JURNAL BAHASA, SASTRA DAN BUDAYA TAMADDUN LIFE
ISSN 0216 – 809X (Print)
ISSN 2685 – 4112 (Online)

Exploring the Potential Integration of Virtual Human-based Artificial Intelligence into the Marketing of Tourism Spots

Andi Anto Patak[1*], Muhammad Taufik Al Hakim Yaumi[2], Muhammad Yaumi[3]
[*]*Corresponding author: andiantopatak@unm.ac.id*
[1]Business English and Communication Department, Faculty of Languages and Literature, Universitas Negeri Makassar, Indonesia
[2]Universitas Handayani Makassar, Indonesia
[3]Universitas Islam Negeri Alauddin Makassar, Indonesia
DOI: https://10.33096/tamaddun.v24i2.1029

Received: 20 November 2025 **Accepted**: 9 December 2025 **Published**: 12 December 2025

Abstract

This study explores how virtual human-based artificial intelligence can be used to enhance the promotional strategies of tourism spots in Indonesia. As digital technologies rapidly evolve, these destinations need to adopt innovative solutions to enhance their appeal and sustainability. We examine the potential of integrating virtual human AI to enhance the image and promotion of these destinations on digital platforms, employing a qualitative approach. This involves analyzing case studies of several Indonesian tourism spots that have embraced digital technology for management and promotion. Data were gathered from various academic sources, including journals, research reports, and digital publications on digital technology in tourism. Our analysis highlights emerging trends, challenges, and opportunities for integrating virtual human AI into destination management and marketing. Virtual human AI can enhance visitor interactions by offering personalized and innovative experiences. It can also create compelling virtual representations, improve data management, and expedite decision-making in promotional strategies. Nonetheless, challenges such as infrastructure limitations and the need to raise awareness among tourism managers remain. This discussion offers valuable insights into how digital technology can help shape destination identity and attract more tourists, emphasizing the importance of building human resource capacity to make the most of these new tools. Ultimately, this research aims to serve as a helpful reference for developing technology-driven destination promotion in Indonesian tourism destinations.

Keywords: *Virtual human-based AI, Artificial Intelligence, Tourism marketing, tourism destinations.*

INTRODUCTION

In today's rapidly changing digital landscape, the integration of sophisticated technologies, particularly virtual human-based artificial intelligence, has emerged as a focal point across numerous industries, with tourism standing out prominently. In Indonesia, this is especially relevant in tourist villages, where the adoption of such advanced technology offers significant opportunities to enhance destination promotion. The infusion of digital technology into the tourism sector is not merely a trend but a vital catalyst for advancing the industry and strengthening the competitiveness of various locales (Fatema et al., 2024). By harnessing AI, particularly for curating personalized experiences for travelers, stakeholders find that customer interactions are more engaging and meaningful, ultimately leading to greater satisfaction and loyalty among visitors. The use of AI in digital promotion has become a significant research

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112

topic. AI has the potential to enhance the efficiency and effectiveness of tourism marketing strategies by personalizing traveler experiences and optimizing campaigns through big data analysis. AI enables destinations to understand traveler preferences better and develop more dynamic, relevant promotional strategies by leveraging real-time data.

A virtual human is an intricate digital representation of a person that resembles and behaves like a real individual across various digital environments (Neo et al., 2021). These sophisticated avatars are particularly valuable in tourism promotion, where they serve as engaging virtual ambassadors for travel destinations. By interacting with potential travelers in real time, virtual humans can deliver personalized information, answer questions, and passionately showcase local attractions, thereby creating a unique and immersive experience for users. Innovative projects like Spacemonkeys-ESB exemplify the fusion of artificial intelligence and animation, enabling the creation of compelling promotional media that aligns seamlessly with specific marketing goals and audience expectations. As the tourism industry increasingly embraces these digital representatives, destinations can captivate and inspire prospective visitors in ways that are both creative and impactful, making virtual humans a transformative tool in tourism marketing.

Artificial intelligence has transformed numerous facets of digital marketing, with a notable application in social media sentiment analysis, which reveals public perceptions of various tourist destinations (Graham & Stough, 2025). By leveraging AI technologies, tourism villages can adapt their promotional strategies in real-time, responding dynamically to shifts in consumer sentiment and emerging trends. This approach not only enhances tourist engagement but also enables the optimization of marketing campaigns to resonate more deeply with prospective visitors. Recent research highlights that AI-driven sentiment analysis provides more nuanced and precise insights into tourists' preferences and overall public sentiment toward specific destinations, enabling targeted efforts that align closely with travelers' interests and desires.

The potential for integrating virtual human-based artificial intelligence into tourism marketing is substantial, yet several significant challenges must be addressed to realize this vision (Cui & Liu, 2023a). A primary concern is the limited digital infrastructure present in many tourist villages, which can hinder the deployment of advanced technologies. Additionally, concerns about data privacy complicate matters, making stakeholders cautious about adopting such innovative solutions. Recent studies emphasize that outdated infrastructure and a lack of technological readiness in rural areas stand as formidable barriers to harnessing the full capabilities of virtual human-based artificial intelligence. However, with a proactive and collaborative approach that unites government entities, private sector innovators, and local communities, these obstacles can be systematically addressed. By pooling resources and expertise, it is possible to enhance access to technology, thereby enabling more effective and engaging digital promotion in these picturesque locales.

The incorporation of virtual human-based artificial intelligence into tourism promotion presents a significant opportunity for tourist villages across Indonesia to enhance their appeal and attract more visitors. By harnessing this cutting-edge technology, these villages can craft uniquely personalized and interactive experiences for travelers, transforming the way they engage with their surroundings. This innovation not only enriches the visitor experience but also fine-tunes marketing strategies to reach and resonate with a broader audience. Recent studies underscore the immense potential of digital technology to revolutionize the tourism sector, paving the way for more imaginative and immersive experiences that captivate the hearts and minds of travelers. This study explores both the positive impacts and the obstacles associated with adopting this technology. Therefore, this study proposes the following research question: “What are the positive impacts and the obstacles associated with adopting this technology in integrating virtual human-based AI into the marketing of tourism destinations?”

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112 (Online)

METHOD

This research employs a comprehensive literature review methodology to investigate the role of virtual human-based artificial intelligence in enhancing the experience of tourist destinations (Cui & Liu, 2023b), with a particular focus on the vibrant and diverse tourist villages of Indonesia. By systematically examining a range of scholarly journals, authoritative books, and relevant scientific articles published within the last five years, this study seeks to uncover the multifaceted applications and implications of this cutting-edge technology. The literature review approach has been selected as it enables researchers to delve deeply into a wealth of credible sources, facilitating a thorough exploration and analysis of how virtual human AI can innovate and transform the tourism sector in these culturally rich locales.

This study employed literature review steps by Washington State University (2025). The steps include developing a question, searching the literature, identifying peer-reviewed resources, managing results, analyzing the literature, and writing the review. The researchers identified relevant literature sources through the Scopus academic database. The primary focus was on journal articles discussing virtual human-based artificial intelligence and destination promotion strategies in the tourism sector. Selection was based on inclusion criteria, including documents published within the last five years that are relevant to the research topic, sourced from reputable journals and other highly relevant sources. After selecting the literature, a content analysis was conducted to identify main themes, concepts, and relationships between topics related to virtual human-based artificial intelligence in promoting tourist villages. This analysis was conducted using a thematic approach. Findings from the literature were synthesized to provide a comprehensive overview of the potential and challenges of implementing virtual human-based artificial intelligence to promote tourist villages.

This literature review offers a detailed exploration of the various ways technology can be utilized to elevate the competitiveness of tourist destinations. It delves into the transformative power of innovative solutions such as digital marketing, smart tourism applications, and data analytics in attracting visitors and enhancing their experiences. Additionally, the research emphasizes several critical factors that must be considered when implementing technology. These factors include the robustness of existing infrastructure, the engagement and involvement of the local community, and a strong commitment to environmental sustainability. Together, these elements contribute to a balanced and thriving tourism ecosystem that benefits all stakeholders.

FINDINGS AND DISCUSSION

The rapid evolution of information and communication technologies in the 21st century has driven profound transformations across numerous facets of everyday life, with the tourism sector among the most significantly affected. Among the remarkable advancements redefining this industry is the integration of sophisticated technology, specifically the utilization of virtual human-based artificial intelligence. This innovative approach not only amplifies the appeal of tourist attractions but also revitalizes tourism marketing and enriches the overall experience for travelers. Virtual humans, which are hyper-realistic digital avatars, function as captivating interfaces through which visitors can engage with the rich tapestry of local culture, history, and traditions (Hutson, 2024a). These lifelike representations enable tourists to participate in interactive virtual experiences that transcend geographical boundaries, offering them opportunities to converse with figures from local folklore or explore historical events through a personalized lens. Moreover, the seamless integration of artificial intelligence enables the collection and analysis of large datasets, yielding insights into consumer preferences and behaviors (Zong & Guan, 2025). This data-centric approach equips businesses with the tools needed to create tailored marketing strategies, optimize service offerings, and elevate customer satisfaction. As a result, the synergy of advanced technology and creativity is steering the

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112

tourism sector into an exhilarating new frontier, where the potential for exploration and connection is continuously expanding, offering travelers experiences that blend the digital with the deeply personal.

In Indonesia's archipelago, the rural tourism sector has emerged as a pivotal force, significantly contributing to local communities' livelihoods and serving as a vital driver of the regional economy (Utami et al., 2023). This flourishing sector has extraordinary potential to showcase the country's natural landscapes, unique cultural heritage, and age-old traditions. As the global tourism market becomes increasingly saturated and competitive, the adoption of cutting-edge technology in tourism marketing has shifted from a mere option to an urgent necessity. This research aims to analyze the role of virtual human-based artificial intelligence (AI) in the marketing strategies of rural tourism villages across Indonesia. By focusing on this innovative approach, we will explore its multifaceted positive impacts, identify the challenges associated with its implementation, assess the broader technological implications for the tourism industry, and offer actionable recommendations for future advancements.

Figure 1. The integration of virtual human-based AI into tourism marketing: impacts and obstacles.

A. Impact

The incorporation of virtual human-based artificial intelligence in promoting Indonesia's rural tourism villages presents a wealth of positive impacts, including:

Enhancement of Visitor Experience

One of the most compelling advantages of using virtual human artificial intelligence in tourism marketing is its transformative impact on visitor experiences (Carrasco-García et al., 2025). This cutting-edge technology enables highly engaging and realistic interactions between tourists and meticulously crafted digital avatars representing authentic local figures—such as traditional artisans, folklore storytellers, or historical characters from the area's rich past. For instance, visitors can immerse themselves in animated dialogues with these virtual personas, gaining insights into the intricacies of local craftsmanship, the significance of traditional festivals, or age-old customs that shape the community's identity. Such interactive experiences not only illuminate the destination's vibrant character but also serve as powerful storytelling tools, allowing tourists to delve deeper into the cultural heritage and social fabric of the tourist village. By creating these unique and memorable connections, virtual human-based AI transforms the typical sightseeing excursion into a multifaceted exploration, ultimately making the tourism experience more immersive, educational, and deeply personal for every visitor.

Furthermore, AI technology has the potential to enhance the personalization of the tourist experience significantly (Bronzin et al., 2021; Leka et al., 2025; Yang et al., 2024). By leveraging

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112 (Online)

data analytics from various applications and digital platforms, AI can curate tailored recommendations for tourists based on their individual preferences and interests. For instance, if a traveler expresses a preference for specific cuisines, the system can suggest local restaurants renowned for their signature dishes or immersive dining experiences. Similarly, for those seeking adventure, AI can identify and recommend breathtaking natural destinations, such as hidden waterfalls, scenic hiking trails, or serene beaches, that align with their preferred activities. Moreover, for tourists interested in local culture, AI can highlight unique craft workshops where they can engage in hands-on experiences, such as pottery making or traditional weaving. This tailored approach not only fosters a deeper connection between tourists and their surroundings but also enhances overall satisfaction. When travelers receive customized recommendations that align with their preferences, they are more likely to have memorable experiences, which can ultimately increase the likelihood of repeat visits to the tourist village. In this way, AI serves as a powerful tool in transforming ordinary travel into extraordinary adventures.

Marketing and Promotion Efficiency

AI significantly enhances marketing efficiency by leveraging advanced data analytics (Zong & Guan, 2025). By analyzing large datasets—commonly referred to as big data—AI can uncover intricate market trends, pinpoint tourist preferences, and discern behavioral patterns. This nuanced understanding enables the formulation of targeted marketing strategies tailored to specific audience segments. For instance, tourist villages that adopt AI can optimize their marketing expenditures by targeting the demographics with the highest potential for engagement, both within local communities and internationally. This strategic targeting not only minimizes wasteful spending but also maximizes the impact of marketing campaigns. Furthermore, the capabilities of big data enable these villages to access real-time insights, facilitating more rapid and accurate assessments of market demand and opportunities. By using AI-driven analytics, tourist villages can better adapt to shifting market dynamics and enhance their appeal to diverse tourist groups, ultimately improving visitor experiences and increasing revenue.

By integrating virtual human-based artificial intelligence into their digital marketing strategies, tourist villages can significantly enhance their contemporary appeal and modern image (Bhattacharya & Sharma, 2025). Utilizing digital characters in promotional videos and immersive virtual tours not only captivates viewers but also resonates particularly well with a younger audience that is increasingly adept with digital technology. This innovative approach serves as a powerful tool for engagement, allowing for a dynamic storytelling experience that showcases the unique attributes of each tourist village. Furthermore, adopting these advanced marketing techniques enables tourist villages to access an expansive international tourist market that has historically been difficult to penetrate due to budgetary constraints and limited marketing reach. By leveraging virtual characters, these villages can create engaging content that transcends geographical boundaries and effectively attract a diverse demographic of travelers (Chen, 2025). Ultimately, this strategy positions tourist villages to thrive in a competitive landscape, promoting not only visitation but also fostering a deeper connection with potential tourists worldwide.

Enhancement of Tourist Destination Competitiveness

The integration of cutting-edge technology into tourism marketing for tourist villages can significantly enhance their public perception, positioning them as innovative pioneers at the forefront of technological advancement. This transformation is not merely advantageous; it is essential for bolstering the competitive edge of tourist villages within an increasingly competitive and dynamic tourism landscape (Nag & Mishra, 2024). For instance, the implementation of virtual human-based artificial intelligence can create highly immersive experiences that invite potential visitors to engage with local culture in unprecedented ways (Allam et al., 2022a). Through vivid virtual tours, travelers can explore the scenic landscapes, historical landmarks,

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112

and hidden gems of a tourist village from the comfort of their homes. Accompanied by sophisticated AI-powered digital tour guides, these experiences can offer personalized narratives tailored to individual interests, enriching viewers' understanding and appreciation of the destination. Moreover, these interactive experiences provide a richer, more engaging, and contemporary alternative to traditional tourism marketing methods. By employing 360-degree video technology, augmented reality features, and live virtual interactions with residents, tourist villages can foster a deep emotional connection between potential visitors and the unique stories, traditions, and cultural heritage of each location. This innovative approach not only captivates the imagination of travelers but also positions tourist villages as must-visit destinations aligned with the latest advancements in technology and visitor engagement.

By embracing interactive and personalized engagement, innovative technology caters specifically to the unique preferences of Millennials and Generation Z travelers, who actively seek out distinctive and diverse travel experiences that resonate with their adventurous spirit. These tech-savvy generations are drawn to seamless experiences that combine convenience with authentic cultural immersion. Tourist villages that adopt cutting-edge advancements such as augmented reality guides, mobile apps that promote local events, or platforms for connecting with local artisans can significantly captivate this younger audience. Such technologies facilitate a deeper exploration of surroundings and enable travelers to curate their own itineraries based on their interests. By positioning themselves as forward-thinking destinations, these villages not only attract higher visitor numbers but also foster enhanced community engagement. This creates meaningful connections between travelers and locals, enabling genuine cultural exchange that benefits both parties. Ultimately, this strategic approach champions a more sustainable tourism model. It bolsters the local economy, supports small businesses, and ensures that the vibrant cultural tapestry of each destination is preserved for future generations. In this way, the integration of artificial intelligence not only enhance the travel experience but also reinforces the integrity and authenticity of local traditions and communities (Semwal et al., 2023).

Local Economic Development

The integration of virtual human-based artificial intelligence technology in tourism marketing presents a transformative opportunity for tourist villages, significantly amplifying their economic potential (Allam et al., 2022b). By utilizing this state-of-the-art technology, these villages can create highly engaging and personalized marketing campaigns that resonate with prospective visitors. Virtual humans, designed to simulate real interactions, can provide immersive storytelling experiences, showcase local culture, and highlight unique attractions, effectively capturing the attention of potential tourists. As these enhanced marketing strategies attract more visitors, local economies are poised for substantial growth. The influx of tourists is likely to increase demand for goods and services, thereby expanding employment opportunities and raising income levels within the community. This economic boost is not only beneficial for business owners; it can also play a vital role in enhancing residents' overall quality of life, ensuring the sustainability of community livelihoods, and preserving local traditions and heritage. Ultimately, the strategic application of virtual human-based AI in tourism marketing can foster a thriving ecosystem that supports both economic development and cultural vitality in these charming tourist villages.

The recent surge in visitor numbers not only generates significant direct economic benefits but also fosters a thriving ecosystem for the development of micro, small, and medium enterprises (MSMEs) within these vibrant tourist villages (Trupp et al., 2025). These enterprises, which typically comprise local artisans producing handcrafted goods, food vendors offering authentic regional delicacies, and hospitality services ranging from homestays to boutique hotels, are well positioned to prosper as demand for their unique offerings increases. This influx of tourism facilitates job creation across diverse sectors, thereby boosting employment opportunities for local residents and providing a sustainable income source for families. Consequently, enhanced economic activity revitalizes local economies, strengthens community

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112 (Online)

resilience, and promotes a richer cultural experience for visitors to these destinations.

Moreover, virtual human-based AI can streamline the marketing process and optimize information dissemination. Traditionally, many resource-limited tourist villages face significant challenges related to marketing and reaching wider audiences due to budgetary constraints. However, with AI-driven tools, these villages can conduct cost-effective campaigns and distribute promotional content more efficiently. This transformation could drastically reduce marketing costs and allow for more targeted outreach efforts, making it easier for potential visitors to discover and engage with the unique offerings of these destinations. In essence, the adoption of this technology not only mitigates existing barriers but also paves the way for sustainable growth and development in the tourism sector of rural communities.

Preservation of Local Culture

One of the most significant benefits of virtual human-based artificial intelligence lies in its extraordinary capacity to preserve and promote local culture (Mhlanga, 2022). Utilizing sophisticated digitization techniques, AI can meticulously capture and archive a diverse array of cultural elements, ranging from traditional art forms such as painting, sculpture, and crafts to various music genres, folk traditions, and oral histories. This initiative not only safeguards unique cultural identities but also enhances their visibility in a rapidly evolving digital landscape. By allowing these cultural expressions to be documented, showcased, and shared on global platforms, AI ensures that they can thrive alongside technological advancements rather than being overshadowed or forgotten. Furthermore, virtual human interfaces can facilitate interactive experiences that engage younger generations, fostering a deeper appreciation and understanding of their cultural heritage in an increasingly interconnected world.

Visitors have the opportunity to engage with digital manifestations of culture through intricate, immersive interactions with virtual characters. These avatars draw inspiration from notable local figures—historical heroes, contemporary leaders, or legendary characters deeply rooted in the community's folklore. Each AI-driven avatar is designed to personify specific traits, stories, and cultural practices, allowing visitors to connect with a local historical figures (Hutson, 2024b). As guests interact with these virtual entities, they can hear captivating stories that encapsulate the essence of traditions, explore the nuances of cultural practices, and witness performances of traditional art forms, such as virtual dance, music, or storytelling sessions. This multi-dimensional engagement offers a profound and enriching experience, drawing visitors deeper into the cultural landscape.

Moreover, this innovative approach extends beyond mere entertainment; it plays a pivotal role in preserving cultural heritage. By capturing and transmitting these rich traditions to future generations through technology, we ensure that they remain vibrant and authentic, free from the risks of dilution that often accompany rapid change. Ultimately, this harmonious blend of technology and culture not only enhances the learning experience but also cultivates a greater appreciation for diversity and the continuity of cultural expressions, fostering understanding and respect in an ever-changing global context.

Sustainable Tourism

Leveraging cutting-edge artificial intelligence technology for the analysis of tourist data empowers the management of tourism villages to adopt a more sustainable and responsible approach to tourism development. By harnessing comprehensive, data-driven insights, village managers can conduct detailed assessments of the environmental carrying capacity, which indicates the maximum number of visitors the local ecosystem can sustain without experiencing irreversible damage. This in-depth analysis facilitates the effective regulation of visitor numbers, thus safeguarding vital ecological processes and preventing habitat degradation. Through advanced predictive modeling, village managers can identify peak visitation periods and implement visitor management strategies, thereby ensuring that the delicate balance of the local

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112

ecosystem remains intact while preserving the area's rich cultural heritage. Furthermore, by engaging local communities in decision-making and promoting environmentally friendly practices, tourism villages can foster a sustainable tourism model that benefits both visitors and residents (Utami et al., 2023).

The application of artificial intelligence (AI) extends beyond enhancing traditional marketing strategies; it plays a pivotal role in advancing sustainable and responsible tourism practices (Fatema et al., 2024). By harnessing sophisticated algorithms and machine learning techniques, AI can analyze an extensive range of data sources, including social media trends, economic indicators, and environmental factors, to predict emerging tourism trends. Furthermore, AI tools can monitor and interpret visitor behavior in real time, enabling a comprehensive understanding of traveler preferences and activities. With this wealth of data, tourism management can develop informed and strategic plans that not only enhance the overall visitor experience but also prioritize environmental stewardship. For instance, AI can help identify peak tourism periods, enabling destinations to optimize resources and reduce overcrowding. Additionally, it can provide insights into sustainable practices, such as recommending eco-friendly accommodations or activities that minimize ecological footprints. By integrating AI into tourism planning and operations, stakeholders can create a more sustainable framework that benefits both travelers and the ecosystems they engage with. This proactive approach ensures that tourism development aligns with both economic growth and environmental conservation, fostering a healthier relationship between visitors and the destinations they explore.

For instance, AI tools can optimize resource allocation by analyzing when and where visitors are most likely to congregate, thereby enabling better crowd management and reducing environmental impact. Additionally, by understanding visitor preferences and patterns, tourism operators can tailor offerings that are not only appealing but also environmentally responsible, for example by promoting off-peak travel or eco-friendly activities. This holistic and proactive approach serves a dual purpose: it protects natural resources. It maintains the integrity of local communities while simultaneously fostering the long-term viability of the tourism sector within the village. By prioritizing sustainable practices, communities can ensure that their cultural heritage and natural landscapes are preserved for future generations while still reaping the economic benefits of tourism.

B. Obstacles

In addition, there are challenges in implementing virtual human-based artificial intelligence in the marketing of Indonesian tourism villages:

Limited Infrastructure and Technology Access

One of the primary challenges in implementing virtual human-based artificial intelligence (AI) in Indonesian tourist villages is the significant inadequacy of technology infrastructure. A considerable number of these villages struggle with unreliable access to high-speed and stable internet connections(Kartiasih et al., 2023)—an essential requirement for the seamless operation of advanced AI technologies. This technological deficit is not limited to internet connectivity; it also includes a shortage of the necessary hardware and software components required to support virtual human-based AI applications. Many villages lack computers with sufficient processing power, high-performance servers, and up-to-date software capable of handling the sophisticated algorithms and data-intensive tasks inherent in AI.

Furthermore, the limitations posed by unreliable local power supply and inadequate maintenance services significantly compound these challenges, making it increasingly difficult to maintain the necessary technological infrastructure. These issues hinder the sustainability of advanced systems that are crucial for enhancing the tourism experience. Additionally, the absence of comprehensive training and skill-development programs for local residents impedes

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112 (Online)

the effective adoption and use of these advanced technologies. This gap limits the community's ability to fully engage with and benefit from innovations designed to enhance its tourism offerings. Therefore, addressing these pressing infrastructure deficiencies is imperative for the successful integration of virtual human-based AI technologies. Such advancements hold the potential to dramatically enhance the tourism experience in these Indonesian villages, ultimately fostering economic growth and community development.

The lack of essential technological infrastructure significantly hinders tourist villages' capacity to utilize and benefit from innovative solutions fully (Kusumastuti et al., 2024; Xiao et al., 2025a). These rural destinations face challenges in competing with more advanced tourist destinations that have effectively integrated cutting-edge technologies into their offerings. Without substantial enhancements in both internet connectivity and the availability of necessary hardware, the potential of virtual human-based AI applications remains largely untapped. This limitation not only restrains the growth of these tourist villages but also diminishes their overall attractiveness to potential visitors in Indonesia. Consequently, there is an urgent need to invest in infrastructure to foster a more competitive environment, enabling these destinations to thrive in an increasingly digital world and better meet the evolving expectations of tourists.

Limited Trained Human Resources

The successful implementation of virtual human-based artificial intelligence (AI) requires a high level of technical expertise, particularly in data management, algorithm development, and the operation of sophisticated technological systems (Cui & Liu, 2023c; Goos & Savona, 2024). This presents a significant challenge in many tourist villages, where there is often a notable shortage of adequately trained personnel equipped with the requisite skills to leverage this cutting-edge technology effectively. Frequently, managers who oversee operations in these tourist villages, as well as members of the local communities, may lack a comprehensive understanding of digital infrastructure and AI applications necessary to realize the potential benefits of these innovations fully. This knowledge gap can impede the integration of AI solutions, limiting their effectiveness and preventing the realization of their potential to enhance visitor experiences, optimize operational efficiency, and drive economic growth within these communities. Therefore, addressing the skills gap through targeted training and educational programs becomes essential for the successful adoption of virtual human-based AI in these environments.

To effectively address the existing skills gap, it is essential to establish comprehensive training programs that are specifically designed for community members and village managers. These programs should prioritize not only the foundational principles of operating and maintaining artificial intelligence technologies, but also delve into advanced topics such as data analysis techniques, user interface navigation strategies, and effective troubleshooting methods. A well-rounded curriculum could include modules on machine learning basics, predictive analytics, and ethical considerations in AI usage. Additionally, hands-on training workshops would provide participants with the opportunity to engage with AI tools in real-world scenarios, enabling them to apply theoretical knowledge in practice.

To further enhance learning outcomes, it is essential to implement robust ongoing support systems that include structured mentorship programs and comprehensive access to a wide array of online resources. These initiatives should aim to create a vibrant and continuous learning environment that caters to the diverse needs of individuals. By equipping participants with both advanced technical skills and a strong sense of confidence, we can ensure they are proficient in utilizing cutting-edge virtual human-based AI technologies. Such empowerment will not only improve their technical capabilities but also foster innovative thinking and problem-solving skills. This holistic approach will, in turn, lead to significant improvements in operational efficiency within their tourist villages. As these villages adopt and integrate these technologies,

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112

they will be able to streamline processes, enhance customer service, and offer unique, personalized experiences to visitors (Suanpang et al., 2024). Ultimately, these enhancements will make the tourist villages more attractive destinations, capable of captivating a broader audience and enriching the overall visitor experience.

Resistance to Change and Traditional Habits

While technology holds significant promise for enhancing various aspects of rural tourism, many communities that depend on this industry continue to rely heavily on traditional methods of destination management (Ningrum & Abdullah, 2025; Wahyuningrat & Harsanto, 2025; Xiao et al., 2025b). This reliance is deeply rooted in a commitment to preserving local culture, heritage, and authenticity. These communities often have unique cultural practices, traditional crafts, and historical narratives that they strive to maintain and share with visitors. There is, however, growing apprehension that the introduction of advanced technologies, particularly those involving virtual human-based artificial intelligence and digital experiences, could fundamentally disrupt the essence of these time-honored traditions. For example, the use of AI-driven guides or virtual reality experiences might offer a convenient way for tourists to engage with local culture, but they could also risk diluting the very authenticity that makes these experiences valuable. Communities may fear that reliance on technology will overshadow personal interactions, storytelling, and the intimate connections that arise from direct engagement with local heritage and its custodians. As such, striking a balance between technological integration and the preservation of cultural authenticity remains a critical challenge for rural tourism stakeholders.

Consequently, the process of integrating new technologies into rural tourism must be approached with meticulous attention to detail and a profound awareness of the cultural values and historical narratives integral to the community's identity (Xiao et al., 2025c; Yanan et al., 2024). It is imperative to engage with local stakeholders—such as community leaders, artisans, and residents—to gain a comprehensive understanding of their perspectives, concerns, and aspirations regarding technological advancements. If community members perceive these innovations as a threat to their cultural heritage, they are likely to resist implementation, fearing a detrimental impact on their traditions, social practices, and authenticity.

To foster trust and cooperation, it is essential to facilitate open dialogue in which community voices are prioritized and their insights are genuinely considered. This engagement not only aids in identifying potential risks but also highlights opportunities for aligning technology with community aspirations. For instance, incorporating technologies that enhance local craftsmanship or promote cultural storytelling can enrich the tourist experience without undermining the community's heritage. Therefore, adopting a balanced approach that harmonizes technological advancements with the preservation of cultural integrity is crucial. This ensures that rural tourism development is not only economically sustainable but also respects and enhances the community's unique cultural identity. By doing so, it can contribute to a more inclusive and resilient tourism model that honors local traditions while embracing the benefits of modernity.

Discussion

The literature indicates that virtual human–based AI is emerging as a practical “front-stage” interface for tourism marketing, particularly as destinations move from conventional social-media promotion toward AI-augmented and immersive engagement journeys. Recent work on digital tourism marketing highlights that AI, immersive media, and metaverse-oriented touchpoints are increasingly positioned as core instruments for destination branding, customer engagement, and experience co-creation rather than as add-on communication channels (Christou, 2025).

A key implication for tourism villages is the potential of virtual humans to enhance the

This is an open access article distributed under the Creative Commons Attribution 4.0 International

perceived quality of the visitor experience by improving informativeness and interactivity, two dimensions consistently associated with stronger destination experiences and evaluations in smart-destination research. Meta-analytic evidence suggests that technology-enhanced tourism experiences tend to benefit when information is timely, relevant, and delivered through interactive formats that reduce visitor effort and uncertainty (Buhalis, et al., 2023). In parallel, tourism and hospitality studies on conversational agents show that humanlike cues (e.g., anthropomorphism, social presence) can increase adoption intentions, but only when they also signal competence and usefulness meaning that "human-likeness" alone is not sufficient without credible service performance (Sustacha et al., 2023)

Beyond experience support, the marketing value of virtual humans becomes clearer when viewed through meaning-transfer and persuasion mechanisms. Evidence from destination marketing research shows that digital human influencers can shape marketing effectiveness through both affective and cognitive pathways (i.e., emotions/liking and information-based evaluation), and that congruence between the influencer and the destination strengthens these effects. This supports the argument that virtual humans can do more than "present information": they can actively build destination imagery and persuasion if their persona, narrative role, and cultural fit are designed strategically (Huang et al., 2025).

At the same time, the literature flags a central tension for tourism villages: technology-enabled visibility can create an authenticity trade-off. Systematic evidence in cultural tourism suggests that digital and social media environments may privilege engagement-optimized content over culturally accurate representations, producing risks of simplification, performative "staging," or algorithm-driven distortions of heritage narratives (Manlee & Kasemsarn, 2025). For tourism villages where community identity and living culture are the core asset virtual humans should therefore be co-designed with local stakeholders, grounded in community-approved scripts, and aligned with heritage values to avoid commodification and misrepresentation (Cai et al., 2022).

Implementation feasibility remains a decisive constraint. Evidence from Indonesia's tourism-village context shows uneven digital readiness across villages, commonly limited by infrastructure (internet/signal/electricity), digital literacy and human capital, investment capacity, and governance readiness (Rismayani et al., 2025). This matters because virtual human deployment typically requires stable connectivity (or robust offline alternatives), continuous content updates, and operational governance (data handling, access control, accountability). In settings where readiness remains partial, phased adoption (starting from lightweight AI-assisted content and guided interactions, then scaling toward richer virtual human deployment) is more realistic than immediate full-scale transformation.

Finally, governance and ethics must be treated as part of the design, not as an afterthought particularly when systems collect visitor data, personalize content, or simulate humanlike identities. International AI-ethics standards emphasize transparency, fairness, human oversight, and robust data governance; these principles translate in tourism villages into practical requirements such as clear disclosure that visitors are interacting with AI, consent-based data practices, culturally safe content policies, and community review mechanisms for narratives representing local heritage. Future research is strongly encouraged to test virtual human interventions through field experiments and longitudinal studies (e.g., impacts on visit intention, satisfaction, learning, and local economic outcomes), while also evaluating risks (misrepresentation, bias, privacy concerns) under real operational conditions (UNESCO, 2021).

CONCLUSION

The use of virtual human-based artificial intelligence in the marketing of Indonesian tourist villages has a significant impact, including enhancing tourist experiences, improving marketing efficiency, and supporting local economic development and cultural preservation.

This is an open access article distributed under the Creative Commons Attribution 4.0 International

ISSN 0216 – 809X (Print)
ISSN 2685 – 4112

Virtual human-based AI technology enables more personal and immersive interactions between tourists and local culture, while AI assists in analyzing data to create experiences tailored to visitors' preferences. With this technology, tourist villages can increase their attractiveness and competitiveness in an increasingly competitive tourism market.

However, implementing this technology faces challenges, including limited infrastructure in tourist villages, a lack of trained personnel to operate it, and resistance to change within more traditional tourism management. Therefore, to support the successful implementation of this technology, collaboration among stakeholders including government, academia, and the private sector is necessary to develop affordable and accessible solutions for all parties. Further research is needed to explore the long-term impacts of using virtual human-based AI on the development of village tourism, including economic, social, and cultural aspects. This research can also examine how this technology influences tourist behavior and how local communities can adapt to these changes.

The government and related agencies should accelerate the development of technological infrastructure in tourist villages, including the provision of high-speed, affordable internet access and the necessary devices to implement human-like AI. Training programs for village tourism managers and local communities should also be expanded to ensure effective and beneficial adoption of technology. Tourism village managers, the government, academia, and technology companies need to collaborate to develop user-friendly, affordable technological solutions for tourist villages. This collaboration is crucial to ensure that technology implementation benefits not just one party but also empowers local communities comprehensively.

REFERENCES

Allam, Z., Sharifi, A., Bibri, S. E., Jones, D. S., & Krogstie, J. (2022a). The metaverse as a virtual form of smart cities: Opportunities and challenges for environmental, economic, and social sustainability in urban futures. *Smart Cities*, *5*(3), 771–801.

Allam, Z., Sharifi, A., Bibri, S. E., Jones, D. S., & Krogstie, J. (2022b). The metaverse as a virtual form of smart cities: Opportunities and challenges for environmental, economic, and social sustainability in urban futures. *Smart Cities*, *5*(3), 771–801.

Bhattacharya, A., & Sharma, S. (2025). AI and Metaverse ROI in Tourism: Measuring Impact, Effectiveness, and Return on Investment (ROI). In *Redefining Tourism With AI and the Metaverse* (pp. 1–84). IGI Global Scientific Publishing.

Bronzin, T., Prole, B., Stipić, A., & Pap, K. (2021). Artificial Intelligence (AI) brings enhanced personalized user experience. *2021 44th International Convention on Information, Communication and Electronic Technology (MIPRO)*, 1070–1075.

Buhalis, D., Leung, R., & Lin, M. (2023). Metaverse as a disruptive technology revolutionising tourism management and marketing. Tourism Management, 97, 104724. doi:10.1016/j.tourman.2023.104724

Cai, D., Li, H., & Law, R. (2022). Anthropomorphism and OTA chatbot adoption: A mixed methods study. Journal of Travel & Tourism Marketing, 39(2), 228–255. doi:10.1080/10548408.2022.2061672

Carrasco-García, P.-M., Polo-Peña, A.-I., & Frías-Jamilena, D.-M. (2025). Can artificial intelligence-supported virtual tourist experiences improve tourist wellbeing? *Tourism Recreation Research*, 1–19.

Chen, Z. (2025). Beyond boundaries: exploring the Metaverse in tourism. *International Journal of Contemporary Hospitality Management*, *37*(4), 1257–1275. https://doi.org/10.1108/IJCHM-06-2023-0900

Christou, E. (2025). The evolution of digital tourism marketing: From hashtags to AI-immersive journeys in the metaverse era. Sustainability, 17(13), 6016. doi:10.3390/su17136016

Cui, L., & Liu, J. (2023a). Virtual human: A comprehensive survey on academic and applications.

This is an open access article distributed under the Creative Commons Attribution 4.0 International

IEEE Access, *11*, 123830–123845.

Cui, L., & Liu, J. (2023b). Virtual human: A comprehensive survey on academic and applications. *IEEE Access*, *11*, 123830–123845.

Cui, L., & Liu, J. (2023c). Virtual human: A comprehensive survey on academic and applications. *IEEE Access*, *11*, 123830–123845.

Fatema, K., Sinnappan, P., Meng, C. S., & Watabe, M. (2024). Technological advancements and innovations in the tourism industry: driving sustainable tourism. In *The need for sustainable tourism in an era of global climate change: Pathway to a greener future* (pp. 121–149). Emerald Publishing Limited.

Goos, M., & Savona, M. (2024). The governance of artificial intelligence: Harnessing opportunities and mitigating challenges. In *Research Policy* (Vol. 53, Issue 3, p. 104928). Elsevier.

Graham, C., & Stough, R. (2025). Consumer perceptions of AI chatbots on Twitter (X) and Reddit: an analysis of social media sentiment and interactive marketing strategies. *Journal of Research in Interactive Marketing*.

Huang, D., So, K. K. F., Huang, J., & Huang, S. S. (2025). Exploring the attractiveness of digital human influencers in destination marketing: The allure of two-path meaning transfer. Tourism Management, 110, 105166. doi:10.1016/j.tourman.2025.105166

Hutson, J. (2024a). Combining large language models and immersive technologies to represent cultural heritage in the metaverse context. In *Augmented and Virtual Reality in the Metaverse* (pp. 265–281). Springer.

Hutson, J. (2024b). Combining large language models and immersive technologies to represent cultural heritage in the metaverse context. In *Augmented and Virtual Reality in the Metaverse* (pp. 265–281). Springer.

Kartiasih, F., Djalal Nachrowi, N., Wisana, I. D. G. K., & Handayani, D. (2023). Inequalities of Indonesia's regional digital development and its association with socioeconomic characteristics: a spatial and multivariate analysis. *Information Technology for Development*, *29*(2–3), 299–328.

Kusumastuti, H., Pranita, D., Viendyasari, M., Rasul, M. S., & Sarjana, S. (2024). Leveraging local value in a post-smart tourism village to encourage sustainable tourism. *Sustainability*, *16*(2), 873.

Leka, E., Aliti, A., Lamani, L., & Hoxha, E. (2025). The role of artificial intelligence in transforming tourism: Enhancing personalization, engagement, and sustainability. *2025 MIPRO 48th ICT and Electronics Convention*, 1–8.

Manlee, N., & Kasemsarn, K. (2025). The authenticity challenge in digital and social media in cultural tourism: A systematic literature review. Heritage, 8(11), 478. doi:10.3390/heritage8110478

Mhlanga, D. (2022). Human-centered artificial intelligence: The superlative approach to achieve sustainable development goals in the fourth industrial revolution. *Sustainability*, *14*(13), 7804.

Nag, A., & Mishra, S. (2024). Sustainable competitive advantage in heritage tourism: Leveraging cultural legacy in a data-driven world. In *Review of technologies and disruptive business strategies* (Vol. 3, pp. 137–162). Emerald Publishing Limited.

Neo, J. R. J., Won, A. S., & Shepley, M. M. (2021). Designing immersive virtual environments for human behavior research. *Frontiers in Virtual Reality*, *2*, 603750.

Ningrum, L. P., & Abdullah, T. (2025). Negotiating modernization in village tourism amidst efforts to preserve traditional culture. *Journal of Heritage Tourism*, 1–22.

Rismayani, R., Tricahyono, D., Maulana, A., Oktaviyanti, D., Astuti, Y., Hakim, I., Khoiriyani, F., Milanyani, H., Tantra, T., Margono, T., Damayanti, S., Raharja, A. N., Dani, F., Usman, Y., Asshagab, S., & Inayati, A. (2025). Tourism village digital transformation readiness analysis: Case study in two super priority destinations in Indonesia. Geojournal of Tourism

This is an open access article distributed under the Creative Commons Attribution 4.0 International

and Geosites, 61(3), 1887–1899. doi:10.30892/gtg.61346-1556

Semwal, R., Tripathi, N., Rana, A., Chauhan, A., Bhutani, V., & Gupta, K. (2023). Conceptual Integration of AI for Enhanced Travel Experience. *2023 10th IEEE Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON)*, *10*, 1044–1048.

Suanpang, P., Jamjuntr, P., Lertkornkitja, A., & Jittithavorn, C. (2024). Can Optimized Genetic Algorithms Improve the Effectiveness of Homestay Recommendation Systems in Smart Villages? A Case of Thailand. *International Journal of Tourism Research*, *26*(5), e2762.

Sustacha, I., Baños-Pino, J. F., & Del Valle, E. (2023). The role of technology in enhancing the tourism experience in smart destinations: A meta-analysis. Journal of Destination Marketing & Management, 30, 100817. doi:10.1016/j.jdmm.2023.100817

Trupp, A., Salman, A., Stephenson, M. L., Chan, L.-F., & Gan, J.-E. (2025). A systematic review of challenges faced by Micro and small Enterprises in Tourism Destinations: Producing solutions through resilience building and sustainable development. *Tourism Planning & Development*, *22*(3), 301–323.

UNESCO. (2021). Recommendation on the Ethics of Artificial Intelligence.

Utami, D. D., Dhewanto, W., & Lestari, Y. D. (2023). Rural tourism entrepreneurship success factors for sustainable tourism village: Evidence from Indonesia. *Cogent Business & Management*, *10*(1), 2180845.

Wahyuningrat, & Harsanto, B. T. (2025). Managing human resource in the rural tourism sector: evidence from Indonesia. *Cogent Business & Management*, *12*(1), 2493312.

Washington State University. (2025). *Conducting a Literature Review*. https://libguides.libraries.wsu.edu/litreview

Xiao, M., Luo, S., & Yang, S. (2025a). Synergizing Technology and Tradition: A Pathway to Intelligent Village Governance and Sustainable Rural Development. *Journal of the Knowledge Economy*, *16*(1), 1768–1823.

Xiao, M., Luo, S., & Yang, S. (2025b). Synergizing Technology and Tradition: A Pathway to Intelligent Village Governance and Sustainable Rural Development. *Journal of the Knowledge Economy*, *16*(1), 1768–1823.

Xiao, M., Luo, S., & Yang, S. (2025c). Synergizing Technology and Tradition: A Pathway to Intelligent Village Governance and Sustainable Rural Development. *Journal of the Knowledge Economy*, *16*(1), 1768–1823.

Yanan, L., Ismail, M. A., & Aminuddin, A. (2024). How has rural tourism influenced the sustainable development of traditional villages? A systematic literature review. *Heliyon*, *10*(4).

Yang, X., Zhang, L., & Feng, Z. (2024). Personalized tourism recommendations and the E-tourism user experience. *Journal of Travel Research*, *63*(5), 1183–1200.

Zong, Z., & Guan, Y. (2025). AI-driven intelligent data analytics and predictive analysis in Industry 4.0: Transforming knowledge, innovation, and efficiency. *Journal of the Knowledge Economy*, *16*(1), 864–903.

This is an open access article distributed under the Creative Commons Attribution 4.0 International