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An Artificial Intelligence-Based Smart Virtual Culture–Tourism Model: Integrating Tourism and Majalengka's SMEs to Enhance the Customer Delight Experience

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Abstract

Majalengka possesses substantial cultural, natural, and creative economy potential; however, its tourism development remains constrained by limited destination awareness, fragmented digital information, insufficient cultural narratives, and weak integration between tourist destinations and micro, small, and medium enterprises (MSMEs). This study aimed to design and conduct an initial validation of an artificial intelligence-based Smart Virtual Culture–Tourism model that integrates personalized tourism recommendations, virtual cultural content, and an MSME marketplace to enhance the Customer Delight Experience. The study employed a combination of Research and Development, Design Thinking, Co-Creation, R.A.I.S.E., and CRISP–DM approaches. Data were collected through interviews, focus group discussions, observations, document reviews, questionnaires, co-creation workshops, usability testing, and user validation involving tourism stakeholders, cultural communities, government agencies, MSME actors, and tourists. The findings revealed low initial cultural awareness (2.40) but a very high demand for personalized experiences (4.60). Prototype testing achieved task-success rates ranging from 80% to 100%, while validation results showed scores of 4.38 for Customer Delight Experience, 4.53 for destination brand awareness, 4.25 for engagement, 4.20 for AI feature quality, and 4.50 for marketplace and repeat intention. Users particularly valued route-based recommendations, cultural narratives, and nearby MSME discovery features. The model demonstrated preliminary conceptual and functional feasibility in strengthening destination identity, tourist engagement, and MSME market access; however, large-scale technical testing and causal validation are still required.

INTRODUCTION

Tourism and the creative economy are among Indonesia's strategic priorities for strengthening national competitiveness through cross-sector collaboration (Geohansa et al., 2025). Majalengka, which is rich in cultural heritage, natural resources, culinary traditions, handicrafts, and local practices, is supported by the presence of Kertajati International Airport. However, Majalengka's tourism development continues to face challenges, including limited

destination brand awareness, suboptimal digitization of cultural content, and the lack of integrated tourism platforms that connect destinations with micro, small, and medium enterprises (MSMEs) (Umam et al., 2025; Umam & Abdurokhim, 2024). Strengthening this sector requires the development of leading destinations, cultural preservation initiatives, and technology-driven MSME digitalization to establish a sustainable local economic foundation (Salindri et al., 2022). Digital transformation and technology integration are essential for creating an adaptive tourism ecosystem. However, existing promotional activities remain largely conventional, resulting in limited market reach and suboptimal contributions of the tourism sector to community welfare (Umam et al., 2025).

Majalengka's tourism sector remains limited in technological adoption, particularly due to the absence of an artificial intelligence (AI)-based platform that is immersive, personalized, interactive, and integrated with cultural narratives and MSME marketplaces. Therefore, the development of an AI-based Smart Tourism concept provides a potential solution for establishing a culture-based digital tourism model that can contribute to strengthening regional tourism development (Jaelani et al., 2024). This research focuses on designing an AI-based Smart Tourism model that integrates personalized tourism recommendations, digital cultural narratives, and MSME marketplaces within a unified digital ecosystem to create a Customer Delight Experience. The application of AI is expected to increase repeat visits, encourage repeat purchases, expand market access for Majalengka MSMEs, strengthen local cultural identity through the digitization of cultural narratives, and improve the competitiveness of Majalengka tourism at the national level.

Research on the development of integrated AI-supported digital tourism platforms connected with MSME marketplaces remains limited. Existing conditions indicate that no platform has optimally combined personalized travel recommendations, automated curation of MSME products, and virtual cultural experiences. This limitation may slow tourism growth, restrict MSME marketing opportunities, and reduce community participation. Therefore, the urgency of this research lies in mapping the conditions of tourism and MSMEs in Majalengka and designing an integrated AI-based Smart Tourism model. This model is expected to enhance destination brand awareness, expand MSME market access, create a Customer Delight Experience, and strengthen Majalengka's cultural identity as a competitive tourism destination at the national level (Sitanggang et al., 2022). The proposed problem-solving approaches include:

1. AI-based Smart Tourism as an ecosystem platform rather than merely a promotional website. This platform functions as an ecosystem coordinator that connects various stakeholders, including local governments, tourism actors, cultural communities, MSMEs, and tourists (Kapoor et al., 2021).
2. Personalizing AI-driven travel experiences through recommendation systems and contextual analytics to improve the relevance, satisfaction, and quality of tourism experiences. This approach addresses the limitations of conventional promotion by providing recommendations for tourism routes, cultural events, and MSME products based on tourist profiles, thereby creating a Customer Delight Experience (Lv et al., 2024).
3. Leveraging Generative Artificial Intelligence (GenAI) to accelerate destination content development and hyper-segmented promotional campaigns. GenAI functions

as a co-creator in producing cultural narratives, promotional materials, and personalized messages based on tourist personas efficiently and consistently, thereby strengthening destination brand awareness and Majalengka's tourism identity (Li et al., 2025).

4. Integrating tourism platforms with MSME marketplaces through an experience-to-commerce loop. AI connects tourism experiences and cultural narratives with product curation, bundling strategies, and recommendations for relevant MSME products, thereby encouraging repeat purchases and generating sustainable economic value for local stakeholders (Serra et al., 2025).

Digitalization and artificial intelligence (AI) are driving significant transformations in the tourism sector at both global and national levels. Various studies have shown that AI applications in tourism include personalized recommendations, virtual tourism experiences, travel chatbots, AI-driven storytelling, and automated service personalization, which have been demonstrated to improve tourist comfort and satisfaction. International studies have revealed that AI functions as a catalyst for improving destination efficiency, expanding access to information, and enriching travelers' emotional experiences (Díaz-Parra et al., 2023; Herrera et al., 2023; B. Singh et al., 2024; Traversa, 2024). Smart tourism has developed through the digitization of tourist villages, e-tourism platforms, and digital marketing initiatives. Community-based digital transformation plays an important role in developing tourism villages (Geohansa et al., 2025), while e-tourism has been shown to increase the visibility of regional tourism destinations (Sitanggang et al., 2022). However, existing implementations remain largely limited to basic digitalization and have not fully utilized AI capabilities for immersive personalization and cultural experiences. Similarly, studies on tourism-related MSMEs, including digital marketing and productivity enhancement strategies, have been widely conducted (Salindri et al., 2022; Umam et al., 2025; Umam & Abdurokhim, 2024). Nevertheless, these studies have not directly connected the MSME ecosystem with tourism experiences through AI integration. Previous research has primarily focused on digital marketing strategies and local-resource-based business models but has not comprehensively addressed the integration of culture and tourism within an immersive digital ecosystem (Salindri et al., 2022; Umam et al., 2025).

Global studies have demonstrated the potential of AI in enhancing virtual cultural experiences, AI-curated tourism routes, and immersive digital interactions (Altiarika et al., 2025; Burlov & Yakovlev, 2025; A. Singh, 2025; Varghese & Pratyusha, 2024). However, these studies have generally remained fragmented because they have focused on specific technological applications or individual destination components rather than integrating tourism, culture, and MSMEs within a comprehensive ecosystem. Several studies have examined AI applications in cultural and tourism contexts (B. Singh et al., 2024; Traversa, 2024), but limited research has specifically developed an ecosystem model that simultaneously integrates virtual culture, personalized smart tourism, and local MSME empowerment, particularly in destinations with strong cultural identities such as Majalengka. Therefore, a research gap exists in developing AI-based tourism models capable of combining virtual cultural experiences, AI-driven tourism personalization, and MSME product promotion within a single digital ecosystem. Furthermore, previous studies have generally emphasized tourist satisfaction but have paid limited attention to Customer Delight Experience as a strategic

indicator for improving destination competitiveness (Altiarika et al., 2025).

This research contributes a new framework that connects AI, local culture, and the creative economy within the context of smart tourism through conceptual development, methodological approaches, and practical implementation directions that have not been specifically developed in previous national and global studies. The novelty of this research lies in the AI-based Smart Virtual Culture–Tourism model and framework, which integrates local culture, tourism activities, and MSMEs into a unified digital ecosystem. This research also introduces Customer Delight Experience as an approach within culture-based Smart Tourism and formulates a model that positions Majalengka's cultural identity as a destination advantage and differentiating factor.

Conceptually, these novelty aspects are synthesized into a single model called the Integrated Smart Virtual Culture–Tourism Ecosystem (ISVCTE). This model represents the primary conceptual contribution of the research and distinguishes it from conventional integration studies involving AI, culture, and MSMEs. The ISVCTE model consists of six interconnected layers: (1) the AI Intelligence Layer, which includes recommendation engines, cultural chatbots, and content personalization engines; (2) the Cultural Knowledge Layer, which contains a knowledge base of local cultural and historical narratives validated by communities; (3) the Tourism Experience Layer, which provides virtual cultural experiences and tourism route maps; (4) the Marketplace Layer, which integrates MSME product catalogs and transactions with tourism experiences; (5) the Analytics Layer, which provides performance indicators such as delight, engagement, and repeat intention; and (6) the Governance Layer, which incorporates regulations, cross-agency data integration, ethical considerations, and data security mechanisms. Based on the ISVCTE model and the conceptual relationships among these layers, this study proposes four propositions as a foundation for future empirical testing of variable relationships:

P1: AI-based personalization within the AI Intelligence Layer enhances travelers' Customer Delight Experience.

P2: The presentation of virtual cultural narratives through the Cultural Knowledge Layer and Tourism Experience Layer strengthens destination brand awareness.

P3: The integration of MSME marketplaces into tourism experiences through the Marketplace Layer increases repeat purchases of MSME products.

P4: Customer Delight Experience formed through AI personalization and cultural narratives increases tourists' repeat visits to Majalengka destinations.

This research represents the initial stage of a roadmap for developing Smart Tourism Majalengka, which is planned to continue through subsequent stages involving multilocation adaptation, long-term validation, predictive optimization, and model replication and downstream implementation during 2024–2033. Therefore, this research aims to design and validate an initial conceptual model of an Artificial Intelligence-based Smart Virtual Culture–Tourism ecosystem that integrates tourism and Majalengka MSMEs to enhance Customer Delight Experience. The model is expected to serve as a scientific foundation for further research toward achieving higher levels of technological readiness.

METHOD

This study employed a combination of Research and Development (R&D), Design Thinking, Co-Creation, and a CRISP–DM-based AI model development process (Kaakandikar et al., 2025; Lee & Lim, 2018; Nava & Hernández, 2012), as illustrated in Figure 1. The research framework was organized into process stages, expected outputs, achievement indicators, and responsible parties for each research stage. Data were collected using 12 validated instruments, including in-depth interview guidelines, focus group discussion (FGD) guides, observation sheets, document review forms, traveler baseline questionnaires, co-creation workshop (MoSCoW) guides, usability testing sheets, user validation questionnaires, and expert validation sheets.

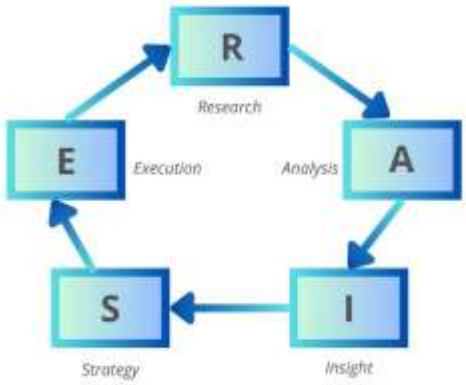


Figure 1. R.A.I.S.E Research Design Concept

The five frameworks were selected because they addressed complementary aspects of the research process. R&D provided the overall structure for model development, from initial investigation to dissemination; Design Thinking emphasized user needs as the basis for feature design; Co-Creation supported the validation and authenticity of cultural content through stakeholder involvement; R.A.I.S.E. translated field findings into strategic directions and feature priorities; and CRISP–DM guided the development of AI components. This integrated approach was appropriate for the research context, which involved multiple stakeholders, including government agencies, MSMEs, cultural communities, and tourists, while producing both an ecosystem/business model and a technical AI model. Therefore, methodological triangulation was applied to provide a more comprehensive research framework.



Figure 2. Research Method Flow Chart

The research began with market research which included literature studies related to AI Tourism, local culture, virtual culture, and MSMEs. Data collection was carried out through field observations, in-depth interviews, and Focus Group Discussions (FGD) with tourism actors, destination managers, MSMEs, cultural communities, and government agencies, using purposive sampling techniques. This stage results in an initial study, problem map, and user needs profile. The Analysis and Strategy Preparation stage uses the R.A.I.S.E (Research, Analysis, Insight, Strategy, Execution) approach in figure 2, this is done to produce directions for the development of an AI-based Smart Virtual Culture–Tourism model that is relevant, measurable, and in accordance with the needs of the tourism ecosystem and MSMEs in Majalengka.

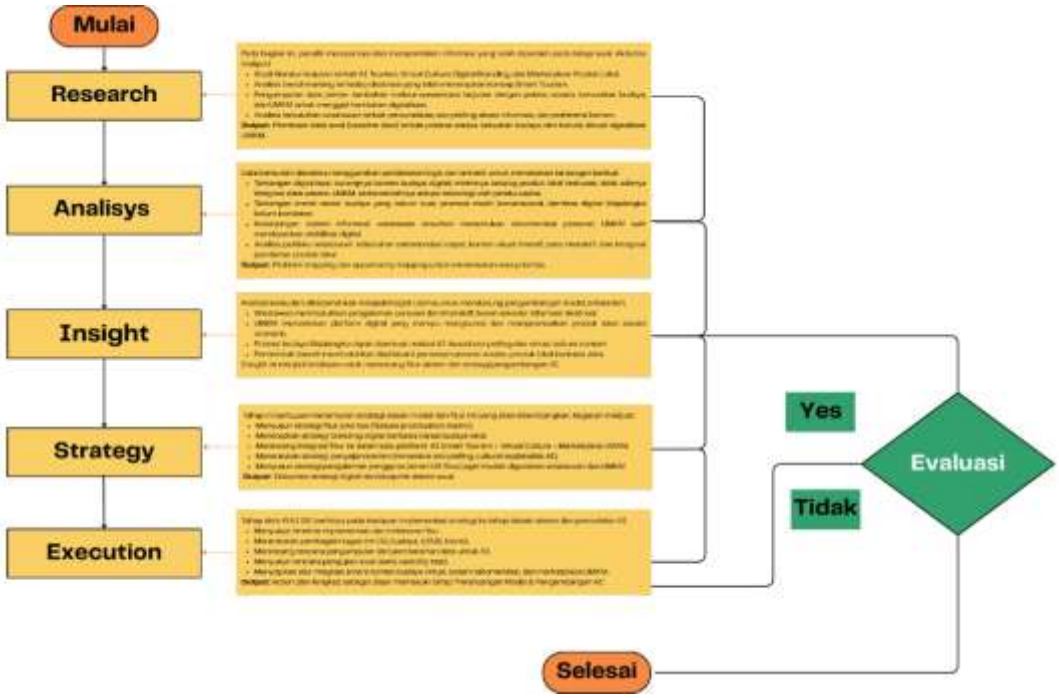


Figure 3. R.A.I.S.E Flowchart

Figure 3 illustrates the design of the model and system design using Design Thinking (empathize, define, ideate, prototype) and Co-Creation with local stakeholders. This stage produces a model architecture, core feature design (virtual culture, AI recommender, chatbot, marketplace), and a UI/UX prototype concept which is then tested through an Initial Usability Test.

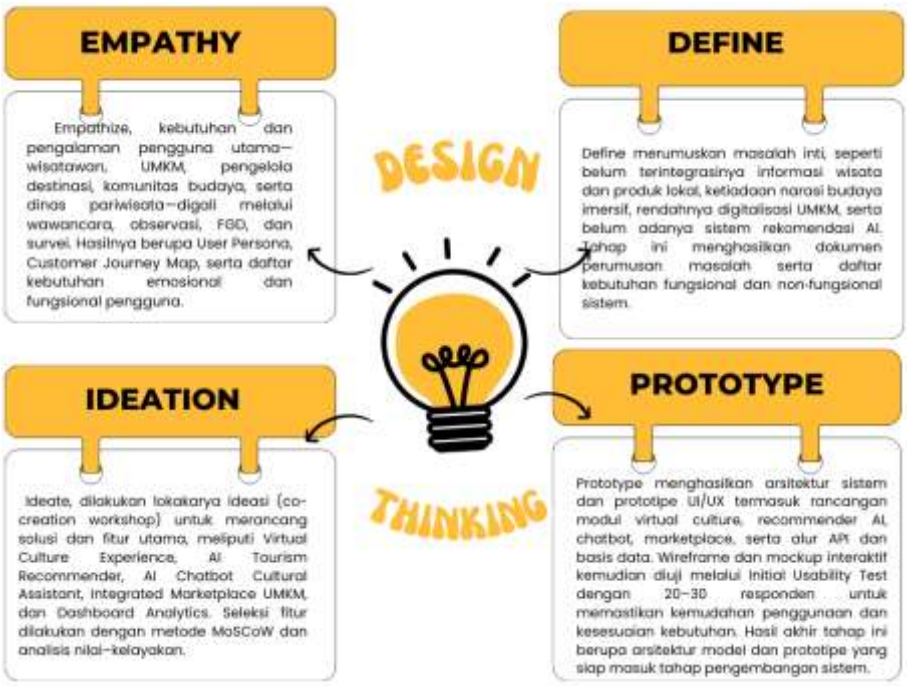


Figure 4. Design Thinking Stages

Figure 4 illustrates the development of AI models using the CRISP–DM framework which consists of business understanding, data understanding, data preparation, modeling, evaluation, and deployment. The developed model includes the Tourism Recommender System and the AI Chatbot Cultural Assistant.

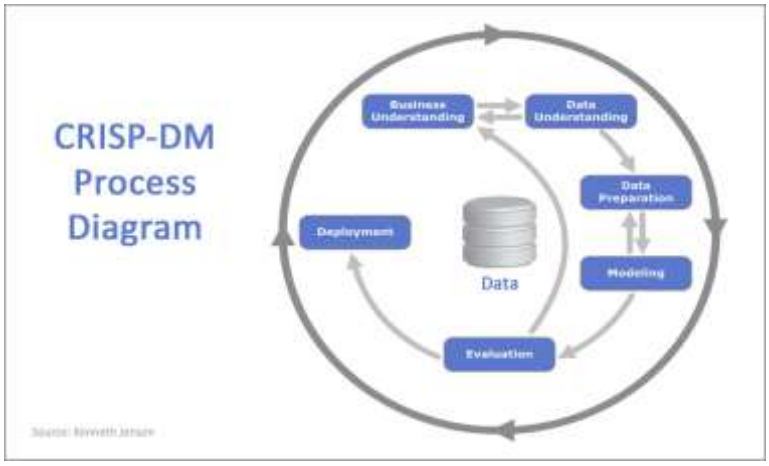


Figure 5. CRISP–DM Framework

The CRISP–DM framework was applied through six stages. The Business Understanding stage identified system requirements related to personalized tourism recommendations, cultural chatbots, and MSME content personalization. The Data Understanding stage involved collecting data on tourism destinations, cultural resources, tourist preferences, and MSME products. Data Preparation was conducted through data cleaning, coding, normalization, and feature processing. During the Modeling stage, the Tourism Recommender System and AI Cultural Chatbot were developed using recommendation techniques, natural language

processing (NLP), and machine learning methods. The Evaluation stage assessed model performance through accuracy, recommendation relevance, user satisfaction, and engagement, with an initial accuracy target of at least 70%. The Deployment stage integrated the developed model into the Smart Virtual Culture–Tourism platform prototype through an API and included end-to-end testing.

Because AI represented a core component of the proposed model, explainability considerations were incorporated during the conceptual development stage to ensure that recommendations were transparent and interpretable. The prototype design considered three approaches: (1) rule-based traceability, in which tourism recommendations and MSME product suggestions were accompanied by brief explanations based on factors such as route suitability, user interests, or location proximity; (2) balanced data curation during the Data Preparation stage to improve representation of natural tourism, cultural resources, and MSMEs across subdistricts and reduce potential bias toward highly promoted destinations; and (3) a user feedback mechanism within the Analytics Dashboard to support periodic evaluation of recommendation relevance and fairness. These approaches represented conceptual considerations that required further technical verification during subsequent production-level development.

User validation and usability testing were conducted through small-scale multilocation trials involving natural tourism destinations, cultural sites, and MSME centers (Prakasa & Ardiansyah, 2018). Measurements focused on destination brand awareness, engagement, Customer Delight Experience, and repeat intention. System refinement was conducted through AI model improvement, enhanced MSME marketplace integration, and the development of predictive modules (Firly, 2024). The finalization and dissemination stage included the preparation of the final model, policy recommendations, scientific publications, and research reports for further implementation.

This research methodology was designed at the conceptual model and prototype levels rather than for large-scale AI deployment. The integration of R&D, Design Thinking, Co-Creation, and CRISP–DM approaches was intended to validate the conceptual and functional feasibility of an AI-based Smart Virtual Culture–Tourism model. AI development was exploratory, and technical targets such as ≥70% accuracy were considered indicators of initial validation rather than final system performance claims. Qualitative data were analyzed thematically through data reduction, data presentation, and conclusion drawing, with findings validated through source and methodological triangulation. Quantitative data obtained from Likert-scale measurements were processed into mean scores and construct indices, which were interpreted based on category ranges. The content validity of the conceptual model was planned to be assessed using Aiken's V index (Aiken, 1985).

RESULTS AND DISCUSSION

Data collection at the Market Research stage and the validation stage was carried out using purposive sampling techniques for qualitative data and exploratory approaches for quantitative data. The total number of qualitative informants (Instruments 1-4) was 29 people. Interviews with five destination managers representing typologies of natural tourism, tourism tourism, tourism villages, historical/religious tourism, and accommodation show a consistent pattern: promotion relies heavily on visual content on social media, while cultural narratives

are barely digitally touched. The five informants expressed uniform expectations for AI features in the form of virtual historical narratives and recommendations for MSMEs on the visit route, a pattern that was also confirmed by field observations in ten destinations and MSME centers. The natural attraction and distribution of MSME points of sale is classified as "Exist", but the relationship between cultural narratives and local products is classified as "Absent".

Interviews with 15 MSME actors across the culinary, handicrafts, and ethnic fashion sectors revealed that the majority of MSMEs already have basic digital readiness in the form of social media and national marketplace accounts. However, the main obstacle lies in the connection with the tourism route and the market's trust in the authenticity of the cultural value of the product. The most widely expressed expectations are the cultural narrative that accompanies the product, location-based notifications, and pre-order mechanisms that are connected to the tour schedule, a need that is directly relevant to RM-2 regarding the expansion of MSME market access through AI.

In the cultural dimension, the community affirms five main narrative pillars that have the potential to be raised as virtual culture content, including terracotta art, local royal history, agrarian traditions, traditional dances, and legends of regional origin, as well as important notes on the maintenance of authenticity and ethical boundaries on sacred elements. Meanwhile, the four government agencies interviewed consistently identified ecosystem fragmentation and the absence of integrated data as key challenges, while also expressing readiness to support the model through regulation and cross-agency data integration. The secondary document review also confirmed the availability of MSME destination, cultural, and catalog data, but also confirmed the lack of tourist preference data and tourism–MSME value chain maps, gaps that directly validate the urgency of the Dashboard Analytics feature in the proposed model.

A baseline questionnaire of 50 travelers was used to compile the initial User Persona and Customer Journey Map. The demographic profile of the respondents is shown in Figure 6, showing that the respondent profile is dominated by the age group of 20–35 years old (70%) who come from Greater Jakarta (40%) and Greater Bandung (30%), with the majority looking for tourist information through social media (65%) and planning a spontaneous trip (45%).



Figure 6. Demographic Profile of Baseline Questionnaire Respondents (N = 50)

Based on table 1, the cultural awareness (brand awareness) of tourists is relatively low (2.40), while the interest in buying MSME products (4.20) and the need for personal experience (4.60) are very high. This is a gap that is the starting point for research.

Table 1. Baseline Score of Traveller's Initial Condition

Statement	Average	Interpretation
Getting to know the identity and cultural attraction of Majalengka	2,40	Low
Tourist information is easy to find digitally	3,40	Enough
Interested in buying local products/MSMEs while traveling	4,20	Height
Personal & effective experience is important to me	4,60	Very High

Source: Data processed, 2026

Thematic analysis of open-ended fillings revealed two dominant patterns of pain points: difficulty finding culinary or souvenirs along the way home (22 out of 50 responses) and destination information rated "just a good photo with no story/history" (15 out of 50 responses). In contrast, the most expected feature was the route-based intelligent recommendation (30 responses), which directly confirms the relevance of the AI Tourism Recommender feature as an answer to the real needs of tourists, rather than just the normative assumptions of the researcher.

The Focus Group Discussion involving 12 cross-sector participants agreed that the biggest problem point in tourist travel today is ecosystem fragmentation; Tourists tend to leave natural destinations immediately after taking pictures, without stopping at cultural narratives or MSME centers. The three points of agreement produced, namely ecosystem integration in one customer journey, AI orientation on hyper-local recommendations to encourage repeat purchases, and the obligation to validate cultural content with agencies and historical experts, were then processed through the R.A.I.S.E approach into the direction of the model development strategy, before being poured into the priority of features in the co-creation workshop using the MoSCoW method. The results of the feature prioritization are attached in Table 2, based on the results of the workshop agreed that the scope of the initial prototype was focused on three modules: the AI Tourism Recommender interface, the Integrated MSME Marketplace catalog and transactions, and the Virtual Culture Experience educational narrative page, while the development of the AI Chatbot Cultural Assistant was delayed (Won't Have for now) because the language model training for the local Sundanese dialect was considered too ambitious.

Table 2. Feature Prioritization Results (MoSCoW)

Candidate Features	Priorities	Notes–Eligibility
Virtual Culture Experience	*Should Have*	Crucial for cultural identity (RM-3), but content curation takes time
AI Tourism Recommender	*Must Have*	The ultimate solution for pain points for travelers' travel routes
AI Chatbot Cultural Assistant	*Won't Have* (currently)	Language model training for local dialects is still too ambitious for a prototype
Integrated MSME Marketplace	*Must Have*	Directly answering complaints about MSME market access (RM-2)
Content Personalization Engine	*Could Have*	The beta version simply uses rule-based recommendations
Dashboard Analytics	*Should Have*	It is urgently needed by local governments as a data-based policy instrument

Candidate Features	Priorities	Notes–Eligibility
Repeat Intention (loyalty/bundling) feature	*Could Have*	Third-party payment gateway integrations are not yet feasible for prototype scale

Source: Data processed, 2026

The Design Thinking stage produces a User Persona and Customer Journey Map based on the findings of Instruments 1–8, a document on the formulation of functional and non-functional needs, as well as a system architecture design and a UI/UX prototype (wireframe) which is then tested through an Initial Usability Test. The AI model is carried out at the conceptual level and the non-operational beta prototype follows the six stages of CRISP–DM, starting from the formulation of system requirements (business understanding) to the integration of the model concept into the prototype through APIs for end-to-end testing on a small scale (conceptual deployment). Since the position of this study is a conceptual baseline, the technical indicator figures, including the accuracy target ≥70%, have not been verified through production model testing and are positioned as a follow-up research agenda.

Table 3 describes the initial usability testing conducted on 30 respondents (20 tourists, 10 MSME actors) on an interactive mockup prototype that includes three modules from the workshop. The highest task success rate was achieved in the virtual culture module (100%), while the task interacting with the culture chatbot recorded the lowest success rate (80%), in line with MoSCoW's decision to delay the development of the feature entirely. The willingness to use the platform score when further developed (4.80) is the most prominent indicator of user acceptance.

Table 3. Prototype Usability Test Results (Task Success & Usability Score)

Aspects Tested	Results
Success of the task, finding travel recommendations	28/30 (93%), average 45 seconds
Task success, unlocking virtual culture content	30/30 (100%), 25 seconds average
Task success, ask a culture chatbot	24/30 (80%), 65 seconds average
Task success, tracing MSME products	29/30 (97%), average 50 seconds
Task success, save/mark favorites	27/30 (90%), 20-second average
Prototypes are easy to use	4.30 (Excellent)
The flow and menu feel clear and consistent	4.17 (Good)
Doesn't require much help	4.00 (Good)
Feel confident when using	4.13 (Good)
Willing to use if further developed	4.80 (Very High)

Source: Data processed, 2026

A small-scale multi-location test in three destinations (Terasering Panyaweuyan, Situ Cipanten, and Majalengka Kota) was conducted on 30 respondents to measure five constructs: Customer Delight Experience, Brand Awareness, Engagement, quality of AI features, and Marketplace & Repeat Intention. All constructs obtained interpretations of "Good" to "Very Good", with the highest score in the Brand Awareness construct (4.53) and the lowest score, although still relatively good, in the quality of AI features (4.20) which is consistent with the usability finding that the cultural chatbot feature still needs improvement. The results are shown in table 4 as follows:

Table 4. Score Recapitulation per User Validation Construct

Construct	Average Score	Interpretation
A. Customer Delight Experience	4,38	Excellent
B. Destination Brand Awareness (RM-3)	4,53	Excellent
C. Commitment	4,25	Excellent
D. Quality of AI Features	4,20	Good/Excellent
E. Marketplace & Repeat Intention (RM-2)	4,50	Excellent

Source: Data processed, 2026

Figure 7 illustrates a comparison of brand awareness scores before (2.40 at baseline) and after the use of the prototype (4.53) showing a large increase exploratively. It should be noted methodologically that this comparison is exploratory because it involves groups of respondents who are not identical between the baseline questionnaire and the validation questionnaire, so the increase in scores is an early indication of the potential impact of the model and not the results of a tightly controlled paired-test.



Figure 7. Comparison of Brand Awareness Scores Before and After Prototype Use

In the qualitative input section, the most memorable aspect for users is the appearance of local legend narratives along with travel recommendations, automatic souvenir recommendations according to the return route, and the ease of finding MSMEs around tourist sites. On the other hand, the most suggested aspects to be improved are the chatbot's response to slang terms or local Sundanese dialect, as well as the display of MSME product images in the marketplace that need to be enlarged and standardized.

Findings from interviews, observations, and baseline questionnaires consistently show the same pattern: tourists' cultural awareness is very low (2.40), while interest in personal experiences is very high (4.60). This gap is the empirical basis for the design of a Smart Virtual Culture–Tourism model that connects personal tourism recommendations, digital cultural narratives, and MSME marketplaces in one ecosystem (RM-1), as agreed at the FGD and realized in the priority of the MoSCoW feature. These findings strengthen the state-of-the-art argument that the use of AI for personalized recommendations and virtual cultural experiences can increase relevance and user satisfaction (Ferràs et al., 2019; Herrera et al., 2023; A. Singh, 2025; Varghese & Pratyusha, 2024). However, unlike these studies which tend to be partial on

one element of the destination, this study integrates the three elements, culture, tourism personalization, and MSMEs, in one model framework, in accordance with the novelty claimed in the Introduction section. The results of the usability and user validation tests provide an early indication that the integration is well received by users, with a delight score of 4.38 and willingness to use 4.80.

The high Customer Delight Experience score in this study is in line with the theory of customer delight which places delight as a positive emotional state that arises when the user experience surprisingly exceeds expectations, qualitatively different from just cognitive and evaluative satisfaction (Oliver, 1997). The element of surprise in this study is most prominent in the cultural narrative that automatically appears along with travel recommendations and souvenir recommendations, a finding that AI-based personalization, when combined with authentic local cultural content, is capable of generating experiences that go beyond mere functional recommendations, in line with the view that the presentation of cultural narratives digitally and immersively can enrich the traveller's experience emotionally (Díaz-Parra et al., 2023; May, 2024; B. Singh et al., 2024)

Mechanistically, the relationship between AI personalization and Customer Delight Experience in this model can be explained through a single conceptual cause-and-effect flow: AI-based personalization (AI Personalization) generates user emotional engagement through elements of surprise and content relevance; such emotional engagement then forms the Customer Delight Experience; that consistently encourages the formation of brand loyalty (Brand Loyalty); and loyalty in turn encourages repeat visits and repurchase of MSME products (Repeat Visit & Repeat Purchase). This flow is visualized in Figure 8, as follows:



Figure 8. The Flow of AI Personalization Mechanism to Customer Delight Experience Repeat Visit

This flow is consistent with the study's empirical scores: the quality of AI features (4.20) and user engagement (4.25) are in the early stages of the pipeline, followed by Customer Delight Experience score (4.38) as the midpoint, willingness to use (4.80) as an indication of initial loyalty, and the Marketplace & Repeat Intention construct score (4.50) which represents the final stage of the pipeline in the form of potential visits and repeat purchases. The gradual pattern of scores along this flow provides an early indication that the proposed conceptual mechanisms are in line with the field data, although statistical proof of causal relationships between variables (e.g. through structural equation modeling) still requires further research with larger samples and longitudinal measurement designs.

The MSME interview revealed a consistent need for features that connect the travel experience with product sales, from the cultural narrative that accompanies the product, location-based notifications, to pre-order mechanisms. The Integrated MSME Marketplace feature was designated as a Must Have at the MoSCoW workshop because it directly answered the market access constraints and user validation results recorded the second highest score in

the Marketplace & Repeat Intention construct (4.50). These findings provide an exploratory indication that the tourism-to-commerce loop has the potential to encourage repeat purchases according to RM-2, strengthening the literature on the role of value co-creation in the smart tourism ecosystem (Kapoor et al., 2021; Serra et al., 2025). As well as a study on digital marketing based on local resources for MSMEs (Umam et al., 2025; Umam & Abdurokhim, 2024). At the same time, it complements the study with a direct integration path to tourism experiences that have not been previously discussed.

Government agencies and cultural communities agree that weak digital narratives are the main cause of low destination brand awareness at the national level. The Brand Awareness construct score on user validation (4.53), the highest score among all the constructs tested, provides an early indication that virtual cultural narrative presentation can strengthen the identity of Majalengka's destination beyond just its natural tourism image, in line with the novelty of research that places Customer Delight Experience as a strategic indicator of competitiveness, not just conventional satisfaction, and is consistent with the findings that the integration of AI in tourism culture can strengthen the competitiveness of destinations (Altiarika et al., 2025; Burlov & Yakovlev, 2025; A. Singh, 2025).

The results of the Initial Usability Test showed a high task success rate (80–100%) and a good to very good usability score (4.00–4.80), which was the basis for the initial feasibility of the prototype to proceed to the development stage of the CRISP–DM-based AI model. Since the target of this study is in TKT 2–3, the feasibility assessment of the model construct formally through the Aiken's V index (Aiken, 1985), in Instrument 12 will complete the conclusions regarding the feasibility of the model at the next stage of the study. Overall, the data obtained from the eleven instruments that have been implemented are mutually reinforcing (triangulation) and provide preliminary evidence that the AI-based Smart Virtual Culture–Tourism model is worthy of further development, while still paying attention to the limitation that all technical performance figures at this stage are proof of concept indicators, not claims of the final performance of the system.

CONCLUSION

This study concluded that the proposed artificial intelligence (AI)-based Smart Virtual Culture–Tourism model was conceptually and functionally feasible for integrating Majalengka’s tourism resources, cultural narratives, and MSME marketplace within a unified digital ecosystem. The findings identified a substantial gap between tourists’ low initial cultural awareness (2.40) and their strong demand for personalized experiences (4.60). Prototype testing demonstrated high task-success rates ranging from 80% to 100%, a Customer Delight Experience score of 4.38, destination brand awareness of 4.53, marketplace and repeat intention of 4.50, and willingness to use the platform of 4.80. These results provided preliminary evidence that the integration of personalized tourism recommendations, authentic virtual cultural content, and MSME products could enhance tourist engagement, strengthen destination identity, and expand market opportunities for local MSMEs. However, these findings represented proof-of-concept evidence rather than confirmation of the system’s final technical performance or causal relationships.

Future research should focus on developing and deploying a fully operational prototype involving larger, more diverse, and geographically representative samples. Longitudinal or

experimental research designs should be employed to evaluate changes in destination brand awareness, Customer Delight Experience, repeat visits, and MSME purchases more rigorously. Further studies should also assess the AI model's accuracy, relevance, fairness, and explainability; improve the cultural chatbot's ability to recognize local expressions and Sundanese dialect variations; and validate cultural content through collaboration with local communities, government agencies, and historical experts. Advanced statistical approaches, such as structural equation modeling, may be applied to examine the relationships among AI personalization, emotional engagement, Customer Delight Experience, destination loyalty, and repeat intention. Finally, replication studies in other destinations are recommended to evaluate the model's adaptability, scalability, and long-term contribution to sustainable tourism development and local economic growth.

REFERENCES

Aiken, L. R. (1985). Three coefficients for analyzing the reliability and validity of ratings. *Educational and Psychological Measurement, 45*(1), 131–142. https://doi.org/10.1177/0013164485451012

Altiarika, E., Hikmawati, A., Fitriana, F., & Sari, W. P. (2025). SmartTourBabel: AI (artificial intelligence)-based tourism system development model to support creative economy and sustainable development in Bangka Belitung. *Jurnal Teknologi Informatika dan Komputer, 11*(1), 248–260.

Burlov, D. I., & Yakovlev, A. R. (2025). Using AI to personalize tourism experiences: The role of artificial intelligence in creating customised tourism products and services. *Èkonomika i upravlenie: Problemy, rešeniâ, 6/11*(159), 143–150. https://doi.org/10.36871/ek.up.p.r.2025.06.11.015

Díaz-Parra, O., Fuentes-Penna, A., Marroquín-Gutiérrez, F., Rodríguez-Lara, B. M., Salgado Ramírez, J. C., Trejo-Macotela, F. R., & Aguilar-Ortiz, J. (2023). Smart tourism (pp. 83–96). IGI Global.

Ferràs, X., Hitchen, E. L., Tarrats-Pons, E., & Arimany-Serrat, N. (2019). Smart tourism empowered by artificial intelligence. *Journal of Cases on Information Technology, 22*(1), 1–13. https://doi.org/10.4018/JCIT.2020010101

Firly, W. (2024). Transformasi pemasaran menggunakan kecerdasan buatan (AI) untuk mendorong kemajuan UMKM di Aceh Bireuen. *Jurnal Manajemen dan Bisnis, 3*(2), 181–192. https://doi.org/10.36490/jmdb.v3i2.1551

Geohansa, A., Sumarna, E., Nabhani, I., Akbar, G. G., Mulyaningsih, M., Ulumudin, A., Nadzri, F. A. A., & Fauzi, T. H. (2025). Community based smart tourism village through digital transformation of tourism villages in Bandung Regency. *International Journal of Research and Innovation in Social Science, IX*(VIII), 3875–3884. https://doi.org/10.47772/ijriss.2025.908000312

Herrera, A., Arroyo, Á., Jiménez, A., & Herrero, Á. (2023). Artificial intelligence as catalyst for the tourism sector: A literature review.

Jaelani, A. K., Luthviati, R. D., Siboy, A., Fatih, S. A., & Hayat, M. J. (2024). Artificial intelligence policy in promoting Indonesian tourism. *Volksgeist: Jurnal Ilmu Hukum dan Konstitusi*, 109–137. https://doi.org/10.24090/volksgeist.v7i1.10623

Kaakandikar, R., Shirude, R., Newase, S. S., & Ningule, S. N. (2025). Research development practices in innovation strategies for sustainable growth and competitive edge (pp. 201–246). https://doi.org/10.4018/979-8-3373-0812-8.ch008

Kapoor, K., Bigdeli, A. Z., Dwivedi, Y. K., Schroeder, A., Beltagui, A., & Baines, T. (2021). A socio-technical view of platform ecosystems: Systematic review and research agenda.

Journal of Business Research, 128, 94–108. https://doi.org/10.1016/j.jbusres.2021.01.060

Lee, S. M., & Lim, S. (2018). Design thinking. https://doi.org/10.1108/978-1-78756-713-920181008

Li, H., Xi, J., Hsu, C. H. C., Yu, B. X. B., & Zheng, X. (2025). Generative artificial intelligence in tourism management: An integrative review and roadmap for future research. *Tourism Management, 110*, 105179. https://doi.org/10.1016/j.tourman.2025.105179

Lv, L., Chen, S., Liu, G. G., & Benckendorff, P. (2024). Enhancing customers' life satisfaction through AI-powered personalized luxury recommendations in luxury tourism marketing. *International Journal of Hospitality Management, 123*, 103914. https://doi.org/10.1016/j.ijhm.2024.103914

Ma, S. (2024). Enhancing tourists' satisfaction: Leveraging artificial intelligence in the tourism sector. *Pacific International Journal, 7*(3), 89–98.

Nava, J., & Hernández, P. (2012). Optimization of a hybrid methodology (CRISP-DM) (pp. 1998–2020). IGI Global. https://doi.org/10.4018/978-1-4666-0297-7.ch014

Oliver, R. (1997). Customer delight: Foundations, findings, and managerial insight. *Journal of Retailing, 73*(3), 311–336. https://doi.org/10.1016/S0022-4359(97)90021-X

Prakasa, A. I. G., & Ardiansyah, F. (2018). Perancangan user experience aplikasi marketplace paket wisata Indonesia untuk wisatawan lokal. *5*(1), 51–60.

Salindri, Y. A., Sulistyo, A., Annisa, R. N., Hadianto, F., & Arifkusuma, M. B. (2022). Pemberdayaan UKM YAD Blangkon Yogyakarta melalui pemasaran berbasis digital sebagai upaya menembus pasar global. *JIPMI, 1*(4), 41–46.

Serra, P. V., Seabra, C., & Caldeira, A. (2025). Smart tourism ecosystem: From connectivity to value co-creation. *Communications in Computer and Information Science*, 379–387. https://doi.org/10.1007/978-3-031-83435-6_

Singh, A. (2025). Integrating artificial intelligence in enhancing cultural tourism experiences (pp. 23–40). IGI Global. https://doi.org/10.4018/979-8-3693-3196-5.ch002

Singh, B., Kaunert, C., & Lal, S. (2024). AI-driven solutions for virtual tourism. *Advances in Hospitality, Tourism and the Services Industry (AHTSI) Book Series*. https://doi.org/10.4018/979-8-3693-7388-0.ch002

Sitanggang, A. S., Yusuf, D. S., Aridho, M. A., Wijaya, P. S., S, R. T. B., & Nurhidayat, Y. (2022). Penggunaan e-tourism sebagai strategi mempromosikan pariwisata di Majalengka. *Altasia: Jurnal Pariwisata Indonesia, 4*(2), 52. https://doi.org/10.37253/altasia.v4i2.6782

Traversa, F. (2024). Artificial intelligence in tourism (pp. 567–570). Elsevier. https://doi.org/10.1016/B978-0-443-13701-3.00344-3

Umam, M. K. (2025a). *Fundamental & strategy digital marketing*. Greenbook Publisher.

Umam, M. K. (2025b). The effect of capital and licensing on the productivity of MSMEs with an innovative and proactive mindset as a mediating variable: A study on MSMEs in Majalengka Regency. *Return: Study of Management, Economic and Business, 4*(2), 152–164.

Umam, M. K., & Abdurokhim, S. (2024). The effect of capital and licensing on the productivity of UMKM in Majalengka Regency. *Winter Journal, 5*(2), 97–110.

Umam, M. K., Askarno, A., & Rochmansyah, B. N. (2025). Optimizing a local resource-based business model for the Gadod weaving industry: Increasing brand awareness and customer engagement. *Journal Research of Social Science, Economics and Management, 5*(4), 4165–4180. https://doi.org/10.59141/jrssem.v5i4.1176

Varghese, B., & Pratyusha, Y. B. V. L. (2024). Smart digital applications for new age tourism (pp. 172–185). IGI Global. https://doi.org/10.4018/979-8-3693-3743-1.ch008