of respondents (47.9%) have not faced any significant challenges, but 26.05% have (see table 3). These challenges could relate to technical difficulties or lack of human interaction, highlighting areas where AI solutions may need further refinement to improve user experience. The 26.05% who were unsure ('I don't know') may reflect a need for better education or clearer user guidelines on AI systems. A substantial percentage of participants expressed concerns about data privacy (39.4% moderately concerned, 35.9% very concerned, 15.5% extremely concerned). These findings highlight a critical issue in AI adoption, data privacy remains a significant barrier to acceptance. The concerns about privacy underscore the need for AI service providers to adopt stringent data protection practices to build user trust. Also, 41.5% (33.1% agreed, 8.4% strongly agreed) believe that there is insufficient transparency in AI decision-making processes, which could deter users from fully embracing AI. This issue is crucial because the perceived "black box" nature of AI systems can erode confidence in the technology. Addressing transparency will be essential for sustained adoption and integration of AI in tourism. Despite the challenges, more than half (52.1%) of respondents believe that AI will continue to evolve and provide enhanced experiences. This optimism suggests that tourists see AI as integral to the future of travel, potentially driving increased investments in AI innovations in the tourism sector. A notable percentage (37.3% agreed, 30.3% strongly agreed) supports stronger regulations to safeguard customers' rights in the use of AI. This aligns with global trends toward stricter regulations in AI ethics, privacy, and governance, reflecting an opportunity for stakeholders in tourism to proactively engage with regulatory developments to secure consumer trust. The majority (44.4% agree, 14.8% strongly agree) also advocate for enhanced AI-related skills among tourism employees. This points to the need for workforce upskilling in AI technologies, which could enhance service delivery and create new employment opportunities within the sector.

Table 3. Technological and ethical challenges regarding AI applications

		Frequency	Percent
Have you faced any challenges or concerns when using AI-based services? (e.g., lack of human interaction, technical difficulties)	No	68	47.887
	I don't know	37	26.056
	Yes	37	26.056
	Total	142	100
I have concerns about data privacy when utilizing AI-powered services in tourism	Not at all	4	2.817
	Slightly	9	6.338
	Moderately	56	39.437
	Very	51	35.915
	Extremely	22	15.493
	Total	142	100



Continuation of Table 3

There is insufficient transparency regarding how AI systems make decisions about my travel preferences	Strongly Disagree	1	0.704
	Disagree	17	11.972
	Neutral	65	45.775
	Agree	47	33.099
	Strongly Agree	12	8.451
	Total	142	100
I believe that AI-powered services in tourism will continue to evolve and provide enhanced experiences in the future	Strongly Disagree	1	0.704
	Disagree	1	0.704
	Neutral	33	23.239
	Agree	74	52.113
	Strongly Agree	33	23.239
	Total	142	100
I advocate for stronger regulations governing the use of AI in tourism to safeguard customer rights	Strongly Disagree	2	1.408
	Disagree	6	4.225
	Neutral	38	26.761
	Agree	53	37.324
	Strongly Agree	43	30.282
	Total	142	100
I believe that enhancing skills in technology and AI is essential for employees in the tourism industry, as it significantly impacts their ability to secure new job opportunities and advance in their careers.	Strongly Disagree	3	2.113
	Disagree	6	4.225
	Neutral	49	34.507
	Agree	63	44.366
	Strongly Agree	21	14.789
	Total	142	100

Source: Author's creation

The data suggests that while AI has significant potential to improve the travel experience, challenges surrounding transparency, ethical use, and data privacy must be addressed. Future research could explore frameworks for AI transparency in tourism and analyze how regulatory interventions can protect consumer rights without stifling innovation. A focus on upskilling the workforce in AI will also be critical to ensure that tourism professionals can fully leverage AI-driven innovations.

The most frequently reported challenge (51 respondents) is the lack of human interaction (figure 4). This finding reveals a significant limitation of current AI technologies in tourism, as many travelers still value human-based customer service, particularly in complex or sensitive situations. The challenge of balancing automation with personalized human service is a critical area for improvement, suggesting the need for hybrid AI systems that can blend automation with human support where necessary. Technical problems, such as delays and inaccuracies, were identified by 48 respondents as a challenge. These issues could lead to frustration and reduced trust in AI-driven services, particularly when the accuracy and timeliness of AI outputs are critical. For tourism businesses, resolving these technical shortcomings is essential to improving user satisfaction and preventing potential reputational damage. A substantial portion of respondents (30) expressed dissatisfaction with non-personalized results that failed to meet their expectations. While AI systems are often praised for personalization, this result indicates that the actual delivery may not consistently align with user preferences. This gap highlights a research opportunity to investigate the effectiveness of current personalization algorithms and to explore how better AI models can cater to individual travelers' unique needs. Although less frequently reported (9 respondents), the issue of difficult-to-use interfaces suggests that AI services need to be more user-friendly. Complex or unintuitive interfaces can deter usage, particularly among less tech-savvy travelers. Simplifying the user experience and making AI more accessible will be crucial for broader adoption in the tourism sector. Interestingly, 36 respondents did not encounter any significant challenges, which indicates that for a substantial portion of users, AI services are functioning effectively. This implies that while challenges exist, many tourists still find value in these technologies.

The findings underscore key areas where AI technologies in tourism fall short of lack of human interaction, technical issues, and inadequate personalization. Research could focus on addressing these challenges by developing hybrid AI-human interaction models, improving technical reliability, and enhancing AI personalization algorithms. This area of study is critical as the tourism industry

increasingly relies on AI to provide seamless and tailored travel experiences and overcoming these challenges could significantly improve user adoption and satisfaction.

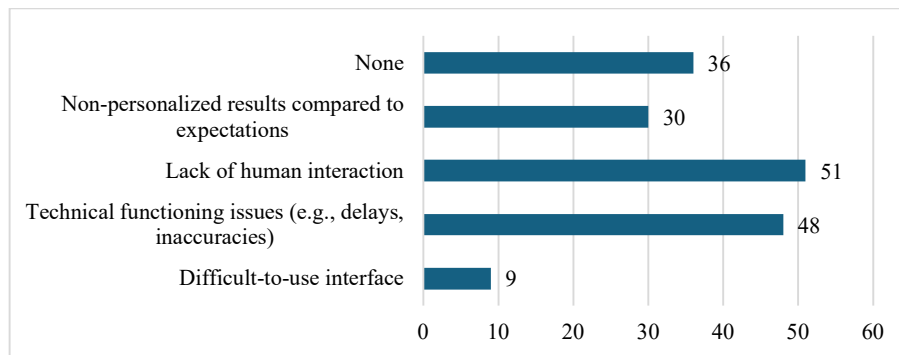


Figure 4. Main Challenges Experienced When Using AI Technologies in Travel  
Source: Author’s creation

How do concerns about data privacy influence travelers' acceptance of AI-driven services in the tourism industry?

More than half of the respondents (59.9%) would refrain from using AI-powered services if they believed their personal data was not adequately protected, underscoring the pivotal role that data privacy plays in shaping consumer behavior (see table 4). This finding indicates that data protection policies are not only ethical necessities but also essential for market acceptance. A strong majority (47.2% agreed, 18.3% strongly agreed) believe AI systems should offer opt-out options for data collection. This sentiment emphasizes that travelers demand more control over their data, which suggests that tourism companies offering AI solutions must prioritize user autonomy and transparency in data practices. A large proportion (49.3% agreed, 23.9% strongly agreed) of respondents want greater transparency about AI data collection and usage practices. This demand reflects growing consumer awareness and concern regarding the ethical implications of data handling by AI systems.

Data privacy concerns are a major deterrent to the acceptance of AI-driven tourism services. This highlights the need for robust, transparent, and consumer-centric data protection frameworks. Future research could investigate how different data privacy regulations impact the adoption of AI in tourism across various regions. Additionally, AI developers must ensure that transparency, especially in data practices, becomes a cornerstone of their service offerings to enhance consumer trust.

Table 4. Impact of Data Privacy Concerns on Travelers' Acceptance of AI-Driven Services in Tourism

		Frequency	Percent
I would refrain from using AI-powered tourism services if I believe my personal data is not adequately protected and may be shared with third parties.	Strongly Disagree	1	0.704
	Disagree	10	7.042
	Neutral	46	32.394
	Agree	42	29.577
	Strongly Agree	43	30.282
	Total	142	100
AI systems should provide users with the option to opt out of data collection and personalized recommendations	Strongly Disagree	2	1.408
	Disagree	6	4.225
	Neutral	41	28.873
	Agree	67	47.183
	Strongly Agree	26	18.31
	Total	142	100
I believe that AI-driven tourism platforms must be more transparent about their data collection and usage practices	Strongly Disagree	1	0.704
	Disagree	3	2.113
	Neutral	34	23.944
	Agree	70	49.296
	Strongly Agree	34	23.944
	Total	142	100

Source: Author’s creation

H1: The implementation of AI significantly improves customer satisfaction and engagement in the tourism sector ( $\alpha = 0.05$ ).

The highly significant p-value ( $< .001$ ) confirms that the relationship between AI implementation and customer satisfaction is robust, suggesting that the use of AI enhances customer experiences by offering personalized recommendations, streamlining services, and automating responses to queries (see table 5). The moderate strength of this relationship ( $\rho = 0.405$ ) implies that while AI plays a crucial role in improving satisfaction, other factors may also influence engagement. This finding aligns with existing literature on customer experience, indicating that AI is a key enabler of personalization in tourism, though its effectiveness depends on the overall service ecosystem (Samala, Katkam, Bellamkonda, & Rodriguez, 2022; Binns, 2018; Filieri, D'Amico, Destefanis, Paolucci, & Raguseo, 2021; Zlatanov & Popesku, 2019; Tussyadiah, 2020).

Tourism businesses looking to enhance customer engagement should invest in AI technologies that offer personalized, efficient services. Future research could explore other moderating variables such as service quality, customer preferences, or cultural factors that may further enhance the relationship between AI and customer satisfaction.

Table 5. Spearman's Correlations

Variable		Implementation of AI	Customer satisfaction and engagement
Implementation of AI	n	—	—
	Spearman's rho	—	—
	p-value	—	—
Customer satisfaction and engagement	n	142	—
	Spearman's rho	0.405***	—
	p-value	$< .001$	—

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Source: Author's creation

H2: Concerns regarding data privacy and transparency of AI algorithms significantly affect travelers' trust and willingness to use AI services in tourism ( $\alpha = 0.05$ ).

Although the correlation is weak ( $\rho = 0.224$ ), the statistically significant p-value (0.007) suggests that privacy concerns are indeed a relevant factor in shaping traveler trust (see table 6). This finding is consistent with global debates about data privacy and the ethical implications of AI in service sectors, where transparency is key to building consumer trust (Samala, Katkam, Bellamkonda, & Rodriguez, 2022; Schönberger, 2023). The relatively low correlation points to the fact that while privacy and transparency issues matter, they may not be the primary drivers of trust in AI systems. Factors such as perceived usefulness, convenience, or prior experience with AI may carry more weight in influencing travelers' willingness to adopt AI-based services. The recently implemented EU AI Act underscores the importance of addressing these concerns through a comprehensive regulatory framework (Farrell, 2024). By mandating transparency and accountability for AI systems, the Act aims to enhance consumer trust by ensuring that organizations disclose how algorithms operate and what data is collected. Compliance with these regulations is not only a legal obligation but also an opportunity for tourism businesses to reassure consumers about the ethical use of their data. To alleviate consumer concerns, the tourism industry must prioritize transparency in AI algorithms and robust data privacy measures. Policymakers and organizations should consider integrating clear privacy policies and explainable AI systems that adhere to the guidelines set forth by the EU AI Act. This alignment with regulatory standards will not only build traveler confidence in AI applications but also promote ethical practices in the deployment of AI technologies.

Future studies should explore how these factors interact with service quality and customer demographics, as well as the evolving landscape of AI regulations and their implications for consumer trust in the tourism sector.

Table 6. Spearman's Correlations

Variable		Data privacy and transparency of AI algorithms	Travelers' trust and willingness
Data privacy and transparency of AI algorithms	n	—	—
	Spearman's rho	—	—
	p-value	—	—
Travelers' trust and willingness	n	142	—
	Spearman's rho	0.224**	—
	p-value	0.007	—
* p < .05, ** p < .01, *** p < .001			

Source: Author's creation

H3: The integration of AI-driven real-time data and predictive analytics significantly enhances operational efficiency and overall traveler experience in the tourism industry ( $\alpha = 0.05$ ).

The significant p-value ( $< .001$ ) indicates a strong and reliable relationship between AI-driven predictive analytics and enhanced operations, validating the hypothesis (see table 7). The correlation strength ( $\rho = 0.485$ ) suggests that AI applications such as dynamic pricing, predictive maintenance, and real-time itinerary updates greatly contribute to the efficiency and smoothness of operations in the tourism industry. These findings align with the growing body of literature that highlights AI's potential to optimize resource allocation, minimize delays, and personalize customer journeys in real time (Huang & Rust, 2018; Schönberger, 2023; Bulchand-Gidumal, William Secin, O'Connor, & Buhalis, 2023; Solakis, Katsoni, Mahmoud, & Grigoriou, 2024). The integration of predictive analytics provides tourism operators with the capability to anticipate customer needs and proactively manage logistics, leading to a better overall traveler experience.

For tourism businesses, adopting AI-based predictive analytics can be a game-changer in optimizing both backend operations and frontend customer interactions. Future research can delve deeper into specific AI tools (e.g., chatbots, recommendation systems) and their individual contributions to operational efficiency, as well as explore the long-term effects of AI integration on customer loyalty.

Table 7: Spearman's Correlations

Variable		Integration of AI-driven	Operational efficiency and overall traveler experience
Integration of AI-driven	n	—	—
	Spearman's rho	—	—
	p-value	—	—
Operational efficiency and overall traveler experience	n	142	—
	Spearman's rho	0.485***	—
	p-value	< .001	—
* p < .05, ** p < .01, *** p < .001			

Source: Author's creation

## Conclusions

1. Influence of AI-driven Personalized Services on Tourist Satisfaction. The findings indicate that AI-driven personalized services significantly enhance tourist satisfaction and overall travel experiences. Tourists reported higher levels of satisfaction when utilizing services tailored to their preferences, suggesting that integrating AI into tourism can lead to improved customer experiences and foster greater loyalty.

2. Ethical Dilemmas and Data Privacy Concerns. The study identified prominent ethical dilemmas and data privacy concerns associated with AI technologies in tourism. Tourists expressed apprehension regarding the collection and use of personal data, highlighting the urgent need for transparent data practices and ethical considerations in deploying AI solutions. These concerns align with ongoing global discussions about consumer rights and data protection.

3. Perceptions of Challenges and Opportunities in AI Implementation. Travelers perceive both challenges and opportunities posed by AI in the tourism industry. While technological readiness remains

a significant concern, many tourists recognize the potential of AI to streamline processes and enhance their travel experiences. There is a growing expectation for companies to adopt ethical responsibilities in implementing AI technologies, ensuring a balance between innovation and consumer protection.

This research provides critical insights into the dual role of AI as both an enabler of enhanced tourism experiences and a source of technological and ethical challenges. The findings underscore the necessity for transparent AI governance, robust data privacy measures, and the upskilling of tourism professionals to ensure the ethical and effective use of AI in the tourism industry.

Future research should aim to broaden the scope to encompass a wider array of tourism contexts, potentially adopting longitudinal methodologies. This approach would not only enrich the understanding of tourist attitudes towards AI but also strengthen the generalizability of the current findings, thereby contributing to the growing body of literature on AI implementation in tourism.

In conclusion, this study emphasizes the importance of balancing the technological advancements offered by AI with the ethical considerations that arise in the tourism industry. The insights gained from this research serve as a foundation for future studies aimed at fostering responsible AI adoption that prioritizes both innovation and consumer trust.

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## **IŠŠŪKIAI IR GALIMYBĖS DIRBTINIO INTELEKTO ĮGYVENDINIMUI TURIZME: ETINĖ IR TECHNOLOGINĖ PERSPEKTYVOS**

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**Santrauka**

Greitas dirbtinio intelekto (DI) technologijų integravimas į turizmo pramonę sukėlė keliautojų entuziazmą ir nerimą. Šiame tyrime nagrinėjamas dvigubas DI vaidmuo turizme, jo potencialas pagerinti turistų patirtį ir etinės dilemos, susijusios su jo įgyvendinimu. Tyrimo problema apima klausimus, kaip DI valdomos personalizuotos paslaugos veikia turistų pasitenkinimą, etinius duomenų privatumo aspektus ir keliautojų iššūkių bei galimybių suvokimą. Pagrindinis šio tyrimo tikslas – ištirti DI poveikį turizmo patirčiai, sutelkiant dėmesį į tris pagrindines sritis: (1) turistų pasitenkinimo didinimą per DI valdomas personalizuotas paslaugas, (2) etines dilemmas, kylančias dėl duomenų privatumo problemų, ir (3) keliautojų suvokimą apie iššūkius ir galimybes, susijusias su DI įgyvendinimu turizmo sektoriuje. Norint pasiekti šiuos tikslus, buvo taikoma kiekybinė tyrimo metodologija, naudojant internetinę anketinę turistų apklausą, kurie savo kelionių metu naudojami DI paslaugomis. Tyrimas, atliktas su 142 dalyviais, apklaustais Albanijoje 2024 metų liepos ir rugpjūčio mėnesiais, orientuojasi į turistų suvokimą apie DI valdomų paslaugų privalumus ir rizikas, ypatingą dėmesį skiriant personalizavimui, privatumui ir technologiniams barjerams, ribojantiems DI plėtrą. Duomenų analizė buvo atlikta naudojant JASP versiją 0.19.1.0, kuri suteikia tvirtas statistines galimybes hipotezių tikrinimui. Naudojant 95 % pasitikėjimo intervalą, buvo nustatyta rezultatų reikšmingumas, užtikrinant griežtą kintamųjų ryšių tyrimą.

Pagrindiniai rezultatai rodo, kad DI valdomos personalizuotos paslaugos žymiai pagerina turistų pasitenkinimą ir bendrą kelionių patirtį. Turistai išreiškė pageidavimą gauti paslaugas, pritaikytas jų individualiems poreikiams, rodančius, kad DI integracija padidina klientų lojalumą ir teigiamas kelionių patirtis. Priešingai, tyrimas identifikavo svarbias etines dilemas ir duomenų privatumo problemas, susijusias su DI technologijomis turizme. Dauguma respondentų išreiškė nerimą dėl asmens duomenų rinkimo ir naudojimo, pabrėždami skaidrių duomenų praktikų ir etinių aspektų poreikį diegiant DI sprendimus.

Be to, keliautojai suvokia tiek iššūkius, tiek galimybes, kurias DI teikia turizmo pramonėje. Nors technologinis pasirėngimas yra svarbus klausimas, daugelis turistų pripažįsta DI potencialą supaprastinti procesus ir pagerinti jų bendrą kelionių patirtį. Iš įmonių tikimasi, kad jos prisiims etinę atsakomybę diegiant DI technologijas, užtikrindamos pusiausvyrą tarp inovacijų ir vartotojų apsaugos. Rezultatai rodo silpną ryšį tarp duomenų privatumo ir DI algoritmų skaidrumo problemų bei keliautojų pasitikėjimo DI paslaugomis ( $\rho = 0.224$ ,  $p = 0.007$ ). Nors šie veiksniai yra svarbūs, jie gali nebūti pagrindiniai pasitikėjimo skatinimo veiksniai; suvokiamas naudingumas ir ankstesnė patirtis su DI taip pat žymiai veikia keliautojų norą priimti DI paslaugas.

Išvados, gautos iš šio tyrimo, pabrėžia technologinės pažangos ir etinių svarstymų pusiausvyros svarbą turizmo pramonėje. Norint spręsti identifikuotas problemas, turizmo sektorius turi prioritetą teikti skaidrumui DI algoritmuose ir

tvirtoms duomenų privatumo priemonėms. Politikai ir organizacijos turėtų įgyvendinti aiškias privatumo politikos nuostatas ir sukurti aiškias DI sistemas, kad padidintų keliautojų pasitikėjimą DI taikomosiomis programomis. Šios studijos išvalgos tarnauja kaip pagrindas būsimam tyrimui, siekiant skatinti atsakingą DI priėmimą, prioritetą teikiant tiek inovacijoms, tiek vartotojų pasitikėjimui.

Būsiami tyrimai galėtų išplėsti apimtį, apimant platesnį turizmo kontekstų spektrą ir taikant ilgalaikes metodologijas. Tai ne tik praturtintų turistų požiūrio apie DI supratimą, bet ir sustiprintų dabartinių rezultatų bendrąjį galiojimą, prisidedant prie vis didėjančio DI įgyvendinimo literatūros turizme. Tyrimas pabrėžia skaidrios DI valdymo ir turizmo specialistų kvalifikacijos kėlimo poreikį, kad būtų užtikrinta etinė ir veiksminga DI technologijų naudojimas, kas tampa vis aktualesniu šiandienos greitai besikeičiančioje skaitmeninėje aplinkoje.

**Pagrindiniai žodžiai:** dirbtinis intelektas turizme, personalizuota patirtis, duomenų privatumas, etiniai klausimai, technologiniai iššūkiai