

Research article

Exploring the role of artificial intelligence in transforming tourism: A systematic review of its impact on business performance

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ABSTRACT

This study aims to analyze existing literature on the applications of Artificial Intelligence (AI) in the tourism industry and assess its effects on business performance, customer satisfaction, and service quality. It seeks to provide a comprehensive understanding of AI's impact across different tourism sectors. The research employed a Systematic Literature Review (SLR) methodology, synthesizing findings from 92 empirical studies on AI implementation in tourism. Various AI technologies such as machine learning, natural language processing, and generative AI were examined for their roles in enhancing tourism services. The findings reveal that AI significantly improves tourism operations through personalized marketing, dynamic pricing, and enhanced customer service, which contribute to customer loyalty and business success. However, notable research gaps remain concerning the long-term impacts, ethical considerations, and cross-cultural effects of AI adoption in tourism. The study concludes that while AI offers substantial benefits for tourism development, further research is needed to address data privacy concerns, cultural differences, and predictive AI modeling. These insights can guide tourism firms in strategically integrating AI to enhance service quality and meet evolving customer expectations

KEYWORDS

Artificial intelligence; smart tourism; hospitality; performance

Introduction

Like many other sectors, tourism is not an exception where artificial intelligence (AI) is one of the most transforming tools. From customer service automation and predictive analytics to personalized marketing and dynamic pricing, artificial intelligence technologies are being progressively included into every aspect of the travel business as they develop. Academics and professionals have focused on artificial intelligence because of its capacity to maximize operational efficiency, improve client experiences, and stimulate innovation (Gretzel et al., 2015; Ivanov & Webster, 2020; Kamgain et al. 2025). Still, even if the acceptance of artificial intelligence keeps rising: how exactly does it affect travel performance results such customer satisfaction, profitability, and service quality? Recent empirical research underline how much artificial intelligence could influence several facets of the travel sector. For example, AI-based recommendation systems—those employed by travel companies and internet sites like Booking.com—have demonstrated significant success in customizing travel experiences and raising client happiness (Buhalis & Sinarta, 2019; Luo et al., 2023). Moreover, AI-powered chatbots have been connected to better customer service efficiency in the hotel industry, therefore lowering response times and improving client experiences (Gretzel et al., 2015). In addition, Food safety is one of the most sensitive areas in the hospitality industry, with potential solutions now including smart sensors to monitor storage and preparation temperatures, and AI-driven hygiene monitoring system applications. Some now employ AI-based staff training to improve food safety (Kamgain et al. 2025). Besides, the integration of interactivity and digital security in smart tourism destinations has proved essential in luring young digital natives in their search for safe and interactive travels (Goeltom et al. 2023). Likewise, dynamic pricing algorithms driven by artificial intelligence have helped travel companies maximize income by real-time price adjustments depending on demand changes (Chatterjee et al.,

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2021). Notwithstanding these developments, the literature still lacks comprehensive analysis of how various artificial intelligence uses affect general tourist performance.

Although artificial intelligence's transforming power is well known, the literature on the thorough knowledge of AI's impact on tourist performance lags far behind. Most current research usually overlook the larger, integrated influence of artificial intelligence across the whole tourist ecosystem in favor of discrete AI applications or certain sectors, such as AI in hotels or AI in travel marketing (Mariani et al., 2021; Tussyadiah, 2020), service delivery (Ab Rashid & Abdul Aziz, 2022; García-Madurga & Grilló-Méndez, 2023), and customer interaction (Gursoy & Cai, 2025). Methodical study that compiles the mounting corpus of empirical data and offers a more complete knowledge of AI's influence on travel performance is obviously much needed. Emphasizing the requirement of knowing how AI affects operational results as well as customer-centric indicators of success, several studies have demanded a more methodical approach to assess the impact of artificial intelligence in tourism (Koo et al., 2017; Xiang, 2018). The capacity of artificial intelligence to provide real-time, adaptable, context-aware services promises to further change how visitors engage with locations and companies, therefore impacting travel decisions and increasing consumer loyalty as it develops. For the travel industry, for example, AI-driven customisation has become increasingly important in raising consumer happiness. Applications in tailored recommendations, notably those employed by online travel agencies (OTAs) like Expedia and Airbnb, have greatly enhanced consumer experiences by offering customized trip ideas based on personal tastes and behavior (Buhalis & Sinarta, 2019). The transition to customization is facilitated by developments in machine learning algorithms, which allow AI systems to evaluate extensive data sets, therefore predicting client wants and providing more pertinent and timely services (Tussyadiah, 2020). The increasing ability to customize experiences in real-time and AI's capacity to respond to contextual data are changing how visitors view and interact with the travel sector, thereby providing fresh chances for companies to increase engagement and loyalty.

Studies have demonstrated that artificial intelligence-driven automation not only lowers running costs but also improves efficiency and service quality, therefore enabling companies to concentrate on more difficult, value-added tasks (Ab Rashid & Abdul Aziz, 2022; Gursoy & Cai, 2025; Ivanov & Webster, 2020). In the hotel sector, for instance, AI-powered solutions for customer inquiries and check-in procedures have greatly shortened waiting times and raised customer satisfaction (García-Madurga & Grilló-Méndez, 2023; Gretzel et al., 2015; Skandali et al., 2024). Likewise, study by Dwivedi et al. (2021) show that artificial intelligence applications in dynamic pricing models help tourism companies to rapidly react to demand variations, thereby maximizing revenue management. Furthermore, proven to increase service speed and accuracy while offering individualized interactions are AI-driven chatbots, such those used by big hotel chains and online travel agents (Buhalis & Sinarta, 2019; Khan, 2024; Law et al., 2024). Along with streamlining processes, these developments in automation have helped to provide more interesting consumer experiences. Notwithstanding these developments, knowledge of the wider, integrated effects of artificial intelligence on tourism performance across many sectors, including its impact on business profitability, long-term customer loyalty, and general industry competitiveness, remains lacking (Li et al., 2023; Mariani et al., 2021). In addition, most prior research adopts a siloed approach, often failing to connect the disparate elements of AI applications within the broader context of tourism performance (Ab Rashid & Abdul Aziz, 2022; Cain et al., 2019).

The systematic evaluation of current literature uncovers significant gaps in coherent approaches linking operational advantages, consumer expectations, and changes in strategic paradigms connected to artificial intelligence (Goel et al., 2022; Stroumpoulis et al., 2022). By methodically analyzing existing research and spotting patterns, gaps, and future study paths, this study aims to explore how artificial intelligence affects tourist performance. This paper emphasizes assessing the effects of artificial intelligence technology on organizational efficiencies inside the tourism sector as well as consumer experiences. This systematic review intends to guide academics, practitioners, and legislators on the strategic integration of artificial intelligence in tourism management by compiling data from several studies (Cunha et al., 2024; Skandali et al., 2024). By doing so, this study hopes to spark discussion among academics and business leaders on the future path of artificial intelligence applications in this dynamic domain. Theoretically, this study intends to enhance the academic discussion around AI in tourism by means of a thorough synthesis including diverse viewpoints spanning from technology developments to consumer behavior. This will enable more in-depth analysis of the interdependence between operational strategies and artificial intelligence technology (Khan, 2024; Stroumpoulis et al., 2022). Practically, the results are meant to be a tool for professionals in the tourism sector—aiding their knowledge of the uses and consequences of artificial intelligence technologies in service optimization and consumer involvement improvement. Companies that use insights from this research will be able to plan more clearly, hence improving their decision-making processes to fit consumer expectations in an ever more AI-driven market (Cunha et al., 2024; Skandali et al., 2024).

Methods

This study used a systematic literature review (SLR) guided by PRISMA, a review protocol, and involved the steps of SLR that previous researchers have applied (Shaffril et al., 2019). The SLR stages include identification, screening, eligibility, quality appraisal, and data abstraction and analysis. This review was guided by PRISMA

(*Preferred Reporting Items for Systematic reviews and Meta-Analyses*). PRISMA is commonly used in the literature review process because it offers three unique advantages: defining clear and systematic research questions, identifying inclusion and exclusion criteria, and examining large scientific databases within the allotted time (Shaffril et al., 2019). The databases used in this review were Scopus and Web of sciences (WoS). Scopus and WoS are the largest databases of abstracts and citations from peer-reviewed literature, with over 75 million records and 24,600 titles from 5000 publishers worldwide (Shaffril et al., 2018). Scopus and WoS consist of various fields of study and documents such as scientific journals, books, and conference proceedings. They provide a comprehensive overview of the world's research results in various fields. They also offer innovative tools to track and visualize research. The review protocol aims to guide the conduct of the review and minimize the possibility of research bias. Essential elements of the review protocol include research question (RQ), search process, inclusion and exclusion criteria, quality assessment, data extraction, and data synthesis. Subsequently, a review protocol was developed and evaluated iteratively during the implementation and reporting stages. RQ was introduced to define research boundaries. It was formulated with the help of the PICo criteria, which recognize RQ from the following points of view.

Table 1. PICo criteria

PICo Criteria	
P = Population	: Tourism industries
I = Intervention	: Artificial Intelligence, machine learning, smart tourism etc.
Co = Context	: Empirical studies in smart tourism industries, both large and small industry

The primary purpose of this SLR is to collect and analyze appropriate evidence to answer the research questions (RQ). The motivation for answering the RQ was to gain insight into significant aspects of the research direction, including advancing knowledge and identifying research limitations to determine further research directions. The RQ of this study are 1) To what extent does the integration of AI technologies influence the strategic performance outcomes of tourism businesses (e.g., tourist satisfaction, decision-making, and repeat visitation, customer retention, brand loyalty, revenue growth)?, 2) What role does AI play in shaping competitive advantage in different segments of the tourism industry (e.g., hotels, travel agencies, smart destinations)?, and 3) What trends emerge from existing literature on the impact of AI on tourism performance, and where do future research opportunities lie?

Systematic literature review

The first phase in the systematic review process was the identification, which involved identifying keywords for information searching purposes. This stage relied on several relevant sources of information such as encyclopedias, dictionaries, thesaurus, keywords from previous literature, and keywords suggested by Scopus for keyword synonyms, possible related terms, and other variations of the halal tourism terms used. The data will be collected by using the following search string.

Table 2. The search strings used in the collecting data process

Database	Keywords
Scopus	TITLE-ABS-KEY(("artificial intelligence" OR "AI" OR "machine learning" OR "intelligent systems") AND ("tourism" OR "tourism industry" OR "travel industry" OR "tourism sector" OR "hospitality" OR "smart tourism" OR "smart destinations") AND ("strategic performance" OR "business performance" OR "operational performance" OR "customer satisfaction" OR "decision-making" OR "repeat visitation" OR "brand loyalty" OR "customer retention" OR "revenue growth" OR "competitive advantage" OR "business strategy" OR "value creation" OR "tourism performance" OR "destination performance" OR "tourism development"))).
WoS	TS=(("artificial intelligence" OR "AI" OR "machine learning" OR "intelligent systems") AND ("tourism" OR "travel industry" OR "hospitality" OR "smart tourism" OR "smart destinations") AND ("strategic performance" OR "business performance" OR "operational performance" OR "customer satisfaction" OR "decision-making" OR "repeat visitation" OR "brand loyalty" OR "customer retention" OR "revenue growth" OR "competitive advantage" OR "business strategy" OR "value creation" OR "tourism performance" OR "destination performance" OR "tourism development"))).

Screening, the second phase, is the process of including or excluding articles based on specified criteria. As an initial process, several double articles will be screened at this stage. Furthermore, articles were judged out of scope based on the titles, and abstracts. At this stage, we will know how many articles that will be gone to the next stage. Thirdly, eligibility is the process of manual inclusion or exclusion of articles according to 'author-specific criteria.' The retrieved papers were being thoroughly reviewed, excluding articles that do not meet the criteria. Eligibility, inclusion, and exclusion criteria were determined to find relevant articles in the systematic review process. First, the timeline was selected between 2020 and 2025 (April 2025) based on the total number of related publications reviewed. The second inclusion criterion is the type of document; journal articles with selected empirical data. Other documents such as review articles, books, book-chapters, and conference proceedings were excluded because they were not primary sources. The third criterion for inclusion and exclusion criteria was language. All non-English documents were excluded to avoid confusion and difficulty in the translation work in this paper. Then another criterion is indexing; all documents Scopus and WoS does not index were excluded. After the identification process, the total documents screened based on the criteria will be selected and go for the review.

Table 3. Inclusion and exclusion criteria

	Criterion	Inclusion	Exclusion
Document type	Timeline	Between 2020 and 2025 Research articles	< 2020 Review articles, books, book chapters, conference proceedings, and reports
	Language	English	Non-English
	Source type	Journals	Non-Journals
	Indexing	Scopus & WoS	Non-Scopus and Non-WoS

Data abstraction and analysis

After the eligibility process, the remaining articles were evaluated, reviewed, and analyzed. Next, the results were discussed in detail. The review was based on a specific study relevant to the research question and focused on it. The studies were then extracted to identify the relevant themes for the current study by reading the title, abstract, and then the full text of the article (in-depth). An integrative review was conducted--a kind of review that synthesizes different types of research designs (qualitative, quantitative, and mixed methods). Thematic analysis was conducted to identify themes related to research patterns and trends. This study will analyze thematically by extracting statements and data that were considered to answer the research questions. In the next phase, the various themes were grouped with coding techniques. In this section, abstract data was converted into valuable data and guided by identifying connected and related themes, ideas, or concepts.

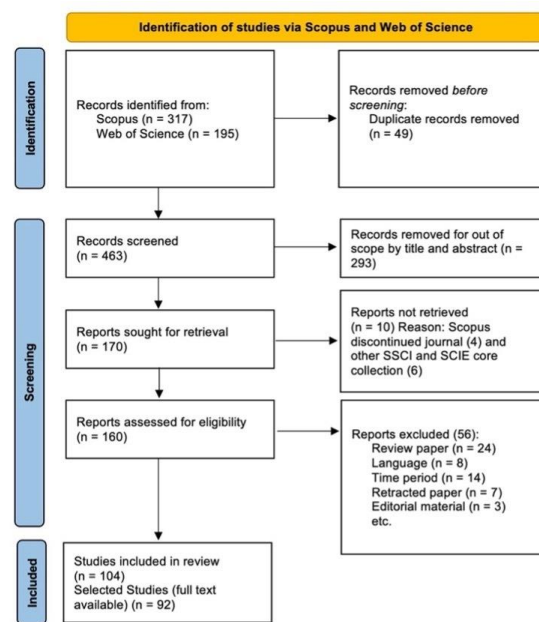


Figure 1. Flowchart of primary studies selection

The first step found 317 records in Scopus and 195 records in Web of Science, for a total of 512 records. But before screening, 49 records that were the same were taken out. We looked at 463 records after getting rid of duplicates. We looked at the records' titles and abstracts as part of the screening procedure. This stage saw the removal of 293 records since their title and abstract showed that they were not relevant. People tried to get the full-text reports for the 170 records that were left. There were, however, 10 reports that could not be found for different reasons. In particular, 4 of the reports came from publications that are no longer published and are listed in Scopus, while 6 others came from journals that are not part of the SSCI and SCIE core collection. A total of 160 reports were looked at to see if they were eligible. After this review, 56 reports were not included for several reasons, such as being review papers (24), having language concerns (8), time period limits (14), being retracted publications (7), being editorial material (3), and others. The review ended up including 104 studies. We chose 92 research from these because they provided full text that could be looked at more closely.

Results and discussion

This systematic review aimed to bring together the most recent research on how to use artificial intelligence (AI) in smart tourism. This study found and looked at 92 research to see how AI technology can help the tourism business. This part covers the distribution of research by year, country, journal, quartile, publisher, and method, as well as the conceptual frameworks and AI technologies most commonly used in the tourism industry. Additionally, this part contains a thematic analysis of the research, highlighting major trends, applications, and issues revealed in the literature.

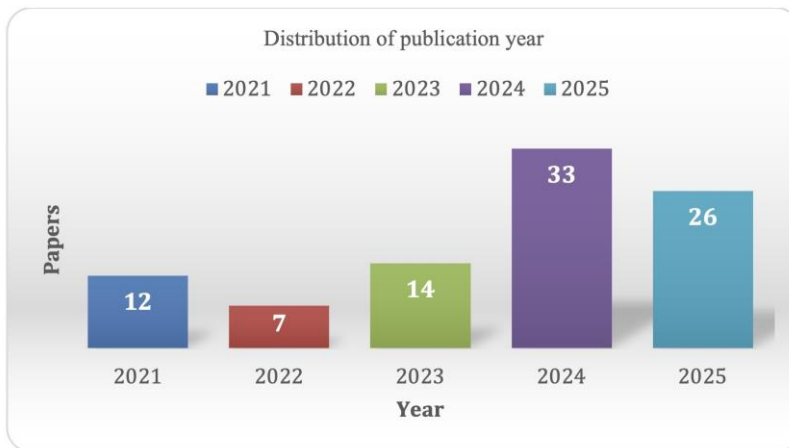


Figure 2. Distribution of publication year

The distribution of publication years for the 92 selected papers shows a notable trend in research activity. There were 12 publications published in 2021, which is a quite small number. The number of papers dropped to only 7 in 2022, which shows that publications are going down a little. In 2023, there were 14 more papers, which means that research output was starting to rise again. In 2024, however, the number of articles published rose the most, reaching a total of 33. This was the highest level of research activity during this time. In 2025, the number went down a little further, to 26 papers published, but it is still a lot more than in prior years. This graph shows that the number of publications changed a little bit from 2021 to 2025, but 2024 was a big peak year. This could be because there was more interest in the research area or because there were big changes in that year. The drop in 2025 could mean that publication rates would go back to what they were before the peak year of 2024.

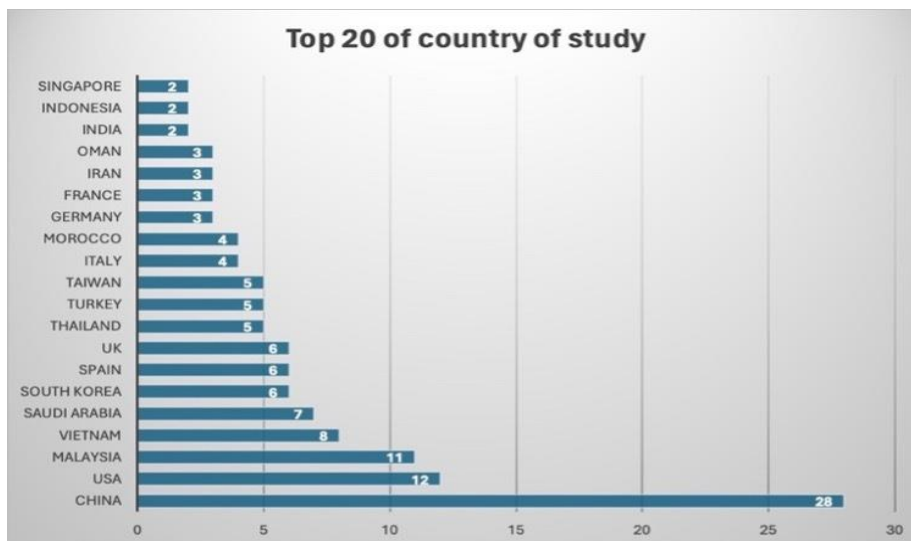


Figure 3. Distribution of research countries

The figure shows how studies carried out around different nations are distributed. With 28 studies, China is clearly the nation most studied; USA comes second with 12 investigations. With 11 and 8 studies respectively, other nations such Malaysia and Vietnam have a somewhat high degree of research as well. Countries including Turkey, Thailand, Taiwan, Italy, and Morocco have between 4 and 5 studies; a cluster of nations including Saudi Arabia, South Korea, and Spain each have 6 studies. Two to three studies apiece are conducted in several nations like Singapore, Indonesia, India, Iran, France, Germany, and others. This graphic shows a concentration of studies in a few nations, with China and the USA leading and many other nations contributing less studies, therefore producing a distorted distribution.

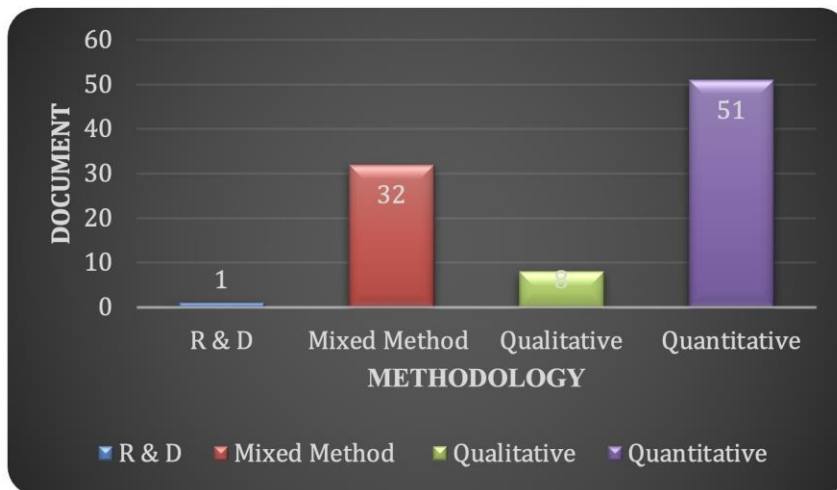


Figure 4. Distribution of research methods

The bar chart shows the variations in research according to the technique applied. With 51, the bulk of the research take a quantitative approach, hence the most often used technique in the dataset. With 32 studies, the second-highest category uses a mixed method approach—that is, combines qualitative and quantitative research. There are much less qualitative studies—just eight investigations total. At last, just one study applies R&D (research and development) techniques. With qualitative and R&D methods significantly less common, this distribution clearly favors quantitative and mixed methodologies in the research.

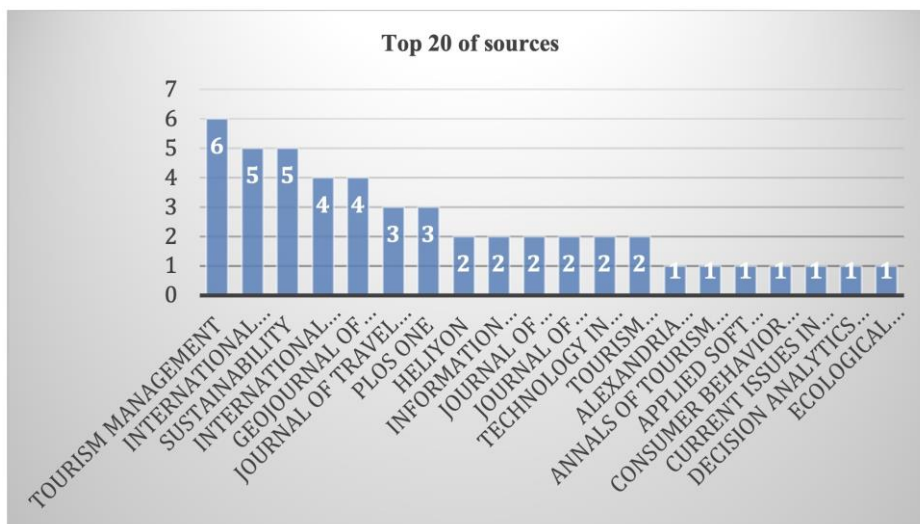


Figure 5. Distribution of top 20 of sources

Along with the overall count of papers released in every journal, the figure offers a ranking of the best ones for research. With six papers, *Tourism Management* is the most often used source; followed by *International Journal of Contemporary Hospitality Management* and *Sustainability*, each with five papers. With four papers apiece, other prominent sources are *International Journal of Hospitality Management* and *Geojournal of Tourism and Geosites*. Several sites, including *PLOSOne* and *Journal of Travel Research*, have three documents apiece. Many publications feature two papers: *Heliyon*, *Information*, and *Technology in Society*. *Alexandria Engineering Journal*, *Annals of Tourism Research*, and others also had just one document each, suggesting a vast tail of less-cited sources. This distribution shows a concentration of research in a limited number of publications with a smaller range of sources producing less publications.

in the tourism industry. They show how AI can make service delivery better and provide companies a competitive edge.

The green cluster is all about the analytical and technical parts of AI in tourism. Terms like machine learning, big data, algorithm, accuracy, and tourism demand forecasting are very important to this group. This cluster shows how important data analytics and AI models are for making operations better and guessing what customers will do. Research conducted by Dursun-Cengizci and Caber (2024) and Meng et al. (2024) underscores the significance of machine learning and big data in delivering personalized experiences and enhancing operational efficiency. AI technology help organizations to process massive datasets, estimate demand, and adjust their offers to match the growing needs of customers. The link between accuracy and big data shows that AI models need to be able to analyze data accurately in order to give useful and reliable information that can help people make better decisions.

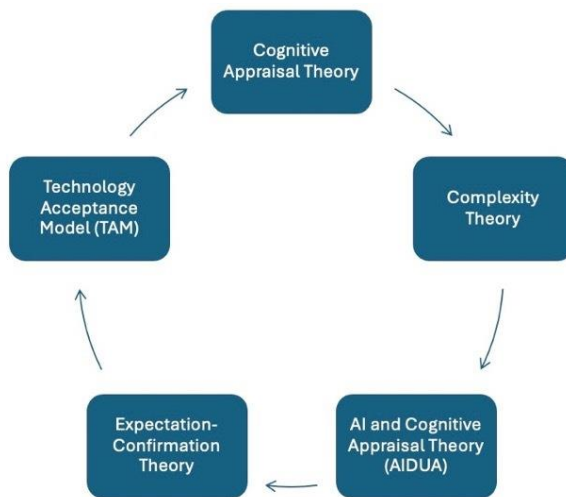


Figure 9. Common theoretical model

The figure highlights the interaction among many fundamental theoretical models usually used in tourism research and artificial intelligence. Several theoretical frameworks have been utilized to study AI adoption in the tourism business, providing significant insights into customer behavior and technological acceptance. The Technology Acceptance Model (TAM) is commonly used to examine how people adopt and use new technology. Pham et al. (2024) emphasized the significance of the Technology Acceptance Model (TAM) in forecasting the adoption of artificial intelligence by assessing perceived ease of use and utility in tourism services. Understanding how people embrace and use technology is mostly dependent on TAM, which also considers elements of perceived usefulness and ease of use as main factors influencing technology adoption. Regarding artificial intelligence in the travel industry, TAM clarifies the elements affecting consumers' choices to use AI-based products such recommendation systems and chatbots. Expectation-Confirmation Theory (ECT) is also used to figure out how client expectations affect satisfaction and future use. According to Oh et al. (2022), this theory assists businesses in assessing if the performance of AI technologies in tourism aligns with customer expectations, which greatly influences their propensity to continue utilizing the technology. The Cognitive Appraisal Theory, as examined by Kim et al. (2023) and Roy et al. (2024), underscores the emotional responses humans exhibit towards technology, contingent upon their judgments of its importance and impact. These emotional responses to AI technology like chatbots and recommendation systems influence customer decision-making, engagement, and satisfaction, making this theory vital for understanding AI acceptability in tourism.

The most frequent AI tech applied in tourism

In the tourism business, machine learning is one of the most common AI technologies. It plays a significant role in a range of applications, including service failure recovery, recommendation systems, sentiment analysis, consumer engagement, and dynamic pricing. Machine learning models allow organizations to predict customer behavior and personalize experiences, making it a strong tool for increasing service delivery and customer happiness. Dursun-Cengizci and Caber (2024) employed machine learning to predict customer demand trends and enhance resource distribution. Lee et al. (2021) built predictive models to improve operational management in the tourism sector, while Wu et al. (2025) used machine learning to assess Point of Interest (POI) data, giving targeted marketing and advice for travelers. Additionally, Alsayat (2023) highlighted machine learning's ability to optimize service delivery in hospitality by predicting consumer preferences, making it a crucial tool for individualized customer experiences. Generative AI is another significant technology creating waves in the tourism business, particularly in content development, service recovery, and personalized solutions. Han et al.

(2024) investigated the role of generative AI in augmenting service recovery through the automation of customer care functions and the creation of tailored content, hence enhancing customer engagement. Wong et al. (2023) emphasized the capability of generative AI technologies, such as ChatGPT, to automate consumer interactions while maintaining elevated levels of customisation. These systems can make personalized responses in real time, which cuts down on the need for people to get involved and makes the customer experience better overall. Gregoriades et al. (2023) also showed how generative AI may be used to make dynamic content, including personalized itineraries and marketing materials, that fits with what customers want. Generative AI is an essential tool for improving consumer happiness since it can supply highly tailored information on a large scale. This lets tourist businesses offer new and exciting experiences.

Natural Language Processing (NLP) is another key AI technology in the tourist sector, notably in consumer engagement. People often utilize NLP to make AI chatbots, do sentiment analysis, and talk to customers on social media. Gregoriades et al. (2023) examined the application of NLP in sentiment analysis to assess customer satisfaction through the evaluation of online reviews and social media content. This helps organizations quickly find ways to improve and change what they offer to better satisfy client needs. Sánchez-Rivero et al. (2025) focused on the application of NLP to improve customer service by enabling AI chatbots to process and comprehend human language in real time. These chatbots can react to consumer concerns in a more natural, conversational manner, boosting the customer experience and encouraging confidence. Additionally, Yadegaridehkordi et al. (2021) explored how NLP-driven sentiment analysis is used to track public opinion on destinations, allowing firms alter their marketing efforts accordingly. By employing NLP, tourist organizations may acquire deeper insights into client feedback and create more personalized services. AI chatbots, which use both machine learning and Natural Language Processing (NLP), are now vital for automating customer care in the tourism industry. These chatbots employ AI to talk to clients and help them right away, fixing problems as they happen. Alsayat (2023) stressed how important AI chatbots are for making communication easier and making tourism firms more efficient. Diwan (2025) examined the role of AI chatbots in assisting organizations with the management of extensive client interactions through the provision of individualized responses and support. Chang et al. (2023) and Zhang et al. (2024) also looked into how emotional expressions by AI chatbots have a big effect on lone travelers, making them more engaged and happy. These chatbots are getting smarter as AI technology gets better, which lets businesses connect with customers in more meaningful ways. AI chatbots are changing the way customer care works in the tourist business by automating regular chores and giving quick answers to consumer questions. This is making customers happier overall.

Deep learning, a more advanced kind of machine learning, is also commonly utilized in tourism, notably for applications like as image recognition, facial recognition, and AI service robots. How facial recognition technology, which is a type of deep learning, may make security and personalization better by letting businesses identify guests and customize their experiences (Gupta et al., 2023). In addition, Zhang et al. (2025) and Yu (2024) have also looked into how deep learning may be used in predictive analytics and sentiment analysis to get customers more involved. Deep learning is also employed in service robots, which assist clients with various activities in tourism-related contexts, boosting efficiency and engagement. Deep learning lets tourist companies deliver more tailored and efficient services by letting them collect and analyze enormous amounts of unstructured data, such videos and pictures. The power of this technology to find patterns and make predictions based on huge amounts of data is changing the way businesses serve their clients. This makes it an important technology for the tourism industry. Last but not least, big data analytics is very important for making prediction models better, finding ways to keep customers, and giving them personalized experiences. Meng et al. (2024) stressed how big data analytics enables tourism organizations to segment their clients more efficiently, allowing for focused marketing campaigns and personalized services. Businesses can find new trends, boost consumer loyalty, and make better pricing decisions by looking at vast datasets. Big data also aids predictive modeling, allowing firms to anticipate customer preferences and adjust their offerings to match individual demands. When coupled with machine learning, big data analytics increases decision-making and generates more personalized experiences. Studies by Xie et al. (2021) and Pham et al. (2024) further shown how big data applications in tourism are altering consumer interaction by forecasting travel trends and behaviors, thereby giving tourism organizations with useful information for optimizing service delivery.

Thematic analysis of AI in tourism

The thematic analysis of AI applications in tourism underscores the significant influence that AI technologies exert on several aspects of the business. From strengthening hospitality operations to enabling more accurate tourism demand forecasts and encouraging sustainability, AI is widely acknowledged as a driver for innovation and transformation. Moreover, it plays a key role in customer experience development and presents important ethical and societal considerations around its use. As the technology continues to grow, these themes will remain key to understanding AI's role in influencing the future of tourism.

Table 4. Thematic analysis of the studies

No	Themes	Information	Author
1	AI in Hospitality Operations	This theme explores how AI technologies like chatbots, service robots, facial recognition, and automation improve the operations and customer experiences in hospitality settings. Ex. Chatbots for customer service (e.g., automated check-ins, inquiries); Service robots for delivering amenities; Facial recognition for efficient check-ins and personalized services.	Ahmad et al., (2024); Meng et al., (2024); Hsu, (2025); Diwan, (2025); Lei et al., (2023); Gupta et al., (2022); Wang & Zhang, (2021); Kapoor & Kapoor, (2021); Al-Hyari et al., (2023); Roy et al., (2020); Nguyen et al., (2022); Kukanja, (2024); Gubhaju et al., (2024); Rekiek et al., (2024); Morosan et al., (2023); Naz et al., (2023).
2	AI in Tourism Demand Forecasting	This theme focus on AI-based systems and machine learning models used to predict tourism trends, visitor numbers, and satisfaction levels using historical data and real-time analytics. Ex. Machine learning models (e.g., Random Forest, XGBoost) for demand prediction; Time-series analysis for forecasting tourist arrivals; NLP and sentiment analysis to gauge tourist sentiment from reviews.	Ramos et al. (2021); Hu (2022); Luo et al. (2024); Xie et al. (2020); Li et al. (2020); Liao et al. (2024); Zhang et al. (2025); Aula et al. (2024); Danbatta & Varol (2024); Bi et al. (2020); Louati et al. (2024); Bouhaddour et al. (2023); Yong Li et al. (2023); Wolfram Hopken et al. (2020)
3	AI and Sustainability	It explores how AI can promote sustainability in tourism, optimizing resources, forecasting demand, and reducing environmental impacts. Ex. AI-based predictive models for sustainable tourism management; Machine learning to optimize tourism flow and minimize environmental impact.	Yadegaridehkordi et al. (2021); Penagos-Londoño et al. (2020); Louati et al. (2024)
4	AI in Tourism Marketing	AI technologies enhance marketing strategies by offering personalized travel recommendations, dynamic pricing, and segmentation to better understand and target tourists. Ex. AI-driven dynamic pricing to adjust pricing based on demand and market conditions; Customer segmentation using machine learning to tailor marketing efforts	Seo et al. (2025); Cunha et al. (2024)
5	AI for Customer Satisfaction	It describes the role of AI and machine learning in improving customer satisfaction by personalizing services, providing real-time feedback, and enhancing the customer journey. Ex. AI chatbots for real-time customer support; Personalized AI recommendations based on customer preferences and behavior; AI-driven service robots to handle requests and improve service delivery.	Alsayat (2022); Ku & Chen (2024); Seyfi et al. (2024); Oh et al. (2022); Jennifer Yee-Shan Chang et al. (2023); Junbo Zhang et al. (2024); IpKin Anthony Wong et al. (2023); Pitakaso et al. (2025); Ilieva et al. (2024); Nguyen & Nguyen (2025); Chotisarn & Phuthong (2025); Van Leeuwen et al. (2024); Giang-Do Nguyen et al. (2024); Nguyen et al. (2024); Nilashi et al. (2023)

AI in hospitality operations

AI technologies are revolutionizing hospitality operations by automating procedures, decreasing labor costs, and customizing guest offerings. Systems like automatic check-ins employing facial recognition allow faster, safe access to rooms, enhancing both efficiency and customer happiness (Ahmad et al., 2024). AI-powered chatbots also improve customer service by giving real-time answers to questions, which makes each guest's experience more personalized (Hsu, 2025). Service robots further contribute by managing duties like room deliveries and concierge services, helping to match the expectations of travelers and minimizing wait times (Diwan, 2025). AI can also forecast what guests will like based on their past experiences, which lets businesses offer proactive, personalized services that improve the guest experience as a whole (Lei et al., 2023). AI also helps connect services across several touchpoints, such as online reservations, in-room services, and restaurant options. AI can make tailored experiences by looking at a lot of data. For example, it might suggest meals or room settings that are just right for each guest. This makes guests happier and more likely to return (Gupta et al., 2023). This tech-driven approach transforms the hotel industry toward a more customer-centric model, where operational efficiency and personalized service go hand in hand. As AI continues to advance, it enables the hotel sector to deliver increasingly smooth and efficient services that suit the evolving expectations of visitors.

AI in tourism demand forecasting

The effect of AI on predicting tourism demand is another important topic in the use of this technology. Tourism companies can utilize machine learning algorithms like Random Forest and XGBoost to figure out how many people will visit and when, so they can change prices, availability, and services to meet changing demand (Y. Zhang et al., 2025). These prediction models are very important for making sure that firms can plan for busy times, keep their inventory levels up, and save costs when demand is low. Such forecasting not only enhances profitability but also helps in matching supply with demand, a critical factor in managing tourism infrastructure. AI is changing how we predict tourism demand by using sentiment analysis and natural language processing (NLP) in addition to predictive analytics. These tools evaluate enormous volumes of text data from online reviews, social media platforms, and customer feedback to gauge public opinion about places, services, and experiences (Ramos et al., 2021). By figuring out the mood of reviews and comments, businesses can learn a lot about what customers like and how happy they are. This lets them make their products better, get more customers involved, and deal with any problems before they get worse. Such AI solutions not only help organizations stay competitive but also create better client trust and happiness. AI-powered demand forecasting is also very important for reducing the effects of over-tourism, which is a big problem for many popular places. By precisely predicting tourist flows, AI enables tourism operators to better manage crowd control and design plans for sustainable tourism. This is particularly vital in areas that are feeling the burden of increased tourist numbers, where maintaining a balance between business expansion and environmental preservation is essential. Machine learning

models can assist control the flow of tourists, keep sensitive areas from getting too crowded, and make sure that resources are accessible where they are most needed (Luo et al., 2025).

AI in tourism marketing

AI is changing the way businesses market tourism by making it easier for them to connect with clients. AI-driven dynamic pricing algorithms change prices in real time based on demand and market conditions. This helps businesses make more money while still keeping prices competitive (Seo et al., 2025). AI also helps businesses better divide their consumer base by looking at data on how customers act and what they like, which leads to more focused and personalized marketing (Cunha et al., 2024). By doing this, tourism businesses may make their marketing efforts more relevant to certain groups of customers, which will lead to more interaction and sales.

AI also helps businesses guess what customers want by looking at a lot of data, which makes it possible to make travel recommendations that are very specific to each person. These AI systems look at things like where you've been before, what you've posted on social media, and your age and gender to propose personalized places to stay, things to do, and activities to do, which makes customers happier and more loyal (Seo et al., 2025). As these AI technologies get better, tourist businesses can keep ahead of trends and give customers exactly what they want, which makes AI an important part of effective marketing tactics in the tourism industry (Cunha et al., 2024).

AI for customer satisfaction

AI is dramatically enhancing client happiness in tourism by giving real-time help and personalized services. Chatbots powered by AI are commonly utilized to give quick customer service, performing tasks such as booking, questions, and even personalized suggestions, ensuring that clients always have access to help when needed (Alsayat, 2023). These AI tools help tourism businesses give their customers a smooth, 24/7 experience, which makes them happier and cuts down on wait times. AI systems can also look at what customers like and how they act to make very personalized suggestions. This makes the consumer experience more delightful and fits their needs better (Ku & Chen, 2024). Beyond chatbots, AI-driven service robots are increasing guest experiences in hotels and airports, where they assist with duties like room service, concierge services, and baggage management (Pitakaso et al., 2025). These robots not only improve operational productivity but also minimize client wait times, ensuring that customers enjoy rapid and efficient service. As AI technology gets better, it helps organizations improve their customer service strategy, which makes both the way they do business and the overall guest experience better. This leads to happier customers and long-term loyalty (Nilashi et al., 2023; Zhang et al., 2024).

Research trend

In recent years, the use of Artificial Intelligence (AI) in tourism services has gotten a lot of attention. It has changed both the way businesses work and the way customers experience them. The fast adoption of AI technologies is not only boosting the efficiency of services but also developing individualized experiences for travelers, enhancing their overall contentment. Research in this field is concentrating on many applications of AI, encompassing intelligent tourism services, operational efficiency, AI-IoT integration, and interdisciplinary uses of AI. These trends are transforming the way the tourism sector operates and interacts with clients, creating a new benchmark for innovation in travel and hospitality services. AI is being used more and more in smart tourist services. Chatbots, recommendation systems, and personalized travel assistants are just a few examples of technologies that are increasingly essential for improving the consumer experience. AI-powered recommendation engines help deliver real-time, bespoke travel ideas based on individual interests, increasing decision-making for travelers (Zhang et al., 2025). This technology enables for more tailored itineraries, recommending activities, dining options, and accommodations matched to specific traveler needs (Alsayat, 2023). AI chatbots are also making communication easier and cutting down on wait times for guests. They are available 24/7 and make operations run more smoothly (Gupta et al., 2023). AI is getting better all the time, and its ability to look at huge volumes of data means that it can offer increasingly more tailored experiences, which keeps customers interested and loyal. AI's involvement in boosting operational efficiency is another developing trend in the tourism sector. Automated check-in systems that use AI-powered predictive analytics and face recognition technologies are making hotel operations more efficient, cutting down on check-in times, and lowering the chance of human error (Lei et al., 2023). These technologies boost guest pleasure by offering speedier, more secure access to services while increasing security standards. AI-based predictive analytics further enhance resource allocation by projecting demand and helping tourism organizations better manage workforce, inventory, and pricing (Zhang et al., 2025). These technologies are also being used for dynamic pricing strategies that change in real time based on supply and demand. This helps firms make the most money while still meeting customer expectations (Ramos et al., 2021). AI tools will keep being important for making the tourist and hospitality industries more efficient as they get better.

Another intriguing change is the use of AI with the Internet of Things (IoT), which is making places smarter and more connected. The synergy of AI and IoT technology is enabling personalized experiences through connected equipment, such as smart hotel rooms that automatically adjust to a guest's preferences for temperature, lighting, and entertainment (Yadegaridehkordi et al., 2021). AI and IoT also help streamline operations at

destinations by regulating energy consumption, optimizing trash management, and controlling crowd movements at key tourist places (Luo et al., 2025). This integration helps businesses to deliver more seamless services, such as automatic modifications to services based on the guest's preferences, thereby boosting the entire customer experience. Additionally, cross-sector applications of AI are gaining traction, with studies studying how AI might enhance service recovery and customer retention strategies not only in tourism but also in industries such as transportation and retail (Louati et al., 2024; Penagos-Londoño et al., 2021). By deploying AI across diverse industries, businesses may develop a more unified and efficient customer service experience, ultimately leading to increased customer satisfaction and long-term loyalty.

Suggestion for future research

Future research on artificial intelligence in hospitality and tourism should prioritize the examination of its long-term effects on customer satisfaction, operational efficiency, and the overall tourism experience. As artificial intelligence becomes increasingly integrated into tourism services, it is necessary to evaluate its impact across various geographical and cultural contexts, particularly as its capabilities advance. Studies should address the evolving role of artificial intelligence in tourism, considering both immediate and sustained effects on service delivery and guest engagement (Gupta et al., 2023; Y. Zhang et al., 2025). Generative artificial intelligence, such as ChatGPT, may improve post-trip engagement by assisting travelers in planning future trips, sharing experiences, and receiving personalized advice following their vacations (Alsayat, 2023). A further significant research direction involves the development of AI-based recommendation systems capable of real-time adaptation to customer behavior and external variables, including seasonal trends and market disruptions (Zhang et al., 2025). Existing artificial intelligence models frequently lack this level of adaptability, which restricts their capacity to provide personalized recommendations. In addition, the ethical and cultural challenges associated with artificial intelligence in tourism, such as data privacy, trust, and misinformation, require more comprehensive investigation. Research should also address how cultural and generational factors affect the adoption of artificial intelligence across different regions (Luo et al., 2025; Ramos et al., 2021). Furthermore, the integration of artificial intelligence and big data for tourism demand forecasting should be expanded, with an emphasis on utilizing granular data such as weather, social media trends, and demographic information to improve prediction accuracy and optimize the management of tourist flows (Louati et al., 2024; Yadegaridehkordi et al., 2021).

Conclusion

This study comprehensively reviewed the use of Artificial Intelligence (AI) technologies within the tourist sector, emphasizing their influence on strategic performance metrics, including customer satisfaction, profitability, and competitive advantage. The findings show that AI, through new technologies like machine learning, natural language processing, and generative AI, greatly improves operational efficiency, customer engagement, and service customisation. AI-powered solutions like recommendation systems, dynamic pricing models, and chatbots have been demonstrated to make clients happier and businesses more successful, which leads to more sales and more loyal customers. This study theoretically enhances the comprehension of AI's function in tourism by integrating diverse applications and technology, facilitating a more comprehensive assessment of its influence. In the real world, tourism businesses can use these insights to make better decisions, deliver better services, and better meet the needs of customers in a market that is driven by technology. While this study sheds light on the present applications of AI in tourism, its reach is limited by the selection of just recent articles and empirical research. The review did not investigate the long-term effects of AI adoption or the potential ethical implications of its use, which are essential as AI technologies continue to grow. Future study should address these gaps by investigating by exploring the long-term sustainability of AI technologies and assessing their ethical implications on privacy and data security within the tourism industry. Additionally, investigating AI applications in multiple geographical and cultural situations would provide better insights into its global applicability. Further research should also study the potential of AI in solving developing concerns like over-tourism and resource optimization, ensuring that AI integration contributes to sustainable tourism development.

Declaration

Grammarly was used by the authors to assess the quality of the language and enhance its readability and clarity. The writers take full responsibility for the publication's content after using this tool, reviewing and editing it as necessary.

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