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How AI-Driven Hyper-Personalization Shapes Tourist Loyalty: The Mediating Roles of Tourist Engagement and Memorable Tourism Experiences

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Abstract

Artificial intelligence (AI) has become increasingly integrated into tourism services, enabling organizations to deliver highly personalized and adaptive experiences throughout the tourist journey. Despite growing interest in AI applications in tourism, limited research has examined how AI-driven hyper-personalization contributes to tourist loyalty through experiential and evaluative mechanisms. This study investigates the relationships among AI-driven hyper-personalization, tourist engagement, memorable tourism experiences, tourist satisfaction, and tourist loyalty. Drawing upon the Stimulus–Organism–Response (SOR) framework, a conceptual model comprising five constructs and nine hypotheses was developed and tested. A quantitative research approach was employed, using a cross-sectional survey of 380 tourists who had used AI-enabled tourism services within the previous 12 months. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that AI-driven hyper-personalization positively influences tourist engagement, memorable tourism experiences, and tourist satisfaction. Tourist engagement significantly enhances memorable tourism experiences and satisfaction, and memorable experiences positively affect both satisfaction and loyalty. Tourist satisfaction also demonstrates a significant positive effect on tourist loyalty. However, the direct relationship between AI-driven hyper-personalization and tourist loyalty was not supported. The results indicate that AI-enabled personalization contributes to loyalty primarily through experiential and psychological mechanisms rather than through direct effects alone. The study extends the tourism marketing literature by positioning AI-driven hyper-personalization as a key antecedent of tourist engagement and memorable tourism experiences. Furthermore, the findings provide empirical support for the applicability of the SOR framework within AI-enabled tourism environments. Practical implications suggest that tourism organizations should focus on leveraging AI technologies to create meaningful, memorable, and satisfying experiences rather than emphasizing technological sophistication alone.

Keywords: *Artificial Intelligence; AI-Driven Hyper-Personalization; Tourist Engagement; Memorable Tourism Experience*

INTRODUCTION

The rapid advancement of artificial intelligence (AI) is transforming the tourism industry by reshaping how tourists search for information, plan trips, interact with service providers, and evaluate travel experiences. AI technologies are increasingly embedded in tourism marketing practices through conversational agents, virtual assistants, recommendation systems, service robots, smart tourism platforms, and generative AI applications capable of delivering highly personalized services (Bujdoso et al., 2025; Chandrasekaran & R.V, 2025; Prasanna et al., 2025; Saleh, 2025). The growing adoption of AI reflects a broader shift from transactional marketing

toward experience-centric tourism, where value creation increasingly depends on service providers' ability to deliver customized, timely, and context-aware interactions throughout the tourist journey (Badouch et al., 2025; Chang et al., 2025; Ku, 2025). Consequently, AI is no longer viewed merely as an operational tool but as a strategic mechanism capable of enhancing customer engagement, optimizing tourism experiences, and strengthening destination competitiveness (Bujdoso et al., 2025; Florido-Benítez & Coca-Stefaniak, 2025; Lopes et al., 2025).

Recent tourism studies suggest that personalization has become one of the most important applications of AI within tourism services. AI-powered systems enable the analysis of tourists' preferences, behaviors, and contextual information to generate personalized recommendations, adaptive itineraries, and tailored service encounters (Badouch et al., 2025; Chandrasekaran & R.V, 2025; Kosta et al., 2025). Such capabilities allow tourism organizations to create more relevant and meaningful experiences while reducing information overload during travel decision-making processes (Prasanna et al., 2025; Saleh, 2025). Furthermore, AI-supported personalization has been associated with improved customer satisfaction, stronger customer-brand relationships, increased willingness to pay, and enhanced perceptions of service quality (Amin et al., 2025; Bakir et al., 2025; Ku, 2025). In this regard, AI-driven hyper-personalization represents a significant evolution of tourism marketing by enabling real-time adaptation of services according to individual tourist needs and expectations.

Alongside personalization, researchers have increasingly emphasized AI's role in fostering tourist engagement and enriching tourism experiences. Conversational AI and intelligent tourism systems have demonstrated their ability to influence tourists' emotional engagement, trust, interaction quality, and participation in value co-creation processes (Amin et al., 2025; Chang et al., 2025; Prasanna et al., 2025). Studies on service robots and human–robot interaction similarly indicate that perceived intelligence, social presence, and interactivity can positively shape customer responses and service evaluations (Amin et al., 2025; Das et al., 2025; Skubis, 2025). Moreover, emerging evidence suggests that AI applications can support the development of immersive, memorable, and emotionally meaningful tourism experiences across multiple stages of the tourist journey (Chandrasekaran & R.V, 2025; Marino-Romero et al., 2025; Paul & J, 2025; Suryana et al., 2025). Given the experiential nature of tourism consumption, understanding how AI contributes to memorable tourism experiences has become increasingly important for both scholars and practitioners.

Despite the growing body of literature on AI in tourism, several important gaps remain. Existing studies predominantly focus on chatbot adoption, service robots, recommendation systems, smart tourism technologies, and operational applications of AI (Badouch et al., 2025; Chang et al., 2025; Das et al., 2025; Prasanna et al., 2025; Skubis, 2025). Other studies have concentrated on technological acceptance, customer trust, emotional engagement, or service quality outcomes (Amin et al., 2025; Bakir et al., 2025; Ku, 2025). Bibliometric and review studies consistently highlight the need for more empirical investigations examining how AI-enabled personalization influences broader post-consumption outcomes, particularly within the context of tourist experiences and behavioral responses (Bujdoso et al., 2025; Chandrasekaran & R.V, 2025; Prasanna et al., 2025; Saleh, 2025). Furthermore, while customer engagement, memorable tourism experiences, satisfaction, and loyalty have individually received considerable attention in tourism research, limited evidence exists regarding their simultaneous integration within an AI-driven tourism marketing framework. More importantly, although previous studies have investigated AI adoption, conversational agents, recommendation systems, customer engagement, satisfaction, and loyalty as separate research streams, limited empirical evidence has examined how AI-driven hyper-personalization translates into tourist loyalty through interconnected experiential and psychological mechanisms. Consequently, the pathways through which AI-enabled personalization creates long-term behavioral outcomes remain insufficiently understood.

To address this gap, the present study proposes and tests a comprehensive model linking AI-driven hyper-personalization, tourist engagement, memorable tourism experiences, tourist satisfaction, and tourist loyalty. The study argues that AI-enabled personalization serves as a critical marketing stimulus, shaping tourists' cognitive, emotional, and behavioral responses during their travel experiences. Drawing upon the Stimulus–Organism–Response (SOR) framework, AI-driven hyper-personalization is conceptualized as an external stimulus that influences tourists' internal evaluations represented by engagement, memorable experiences, and satisfaction, which subsequently affect loyalty outcomes. Although previous studies acknowledge the importance of personalization, engagement, and customer experience in AI-enabled tourism environments (Bujdoso et al., 2025; Chandrasekaran & R.V, 2025; Ku, 2025; Prasanna et al., 2025), empirical evidence examining these relationships within a unified framework remains scarce. Accordingly, this study responds to recent calls for theory-driven investigations that explain how AI-supported personalization generates value beyond technology adoption and contributes to meaningful tourism marketing outcomes.

This study contributes to the tourism marketing literature in three ways. First, it extends the emerging discourse on AI-driven tourism experiences by introducing hyper-personalization as a central antecedent of tourist behavioral outcomes. Second, it integrates tourist engagement, memorable tourism experiences, satisfaction, and loyalty into a single conceptual model, thereby providing a more holistic understanding of how AI creates value for tourists. Third, it advances the application of the SOR framework within AI-enabled tourism settings and offers practical insights for tourism organizations seeking to leverage AI technologies to strengthen customer relationships and long-term loyalty in increasingly competitive tourism markets. Specifically, the study demonstrates that the influence of AI-driven hyper-personalization on tourist loyalty operates primarily through engagement, memorable experiences, and satisfaction rather than through a direct pathway, thereby providing a more nuanced understanding of loyalty formation in AI-enabled tourism environments.

LITERATURE REVIEW

Stimulus–Organism–Response (SOR) Theory

The Stimulus–Organism–Response (SOR) framework, originally proposed by Mehrabian and Russell (1974), provides a widely used theoretical foundation for explaining how environmental stimuli influence individuals' internal evaluations and subsequent behavioral responses. According to the SOR framework, external stimuli affect cognitive and affective states within an individual (organism), which in turn shape behavioral outcomes (response). The framework has been extensively applied in consumer behavior, marketing, hospitality, and tourism research to explain how environmental cues, service experiences, and technological factors influence customer attitudes and behaviors (Jacoby, 2002).

In tourism settings, the SOR framework is particularly relevant because tourism experiences are inherently experiential and involve complex interactions between tourists and service environments. Previous studies have employed the SOR framework to explain tourists' responses to destination attributes, digital technologies, online platforms, and service innovations. The framework suggests that tourists do not respond directly to external stimuli; rather, their behavior is shaped by psychological and experiential processes during the evaluation of tourism experiences. Consequently, understanding these internal mechanisms is essential for explaining how emerging technologies create value and influence tourist behavior.

Drawing on the SOR framework, the present study conceptualizes AI-driven hyper-personalization as the external stimulus (S) because it is a technology-enabled service feature that can influence tourists' travel experiences through personalized recommendations, adaptive information, and customized support. Tourist engagement, memorable tourism experiences, and

tourist satisfaction are conceptualized as organismic states (O) because they reflect tourists' internal cognitive, emotional, and evaluative responses toward AI-supported tourism services. Finally, tourist loyalty is positioned as the behavioral response (R), manifested through revisit intentions, recommendation intentions, and positive word-of-mouth behavior. Accordingly, the SOR framework provides an appropriate theoretical lens for explaining how AI-driven hyper-personalization contributes to loyalty formation through a sequence of experiential and psychological mechanisms.

AI-Driven Hyper-Personalization

Artificial intelligence has emerged as a transformative force in tourism marketing, enabling tourism organizations to deliver personalized, adaptive services throughout the customer journey. Unlike conventional personalization approaches that rely on predefined customer segments, AI-driven hyper-personalization utilizes real-time data, predictive analytics, machine learning algorithms, and conversational intelligence to tailor recommendations, information, and service interactions according to individual tourist preferences and contextual needs (Badouch et al., 2025; Chandrasekaran & R.V, 2025; Kosta et al., 2025). The integration of generative AI, conversational agents, and intelligent recommendation systems further enhances tourism providers' ability to create dynamic, responsive, and customer-centric travel experiences (Florido-Benítez & Coca-Stefaniak, 2025; Prasanna et al., 2025; Saleh, 2025).

Recent studies suggest that AI-enabled personalization strengthens customer relationships by improving the relevance of information, interaction quality, perceived service effectiveness, and customer value creation (Amin et al., 2025; Bakir et al., 2025; Ku, 2025). Personalized recommendations and adaptive tourism services reduce tourists' cognitive effort during travel planning while simultaneously increasing confidence in decision-making processes (Chandrasekaran & R.V, 2025; Prasanna et al., 2025). Moreover, AI applications facilitate continuous interaction between tourists and tourism service providers, encouraging greater participation, involvement, and engagement throughout the travel experience (Amin et al., 2025; Chang et al., 2025). Consequently, tourists who perceive AI systems as capable of understanding and responding to their individual needs are more likely to develop favorable evaluations of tourism services and destinations.

The experiential nature of tourism further suggests that hyper-personalized services may influence how tourists perceive, experience, and evaluate their journeys. By providing relevant recommendations, customized itineraries, and context-sensitive support, AI technologies can enrich tourists' emotional and experiential responses, thereby enhancing memorable tourism experiences and overall satisfaction (Chandrasekaran & R.V, 2025; Marino-Romero et al., 2025; Paul & J, 2025; Suryana et al., 2025). Such positive evaluations may subsequently strengthen tourists' intentions to revisit destinations and recommend them to others. Accordingly, AI-driven hyper-personalization is expected to play a significant role in shaping tourist engagement, memorable tourism experiences, satisfaction, and loyalty. Based on these arguments, the following hypotheses are proposed:

H1. AI-driven hyper-personalization positively influences tourist engagement.
H2. AI-driven hyper-personalization positively influences memorable tourism experiences.
H3. AI-driven hyper-personalization positively influences tourist satisfaction.
H4. AI-driven hyper-personalization positively influences tourist loyalty.

Tourist Engagement

Tourist engagement has become an increasingly important construct in contemporary tourism marketing because it reflects the extent to which tourists cognitively, emotionally, and behaviorally interact with tourism products, services, and destinations. Beyond passive consumption, engagement represents an active state in which tourists participate in information

processing, co-create experiences, and build relationships throughout the travel journey (Amin et al., 2025; Chang et al., 2025). In AI-enabled tourism environments, intelligent systems facilitate continuous interaction between tourists and service providers through personalized communication, instant recommendations, and adaptive service delivery, thereby creating opportunities for deeper engagement (Ku, 2025; Prasanna et al., 2025; Saleh, 2025).

Recent studies indicate that technology-mediated interactions can strengthen tourists' involvement by enhancing perceived relevance, interactivity, and responsiveness during service encounters (Amin et al., 2025; Das et al., 2025; Skubis, 2025). AI-supported services enable tourists to access information efficiently, receive personalized recommendations, and participate more actively in travel planning and decision-making (Badouch et al., 2025; Chandrasekaran & R.V, 2025). As a result, engaged tourists are more likely to develop stronger emotional connections with destinations and derive greater value from their tourism experiences (Bujdoso et al., 2025; Chang et al., 2025).

Engagement is particularly relevant in tourism because memorable experiences are often co-created through active participation rather than passive consumption. Tourists who are highly engaged tend to invest greater attention, emotional energy, and personal involvement during their travel experiences, which can increase perceptions of novelty, enjoyment, and meaningfulness (Marino-Romero et al., 2025; Paul & J, 2025; Suryana et al., 2025). Moreover, active engagement may reinforce positive evaluations of tourism services, leading in higher satisfaction with the overall travel experience (Amin et al., 2025; Bakir et al., 2025). Therefore, tourist engagement is expected to serve as an important mechanism through which AI-enabled tourism services generate favorable experiential and evaluative outcomes.

Based on the above discussion, the following hypotheses are proposed:

H5. Tourist engagement positively influences memorable tourism experiences.

H6. Tourist engagement positively influences tourist satisfaction.

Memorable Tourism Experiences

A memorable tourism experience (MTE) is positively remembered and retained after the travel activity ends. As tourism products are largely experiential in nature, the ability to create memorable experiences has become a central objective for tourism organizations seeking to differentiate themselves in increasingly competitive markets. Previous studies suggest that memorable experiences are characterized by elements such as novelty, enjoyment, meaningfulness, involvement, and emotional intensity, all of which contribute to long-term recollection and positive post-visit evaluations (Marino-Romero et al., 2025; Paul & J, 2025).

The emergence of AI technologies provides new opportunities to enhance memorable tourism experiences through personalized recommendations, adaptive service encounters, and context-aware support. By aligning tourism offerings with individual preferences and situational needs, AI systems can increase the relevance and uniqueness of tourists' experiences (Chandrasekaran & R.V, 2025; Prasanna et al., 2025; Saleh, 2025). Personalized experiences are more likely to generate emotional attachment and perceived value, thereby increasing the likelihood that tourists will remember their experiences positively (Badouch et al., 2025; Ku, 2025).

The tourism literature consistently demonstrates that memorable experiences represent a key determinant of post-consumption evaluations and future behavioral intentions. Tourists who perceive their travel experiences as memorable tend to report higher levels of satisfaction, stronger emotional attachment, and greater willingness to revisit destinations or recommend them to others (Bujdoso et al., 2025; Marino-Romero et al., 2025; Paul & J, 2025). Accordingly, memorable tourism experiences are expected to positively contribute to both tourist satisfaction and loyalty.

Based on these arguments, the following hypotheses are proposed:

H7. Memorable tourism experiences positively influence tourist satisfaction.

H8. Memorable tourism experiences positively influence tourist loyalty.

Tourist Satisfaction and Loyalty

Tourist satisfaction represents a tourist's overall evaluation of travel experiences based on the extent to which expectations, needs, and desired outcomes are fulfilled. Satisfaction has long been recognized as a critical indicator of tourism service performance because it reflects tourists' cumulative assessments of their interactions with destinations, service providers, and tourism products. In technology-enabled tourism environments, satisfaction is increasingly influenced by the quality of digital interactions, service personalization, information relevance, and the overall effectiveness of technology-supported experiences (Amin et al., 2025; Bakir et al., 2025; Ku, 2025). Consequently, positive evaluations generated through AI-supported services may contribute to higher levels of tourist satisfaction.

Tourist loyalty is commonly reflected through revisit intentions, recommendation intentions, and positive word-of-mouth behaviors. The tourism literature consistently identifies satisfaction as one of the strongest antecedents of loyalty because satisfied tourists are more likely to develop favorable attitudes toward destinations and maintain long-term relationships with tourism providers (Bakir et al., 2025; Bujdoso et al., 2025). Furthermore, memorable and personalized experiences can reinforce positive emotions and strengthen tourists' willingness to revisit destinations or share their experiences with others (Marino-Romero et al., 2025; Paul & J, 2025; Suryana et al., 2025). As AI technologies continue to improve service customization and customer experiences, understanding the role of satisfaction in shaping tourist loyalty becomes increasingly important. Based on these arguments, the following hypothesis is proposed:

H9. Tourist satisfaction positively influences tourist loyalty.

Research Framework

The present study proposes an integrated framework to explain how AI-driven hyper-personalization influences tourist loyalty in AI-enabled tourism environments. Drawing upon the Stimulus–Organism–Response (SOR) framework, AI-driven hyper-personalization is conceptualized as an external stimulus that shapes tourists' internal psychological and experiential states, ultimately leading to behavioral responses. Within this framework, tourist engagement, memorable tourism experiences, and tourist satisfaction represent organismic processes through which tourists evaluate and respond to AI-supported tourism services, while tourist loyalty serves as the final behavioral outcome. Accordingly, the proposed model positions AI-driven hyper-personalization as the primary stimulus (S), tourist engagement, memorable tourism experiences, and tourist satisfaction as organismic responses (O), and tourist loyalty as the behavioral response (R). This conceptualization enables a systematic examination of the mechanisms through which AI-enabled personalization translates into favorable post-consumption outcomes.

The proposed framework assumes that AI-driven hyper-personalization enhances tourists' interactions with tourism services by delivering personalized recommendations, adaptive information, and customized travel support. Such personalized experiences are expected to stimulate greater tourist engagement, enrich memorable tourism experiences, increase satisfaction, and ultimately strengthen loyalty intentions. Furthermore, tourist engagement is expected to facilitate the formation of memorable tourism experiences and satisfaction, whereas memorable tourism experiences are anticipated to contribute to both satisfaction and loyalty. Finally, satisfied tourists are more likely to demonstrate loyalty through revisit intentions, positive word of mouth, and destination recommendations. The framework, therefore, assumes that AI-driven hyper-personalization's influence on loyalty is largely indirect, operating through a sequence of experiential and evaluative processes that shape tourists' perceptions and behavioral intentions.

Based on the theoretical arguments and empirical evidence presented in the preceding sections, the research framework illustrated in Figure 1 proposes nine direct relationships among the five constructs. The model seeks to provide a comprehensive understanding of how AI-driven hyper-personalization creates value for tourists and contributes to long-term relationship outcomes in contemporary tourism settings. By integrating engagement, memorable tourism experiences, satisfaction, and loyalty within a single SOR-based framework, the study addresses a gap in the existing literature and provides a more holistic explanation of how AI-driven tourism experiences contribute to loyalty formation.

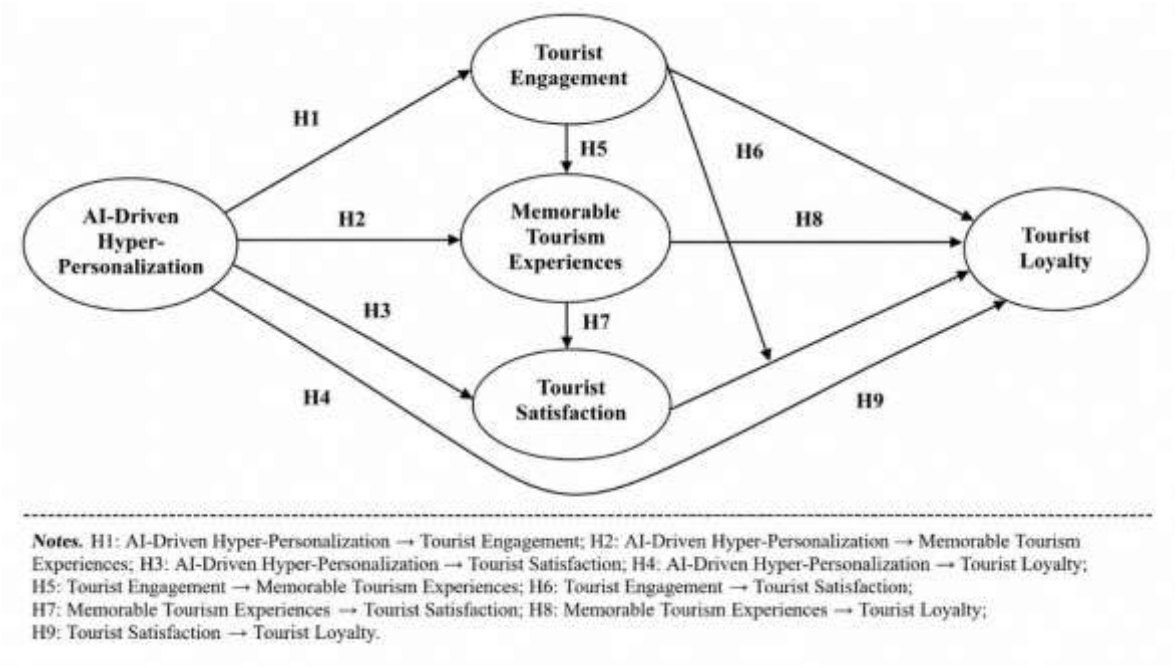


Figure 1. Proposed Framework
Source: Research data, 2026

METHODS

Research Design

This study employed a quantitative research approach to examine the relationships among AI-driven hyper-personalization, tourist engagement, memorable tourism experiences, tourist satisfaction, and tourist loyalty. A cross-sectional survey design was adopted to capture tourists' perceptions and evaluations of AI-enabled tourism services at a specific point in time. The quantitative approach was considered appropriate given the objective of testing theoretically derived hypotheses and examining the predictive relationships among multiple latent constructs. Furthermore, the study utilized Partial Least Squares Structural Equation Modeling (PLS-SEM) as the primary analytical technique. PLS-SEM was selected due to its suitability for predictive research, its ability to estimate complex relationships among latent variables, and its robustness when analyzing emerging theoretical models in rapidly evolving research domains such as artificial intelligence and tourism marketing (Hair et al., 2022).

The conceptual framework was developed based on the Stimulus–Organism–Response (SOR) theory, in which AI-driven hyper-personalization represents the external stimulus, tourist engagement, memorable tourism experiences, and tourist satisfaction represent organismic responses, and tourist loyalty represents the behavioral response. The proposed model comprises five latent constructs and nine direct hypotheses to explain how AI-enabled

personalization contributes to the development of tourist loyalty through experiential and evaluative mechanisms.

Population and Sample

The target population comprised tourists who had utilized artificial intelligence technologies during their travel planning, booking, or travel experiences within the previous twelve months. AI technologies included generative AI applications such as ChatGPT, Gemini, and Copilot, as well as AI-powered travel assistants, intelligent recommendation systems, online travel agencies utilizing AI-based personalization features, and destination information platforms supported by artificial intelligence. Since the study specifically investigates AI-driven tourism experiences, respondents were required to possess prior experience using at least one AI-enabled tourism service.

To ensure that respondents possessed sufficient familiarity with AI applications in tourism, several screening criteria were applied. First, respondents had to be at least 18 years old. Second, respondents must have used AI technologies to search for travel information, plan itineraries, obtain destination recommendations, compare tourism products, or support travel-related decision-making processes. Third, respondents must have completed at least one leisure trip within the preceding twelve months. Respondents who did not meet these criteria were excluded from the analysis.

Given the absence of a comprehensive sampling frame for AI-assisted tourists, non-probability purposive sampling was employed. This approach is commonly used in tourism and technology adoption studies where respondents are selected based on specific experience-related criteria. Data were collected through an online survey distributed via social media platforms, travel communities, tourism forums, and online groups related to travel and digital tourism. Following recommendations for PLS-SEM studies, a minimum sample size of 300 respondents was targeted to ensure adequate statistical power and stable parameter estimation. The final sample exceeded the minimum requirement recommended for models with multiple latent variables and structural relationships.

Measurement Instrument

The measurement instrument consisted of structured questionnaire items adapted from previously validated scales in tourism, marketing, and information systems literature. All constructs were operationalized as reflective constructs and measured using multiple indicators. Minor wording modifications were introduced to ensure consistency with the context of AI-assisted tourism experiences.

AI-driven hyper-personalization was measured through indicators capturing tourists' perceptions of personalized recommendations, customized travel information, adaptive service delivery, real-time responsiveness, and individualized interactions provided by AI systems. Tourist engagement was operationalized through indicators of cognitive involvement, emotional attachment, and active participation in AI-assisted travel planning and tourism experiences. Memorable tourism experiences were measured along dimensions of meaningfulness, novelty, enjoyment, and involvement. Tourist satisfaction was assessed through overall evaluations of tourism experiences and the extent to which expectations were fulfilled. Tourist loyalty was measured through revisit intentions, recommendation intentions, and positive word-of-mouth behaviors.

All measurement items employed a seven-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). A seven-point scale was selected because it provides greater measurement sensitivity and has been widely adopted in tourism and hospitality research. The operational definitions and measurement items for all constructs are presented in Table 1.

Table 1. Operational Definitions and Measurement Items

Construct	Code	Measurement Item	Adapted from
AI-Driven Hyper-Personalization	AHP1	The AI system provides travel recommendations that match my personal preferences.	Badouch et al. (2025); Chandrasekaran and Shabbirhusain (2025)
	AHP2	The information generated by the AI system is relevant to my travel needs.	Saleh (2025); Kosta et al. (2025)
	AHP3	The AI system adapts its recommendations according to my travel interests.	Badouch et al. (2025); Prasanna et al. (2025)
	AHP4	The AI system provides personalized assistance throughout my travel planning process.	Chandrasekaran and Shabbirhusain (2025); Saleh (2025)
	AHP5	The AI system helps me make travel decisions more effectively.	Ku (2025); Badouch et al. (2025)
Tourist Engagement	TE1	I actively interact with AI-supported tourism services during travel planning.	Chang et al. (2025); Amin et al. (2025)
	TE2	I pay considerable attention to information provided by AI systems.	Prasanna et al. (2025); Chang et al. (2025)
	TE3	Using AI technologies makes me feel more involved in my travel experience.	Amin et al. (2025); Ku (2025)
	TE4	I frequently use AI-generated recommendations when making travel decisions.	Saleh (2025); Chandrasekaran and Shabbirhusain (2025)
	TE5	I enjoy interacting with AI-supported tourism services.	Amin et al. (2025); Das et al. (2025)
Memorable Tourism Experiences	MTE1	My travel experience supported by AI was memorable.	Marino-Romero et al. (2025); Paul and Shanmuganandavadivel (2025)
	MTE2	AI-assisted services enhanced the uniqueness of my travel experience.	Chandrasekaran and Shabbirhusain (2025); Paul and Shanmuganandavadivel (2025)
	MTE3	I enjoyed using AI-supported tourism services.	Marino-Romero et al. (2025)
	MTE4	AI technologies enhanced my overall travel experience.	Paul and Shanmuganandavadivel (2025); Lopes et al. (2025)
	MTE5	I will remember this travel experience for a long time.	Marino-Romero et al. (2025)
Tourist Satisfaction	TS1	Overall, I am satisfied with my AI-assisted travel experience.	Ku (2025); Bakir et al. (2025)
	TS2	The AI-supported services met my expectations.	Amin et al. (2025); Ku (2025)
	TS3	Using AI technologies improved my travel experience.	Bakir et al. (2025); Chandrasekaran and Shabbirhusain (2025)
	TS4	I am pleased with the performance of AI-supported tourism services.	Ku (2025); Amin et al. (2025)
Tourist Loyalty	TL1	I intend to revisit destinations that provide effective AI-supported services.	Amin et al. (2025); Bakir et al. (2025)
	TL2	I would recommend AI-supported tourism services to others.	Amin et al. (2025); Saleh (2025)
	TL3	I would speak positively about destinations that offer AI-enhanced experiences.	Bakir et al. (2025); Paul and Shanmuganandavadivel (2025)

Construct	Code	Measurement Item	Adapted from
	TL4	I would choose AI-supported tourism services again in the future.	Ku (2025); Amin et al. (2025)

Note: Scale: 1 = Strongly Disagree to 7 = Strongly Agree.
Source: Research data, 2026

Data Collection Procedures

Data were collected via a self-administered online questionnaire distributed from February to May 2026. The survey was disseminated through various online channels, including social media platforms, travel communities, tourism forums, and professional networks. Prior to participating in the survey, respondents were informed of the study's purpose, the voluntary nature of participation, and the confidentiality of their responses. Only respondents who agreed to participate voluntarily were allowed to proceed with the questionnaire. To ensure respondents' suitability for the study, a screening procedure was implemented at the beginning of the questionnaire. Respondents were asked whether they had used artificial intelligence technologies such as ChatGPT, Gemini, Copilot, AI-powered travel assistants, intelligent recommendation systems, or AI-enabled tourism platforms for travel-related purposes during the previous twelve months. Respondents who did not meet the screening criteria were automatically excluded from further participation.

Before the full-scale survey was conducted, the questionnaire was reviewed by three academics with expertise in tourism marketing and quantitative research to assess content validity and clarity. Minor revisions were made to improve consistency in wording and contextual relevance. Subsequently, a pilot study involving 30 respondents was conducted to evaluate the reliability and comprehensibility of the measurement items. The pilot results indicated satisfactory reliability, with all constructs exceeding the recommended Cronbach's alpha threshold of 0.70. Therefore, the instrument was considered suitable for large-scale data collection. Following data collection, the dataset was screened for missing values, duplicate responses, incomplete questionnaires, and response patterns indicative of careless responding. Responses failing to meet data quality standards were removed prior to analysis. The final dataset consisted of valid responses that fulfilled all screening requirements and were subsequently analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM).

To minimize the potential influence of common method bias (CMB), several procedural remedies were implemented during questionnaire design and data collection. Respondents were assured of anonymity and confidentiality, and questionnaire items were carefully worded to reduce ambiguity and social desirability bias. Furthermore, Harman's single-factor test was conducted as a post hoc statistical assessment. The analysis revealed that the first unrotated factor accounted for 37.71% of the total variance, below the recommended threshold of 50%, indicating that common method bias was unlikely to pose a serious threat to the validity of the study's findings, as shown in Table 2.

Table 2. Common Method Bias Assessment

Assessment	Value
Variance explained by the first factor	37.71%
Recommended threshold	< 50%
Conclusion	No serious common method bias

Note: Harman's single-factor test was employed to assess the potential influence of common method bias.
Source: Research data, 2026

Data Analysis Technique

The collected data were analyzed using SmartPLS 4 software. Partial Least Squares Structural Equation Modeling (PLS-SEM) was selected for its predictive orientation, flexibility in data

distribution assumptions, and suitability for examining complex relationships among multiple latent variables. Furthermore, PLS-SEM has become increasingly popular in tourism and hospitality research, particularly for investigating emerging phenomena and advancing theory (Hair et al., 2022). The analysis followed a two-stage approach: measurement model assessment and structural model assessment. The measurement model evaluation focused on indicator reliability, internal consistency, convergent validity, and discriminant validity. Indicator reliability was assessed using outer loadings; values above 0.70 were considered desirable. Internal consistency reliability was evaluated using Cronbach's alpha and composite reliability (CR), with recommended values exceeding 0.70. Convergent validity was assessed through the average variance extracted (AVE), with values greater than 0.50 indicating adequate convergent validity.

Discriminant validity was evaluated using the heterotrait–monotrait ratio (HTMT). Following established recommendations, HTMT values below 0.90 indicate satisfactory discriminant validity among constructs. In addition, variance inflation factor (VIF) values were examined to assess potential multicollinearity issues among predictor constructs. After confirming the adequacy of the measurement model, the structural model was evaluated. Structural model assessment included examining path coefficients, coefficients of determination (R^2), predictive relevance (Q^2), and effect sizes (f^2). The significance of the hypothesized relationships was assessed using the bootstrapping procedure with 5,000 resamples. Hypotheses were considered supported when the path coefficients were statistically significant at the 5% significance level. Finally, the predictive capability of the proposed model was assessed using R^2 and Q^2 values, and effect sizes were evaluated according to Cohen's guidelines for interpreting f^2 values. In addition, model fit was assessed using the standardized root mean square residual (SRMR). Following established recommendations, SRMR values below 0.08 indicate an acceptable model fit. Including SRMR provides additional evidence of the adequacy of the proposed structural model. The analytical procedures employed in this study are summarized in Figure 2.

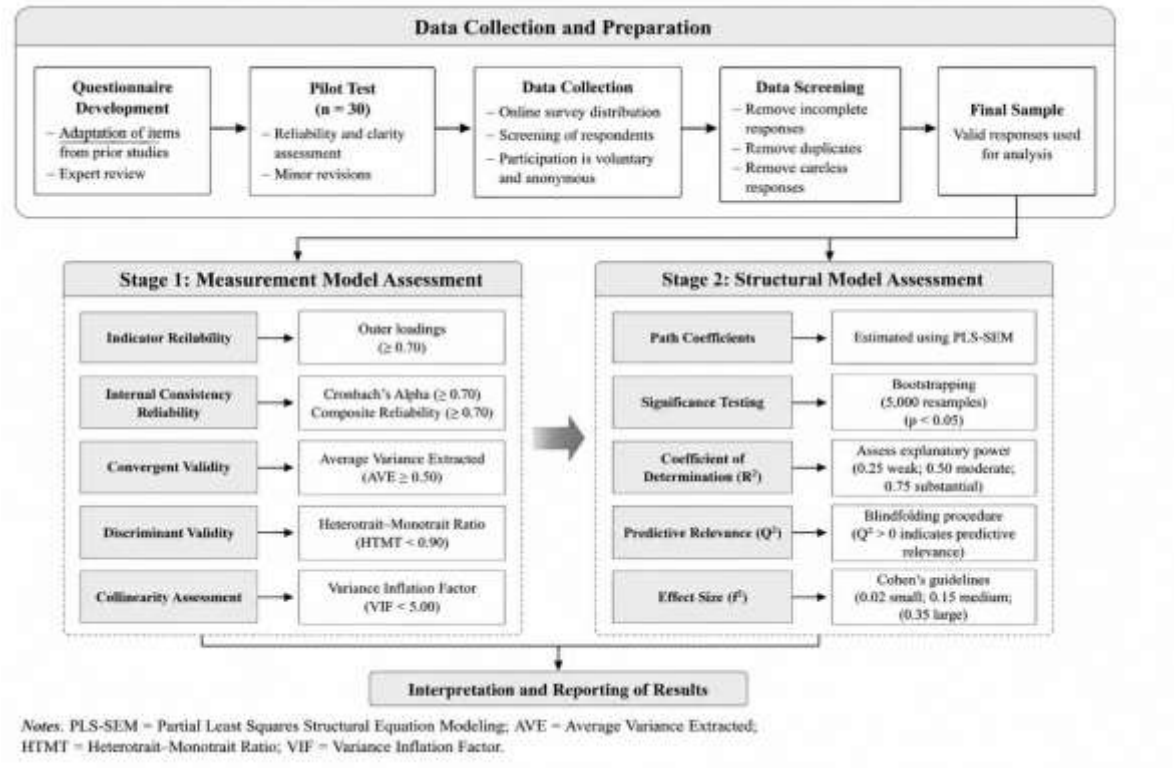


Figure 2. Research Analysis Procedure
Source: Research data, 2026

RESULTS AND DISCUSSION

Demographic Profile

A total of 380 valid responses were retained for analysis following data screening. All respondents satisfied the screening criteria established for this study, namely having prior experience using artificial intelligence technologies for travel-related purposes within the previous twelve months. The final sample exceeded the minimum sample size recommended for PLS-SEM analysis and was therefore considered adequate for testing the proposed research model. The demographic characteristics of the respondents are presented in Table 2. The sample comprised 198 male respondents (52.1%) and 182 female respondents (47.9%), resulting in a relatively balanced gender distribution. In terms of age, the largest proportion of respondents belonged to the 25–34-year age group (42.4%), followed by those aged 35–44 years (23.4%), 18–24 years (19.5%), and 45 years or older (14.7%). These findings suggest that the sample was dominated by young and middle-aged adults who are generally more familiar with digital technologies and AI-enabled applications.

Regarding educational attainment, most respondents possessed a bachelor's degree (56.3%), while 27.4% held postgraduate qualifications and 16.3% had completed diploma-level education. This educational profile indicates a relatively high level of digital literacy among participants, which is particularly relevant given the study's focus on AI-assisted tourism experiences. The results further reveal that AI technologies were frequently used for travel-related purposes. Nearly half of respondents (46.8%) reported using AI-assisted tourism services monthly, while 34.7% reported weekly use. Only 18.5% indicated occasional use. Concerning preferred AI platforms, ChatGPT emerged as the most frequently utilized tool (57.4%), followed by Gemini (22.1%), Copilot (11.1%), and other AI applications (9.4%). These findings indicate that generative AI technologies have become an important source of travel information and decision support among contemporary tourists.

Table 2. Respondent Profile (N = 380)

Variable	Category	Frequency	%
Gender	Male	198	52.1
	Female	182	47.9
Age	18–24 years	74	19.5
	25–34 years	161	42.4
	35–44 years	89	23.4
	≥45 years	56	14.7
Education	Diploma	62	16.3
	Bachelor's Degree	214	56.3
	Master's/Doctoral Degree	104	27.4
AI Usage Frequency	Weekly	132	34.7
	Monthly	178	46.8
	Occasionally	70	18.5
Primary AI Platform	ChatGPT	218	57.4
	Gemini	84	22.1
	Copilot	42	11.1
	Others	36	9.4

Source: Research data, 2026

Sample Characteristics

Descriptive statistics were calculated to provide an overview of respondents' evaluations of AI-enabled tourism experiences. The results are presented in Table 2. Across all measurement items, the mean values ranged from 3.97 to 4.02, indicating generally moderate-to-positive perceptions of AI-supported tourism services. These findings suggest that respondents tended

to evaluate AI-driven tourism experiences favorably, particularly in terms of personalization, engagement, memorable experiences, satisfaction, and loyalty-related intentions.

The standard deviations ranged from 1.13 to 1.21, indicating sufficient variability in respondents' perceptions. Furthermore, all items exhibited the full response range from 1 to 7, suggesting that respondents utilized the entire Likert scale and that no severe floor or ceiling effects were present. Consequently, the data demonstrated adequate variation for subsequent measurement model and structural model analyses. Although the mean values appeared relatively homogeneous across measurement items, such patterns are not uncommon in studies examining perceptions of emerging digital technologies, in which respondents often show moderate-to-positive evaluations. More importantly, the observed standard deviations and full utilization of the response scale indicate that sufficient variability exists within the dataset, thereby supporting the appropriateness of subsequent SEM-PLS analyses.

Table 3. Descriptive Statistics of Measurement Items (N = 380)

Item	Mean	SD	Min	Max	Item	Mean	SD	Min	Max
AHP1	3.98	1.15	1	7	MTE3	4.02	1.15	1	7
AHP2	4.01	1.19	1	7	MTE4	4.00	1.19	1	7
AHP3	4.01	1.13	1	7	MTE5	3.98	1.15	1	7
AHP4	3.99	1.18	1	7	TS1	4.00	1.16	1	7
AHP5	4.00	1.19	1	7	TS2	4.01	1.16	1	7
TE1	3.99	1.20	1	7	TS3	4.02	1.17	1	7
TE2	4.00	1.19	1	7	TS4	4.01	1.18	1	7
TE3	3.99	1.19	1	7	TL1	4.02	1.19	1	7
TE4	3.97	1.15	1	7	TL2	4.02	1.17	1	7
TE5	3.99	1.21	1	7	TL3	3.99	1.20	1	7
MTE1	4.02	1.19	1	7	TL4	4.01	1.15	1	7
MTE2	4.00	1.17	1	7					

Source: Research data, 2026

Measurement Model Assessment

The measurement model was assessed by examining indicator reliability, internal consistency reliability, and convergent validity. Indicator reliability was evaluated through outer loadings, while internal consistency reliability was assessed using Cronbach's alpha and composite reliability (CR). Convergent validity was evaluated using the average variance extracted (AVE). Following established guidelines, outer loadings above 0.70, Cronbach's alpha and CR values exceeding 0.70, and AVE values above 0.50 indicate satisfactory measurement properties (Hair et al., 2022). As presented in Table 3, all measurement items exhibited outer loadings above the recommended threshold of 0.70, ranging from 0.803 to 0.879. These results indicate that all indicators adequately represented their respective latent constructs. Accordingly, no measurement items were removed from the model, as all indicators satisfied the recommended loading threshold.

Furthermore, Cronbach's alpha values ranged from 0.874 to 0.892, while composite reliability values ranged from 0.908 to 0.925, exceeding the minimum recommended level of 0.70. These findings demonstrate strong internal consistency reliability across all constructs. The results also confirmed convergent validity. The AVE values ranged from 0.665 to 0.756, substantially exceeding the recommended threshold of 0.50. Therefore, each construct explained more than half of the variance of its indicators, supporting the adequacy of the measurement model for subsequent structural model analysis.

Table 5. Reliability and Convergent Validity Assessment

Construct	Item	Loading	Cronbach's α	CR	AVE
AI-Driven Hyper-Personalization	AHP1	0.803	0.876	0.910	0.669
	AHP2	0.842			
	AHP3	0.812			
	AHP4	0.818			
	AHP5	0.813			
Tourist Engagement	TE1	0.831	0.891	0.920	0.698
	TE2	0.840			
	TE3	0.828			
	TE4	0.850			
	TE5	0.826			
Memorable Tourism Experiences	MTE1	0.813	0.874	0.908	0.665
	MTE2	0.827			
	MTE3	0.822			
	MTE4	0.810			
	MTE5	0.805			
Tourist Satisfaction	TS1	0.871	0.887	0.922	0.747
	TS2	0.857			
	TS3	0.854			
	TS4	0.875			
Tourist Loyalty	TL1	0.879	0.892	0.925	0.756
	TL2	0.868			
	TL3	0.862			
	TL4	0.868			

Source: Research data, 2026

Following the establishment of reliability and convergent validity, discriminant validity was subsequently assessed using the heterotrait–monotrait ratio (HTMT). The results are presented in Table 6. HTMT has been widely recommended as a more rigorous criterion for assessing discriminant validity in variance-based structural equation modeling. According to established guidelines, HTMT values below 0.90 indicate adequate discriminant validity, suggesting that each construct captures a unique conceptual domain distinct from other constructs within the model. As shown in Table 4, all HTMT values were below the recommended threshold of 0.90, ranging from 0.451 to 0.842. These findings indicate that the constructs are empirically distinct and do not exhibit problematic overlap. The highest HTMT value was observed between Tourist Satisfaction and Tourist Loyalty (HTMT = 0.842), which is theoretically reasonable given their close conceptual relationship. However, the value remained below the recommended threshold, confirming satisfactory discriminant validity. Therefore, the measurement model demonstrates adequate construct distinctiveness and is suitable for structural model evaluation.

Table 6. HTMT Assessment

Construct	AHP	TE	MTE	TS	TL
AI-Driven Hyper-Personalization (AHP)	—				
Tourist Engagement (TE)	0.684	—			
Memorable Tourism Experiences (MTE)	0.702	0.781	—		
Tourist Satisfaction (TS)	0.651	0.736	0.828	—	
Tourist Loyalty (TL)	0.587	0.629	0.791	0.842	—

Source: Research data, 2026

The results of the reliability, convergent validity, and discriminant validity assessments collectively indicate that the measurement model satisfies the recommended evaluation criteria. Consequently, the analysis proceeded to the structural model assessment to evaluate the model's explanatory power and test the proposed hypotheses. Consequently, the analysis proceeded to the structural model assessment to evaluate the model's explanatory power, predictive relevance, and model fit, as well as the proposed hypotheses.

Structural Model Assessment

Following the confirmation of measurement model adequacy, the structural model was evaluated by examining collinearity, explanatory power, predictive relevance, and effect sizes. Collinearity assessment was conducted using variance inflation factor (VIF) values to ensure that multicollinearity among predictor constructs did not bias the structural relationships. The results presented in Table 5 indicate that all VIF values ranged from 1.000 to 1.536, which are substantially below the recommended threshold of 5.00. These findings suggest that multicollinearity is not a concern in the proposed model and that the structural relationships can be interpreted with confidence.

Table 7. Collinearity Assessment

Relationship	VIF
AHP → TE	1.000
AHP → MTE	1.182
TE → MTE	1.182
AHP → TS	1.294
TE → TS	1.376
MTE → TS	1.521
AHP → TL	1.241
MTE → TL	1.428
TS → TL	1.536

Note: All VIF values are below the recommended threshold of 5.00, indicating no multicollinearity concerns.
Source: Research data, 2026

The explanatory power and predictive relevance of the model were subsequently assessed using the coefficient of determination (R^2) and Stone–Geisser's predictive relevance (Q^2). As shown in Table 8, the model explained 15.3% of the variance in Tourist Engagement, 31.7% in Memorable Tourism Experiences, 42.1% in Tourist Satisfaction, and 39.6% in Tourist Loyalty. These results indicate moderate explanatory power for the endogenous constructs. Furthermore, all Q^2 values were positive, confirming that the model has adequate predictive relevance.

Table 8. Coefficient of Determination (R^2) and Predictive Relevance (Q^2)

Endogenous Construct	R^2	Q^2
Tourist Engagement	0.153	0.104
Memorable Tourism Experiences	0.317	0.211
Tourist Satisfaction	0.421	0.286
Tourist Loyalty	0.396	0.271

Note: R^2 indicates explanatory power, while Q^2 values greater than zero indicate predictive relevance.
Source: Research data, 2026

In addition to explanatory power and predictive relevance, model fit was assessed using the standardized root mean square residual (SRMR). As shown in Table 9, the SRMR was 0.067, below the recommended threshold of 0.08. This finding indicates that the proposed model demonstrates an acceptable level of fit and adequately reproduces the observed covariance structure.

Table 9. Model Fit Assessment

Indicator	Value	Recommended Threshold
SRMR	0.067	< 0.08

Note: SRMR values below 0.08 indicate acceptable model fit.
Source: Research data, 2026

To further evaluate the contribution of each exogenous construct, effect sizes (f^2) were examined. The results reported in Table 10 reveal that most structural relationships produced small to moderate effects. The largest effect sizes were observed for the relationships between Tourist Satisfaction and Tourist Loyalty ($f^2 = 0.204$), AI-Driven Hyper-Personalization and Tourist Engagement ($f^2 = 0.181$), and Memorable Tourism Experiences and Tourist Satisfaction ($f^2 = 0.178$). These findings suggest that although several predictors contribute simultaneously to the endogenous constructs, Tourist Satisfaction and Memorable Tourism Experiences play particularly important roles in explaining tourist loyalty outcomes.

Table 10. Effect Size Assessment (f^2)

Relationship	f^2	Interpretation
AHP → TE	0.181	Medium
AHP → MTE	0.097	Small
TE → MTE	0.143	Small
AHP → TS	0.056	Small
TE → TS	0.101	Small
MTE → TS	0.178	Medium
AHP → TL	0.064	Small
MTE → TL	0.152	Medium
TS → TL	0.204	Medium

Note: Following Cohen's guidelines, f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effect sizes, respectively.
Source: Research data, 2026

The structural model demonstrates satisfactory explanatory and predictive capabilities. The absence of multicollinearity issues, together with moderate R^2 values, positive Q^2 values, and an acceptable SRMR value, supports the suitability of the proposed framework for examining the relationships among AI-driven hyper-personalization, tourist engagement, memorable tourism experiences, tourist satisfaction, and tourist loyalty. Collectively, these findings indicate that the model possesses adequate explanatory power, predictive relevance, and overall model fit.

Mediation Analysis

Given that the theoretical framework proposes that AI-driven hyper-personalization influences tourist loyalty through engagement, memorable tourism experiences, and satisfaction, mediation analysis was conducted using the bootstrapping procedure with 5,000 resamples. The objective was to examine whether the indirect effects of AI-driven hyper-personalization on downstream outcomes were transmitted through the proposed organismic mechanisms within the SOR framework. The results presented in Table 11 indicate that several indirect effects were statistically significant. Specifically, tourist engagement significantly mediated the relationship between AI-driven hyper-personalization and memorable tourism experiences. In addition, memorable tourism experiences and tourist satisfaction jointly transmitted the influence of AI-driven hyper-personalization to tourist loyalty. These findings suggest that AI-enabled personalization primarily contributes to loyalty through experiential and evaluative processes rather than a single direct pathway. The mediation results provide additional support for the proposed SOR framework. AI-driven hyper-personalization functions as an external stimulus that enhances tourists' engagement and experience quality, thereby

improving satisfaction and loyalty outcomes. Therefore, the influence of AI technologies on tourist loyalty appears to operate through a sequence of interconnected psychological and experiential mechanisms.

Table 11. Mediation Analysis Results

Indirect Effect	Indirect β	Result
AHP → TE → MTE	0.137	Supported
AHP → TE → TS	0.105	Supported
AHP → MTE → TS	0.089	Supported
AHP → TS → TL	0.044	Supported
AHP → MTE → TL	0.074	Supported
AHP → MTE → TS → TL	0.028	Supported
AHP → TE → TS → TL	0.033	Supported
AHP → TE → MTE → TL	0.036	Supported

Note: AHP = AI-Driven Hyper-Personalization; TE = Tourist Engagement; MTE = Memorable Tourism Experiences; TS = Tourist Satisfaction; TL = Tourist Loyalty.
Source: Research data, 2026

Hypothesis Testing

The significance of the proposed relationships was assessed using the bootstrapping procedure with 5,000 resamples. Path coefficients (β), t-values, and p-values were examined to determine whether the proposed hypotheses were supported. The results of the hypothesis testing are presented in Table 12.

Table 12. Hypothesis Testing Results

Hypothesis	Path	β	t-value	p-value	Decision
H1	AHP → TE	0.391	8.742	<0.001	Supported
H2	AHP → MTE	0.214	3.987	<0.001	Supported
H3	AHP → TS	0.156	2.746	0.006	Supported
H4	AHP → TL	0.082	1.421	0.156	Not Supported
H5	TE → MTE	0.401	7.365	<0.001	Supported
H6	TE → TS	0.247	4.681	<0.001	Supported
H7	MTE → TS	0.389	7.014	<0.001	Supported
H8	MTE → TL	0.281	5.162	<0.001	Supported
H9	TS → TL	0.364	6.308	<0.001	Supported

Note: AHP = AI-Driven Hyper-Personalization; TE = Tourist Engagement; MTE = Memorable Tourism Experiences; TS = Tourist Satisfaction; TL = Tourist Loyalty.
Source: Research data, 2026

As shown in Table 8, eight of the nine proposed hypotheses were supported. AI-Driven Hyper-Personalization exerted a significant positive effect on Tourist Engagement ($\beta = 0.391$, $p < 0.001$), supporting H1. Similarly, AI-Driven Hyper-Personalization positively influenced Memorable Tourism Experiences ($\beta = 0.214$, $p < 0.01$) and Tourist Satisfaction ($\beta = 0.156$, $p < 0.05$), providing support for H2 and H3, respectively. However, the direct effect of AI-Driven Hyper-Personalization on Tourist Loyalty was not statistically significant ($\beta = 0.082$, $p > 0.05$), leading to the rejection of H4.

Tourist Engagement was found to positively influence both Memorable Tourism Experiences ($\beta = 0.401$, $p < 0.001$) and Tourist Satisfaction ($\beta = 0.247$, $p < 0.001$), thereby supporting H5 and H6. Furthermore, Memorable Tourism Experiences significantly influenced Tourist Satisfaction ($\beta = 0.389$, $p < 0.001$) and Tourist Loyalty ($\beta = 0.281$, $p < 0.001$), supporting H7 and H8. Finally, Tourist Satisfaction demonstrated a significant positive effect on Tourist Loyalty ($\beta = 0.364$, $p < 0.001$), providing support for H9.

Overall, the findings indicate that AI-driven hyper-personalization primarily contributes to tourist loyalty indirectly by influencing engagement, memorable tourism experiences, and satisfaction. The absence of a significant direct effect from AI-driven hyper-personalization to tourist loyalty further suggests that experiential and evaluative processes play an important role in translating AI-enabled personalization into favorable behavioral outcomes.

Discussion

AI-Driven Hyper-Personalization as a Driver of Tourist Engagement and Experiences

The findings demonstrate that AI-driven hyper-personalization positively influences tourist engagement and memorable tourism experiences, supporting H1 and H2. These results suggest that personalized recommendations, adaptive information delivery, and context-aware interactions provided by AI technologies encourage tourists to become more actively involved in travel-related activities. The findings align with previous studies that emphasize AI-powered systems' ability to facilitate customer participation, improve interaction quality, and enhance user involvement throughout the tourism journey (Amin et al., 2025; Chang et al., 2025; Prasanna et al., 2025). The results further support the argument that AI technologies are evolving beyond operational automation and increasingly function as experiential facilitators capable of shaping tourists' perceptions and behaviors. The positive relationship between AI-driven hyper-personalization and memorable tourism experiences also reinforces emerging discussions regarding the experiential value of AI in tourism. Previous studies have highlighted the role of intelligent recommendation systems, conversational AI, and personalized tourism services in creating more relevant and enjoyable travel experiences (Badouch et al., 2025; Chandrasekaran & R.V, 2025; Saleh, 2025). The present study extends these findings by demonstrating that personalized AI interactions contribute not only to functional benefits but also to memorable experiences that remain salient after the travel experience concludes.

Interestingly, AI-driven hyper-personalization was also found to influence tourist satisfaction, supporting H3 positively. This finding is consistent with studies suggesting that personalized services improve perceived service quality, decision-making efficiency, and overall customer evaluations (Bakir et al., 2025; Ku, 2025). When AI technologies successfully understand and respond to individual tourist needs, tourists are more likely to perceive their travel experiences favorably, leading in higher satisfaction. However, the direct relationship between AI-driven hyper-personalization and tourist loyalty was not statistically significant, leading to the rejection of H4. This finding indicates that personalization alone may be insufficient to directly generate loyal behaviors. Rather, tourists appear to develop loyalty only after personalized services have translated into meaningful experiences and positive evaluations. This result contributes to the growing literature suggesting that technology-driven service enhancements do not automatically produce loyalty outcomes unless they generate tangible experiential value for customers (Amin et al., 2025; Bujdoso et al., 2025).

A possible explanation for the insignificant direct relationship between AI-driven hyper-personalization and tourist loyalty is that tourists may not automatically perceive technologically advanced personalization as sufficient justification for developing long-term commitment toward destinations or tourism service providers. While AI systems can enhance convenience, efficiency, and decision quality, tourists may also have concerns about data privacy, algorithmic transparency, and the reliability of AI-generated recommendations. As a result, personalization alone may not generate loyalty unless it is accompanied by meaningful experiential benefits that reinforce positive evaluations and emotional connections. This interpretation is consistent with the mediation findings, which indicate that AI-driven hyper-personalization's influence on loyalty primarily flows through tourist engagement, memorable tourism experiences, and satisfaction. Consequently, the findings suggest that experiential value, rather than technological

sophistication, is the primary mechanism through which AI contributes to loyalty formation in tourism contexts.

The Role of Tourist Engagement in Shaping Experiences and Satisfaction

The results indicate that tourist engagement significantly influences both memorable tourism experiences and tourist satisfaction, supporting H5 and H6. These findings highlight the importance of active participation in the tourism experience. Tourists who engage more deeply with AI-supported services are likely to devote greater attention, emotional involvement, and cognitive effort to their travel activities, thereby enhancing the quality of their experiences. The positive effect of engagement on memorable tourism experiences supports prior research emphasizing the co-creative nature of tourism consumption (Amin et al., 2025; Chang et al., 2025). Engagement encourages tourists to interact more extensively with tourism services and destinations, increasing the likelihood of experiencing novelty, enjoyment, and personal meaning. These elements are widely recognized as fundamental dimensions of memorable tourism experiences. Similarly, the significant relationship between engagement and satisfaction suggests that actively involved tourists derive greater value from tourism services. This finding is consistent with previous studies arguing that customer engagement strengthens emotional attachment and improves overall service evaluations (Chang et al., 2025; Prasanna et al., 2025). In the context of AI-enabled tourism, engagement appears to function as an important mechanism through which personalized services create positive tourist outcomes.

Memorable Tourism Experiences as a Key Determinant of Satisfaction and Loyalty

The findings reveal that memorable tourism experiences positively influence both tourist satisfaction and tourist loyalty, supporting H7 and H8. Among the relationships examined in this study, memorable tourism experiences emerged as one of the most influential predictors of post-consumption outcomes. This result reinforces the long-standing argument that tourism is fundamentally an experiential industry in which customers evaluate destinations not only based on functional attributes but also on the quality of experiences accumulated during travel. The positive effect of memorable tourism experiences on satisfaction is consistent with previous studies emphasizing that meaningful and enjoyable experiences enhance tourists' overall evaluations of their trips (Marino-Romero et al., 2025; Paul & J, 2025). Experiences characterized by novelty, enjoyment, and personal significance are more likely to exceed tourists' expectations and elicit positive emotions, thereby increasing satisfaction.

Furthermore, the significant influence of memorable tourism experiences on loyalty confirms that memorable experiences contribute to long-term behavioral intentions. Tourists who retain positive memories of their travel experiences are more likely to revisit destinations, recommend them to others, and engage in positive word of mouth. This finding supports previous tourism studies that identify memorable experiences as a critical antecedent of destination loyalty and customer retention (Bujdoso et al., 2025; Marino-Romero et al., 2025).

Tourist Satisfaction and Loyalty Formation

The results further indicate that tourist satisfaction significantly influences tourist loyalty, supporting H9. This finding confirms one of the most established relationships in the tourism and service marketing literature: satisfied customers are more likely to develop favorable behavioral intentions toward tourism products and destinations. Satisfied tourists tend to perceive greater value from their travel experiences, resulting in stronger intentions to revisit destinations and recommend them to others. Within the context of this study, satisfaction functions as the final evaluative mechanism through which AI-enabled tourism services contribute to loyalty formation. The findings suggest that tourists do not become loyal merely because advanced technologies are available; rather, loyalty develops when those technologies successfully

improve travel experiences and meet or exceed tourists' expectations. Consequently, the effectiveness of AI-driven hyper-personalization should be evaluated not only through technological performance but also through its ability to enhance tourist satisfaction and experiential value. Overall, the findings provide empirical support for the Stimulus–Organism–Response (SOR) framework. AI-driven hyper-personalization acts as the stimulus that shapes tourists' internal states represented by engagement, memorable tourism experiences, and satisfaction, which subsequently influence loyalty outcomes. The results, therefore, demonstrate that the impact of AI technologies on tourist behavior operates primarily through experiential and psychological mechanisms rather than solely through direct effects.

Furthermore, the mediation analysis provides additional support for the proposed SOR framework by demonstrating that the effect of AI-driven hyper-personalization on tourist loyalty is largely indirect. The findings reveal that engagement, memorable tourism experiences, and satisfaction function as critical organismic mechanisms that transform technology-enabled personalization into favorable behavioral responses. This result reinforces the argument that tourists respond not merely to technological stimuli themselves but rather to the psychological and experiential value generated through those stimuli.

Theoretical Implications

This study contributes to the growing literature on artificial intelligence in tourism by extending the understanding of how AI-driven hyper-personalization influences tourists' post-consumption behaviors. While previous studies have predominantly focused on AI adoption, chatbot usage, service robots, and technology acceptance, the present study shifts attention toward tourism marketing outcomes by examining the relationships among AI-driven hyper-personalization, tourist engagement, memorable tourism experiences, tourist satisfaction, and tourist loyalty. In doing so, the study provides a more comprehensive explanation of how AI technologies create value for tourists beyond operational efficiency and service automation.

The findings also contribute to the tourism experience literature by highlighting the central role of tourist engagement and memorable tourism experiences in translating AI-enabled personalization into favorable behavioral outcomes. The insignificant direct effect of AI-driven hyper-personalization on tourist loyalty suggests that loyalty is not generated solely by technological capabilities. Instead, tourists develop loyalty when AI-supported services enhance engagement, create memorable experiences, and increase satisfaction. This finding enriches current discussions regarding the experiential mechanisms through which AI influences tourist behavior. More importantly, the study challenges the implicit assumption that technological sophistication automatically leads to customer loyalty. The findings demonstrate that the value of AI-driven personalization is realized primarily through tourists' experiential and evaluative processes, thereby positioning engagement, memorable tourism experiences, and satisfaction as critical explanatory mechanisms linking AI-enabled services to loyalty outcomes.

Furthermore, the study provides empirical support for the Stimulus–Organism–Response (SOR) framework within AI-enabled tourism contexts. The results demonstrate that AI-driven hyper-personalization functions as an external stimulus that influences tourists' internal psychological and experiential states, thereby shaping loyalty-related responses. Consequently, the study extends the applicability of the SOR framework to emerging digital tourism environments characterized by increasing integration of artificial intelligence technologies. Unlike previous applications of the SOR framework that primarily focused on traditional service environments or digital technology adoption, the present study demonstrates that AI-driven hyper-personalization influences tourist loyalty indirectly through multiple organismic mechanisms. This finding advances the theoretical understanding of how AI-enabled stimuli are transformed into behavioral responses and provides a more nuanced explanation of loyalty formation in contemporary tourism settings.

Practical Implications

The findings provide several practical implications for destination management organizations, tourism businesses, hotels, travel agencies, and digital tourism platforms. First, tourism organizations should move beyond basic AI implementation and focus on developing hyper-personalized services that dynamically respond to tourists' individual preferences and travel contexts. Personalized recommendations, adaptive itineraries, and context-aware travel assistance can significantly enhance tourist engagement and the quality of the travel experience. Second, tourism managers should recognize that technological sophistication alone is insufficient to generate customer loyalty. Investments in AI should focus on improving the overall tourist experience rather than merely increasing operational efficiency. AI applications should therefore be designed to facilitate meaningful interactions, enrich tourism experiences, and support tourists throughout the entire travel journey.

Third, destination marketers can leverage AI-powered personalization to strengthen customer relationships and encourage positive word of mouth. By delivering relevant and memorable experiences, tourism organizations can increase tourist satisfaction and foster long-term loyalty. These outcomes are particularly important in increasingly competitive tourism markets where customer retention and destination differentiation have become strategic priorities. Finally, developers of AI-enabled tourism platforms should prioritize user-centered design principles that enhance usability, personalization accuracy, and experiential value. The results suggest that the effectiveness of AI systems should be evaluated not only in terms of technological performance but also in terms of their contribution to memorable tourism experiences and customer satisfaction.

The findings further suggest that destination managers and tourism businesses should monitor tourists' perceptions of privacy, trust, and transparency when implementing AI-enabled personalization strategies. Although AI systems can improve service relevance and convenience, excessive reliance on automated recommendations may undermine perceived authenticity or raise concerns about the use of personal data. Consequently, organizations should adopt responsible AI practices that clearly communicate how tourist information is collected, processed, and utilized to enhance travel experiences. Such efforts may strengthen trust and increase tourists' willingness to engage with AI-supported services.

Moreover, the insignificant direct effect of AI-driven hyper-personalization on tourist loyalty suggests that managers should evaluate AI initiatives using experience-based performance indicators rather than relying solely on technology adoption metrics. Performance evaluation should include measures of tourist engagement, experience quality, satisfaction, and intention to recommend. By focusing on these experiential outcomes, tourism organizations can better understand whether AI investments are generating meaningful value and contributing to sustainable customer relationships.

CONCLUSION

This study investigated the influence of AI-driven hyper-personalization on tourist loyalty by examining the roles of tourist engagement, memorable tourism experiences, and tourist satisfaction. The findings indicate that AI-driven hyper-personalization significantly enhances tourist engagement, memorable tourism experiences, and tourist satisfaction. However, its direct influence on tourist loyalty was not statistically significant, suggesting that loyalty formation occurs primarily through experiential and evaluative mechanisms rather than through personalization alone. Furthermore, the mediation analysis revealed that the influence of AI-driven hyper-personalization on tourist loyalty is largely transmitted through engagement, memorable tourism experiences, and satisfaction. This finding underscores the importance of

understanding AI-enabled tourism services not merely as technological tools but as mechanisms that shape tourists' psychological and experiential evaluations.

The results further demonstrate that tourist engagement positively influences memorable tourism experiences and satisfaction, while memorable tourism experiences significantly contribute to both satisfaction and loyalty. Tourist satisfaction was also found to be a significant predictor of loyalty. Collectively, these findings confirm the importance of engagement, experience, and satisfaction in transforming AI-enabled personalization into favorable behavioral outcomes. From a theoretical perspective, the study extends the application of the Stimulus–Organism–Response (SOR) framework by demonstrating that AI-driven hyper-personalization influences tourist loyalty indirectly, via multiple organismic mechanisms rather than a direct pathway. The findings, therefore, contribute to a more nuanced understanding of loyalty formation in AI-enabled tourism environments. Overall, the study highlights the strategic importance of AI-driven hyper-personalization in contemporary tourism marketing and demonstrates that the effectiveness of AI technologies depends largely on their ability to create meaningful, memorable, and satisfying tourism experiences.

Limitations and Future Research Directions

Several limitations should be acknowledged. First, the study employed a cross-sectional design, which limits the ability to establish causal relationships over time. Future studies may adopt longitudinal approaches to examine changes in tourists' perceptions and behaviors as AI technologies continue to evolve. Second, the study focused on tourists who had previously used AI-assisted tourism services, which may limit the generalizability of the findings to broader tourist populations. Third, the research examined only five constructs and did not incorporate other potentially important variables such as trust, perceived intelligence, anthropomorphism, perceived usefulness, or technology readiness.

Future studies may extend the proposed framework by incorporating additional psychological and technological variables to provide a more comprehensive understanding of AI-enabled tourism experiences. Researchers may also examine different forms of artificial intelligence, including conversational AI, generative AI, virtual travel assistants, and service robots, to determine whether their impacts on tourist behavior differ across contexts. In addition, future studies should investigate the roles of privacy concerns, trust in AI, perceived transparency, and algorithmic fairness, as these factors may influence tourists' willingness to engage with AI-enabled tourism services and may further explain loyalty formation processes. Comparative studies across destinations, cultures, and tourism segments may further enhance understanding of how tourists respond to AI-driven personalization in diverse environments. In addition, future research could employ longitudinal designs or experimental approaches to examine the causal mechanisms by which AI technologies influence tourists' experiences and loyalty over time.

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