

Integrating artificial intelligence into community-based tourism: A sustainable development approach for enhancing cultural and environmental capital



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ABSTRACT

The integration of artificial intelligence (AI) into community-based tourism (CBT) presents significant opportunities to enhance sustainable tourism development. This study examines the Hat Chao Samran and Laem Phak Bia communities in Phetchaburi, Thailand, using qualitative methods, including in-depth interviews and stakeholder focus groups. Rather than focusing only on platform development, the study adopts a socio-technical perspective to examine the process of AI integration within a community context. The findings reveal inherent tensions between community priorities, such as cultural preservation, environmental sustainability, and local control, and tourists' expectations for convenience and digitally enhanced experiences. Furthermore, local power structures, including community leaders and government agencies, play a significant role in influencing platform design and implementation. The study identifies eight key components of an AI-based tourism platform: community information, tourism activities, travel routes, accommodation, food services, transportation, tourist attractions, and public relations. By conceptualizing AI as a mediating mechanism within complex social and institutional systems, this study contributes to a deeper understanding of digital transformation in sustainable tourism and highlights the importance of collaborative governance for achieving long-term sustainability.

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1. Introduction

Tourism is an important service industry today and comprises multiple sectors like tour operations, hospitality, food service, transportation, and advertising. It is acknowledged as the primary source of income for a country. The tourism industry keeps improving in parallel with new modern technologies. As defined in the National Tourism Policy Act (No. 2) B.E. 2562, "tourism management and development" includes the creation, development and enhancement of tourist attractions with administrative functions, active participation in quality control of the attractions, management of tourism activities, continual improvement of tourism services and personnel, active dissemination of tourism knowledge, development of tourism

products, active promotion and advocacy for tourism safety and a host of other related activities showing the interrelationship between tourist attractions, tourists, and the broad tourism industry. Such a definition follows the concept of inclusivity in tourism, aiming at alleviating social injustice and inequity, thus enhancing the sustainable development of tourism. Information gathered by the Ministry of Tourism and Sports in 2024 on worldwide tourism showed Asia leading the world in international tourism performance (Kosta et al., 2025).

Thailand aims to achieve sustainable tourism development alongside improving its global tourism competitiveness. This vision is well depicted in the 12th National Economic and Social Development Plan, which highlights tourism policy under Strategy 3: Building Sustainable Economic Strength and Competitiveness. The outlined objectives are rather bold, such as increasing the revenue from tourism to a minimum of 3 trillion baht and improving the nation's position in the Travel & Tourism Competitiveness Index (TTCI) ranking to 30th or better (Kiriwongwattana and Waiyasusri, 2024). To meet the outlined objectives, the enhanced

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integrated tourism framework aims to capitalize on Thai identity, culture, and traditional local community lifestyles through appropriate and value-added tourism products and services. Priority is given to responsible tourism that adheres to the environment's carrying capacity in order to achieve equilibrium and long-term sustainability in the tourism industry. Besides these, the country also aims to create new, high-quality international tourist destinations through the development of artificial tourist sites to diversify the Thai tourism economy while enhancing its appeal to international tourists.

In 2023, Thailand's tourism development strategy changed due to recognizing the country's heavy dependence on ecotourism. This realization stimulated a change in environmental awareness among the public and private sectors. Consequently, the TAT developed a purpose-driven promotion toward tourism as a vehicle for Social Responsibility and Environmental Responsibility (SRER) awareness, cultivating continuous commitment toward responsible travel. One of the main objectives of the plan was to encourage and implement responsible tourism activities. Engaging with private tourism sector stakeholders to achieve a 50% reduction of plastic use target in 2024 was part of the plan. Single-use plastic waste was a prime target for the initiative, including straws, cup lids, plastic bags, and food containers. These items were to be replaced with cloth bags, refillable water bottles, portable lunch boxes, natural-material straws, and reusable handkerchiefs. This initiative sought to preserve the aesthetic and long-term environmental impacts of tourist destinations and neighboring regions. This trend matches the forecast of the online hotel reservation service Agoda, which predicted that travelers are searching for sustainable travel alternatives. The dramatic growth of travel-related mobile apps and internet-based services is continuing to shape and dictate future traveler behavior. These factors are of great concern to the tourism sector, especially in 2020, forcing tourism business operators to adapt to ever-changing disruptive technologies. Perhaps the most influential change in behavior is noticed from Free Independent Travelers (FITs), who increasingly prefer self-planned travel. Buoyed by the wider availability of online information, digital services, and tools, travelers are now able to organize their itineraries and manage bookings without assistance. This is further supported by the information from the Tourism Market Research Center of the Tourism Authority of Thailand (TAT), which shows that Phetchaburi Province has been able to maintain strong and active tourism as reflected by hotel occupancy levels, with rates between 71.00% and 90.00% (Manotungvorapun and Gedsri, 2025).

The Hat Chao Samran and Laem Phak Bia communities in Mueang Phetchaburi District of Phetchaburi Province are notable as exemplary tourism development sites. The areas are endowed with favorable geographic conditions, invaluable local knowledge, cultural heritage, and their

renowned historically valued coastlines. Additionally, these communities have adopted systematic tourism management, which has in turn fortified their local economic structures and enhanced the resilience and sustainability of community-based tourism. Phetchaburi's proximity to Bangkok and neighboring provinces makes the tourism site more attractive as it allows for same-day travel, which is favorable for local and international tourists. Tourism statistics show the province has an average visitor occupancy rate of 71-90%, which indicates that the area is becoming increasingly popular. Coupled with the region's rich culture, unspoiled natural beaches, and the area's increasing tourism infrastructure, the region has significant potential for tourism expansion. The area's internet and communication infrastructure provide for real-time data collection and research capabilities. The researchers argue that community-based tourism management in the area enhanced with AI technology has the potential to greatly improve tourism competitiveness and facilitate sustainable tourism development (Euarchukiati, 2021).

Tourism development with an emphasis on sustainability, community participation, and the integration of digital technologies in Thailand has been a growing trend. Although artificial intelligence (AI) has received a lot of promotion as an instrument to improve tourism efficiency and competitiveness, the studies published until now have provided little information about the social processes that drive its implementation or technological applications.

Consequently, instead of reproducing the approach whereby implementers present AI as a panacea, this study examines the socio-technical process of embedding AI technology in community-based tourism (CBT). The research particularly examines how various stakeholders such as community members, tourism operators and tourists negotiate the design of an AI-based tourism system and its implementation.

Both the tensions between community needs and tourist expectations are a central focus of this study. Tourists pursue convenience, accessibility, and custom experiences through digital technologies, whereas local communities prioritize cultural preservation, environmental sustainability, and equitable income distribution. These competing priorities make it challenging to create a technologically advanced platform that is sensitive to cultural needs.

Additionally, the research critically explores the extent to which local power structures and governance mechanisms impact this process of platform development. Furthermore, the findings reveal that decision-making power is not uniformly distributed among stakeholders but is shaped by local authorities, community leaders, and external technological actors. These dynamics shape whose knowledge is privileged, how tourism resources are imagined, and how benefits are allocated within the community.

By drawing on this interaction, our analysis adds to the body of literature on how AI can be reconceptualized as a mediating object that operates amid complex social, cultural and institutional systems rather than simply being rendered as 'a tool'. This view offers insights into the dynamics of digital transformation in the context of community-based tourism, especially in emerging economies like Thailand.

2. Literature review

2.1. Artificial intelligence in community-based tourism

Instead of giving a generic picture of artificial intelligence (AI), this research concentrates on AI only within the scope of community-based tourism (CBT). The rapid adoption of AI in tourism has been motivated by the need for more personalized services, better resource management, and greater support for real-time decision-making (Li et al., 2024). AI has a vital role in CBT, including integrating dispersed tourism data, facilitating coordination among stakeholders, and enhancing visitors' experiences, which drives them towards sustainable practices.

Previous research reported in the literature, however, focused almost solely on technological efficiency while largely neglecting social processes shaping AI deployment across community settings. Especially, Community participation, local governance, and socio-cultural impact are some aspects that need more research. The research fills this gap by studying AI as more than a technological tool, but rather a socio-technical system that evolves due to stakeholder interactions and the surrounding institutional landscape.

2.2. The concept of sustainable cultural capital management

The concept of cultural capital was introduced by Bourdieu (2018), who classified it into three forms: embodied, objectified, and institutionalized. Embodied cultural capital refers to intangible assets such as knowledge, beliefs, values, traditions, customs, and skills acquired through socialization and experience. It is closely related to the concept of *habitus*, which shapes individuals' behaviors and social interactions. Objectified cultural capital consists of tangible cultural assets, including artworks, books, tools, artifacts, architecture, and cultural heritage sites. These physical resources preserve cultural identity while supporting education, tourism, and community development. Institutionalized cultural capital refers to cultural values and recognition embedded in formal institutions, such as educational systems, religious organizations, governments, and other recognized social bodies. It provides legitimacy to cultural knowledge and practices within society.

Understanding these three forms of cultural capital provides a foundation for sustainable cultural management by supporting the preservation, integration, and effective use of both tangible and intangible cultural resources, thereby strengthening community development, tourism, cultural identity, and long-term sustainability.

Suriyankietkaew et al. (2025) investigated the sustainability concerns of tourism as a development approach for the cultural landscapes of China, focusing on Ping'an Village as a case study. The findings indicated that although there is great economic potential that poses complex sustainability challenges, tourism development in the village is economically limited due to chronic rural poverty. The study emphasized that while there is marked participation and input from various stakeholders and private sector entities in tourism development and promotion initiatives, it is the government agencies that remain fundamental in policy and strategy formulation. Residents see in tourism an avenue through which their traditional culture is preserved and revitalized as it is made more visible and valuable. Besides, tourism is bound to bring in the revenue that local governments and communities need to directly socialize, if not substantially alleviate, major social and economic challenges. The study recommends that in the context of economic development, cultural conservation, and environmental sustainability, government officials need to substantially prioritize human capital investment in the services sector through local entrepreneurship promotion paired with policies that improve collaboration, service delivery, and sustainable governance.

In sympathy with Panzarella et al. (2025) on the preservation of cultural landscaping areas vis-a-vis tourism in Bosnia and Herzegovina, the study in question included the historical sites of Blagaj, Travnik, and Jajce as areas of exceptional natural and cultural importance. Blagaj, Travnik, and Jajce incorporate exceptional natural beauty and historically and architecturally striking heritage, which warranted UNESCO designation and thus increase tourism potential and the prospects of sustainable tourism. Economic tourism has developed in these areas and has become an important source of income for the local population. Nonetheless, the absence of transport and parking services, modest cultural programming, and limited accommodation hosting facilities all pose far greater challenges for the effective management of sustainable tourism. The study indicated that public involvement is key for the enhancement of local appreciation of the importance of the heritage. With improved service and infrastructure along with public involvement, it would allow many tourists to participate and engage with the cultural landscapes of these historic towns. More importantly, the study also insisted that the professional reconstruction and development of sustainable tourism must, without fail, adhere to the guiding principles of

respect, authenticity, and appreciation for the local community and the cultural heritage values.

Following the study conducted by [Tabatabaei and Tabatabaei \(2024\)](#) on the prospects of cultural and religious tourism in the scope of Iran, the findings reinforce the degree to which tourism phenomena are intricately interwoven within the socio-cultural fabric of the society in question. Looking at Iran, a nation which is a storehouse of cultural and religious tourist places, the socio-religious structure of the country greatly influences the tourism policies. At the moment, the cultural and religious tourism in Iran mainly caters to local pilgrims. For more than the last two decades, the country has had a predominantly Muslim (Shia) population, in addition to a small population of Christians, Zoroastrians, and Jews, which highlights the religious diversity of the country. Also, Iran is enriched with ancient civilizations, which, coupled with its vast nurtured culture and religion, render it unique for heritage and spiritual tourism. A trip to Iran surely provides unmatched cultural *joie de vivre* because it is one of the cradles of civilization endowed with more than two and a half millennia of history, and continues to shape world culture and heritage.

2.3. Community-based tourism (CBT)

Community-based tourism (CBT) is defined as tourism which is planned and organized by local people in which most of the benefits accrue to the host community. It encourages local economic development by creating jobs and improving income distribution equity and helps to retain the community's unique culture and traditions. This is in accordance with the definition of [Cordova-Buiza et al. \(2025\)](#), where they stated that CBT should be a tourism sector and a tool to generate and enhance income and development for local people.

Tourism is one of the most important sectors of the Thai economy. However, conventional tourism often focuses mainly on economic development and may not provide sufficient benefits to local communities. Community-based tourism (CBT) has emerged as an alternative approach that promotes more balanced and sustainable tourism development by placing local communities at the center of planning and decision-making.

The growth of CBT has been driven by several important factors. First, there is increasing attention to integrated and sustainable development, which emphasizes the active role of local communities as the main stakeholders in tourism development. Second, changes in demographic markets have created new opportunities for CBT. Advances in technology and communication have increased tourists' interest in authentic and meaningful travel experiences, while demographic factors such as gender, income level, and social class influence the demand for community-based tourism. Third, tourists are becoming more aware of ethical and environmental issues. Many travelers now prefer tourism that supports cultural exchange, enhances

learning, and protects natural ecosystems. This growing awareness has strengthened the attractiveness of CBT among socially and environmentally conscious tourists. As a result, CBT is increasingly recognized as an effective approach for promoting responsible, equitable, and sustainable tourism development ([Dulyakasem et al., 2025](#)).

Community tourism benefits local residents by integrating them into sustainable development practices. A community's way of life, culture, and natural environment are interconnected and form a whole. Community tourism looks after heritage and local culture, which, undergoing continuous transformation, defines the community. A community possessing deep-rooted identity emerges strong in the face of change. Community tourism fosters local identity and fosters pride, which leads to improved social cooperation, thus furthering human development. It sustains the local identity and enhances the local economy. It creates economic activities and income in the community by attracting visitors interested in local culture. The generated income enhances community development projects and social welfare, thereby ensuring community sustainability ([Jermisittiparsert et al., 2025](#)).

As [Cai et al. \(2025\)](#) noted in her study on the global trends in the development of tourism while in the Republic of Armenia, it has been noted that tourism is a global phenomenon that is increasingly engaging and capturing the interests of a growing population and stands today as one of the largest industries in the world. The study also points out the fact that tourism on a global scale is undergoing significant expansion, largely due to the proliferation of the Internet. Information accessible over the internet is advantageous, as it allows travelers to make decisions on the spot and also plan ahead of time.

According to [Rahimian et al. \(2025\)](#), leisure tourism, cultural tourism, ecotourism, religious tourism, pilgrimage tourism, spa and medical tourism, family and friends' tourism, and even sports tourism fall under one of the major forms of tourism. The study also outlines the urgent need to address and develop strategic comprehensive tourism master plans on a national scale, hence the raising of frameworks, as well as the long-term strategic development of the tourism sector over a period of 10 and 20 years. These plans should aim to fill the gaps in policy development, legislative frameworks, control mechanisms for legal product development, strategies in market diversification, promotion of infrastructure, and investment in human capital. The study as a whole reiterates that tourism is a very important and fast-growing global industry that, both directly and indirectly, connects to numerous other industries, and it is fundamental to the improvement of critical development descriptors both for the nation and the world. An international research literature review captures strategic development planning at the government policy level as dominantly practiced, but the effectiveness

of the initiatives is the greatest challenge. In all studies, community engagement is considered the most important element when it comes to fostering development in the domain of sustainable tourism. These studies also emphasize local context by articulating the case that sustainable tourism has to be based and rooted in the peculiar and distinct resources, identity, and potential of every community. These resources must be strategically and systematically organized and managed to cope with and host tourism.

This is also the position adopted by Khaenamkhaew et al. (2023), who studied the case of community tourism development in Rayong Province, Thailand, focusing on the role of public participation and Cross Ban Charung Homestay. Their research has analyzed and exposed three participatory communication types or models among the key actors and stakeholders. These include the Ban Charung Homestay group, Ban Nee Ok University, the Ban Charung community, and others who were supporting the development of the homestay:

- **Participation by Person:** In this model, community members actively 'to be' part of the research team, and 'to undertake' their own research; community members as part of the so-called "community research team" contributed data and evidence.
- **Participation by Content:** In this context, local tourism and homestay information were used for the joint development of promotional materials, for example, brochures.
- **Participation by Process:** Community people were active in making decisions about the research, such as choosing and designing the media elements, assessing the media's value, and determining the media's effectiveness.

This work highlights the importance of the participatory approach in constructing community-based tourism, focusing on the ever-increasing need to ensure that the development processes are local and sustainable.

To increase attention on community tourism for the Ban Charung Homestay Group, Ban Ni Ok University, along with local stakeholders, prepared and distributed participatory public relations

multimedia, concentrating on the promotion of the printed brochures as the mainstay of the homestay initiative and the ancillary program of the community citizens strategy. Community members' active participation was sought throughout all three identified phases: the pre-development, development, and post-development phases, especially the final stage of the post-development phase of the program. This participatory approach ensured that the media was community-driven in terms of its desired outcomes (Jianchatchawanwong et al., 2024).

This undertaken project aimed to achieve the same purpose as described in the works of Phongpradist (2024), who demonstrated the positive outcomes of managing community-based tourism for improving quality of life through structured knowledge management. Their study surveyed the entire tourism context and described how all indicator dimensions were highly and equally scored, ranked by average value as community's longitudinal identity, active community member engagement, community-based system for tourism, and community tourism resource planning. Surin Province, by way of an example, was particularly high in managing cultural tourism with community-based tourism governance, a rich and varied community cultural resource, and developer-level infrastructure.

Cultural tourism management on the February migration routes was enhanced and integrated into the aughties. Marketing frameworks on advertising, sales and promotion, and public relations have increased in complexity and intensity. Promotion of supporting key activities and streams of the year-round tourism calendar has emphasized its active promotion on the primary communication channels. Broad communication activities and the year-round tourism calendar aim to maintain an active flow of interested tourists.

Based on the reviewed literature and the theoretical foundation of this study, Fig. 1 presents the conceptual framework illustrating the integration of artificial intelligence into community-based tourism management for enhancing cultural and environmental capital. The framework guided the development of the research design and data collection process.

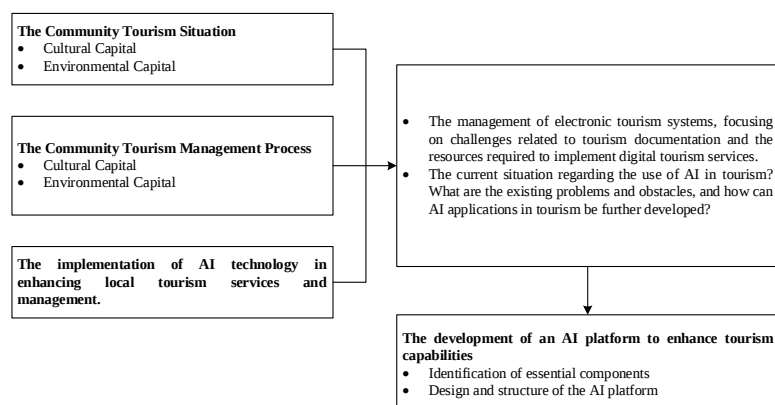


Fig. 1: Conceptual framework

3. Research methodology

This study aims to enhance community-based tourism management through the integration of artificial intelligence (AI), with a particular focus on leveraging cultural and environmental capital for sustainable development. The findings of this study form the basis for developing appropriate tourism data visualization systems, which support the design and implementation of an AI-based platform for community-based tourism management.

3.1. Qualitative research design

The qualitative research approach was applied to integrate information on AI applied in community-based tourism CBT (Hat Chao Samran and Laem Phak Bia communities, Phetchaburi, Thailand). This study applies a qualitative analysis because it allows for an in-depth understanding of the perspectives, social dynamics, and contextual factors that affect the adoption of AI within tourism management.

This study is conducted through a socio-technical lens, whereby sociotechnical systems are believed to mediate each other. More specifically, the study investigates how community values, stakeholder dynamics, and institutional context shape AI integration.

The framework through which we conceived this research is organized around four interrelated dimensions:

- Assessment of cultural and environmental capital, focusing on identification and evaluation of resources available locally;
- Community tourism management processes, including stakeholder mediation and sociopolitical practices of governance;
- Socio-cultural and economic impacts, examining how tourism creates changes in livelihoods, inclusion, and sustainability; and
- Technology preparedness and acceptance of AI, evaluation of infrastructure, technological literacy,

and perception on AI rollout with various stakeholders.

3.2. Key informants and sampling

Purposive sampling was used in this study to select key informants who were presumed to have relevant knowledge and experience about community-based tourism. Forty participants were assigned into four groups of stakeholders to capture various perspectives:

- Community Leaders (n = 10): Local government representatives, village head, and community leaders in both of the study areas.
- Tourism Operators (n = 10): Business owners, e.g., restaurant operators, accommodation providers, and tour service providers
- Community Tourism Networks (n = 10): Fishers, seafood traders, and resource managers
- Tourist (n = 10): People with direct experience in the study areas.

The sampling of stakeholders empowers both supply-side and demand-side indicators, thereby providing a holistic overview of the phenomena under study in tourism development. [Table 1](#) summarizes the characteristics of the target groups and key informants involved in this study, including the participant categories, selection criteria, and number of participants from each stakeholder group.

3.3. Data collection methods

We used multiple qualitative data collection methods to achieve depth and triangulation of findings. Semi-structured interviews explored participants' experiences, perceptions, and expectations of tourism management and AI integration. This approach allowed for a degree of flexibility and the emergence of rich and nuanced data around important issues through open-ended questions.

Table 1: Target groups and key informants summary

No.	Target group	Description & number of participants
1	Community leaders	Includes the Mayor of Hat Chao Samran Subdistrict Administrative Organization, the Mayor of Laem Phak Bia Subdistrict Administrative Organization, and other key local leaders. Five participants from each community, totaling 10 people.
2	Tourism operators	Comprises restaurant owners, accommodation providers, and local tour operators from both Hat Chao Samran and Laem Phak Bia. Total: 10 people.
3	Community tourism networks	Includes representatives from fishing networks, seafood sales networks, and natural resource planning groups. Five from each community, totaling 10 people.
4	Tourists	Visitors to Hat Chao Samran and Laem Phak Bia communities, selected based on experience and willingness to participate. Total: 10 people.

The interview protocols were modified according to the participant group for relevance and contextual sensitivity. All interviews were tape-recorded and then transcribed, and the transcripts checked for accuracy. Focus group discussions (FGDs) were conducted to elicit collective views and stimulate interaction among the respondents. All groups had a maximum of five participants in order to encourage engagement. These discussions proved especially

valuable in pinpointing common concerns, community priorities and differing perspectives around tourism development and AI adoption.

Non-participant observations were performed for data contextualization and triangulation. Data observed during fieldwork included tourism-related activities, community interactions, and behaviors in the study sites. Although focused on the Bukit Barisan region, these notes cultivated knowledge

beyond formal interview context and provided valuable information for identifying differences between expected and real practices in community-based tourism.

3.4. Data collection

To better understand community-based tourism. Data collection was conducted from both primary and secondary sources. Secondary data sources comprised government documents, policy records, theoretical papers, and literature that not only gave contextual background but also provided an area grounding. Direct engagement with stakeholders was achieved through the collection of primary data via interviews, focus group discussions, and observations. Triangulation of data sources ensures the validity and reliability of the research findings.

3.5. Data analysis

Thematic analysis is used in this study to systematically analyze qualitative data. The analysis was conducted in a standardized multi-phase approach:

- Initially, the interview and discussion data were transcribed and read multiple times to familiarize with the material.
- Secondly, open coding was performed to identify patterns, concepts, and issues identifying in the data.
- Third, similar codes were clustered into overarching themes that captured core elements of the socio-technical process of AI integration.

Three major themes were identified:

- Tensions between the values of local communities and those of tourists,
- Concerns about technological adoption, and
- The dynamics of local power structures that shape decision-making.

To increase analytical rigor and transparency, representative quotations were included to support the interpretation of findings across participants—including community leaders, tourism operators, and tourists.

3.6. AI platform design framework

The AI-based tourism platform was designed iteratively on the basis of inputs received from stakeholders during interviews and focus group discussions. The platform components were not pre-defined technical features; rather, they emerged via a co-creation process with multiple stakeholders. As a result of this process, we ended up with the following 8 components:

- Community information

- Tourism activities
- Travel routes
- Accommodation
- Food services
- Transportation
- Tourist attractions
- Public relations

Such building blocks are the result of negotiations among stakeholders with various priorities in mind, which aim to find a middle ground for conserving tradition, serving community needs, and fulfilling tourist wishes.

4. Research results

4.1. Thematic findings

Theme 1: Tension between community and tourist needs. The analysis revealed a clear tension between the priorities of local communities and the expectations of tourists. Community members emphasized the importance of preserving local traditions, cultural values, and environmental sustainability. In contrast, tourists expressed a stronger preference for convenient and accessible digital services that provide real-time information.

A community leader stated: “We want tourism that enhances our way of life, not transforms it. If everything becomes digital, we fear losing our identity.” In contrast, a tourist commented: “It would be easier if everything were available in one application, including booking, navigation, and payment.”

These different perspectives highlight the challenge of developing an AI platform that balances cultural preservation with technological convenience.

Theme 2: Concerns about AI and technology. The second major theme identified from the data was concern about the use of AI technologies in community-based tourism. Although stakeholders recognized the potential of AI to improve tourism efficiency and service quality, they also raised concerns about data privacy, digital inequality, and trust in technology. A tourism operator explained: “Some members of the local community are not familiar with digital technologies. If implementation happens too quickly, they may not be able to keep up.”

Participants also expressed concerns about surveillance technologies: “Facial recognition could improve security, but we do not know how the data will be used.”

These findings indicate that adopting AI is not only a technical challenge but also a social and ethical issue that requires careful consideration.

Theme 3: Power structure and decision-making. The findings also showed that local power structures influenced the platform development process. Community leaders and local government representatives played a dominant role in decision-making, shaping development priorities and

determining whose opinions were included. One community participant stated: “Decisions are mainly made by those in leadership positions. Sometimes, they do not fully involve ordinary villagers.”

This finding suggests that the implementation of AI-based tourism systems occurs within existing governance structures, raising important issues related to participation, representation, and inclusiveness. The identification of the eight platform components resulted from negotiations among stakeholders rather than being based solely on technical design decisions.

4.2. Community reactions

The results suggest that community reactions toward the proposed components of the AI platform were heterogeneous and context-dependent. Although stakeholders understood the advantages of improved coordination, service efficiency, and enhanced tourist experiences, several issues arose related to implementation and sustainability in the long term.

One of the biggest concerns is with digital literacy and access. Many of the community members, older residents in particular, said they were unsure if they could interact with AI-enabled systems. This emphasizes the need to ensure inclusive access for all potential users. It also highlights the importance

of capacity-building initiatives to support technology adoption without excluding certain groups within the community. A tourism operator noted: “The system is helpful, but not everyone in the community is prepared to utilize it.”

Participants also stressed the need for cultural authenticity and community identity. Not all stakeholders were entirely in favor of using digital technologies too much; they are concerned that it will change traditional practices or make local culture commercial.

Ethical questions also arose, especially over issues related to privacy and data governance. Technologies like facial recognition had appeared to have potential benefits for security and managing who visits, but participants expressed concern about how their personal information would be collected and used. AI platforms involve more than just the technological design and require a social context that is ready, ethically sound, and practically oriented to align digital innovation with community values. Fig. 2 illustrates the contextualized AI applications supporting the proposed community-based tourism platform. The framework demonstrates how artificial intelligence technologies can be integrated into tourism management while balancing community values, environmental sustainability, and visitor experience.

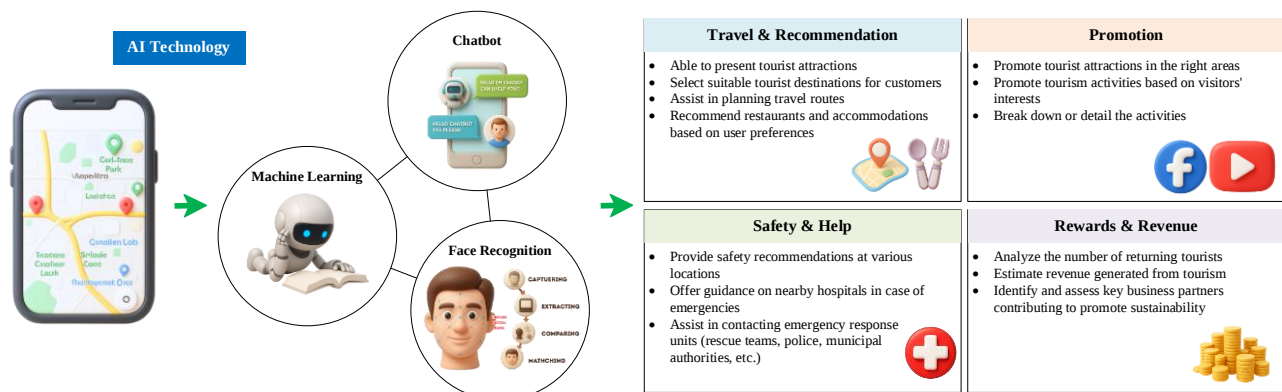


Fig. 2: Contextualized AI applications supporting community-based tourism platform

4.3. AI technologies and their contextual implications in community-based tourism

Instead of treating artificial intelligence (AI) as a standardized technological solution, this study highlights the integration of targeted AI applications into the suggested tourism platform in relation to the Hat Chao Samran and Laem Phak Bia communities.

Based on the findings, the authors conclude that there is no standardized solution with AI technologies and that their effectiveness depends on local needs, capabilities of stakeholders, and socio-cultural contexts. Three main areas of focus for AI were deemed relevant to the platform components.

The first one is that chatbot systems can enable communication in real-time between travelers and local service providers. This is crucial in helping enhance accessibility and facilitating multilingual

experiences. However, stakeholders stressed that these systems have to remain simple and intuitive to meet the community's varying degrees of digital literacy.

Adding a second benefit, machine learning-driven recommendation systems have the potential of improving tourists' experiences while traveling by providing personalized recommendations in relation to their travel locations and regions. At the same time, these systems can encourage local businesses and help distribute tourism benefits more equitably across the community. Still, participants emphasized the need for recommendations to reflect genuine local experiences instead of being overly commercialized. Third, facial recognition technology was seen as sensitive and controversial, although potentially useful for enhancing safety and visitor management. Some participants raised concerns

about privacy, data governance, and the potential misuse of personal information. Such technologies need to be mindful of ethical considerations and regulatory frameworks when being adopted."

In sum, these findings suggest that AI should not be deployed as a general-purpose solution; rather, it must be carefully adapted to local contexts, aligned with community values, and supported by appropriate governance mechanisms to ensure

sustainable and inclusive tourism development. Fig. 3 presents the proposed AI-powered tourism platform model developed from the empirical findings of this study. The model illustrates the integration of key artificial intelligence technologies into community-based tourism management to strengthen tourism capacity while supporting sustainable cultural and environmental development.

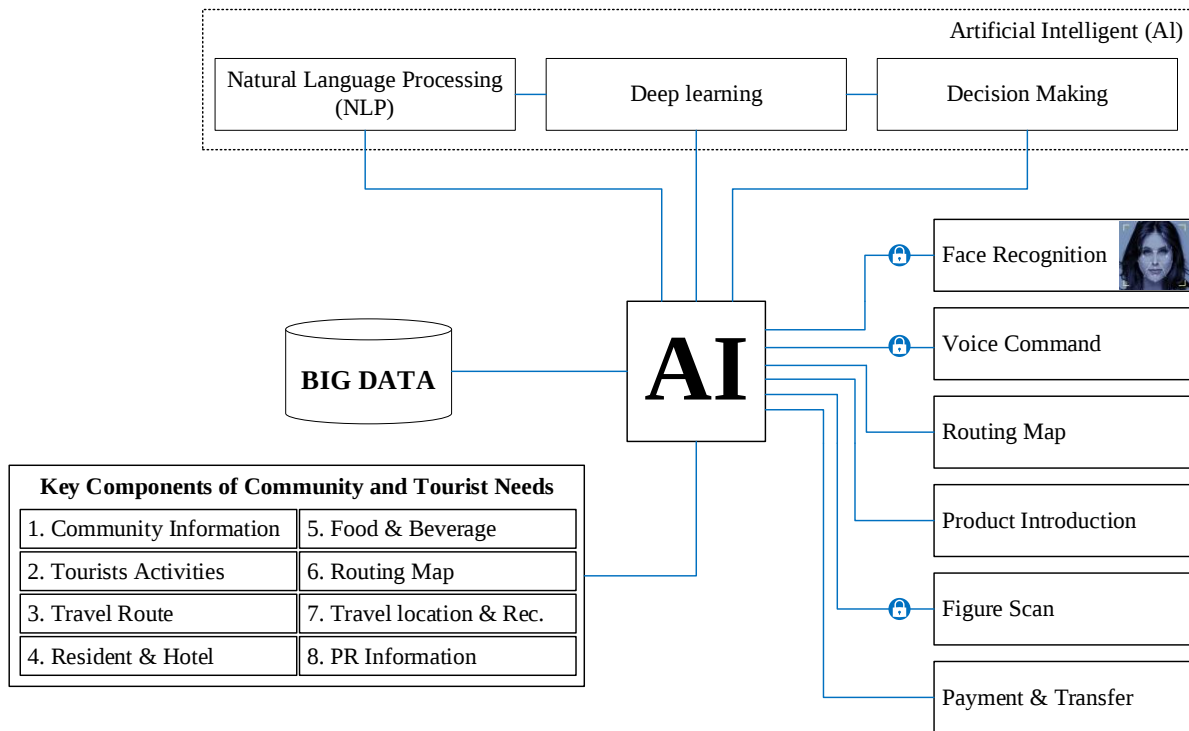


Fig. 3: Model for the development of an AI-powered tourism platform to strengthen tourism capacity

5. Conclusion and discussion

This paper builds on the existing studies that have examined the application of artificial intelligence (AI) in tourism—by orientating its focus, not on what technology can do, but rather on how AI technologies are implemented through socio-technical processes and become a part of community-based tourism (CBT). The results illustrate that AI diffusion is not simply a technical exercise, but rather tightly coterminous with sociopolitical practice as defined through stakeholders' relationships, local policy regimes, and cultural norms.

The findings underscore a longstanding tension between communities' priorities and tourists' expectations. Tourists may focus on convenience, accessibility, and seamless digital experiences; community members tend to value cultural preservation, environmental sustainability, and local control. This conclusion is in line with previous studies of CBT, which highlight the necessity for perspectives that balance economic growth with cultural preservation and communal prosperity (Dulyakasem et al., 2025). However, this research contributes to the body of knowledge by revealing

how these tensions affect the co-design and acceptance of AI-enabled tourism platforms.

Moreover, the research shows local power structures underpin how decisions get made. In practice, however, community leaders and government actors frequently have outsized influence over platform design that may not allow for broader participation from other stakeholders. Such findings are in line with Khaenamkhaew et al. (2023) emphasize participatory communication in community tourism development. And yet, the current study adds a level of articulation in showing that involvement doesn't necessarily come equally across groups or sectors, calling into question inclusiveness and representation within tech-based initiatives.

Identification of the social and ethical issues related to AI adoption is another important contribution of this study. Barriers emerged, including digital literacy gaps, privacy concerns, and mistrust of technologies, especially facial recognition. These results align with wider research around technology adoption, which highlights perceived risk and user preparedness as significant predictors of uptake. Yet, this study adds value by framing these anxieties in a particular community-

based form of tourism and revealing the ways local socio-cultural contexts shape technological adoption.

Importantly, the findings imply that AI should not be adopted as a one-size-fits-all or technical solution. AI should be adapted to local contexts and aligned with community values and governance structures rather than introducing standardized technological solutions into every context. The notion of AI as an intervening agent in a socio-hegemonic debate, rather than something that stands alone as an innovation.

Overall, this study adds to the literature by making use of public policy foundations in showcasing how technology, society, and governance are dynamic metaphors for the success of AI applications for community-based tourism. It underlines the importance of inclusive design processes, ethical safeguards, and context-sensitive implementation strategies that can ensure digital transformation serves to support rather than undermine sustainable community development.

6. Recommendations

The issues relating to isolation on the part of stakeholders and the lack of support from the local governmental agencies on the ecotourism management plan certainly justify the continued research into the development of the application in a localized software system. It would serve a purpose for the real-time accessible and user-friendly information for traveling users, better if developed and sustained by the relevant governmental organizations or the local government. Trust building from the local stakeholders and the incorporation of this system into the local tourism development programming may lead to a favorable decision influencing the averted costs of the tourists, at the same time turning the money edges into profit from the local tourism promotion.

In addition, the potential of the development of the tourism system which is driven by the artificial intelligence (AI) is overwhelming. Nonetheless, the architecture and the working of the system have to constantly be revised and refined based on the field study, interaction with the stakeholders, and the cyclic response system from the users. The aim is not only to serve the purpose of the system but also to ensure reciprocal benefits for the users, in this instance, the tourists and the local population. Another aspect is that the research was carried out during the COVID-19 pandemic, which was a time of little tourist engagement and great economic apprehension. Hence, some data collected during that time could be out of date and no longer representative. In order to preserve the platform's relevance and sustain the platform's relevance, it is suggested in the period that core elements are re-validated and refined as conditions change.

List of abbreviations

AI Artificial intelligence

CBT	Community-based tourism
FGDs	Focus group discussions
FIT	Free independent travelers
SRER	Social responsibility and environmental responsibility
TAT	Tourism authority of Thailand
TTCI	Travel & tourism competitiveness index

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Compliance with ethical standards

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board (IRB) of Suan Sunandha Rajabhat University, Faculty of Management Science, Bangkok, Thailand (protocol code SSRU-ETHICS-2025-001, approved on 15 January 2025). Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. All participants were informed of the purpose, procedures, and their rights prior to participation, in accordance with the ethical guidelines of Suan Sunandha Rajabhat University, Faculty of Management Science, Bangkok, Thailand.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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