

AI-Powered Personalization: Transforming the Tourist Experience

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A. Claran Santhiyagu

*Ph.D Research Scholar, Department of Logistics Management
Alagappa University*

Srinivasan Krishnan

*Ph.D Research Scholar, Department of Logistics Management
Alagappa University*

Dr. P. Rajan Chinna

*Assistant Professor Department of Logistics Management
Alagappa University*

Abstract

The role of hyper-personalization in the tourism industry based on AI technology is explored in this paper, where AI technology employs machine learning, NLP, and generative models to offer hyper-personalized travel experiences to increase traveler satisfaction, bookings, and sustainability. It then talks about the impact of hyper-personalization based on systematic literature reviews and case studies like recommendation systems of Booking.com that show the impact of hyper-personalization that leads to more bookings (20-30%), and other adverse consequences including bias, privacy, and digital divides. The main results are technical, that is, the collaborative filtering and predictive analytics, which are powered by the platforms, and the policy requirements to the GDPR-compliant regulation, and implications to the fair access, particularly in developing markets, which advance Viksit Bharat. Limitations are the gap of Western world data and short-term research studies, which may be considered as the subject of future research on multi-region RCTs, explainable AI hybrids, and IoT-based sustainability trials. Lastly, sustainable tourism systems will be the key to responsible AI implementation, which will i

Keywords: Artificial Intelligence, Personalized Tourism, Tourist Experience, Human–AI Interaction

Introduction

Personalization through AI is changing the tourism industry as the industry uses information-guided smarts to deliver personal experiences that respond to the needs of specific travelers in real-time. The tourism industry is making a fast pivot towards the digital realm, as the tools of AI, like machine learning and recommendation systems that process large volumes of data, including past bookings and social media engagement, and real-time location data, are applied to offer customized travel experiences, offers, and services. This does

not only limit to offering generic experience hyper-personalized experience that enhances customer satisfaction, loyalty, and conversions, but also addresses concerns like overtourism.

This issue relates to the discussed topic of ethical AI in social media advertising, with its concerns including the notion of bias in the recommendation algorithms and privacy matters. Research literature exemplifies that AI can enhance accessibility to every type of demographic, but extensive structures on fairness and sustainability are needed, in accordance with the international policy of initiatives in the hospitality sector, including the implementation of ethical technology.

The AI-led Personalization of tourism is still the highest tier of the industry, and it will be used to combine analytics with new technology in ways that have never been attempted. To create dynamic experiences of adaptive virtual tours or predictive restaurant suggestions, in the context of the Tourism 4.0 AI can process a multimodal scope of user profiles to sentiment analysis of reviews, to IoT sensor data to transform the traditional hospitality paradigm of mass tourism into personalized experiences. The application of data usage being conducted with consent and avoiding the exclusionary biases, as seen with AI with respect to social media advertising, could be a challenge to increase participation rates by up to 30% among early adopters.

The convergence of AI personalization technology is one of the milestones in the digitalization of tourism business, that brings in equal opportunities but needs close monitoring. The major online booking platforms, namely Booking.com and Expedia, have soon adopted AI to predict the preferences of users with 85-90 percent precision that reduces cognitive load on the tourists and maximises profits to the industry due to the instant change of the price in line with the user behaviour trends. As the AI application to online advertisement reflects more widely in the society, AI in tourism platforms must target the various training sets to pull down the discrimination of minority groups, offering the same experience to both low-end and luxury tourists. Observed in the coming years, integrated AI-human interfaces can be used to combine generative AI-based content creation with augmented reality layers to create sustainable and immersive tourism experiences, which can

Literature Review

The recent literature highlights the revolutionary nature of AI in personalization of tourism by data analysis, recommendation system and ethics. The fundamental research shows how machine learning can be used to generate hyper-personalized travel arrangements using Booking.com and Airbnb, by analyzing the behavior of the users to make them more satisfied and efficient. Chatbots and predictive models on real-time personalization are present in qualitative studies, using such sources of big data as reviews and user preferences.

The optimisation of processes, predicting and bespoke routes is identified in systematic reviews (2024-2025) to enhance customer loyalty, although it indicates human-AI balance. The current research centers on NLP in the context of ChatGPT to create a smooth communication process and clustering to provide personalized activities, which reflect the ethics in online advertisements, like bias and privacy.

Examples of AI-big data systems of dynamic and context-based recommendations, combining weather and crowd information, to promote sustainable tourism include applications like INDIANA. The virtual concierge offered by Eau Palm Beach as case studies demonstrates how more revenue can be achieved by making preference-based recommendations, a methodological rigor should be promoted in future empirical research.

Advances in machine learning, in particular, collaborative filtering and deep learning are used to enable systems to process various data and provide correct recommendations (Law et al., 2019). BERT-based natural language processing makes the experiences based on user content sentiment-drivenly personalized (Li et al., 2024).

According to hospitality research, 25-35% increase in revenue is achieved with dynamic pricing when there is a personalized profile (Buhalis and Leung, 2018; Gossling and Hall, 2023). Predictive analysis is applied in sustainable applications in order to achieve a rebalanced flow of tourists to prevent overtourism (Femenia-Serra et al., 2024).

Despite these advancements, studies object to the possibility of black box-like decision-making which can have negative effects on the niche groups (Kiralenko and Stepchenkova, 2025). Privacy policies are not yet mature enough, and human-AI cooperation is required (Samala et al., 2024; Tyan et al., 2025).

Objectives

1. To examine how AI-powered personalization can change tourist satisfaction, loyalty, and decision making.
2. To investigate important AI tools and methods of tourism platforms.
3. To consider the policy implications and sustainability benefits of AI personalization.
4. Influence of personalization based on AI.

The role of the AI-based personalization in the tourism sector is substantial, as it not only enhances the customer experiences, efficiency, and revenue of the industry but also introduces ethical and societal issues.

Based on precise segmentation and targeted campaigns, personalized recommendations have a 20-25% increase in bookings as seen in platforms that analyze consumer behavior and create dynamic itineraries. Real time chatbots and predictive analytics also result in a dramatic improvement in customer satisfaction, which increases loyalty and experiential traveling.

The AI will boost revenue within the industry by 10-25 percent due to the optimization of prices and waste management in the airline/hotel industry, and some examples of successes include Eau Palm Beach Resort, where the people have been observed to interact increased with the virtual concierge. Marketing is also optimized by AI, and one can target advertising and predictive behavior marketing in order to achieve higher conversions.

The loss of trust because of the data-intensive personalization process results in privacy concerns, whereas the bias created by the algorithms hurts niche communities, contributing to inequalities in the same way as AI advertising. The risk of losing jobs in the service industry and entirely depending on technology also highlights the need to up-skill and social governance.

Artificial Intelligence Equipment and Technologies Driving Personalization in Travel Applications

The AI solutions and technologies can support hyper-personalization of tourism platforms by working with massive real-time data. The machine learning (ML) systems, including collaborative filtering and content-based filtering, are the technologies that process browsing history, past bookings, and preferences to suggest the travel arrangements, hotel, and activities. Neural networks of deep learning are unstructured data processing networks (images and reviews), which analyze patterns of user behavior.

Generative AI, like in the Layla or the Trip Planner in Booking.com, will provide personalized travel planning based on natural language queries, whereas NLP-powered chatbots (like the Romie of Expedia) will provide 24/7 multi-language support and proactive advice. Predictive analytics are forecasted using previous data, weather, and trending in social media.

Examples of solutions like Room Price Genie allow real-time pricing with the help of ML algorithms, Amadeus Triportation provides VR/AI avatars as a part of immersive ways in booking, and Google Analytics performs recommendations of flights and destinations with the help of the larger ecosystem.

AI Personalization Effects on Policies

Personalization in the tourism sector that is operated by AI needs active policy in order to take advantage of the positive opportunities and reduce the risks of privacy invasions and inequalities.

The governments of different countries need to adopt GDPR-like policies in the tourist sector where data gathering in applications and websites should be agreed to, and a mandatory audit of data transfer to other countries to protect tourists (Buhalis and Leung, 2018). The AI systems should have policies that promote privacy by design, meaning that they must anonymize data and allow users to control their profiles.

As a precautionary measure, based on the EU AI Act, risk-based approaches define personalization technologies as high-risk, requiring bias impact analysis and various training data, to prevent discriminatory recommendations toward minorities or people with low income (Kiralenko and Stepchenkova, 2025). Transparency of the algorithms promotes trust and responsibility.

The AI should be included in policies to support eco- navigation and overtourism reduction and promote the use of AI by SMEs with subsidies and bridge digital disparities due to training opportunities aligned with Viksit Bharat (Fomenia-Serra et al., 2024). Global standards are fair due to the global cooperation in G7/OECD.

Tourism Platform Implications

The personalization that is driven by AI compels the tourism platforms to make strategic enhancements to be competitive, ethical, and sustainable. ML-driven recommendation systems and live chatbots should be used to drive bookings by at least 20-25% using hyper-personalized travel plans, like Booking.com and dynamic user profiling, which Airbnb is witnessing based on the browsing and social interactions. Install an automated pricing system with predictive analytics to make profits with minimum cart abandonment by offering smooth and preference-based recommendations.

Platforms are encouraged to have bias checks and data processing that is compliant with GDPR and have personalization as opt-in with transparent algorithms to build trust and avoid punishment; platforms such as Expedia do so by providing manually controlled profiles to avoid privacy issues. The highest priority should be given to non-uniform data sources to make impartial suggestions to all users.

To be competitive in the market, platforms should emphasize generative AI in AR/VR preview experiences, IoT-enhanced sustainability solutions, like eco-routing, to meet the needs of Viksit Bharat; APIs provided by Amadeus can be utilised by SMEs to scale at a low cost to support the digital tourism initiative.

Limitations and Research Direction

Despite this, it is stated that the current studies on AI-based personalization in tourism are grossly limited that restricts the scope and usability of tourism personalization.

This study is mostly rooted in secondary literature and Western simulations based on the Booking.com, which should not be applicable to the developing countries such as India where the gap between the culture and infrastructure influences the performance of AI (Law et al., 2019). Small scale empirical studies have no long-term considerations and are unable to determine any long-term customer loyalty after personalization due to the lack of longitudinal studies.

This contributes to biased models since the information regarding some groups is not accessible, and processing in real time cannot be done properly when the level of connections is low; the privacy research is abstract and not tied to the exploration of how GDPR can be deployed to international tourism (Kiralenko and Stepchenkova, 2025).

The study is biased to hotels and airlines, it is not to take into account adventure tourism and heritage tourism, the nature of the AI technology, agentic systems, changes fast and over the limitations of the fixed models and the research findings have temporal gaps.

Future Research Directions

Carry out multi-region randomised controlled trials on bias-corrected AI on multi-travellers, based on Viksit Bharat indicators. Develop human-AI hybrid models, such as explainable AI (XAI), in order to build trust in SMEs. Anticipate the sustainability of generative AI through field research through IoT. Evaluate the policy-AI cross-sections, such as the EU AI Act framework used in the tourism data management.

Conclusion

Personalization through AI is one of the greatest developments on the way of digital transformation of the tourism industry because it provides individual experiences that enhance customer satisfaction levels, efficiency, and sustainability, but it has to be ethically monitored. As shown in this discussion, AI can be utilized to make hyper-personalized tourist experiences and services, increase bookings by 20-30 percent, and prevent overtourism through predictive analytics like the ones in the literature and at Booking.com. Despite the limitations of the prejudice, the privacy attitudes, and online inequality, which are existent in the literature, the policy frameworks, such as GDPR amendments and bias measurement, provide the way of achieving a fair application, as it has been shown in the AI ethics of the user to the advertising.

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