

Digital Spatial Communication for Wellness Tourism: A GIS-Based Model for Communicating the Lifestyle Identity of Bang Kobua Community and Promoting Tourists' Stress Relief in Krapao Moo, Phra Pradaeng District, Samut Prakan Province, Thailand

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Abstract

This study aimed to: (1) identify community-based wellness tourism routes in Bang Kobua Subdistrict, Phra Pradaeng District, Samut Prakan Province, Thailand; (2) develop a geographic information system (GIS) to support wellness tourism promotion; and (3) evaluate the effectiveness of the developed system. The study adopted a developmental research design grounded in the Systems Development Life Cycle (SDLC) framework. Research instruments included the GIS-based wellness tourism platform, a system quality assessment form, a user satisfaction questionnaire, and a technology acceptance questionnaire based on the Technology Acceptance Model (TAM). The sample comprised five experts in information technology and computer science and 411 tourists selected through simple random sampling, of whom 338 were male and 73 were female. Data were analyzed using mean and standard deviation. The findings revealed four community wellness tourism attractions and two tourism routes, namely land-based and water-based routes. The developed GIS incorporated five core functions: wellness tourism destination database management, route management, destination search, destination information display, and route visualization via Google Maps. The evaluation results demonstrated that the quality of the information system the highest level ($\bar{x} = 4.56$), the effectiveness of users with the information system was at a high level ($\bar{x} = 4.42$) and the analysis of user acceptance of the health tourism information system was also at a high level ($\bar{x} = 4.33$). These findings indicate that GIS can function as an effective digital spatial platform for organizing, communicating, and promoting community wellness tourism. The study contributes practical evidence on how geospatial technologies can strengthen destination visibility, improve access to location-based tourism information, and support digitally mediated wellness experiences in community-based tourism settings.

Keywords: Bang Kobua Community Lifestyle Identity, Digital Technology, Geographic Information System (GIS), Stress Relief, Wellness Tourism

1. Introduction

Tourism continues to play a major role in economic and social development, but in contemporary destination competition, attractive resources alone are no longer sufficient. Destinations must also be able to organize, communicate, and deliver tourism information effectively through digital channels. In

this context, geospatial technologies have become increasingly important because they enable spatial data integration, route visualization, destination interpretation, and location-based information delivery in ways that improve both destination management and visitor access to information [1][2]

and [3]. Recent research in the *International Journal of Geoinformatics* highlights the growing role of GIS and WebGIS in tourism development. Sangmanee and Suwanwerakamtorn [1] proposed an integrated WebGIS framework for cultural tourism in Pattani, Thailand, showing that geospatial platforms can support digital archives, virtual tours, and web-based spatial information services for destination promotion. Similarly, Noichan, Noichun, Girdwichai, and Chitngam [2] demonstrated that GIS-based cartography can enhance the mapping and spatial organization of cultural tourism attractions around the Ban Chiang Archaeological Site, thereby supporting location determination, tourism planning, and local spatial development. These studies suggest that GIS should be viewed not merely as a mapping application, but as a strategic digital infrastructure for destination communication and tourism planning [1] and [2].

This role is especially important for community-based destinations, where tourism value often depends on local identity, dispersed attractions, and the accessibility of route-based information rather than on a single iconic landmark. GIS technologies are particularly suitable in such contexts because they can connect destinations, routes, facilities, and interpretive content within a single digital platform. Supporting evidence from the *ISPRS International Journal of Geo-Information* shows that GIS applications can strengthen tourism planning and sustainable destination management by improving spatial analysis, visitor information, and evidence-based decision-making [3]. In parallel, recent scholarship on digital tourism confirms that digital platforms and smart destination tools are becoming central to how tourists search for information, plan trips, and engage with destinations [4] and [5].

These developments are highly relevant to wellness tourism. As tourism demand increasingly shifts toward experiences associated with relaxation, restoration, and well-being, destinations that can communicate calm environments, meaningful local experiences, and accessible tourism routes are likely to become more attractive to visitors. In this regard, digital platforms are not only promotional tools, but also mechanisms for guiding tourists through place-based experiences in ways that enhance usability, convenience, and destination visibility [4] and [5]. For community-based wellness tourism, GIS is especially valuable because it allows the integration of tourism routes, activity points, and local identity into an interactive map-based system that can support self-guided travel and location-aware exploration [1] and [3]. Bang Kobua Subdistrict, located in Phra Pradaeng District, Samut Prakan Province, Thailand

(Figure 1), provides a suitable case for this type of development. The area forms part of the green landscape associated with Bang Kachao and is characterized by a riverside environment, orchard-based livelihoods, local cultural identity, and a relatively calm atmosphere near the Bangkok metropolitan region. The community can be accessed by both land and water and offers wellness-related activities such as herbal compress making, herbal beverages, foot spa activities, and health massage. These characteristics indicate strong potential for community-based wellness tourism. However, despite these assets, the area still lacks an integrated digital system capable of communicating tourism routes, spatial information, and community lifestyle identity in a way that is accessible to tourists.

Accordingly, this study pursued three objectives. First, it examined community-based wellness tourism routes in Bang Kobua Subdistrict, Phra Pradaeng District, Samut Prakan Province, Thailand. Second, it developed a geographic information system (GIS) for promoting wellness tourism. Third, it evaluated the effectiveness of the developed GIS as a digital platform for wellness tourism promotion. By linking geoinformatics with community-based wellness tourism, this study contributes a practical model for improving destination visibility, route communication, and tourist access to location-based tourism information in local community settings [1][2][3][4] and [5].

2. Literature Review

2.1 Wellness Tourism as a Well-Being-Oriented Travel Practice

Wellness tourism has increasingly been recognized as a distinct form of tourism associated with the pursuit of physical, mental, and emotional well-being. The Global Wellness Institute defines wellness tourism as travel associated with the pursuit of maintaining or enhancing one's personal well-being, emphasizing that such travel often combines leisure, health-supportive activities, and restorative environments [6] and [7]. This understanding aligns with earlier Thai conceptualizations of health tourism, which describe it as travel that integrates recreation with health promotion, rehabilitation, and environmentally conscious practices through activities such as massage, herbal therapies, meditation, healthy food consumption, and relaxation in natural settings. In this sense, wellness tourism extends beyond medical treatment and instead encompasses experiences designed to improve holistic well-being through place, activity, and atmosphere.

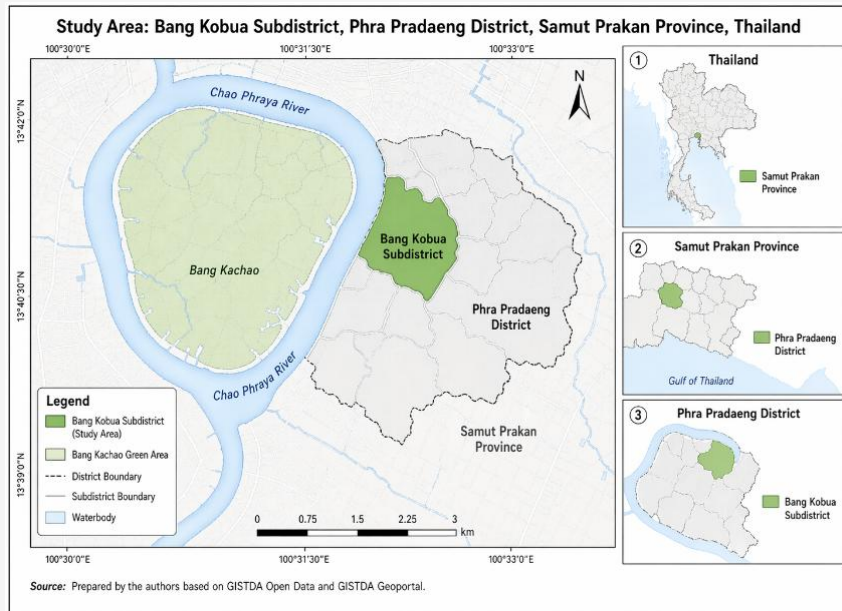


Figure 1: Bang Kobua Subdistrict, Phra Pradaeng District, Samut Prakan Province, Thailand

Recent studies also show that wellness tourism is strongly related to perceived restorative qualities of destinations, emotional recovery, and tourist outcomes such as satisfaction, loyalty, and intention to revisit [8] and [9]. This perspective is especially relevant for destinations that offer calm environments, nature-based experiences, and culturally grounded wellness practices. Therefore, wellness tourism can be understood not only as a product category, but also as a destination strategy that links environmental qualities, local knowledge, and visitor well-being [6][8] and [9].

2.2 Community Participation in Tourism Development

Community participation is widely recognized as a core principle of sustainable and community-based tourism development. In practical terms, participation involves local engagement in planning, decision-making, implementation, monitoring, and benefit-sharing. The Thai conceptual framing provided in the project materials emphasizes participation as a multi-stage process, including joint thinking, collective decision-making, collaborative action, and shared evaluation. These dimensions remain highly relevant to community-based tourism because tourism development is more likely to be sustainable when local residents are not merely service providers, but active co-creators of the tourism system. Recent scholarship supports this view by highlighting that community-based tourism functions most effectively when communities retain agency over tourism resources, cultural representation, and local development priorities [10]

and [11]. Community participation contributes not only to economic benefits, but also to cultural continuity, local ownership, and legitimacy in destination management [10]. For this reason, the effectiveness of tourism promotion in local communities depends not only on technological design, but also on whether local identity and community knowledge are meaningfully embedded in the tourism product and its communication channels.

2.3 Community Lifestyle Identity, Place Meaning, and Stress Relief

Community lifestyle identity refers to the distinctive patterns of living, practices, values, and local knowledge that shape how a community is understood and experienced. The Thai conceptual tradition reflected in the source materials views local way of life as a synthesis of history, culture, customs, and everyday practice that gives meaning and value to the community. From a tourism perspective, this identity becomes important because it differentiates a place from standardized tourism environments and creates opportunities for more meaningful visitor experiences. In wellness tourism, the communication of community lifestyle identity is particularly important because many restorative experiences are inseparable from atmosphere, rhythm of life, cultural intimacy, and environmental calmness. Recent research on wellness destinations suggests that tourists' perceptions of restorative qualities are shaped by both physical and symbolic features of place, including nature, tranquility, authenticity, and emotional comfort [8] and [9]. This makes

community lifestyle identity highly relevant to stress relief in tourism contexts. In other words, the value of a wellness destination does not rest solely on formal wellness services, but also on how effectively the destination communicates a lived environment that supports relaxation, reconnection, and temporary release from urban stress.

2.4 GIS and Digital Platforms for Tourism Communication

The use of GIS in tourism has evolved from basic map production to more integrated digital functions such as destination databases, route planning, spatial visualization, interactive storytelling, and web-based information services. Recent research published in the *International Journal of Geoinformatics* provides strong support for this evolution. A WebGIS framework can integrate cultural tourism information, digital archives, virtual tours, and spatial interfaces to improve destination communication [1]. GIS-based cartography can also support local tourism planning by mapping attractions, identifying location patterns, and strengthening spatial understanding of tourism resources [2]. GIS to analyze hotel distribution patterns, showing how geospatial techniques can support tourism infrastructure analysis and destination planning [3]. The ecotherapy healing forest concept was examined in a natural tourism park, highlighting the relationship between spatial site identification, accessibility, environmental characteristics, and health-oriented tourism [4]. AHP and a vulnerability index was applied to coastal tourism vulnerability assessment, confirming the usefulness of GIS-based multi-criteria approaches for sustainable tourism planning and risk-sensitive destination management [5].

This development is consistent with broader geoinformatics and tourism scholarship. GIS technologies can improve tourism planning and destination management by supporting spatial analysis, route design, destination accessibility, and evidence-based communication [6]. At the same time, digital tourism platforms have become increasingly important for visitor decision-making, destination visibility, and sustainable destination development [7] and [8]. Together, these studies indicate that GIS-based platforms can function not only as technical systems, but also as communication tools that make destination information more intelligible, accessible, and experience-oriented [1][2][3][4][5][6][7] and [8].

For the present study, this literature is especially relevant because Bang Kobua is a community-based destination whose wellness value depends on both physical routes and experiential interpretation.

A GIS-based platform can therefore serve as a mechanism for organizing tourism information, presenting land-based and water-based routes, and communicating local wellness activities in ways that are more useful to self-guided tourists. This conceptual linkage between geoinformatics, destination communication, and community-based wellness tourism forms the central foundation of the study.

2.5 Synthesis and Research Positioning

The literature suggests three important points. First, wellness tourism is increasingly associated with holistic well-being, restorative environments, and meaningful destination experiences rather than with narrowly defined health services alone [6][7][8] and [9]. Second, community-based tourism becomes more effective and sustainable when local participation and lifestyle identity are embedded in destination planning and communication [10] and [11]. Third, GIS and digital tourism platforms provide a practical means of converting dispersed community assets into navigable, visible, and interpretable tourism experiences [1][2][3][4] and [5].

However, the intersection of these three dimensions remains underdeveloped in the literature, especially in the context of Thai community-based destinations. Existing studies often examine GIS in cultural tourism, digital platforms in tourism promotion, or wellness tourism as a market segment, but fewer studies integrate geospatial systems, community lifestyle identity, and tourist stress relief within a single destination model. This gap provides the rationale for the present study, which develops and evaluates a GIS-based system for promoting wellness tourism in Bang Kobua Subdistrict, Phra Pradaeng District, Samut Prakan Province, Thailand.

3. Research Methodology

3.1 Research Design

This study employed a developmental research design to develop and evaluate a geographic information system (GIS) for promoting community-based wellness tourism in Bang Kobua Subdistrict, Phra Pradaeng District, Samut Prakan Province, Thailand. The research was conducted in two phases. Phase 1 focused on examining community wellness tourism routes and developing the GIS-based system. Phase 2 focused on evaluating the developed system in terms of system quality, user satisfaction, and technology acceptance. The system development process was guided by the Systems Development Life Cycle (SDLC), which provided a structured framework for problem identification, feasibility assessment, system analysis and design,

development, implementation, documentation, and maintenance.

3.2 Research Instruments

The research instruments consisted of three main components:

- *GIS-based wellness tourism promotion system:* The first instrument was the geographic information system developed to support wellness tourism promotion in Bang Kobua Community, Phra Pradaeng District, Samut Prakan Province.
- *System quality evaluation form:* The second instrument was a system quality assessment form used by experts in information technology and computer science to evaluate the developed GIS. The evaluation covered five dimensions: system requirements, functional accuracy, ease of use, processing speed, and security.
- *User questionnaires:* The third instrument consisted of two user-oriented questionnaires: (1) a user satisfaction questionnaire regarding the GIS-based system, and (2) a technology acceptance questionnaire assessing users' perceptions of the system.

The user satisfaction questionnaire covered four aspects: content, design, usability, and perceived benefits. The technology acceptance questionnaire examined perceived usefulness and perceived ease of use, together with users' attitudes toward using the system.

3.3 Spatial Models and GIS Analytical Components

The development of the GIS system incorporated spatial models and mathematical approaches commonly used in geospatial data management and analysis. These components were included to support the design logic of the system and the handling of spatial information.

3.3.1 Spatial statistics and spatial regression

Spatial statistical analysis was used to support the spatial logic of the GIS-based wellness tourism system. Because tourism resources, environmental conditions, accessibility, and community lifestyle attractions are distributed unevenly across space, a spatial regression framework was considered as a conceptual method for representing spatially varying relationships among destination characteristics and wellness-tourism communication outcomes. In this study, Geographically Weighted Regression (GWR) was used as a methodological reference to explain how local relationships may vary by location. The general form is presented in Equation 1:

$$y_i = \beta_0(u_i, v_i) + \sum_{k=1}^p \beta_k(u_i, v_i) xk_i + \varepsilon_i$$

Equation 1

Where y_i represents the dependent variable observed at location i . In the context of this study, y_i refers to the expected wellness-tourism communication outcome or suitability value of a tourism location or route segment, such as route attractiveness, wellness-tourism potential, perceived usefulness, or suitability for communicating community lifestyle identity. The terms u_i and v_i denote the geographic coordinates of location i . $\beta_0(u_i, v_i)$ is the local intercept at location i , $\beta_k(u_i, v_i)$ is the location-specific coefficient of explanatory factor k , xk_i is the value of explanatory factor k at location i , p is the number of explanatory factors, and ε_i is the random error term. The explanatory factors considered in the GIS design included route accessibility, proximity to wellness-related activities, proximity to community lifestyle attractions, environmental and restorative setting, availability of supporting facilities, and suitability for land-based or water-based movement.

3.3.2 Physical and environmental modeling

Physical and environmental modeling was used conceptually to represent relationships among environmental conditions, tourism resources, and system structure. This process facilitated system visualization, model hierarchy, and traceability of linked information components.

3.3.3 Suitability analysis

Suitability analysis was applied as a GIS-based approach for organizing wellness tourism routes and identifying appropriate locations or route segments under relevant spatial, environmental, and tourism-development criteria. A weighted linear combination (WLC) approach was used as the conceptual basis for integrating multiple criteria into a composite suitability score. The general form is presented in Equation 2:

$$S_j = \sum_{i=1}^n w_i X_{ij}$$

Equation 2

Where S_j is the overall suitability score of location or route segment j , w_i is the weight assigned to criterion i , X_{ij} is the standardized score of criterion i for location or route segment j , and n is the total number of criteria. In this study, X_{ij} refers to the standardized value of each spatial or tourism-related factor used to support route design and GIS-based communication. The factors considered were: (1) route accessibility and connectivity, (2) proximity to wellness-related activities such as herbal compress, herbal learning, health massage, and foot spa activities, (3) proximity

to community lifestyle identity resources such as local orchards, riverside livelihoods, local occupations, and community learning points, (4) environmental and restorative setting, including green landscape, canal landscape, and low-stress atmosphere, (5) safety and convenience of tourist movement, (6) availability of supporting facilities, local shops, and community services, and (7) suitability for land-based or water-based tourism route organization. These factors were used to support the GIS route structure, tourism information database, and spatial communication design of the developed system.

3.3.4 Coordinate transformation and map projection

Coordinate transformation and map projection were performed to ensure consistency among field-collected location data, tourism route layers, community attraction points, base maps, and web-based map visualization. The procedure was necessary because geographic coordinates collected from GPS-enabled devices and online map services are commonly recorded as latitude and longitude, whereas distance measurement, route preparation, and spatial overlay require a consistent projected coordinate reference system.

The coordinate transformation procedure consisted of four steps. First, location data for tourism attractions, wellness activity points, community lifestyle resources, shops, facilities, and land-based and water-based route segments were collected and recorded in geographic coordinates based on WGS 84 latitude and longitude. Second, all point and route data were imported into the GIS environment and checked for positional accuracy by

overlaying them with administrative boundary data, satellite imagery, and base-map layers. Third, the spatial data were transformed into WGS 84 / UTM Zone 47N for local spatial processing, distance measurement, and route organization because the study area in Samut Prakan Province is located within this UTM zone. Fourth, for online map display and Google Maps-based visualization, the spatial layers were converted or displayed in a web-mapping coordinate environment compatible with online map services.

The transformation was conducted to reduce positional inconsistency among spatial layers, improve route-distance representation, support accurate overlay between tourism resources and base maps, and ensure that the GIS platform could display community-based wellness tourism information correctly on web and mobile interfaces. After transformation, the researchers verified the results by comparing the plotted attraction points and route lines with field observations and base-map references. Any mismatched points were corrected before being included in the final GIS database.

3.4 Study Procedure

The study was conducted in two major phases, as illustrated in Figure 2.

3.4.1 Phase 1: Route exploration and system development

Phase 1 focused on identifying wellness tourism routes in Bang Kobua Community and developing the GIS-based wellness tourism promotion system by following the SDLC framework.

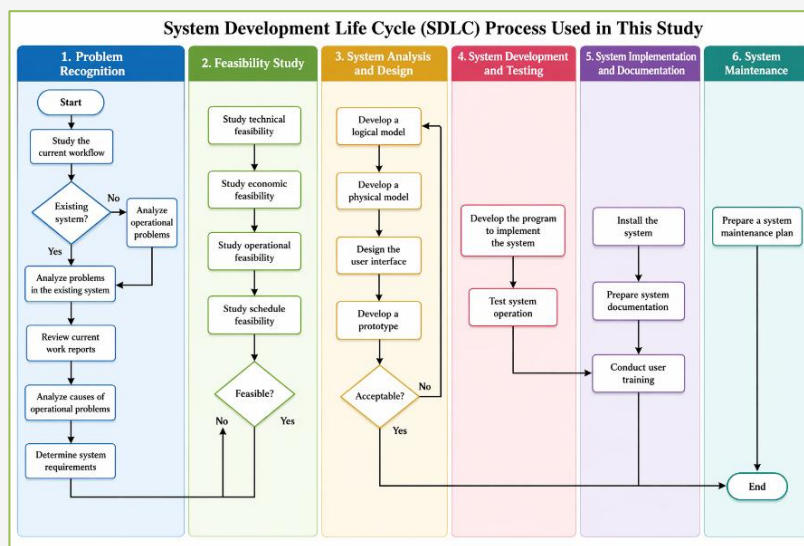


Figure 2: System Development Life Cycle (SDLC) process

(1) Problem recognition

The researchers reviewed documents related to wellness tourism in the Krapao Moo area of Phra Pradaeng District, Samut Prakan Province. The review showed that most tourists tended to visit the area on weekends and long holidays, with tourism activities concentrated mainly around Bang Nam Phueng Floating Market and Sri Nakhon Khuean Khan Park. Although the Krapao Moo area contains several community-based wellness tourism resources, tourists generally lacked awareness of route options and destination information within the area. This created a need for stronger communication through online media, improved spatial information, and route-based guidance for self-guided tourists. Accordingly, the research team developed a GIS-based system to support wellness tourism promotion in Bang Kobua Community.

(2) Feasibility study

The feasibility of the GIS-based wellness tourism system was examined in five dimensions.

- *Technical feasibility*: assessment of available technologies and resources to support tourism system development, including GPS-based location data collection for wellness tourism attractions such as cycling routes, kayaking points, herbal learning centers, and homestays.
- *Operational feasibility*: assessment of whether the system could respond to the needs of both tourists and the local community. This included community willingness to provide information and maintain the system, the usability of the interface for tourists of different age groups, and processes for updating tourism data such as opening hours and special community activities.
- *Economic and market feasibility*: assessment of the balance between development costs and expected economic benefits for the community. The GIS system was expected to improve tourist access to local shops and wellness-related services such as massage and herbal spa activities.
- *Legal feasibility*: consideration of data privacy and compliance with local regulations, particularly because Bang Kachao is a protected green area. System development therefore needed to avoid encouraging tourism practices that could negatively affect the environment.
- *Schedule feasibility*: assessment of the time required for field survey, coordinate collection, system programming, and pilot testing. This phase also considered future functions such as storytelling maps and environmental

monitoring to help manage tourist density and reduce ecological impacts.

(3) Systems analysis and design

The researchers collected tourism destination data and geographic coordinates, including latitude and longitude, using GPS and Google Maps during field surveys. Additional information was gathered from documents and websites. Tourism sites were then selected purposively, and tourism routes were classified based on accessibility, importance, and environmental context. The system components were subsequently analyzed and synthesized into a context diagram, data flow diagram, and entity relationship diagram. Based on the analysis, the researchers designed a relational database and user interface for system interaction. The final GIS structure consisted of five main functions:

- i. community wellness tourism destination database management;
- ii. wellness tourism route management;
- iii. destination search;
- iv. destination information display; and
- v. route display through Google Maps.

(4) Development and implementation

The development phase included field data collection, health-identity data collection, and spatial database design. The spatial database was organized into layers such as roads, canals, wellness tourism sites, and facilities. The front-end system was developed to support mobile and web-based use, with functions such as route optimization and interactive storytelling maps.

The implementation phase involved pilot testing in the Bang Kobua community. Tourists and local residents were invited to test the system in order to identify practical issues such as internet signal limitations and difficulties in understanding map symbols. Technology transfer activities were also conducted to help community representatives and local operators update information in the system, such as adding new locations or revising opening hours. In addition, QR codes were proposed for installation at key locations in the community so that tourists could directly access the GIS platform without manually entering a web address.

(5) Documentation and maintenance

The researchers prepared both printed and electronic user manuals. Community members participated in the design, review, and verification of the manuals to ensure usability and local relevance. After implementation, the system was monitored and maintained to ensure continued functionality, accuracy, and efficiency.

3.4.2 Phase 2: System evaluation

Phase 2 focused on evaluating the developed GIS-based wellness tourism promotion system in three areas.

(1) System quality evaluation by experts

The system was evaluated by experts in information technology and computer science using five criteria: system requirements, functional accuracy, ease of use, processing speed, and security.

(2) User satisfaction evaluation

User satisfaction with the GIS system was assessed in four dimensions: content, design, usability, and benefits received. Satisfaction data were collected through an online questionnaire administered during September 20-30, 2021.

(3) Technology acceptance evaluation

Technology acceptance was evaluated using a questionnaire based on the Technology Acceptance Model (TAM), focusing on perceived usefulness and perceived ease of use. The instrument also assessed users' attitudes toward the system.

3.5 Participants

The participants in this study consisted of two groups. First, five experts in information technology and computer science participated in the system quality evaluation. Second, 411 tourists who used the

GIS system participated in the user satisfaction and technology acceptance evaluation. These participants were selected through simple random sampling.

3.6 Data Analysis

The collected data were analyzed using descriptive statistics, including mean and standard deviation. The interpretation of mean scores was based on five rating levels, as shown in Table 1.

Table 1: Criteria for interpreting mean scores

Mean score range	Interpretation
4.51–5.00	Highest level
3.51–4.50	High level
2.51–3.50	Moderate level
1.51–2.50	Low level
1.00–1.50	Lowest level

3.7 Evaluation Dimensions

To clarify the post-implementation evaluation framework, the study considered four dimensions of success:

- System dimension: navigation accuracy and processing speed
- Behavioral dimension: number of users and time spent in the community
- Economic dimension: increased income for local community shops
- Health dimension: tourist satisfaction and stress relief

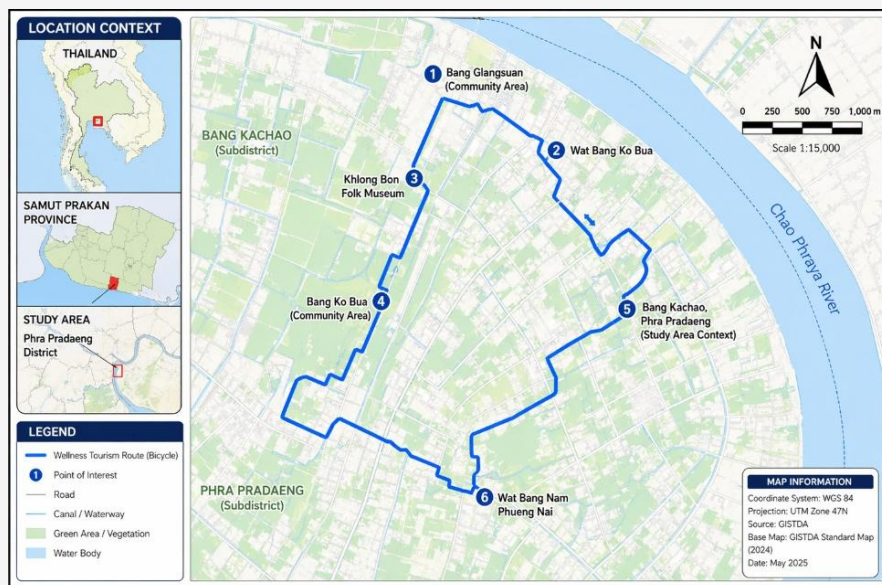


Figure 3: Wellness tourism route and key attractions in Bang Kobua Community, Phra Pradaeng district, Samut Prakan province, Thailand



Figure 4: Detailed wellness tourism route and key attractions in Bang Kobua Community, Phra Pradaeng district, Samut Prakan province, Thailand

4. Results

4.1 Community-Based Wellness Tourism Routes in Bang Kobua

The findings revealed that wellness tourism in Bang Kobua Subdistrict, Phra Pradaeng District, Samut Prakan Province, Thailand, can be characterized as health-promoting tourism. The tourism experience is organized around both land-based and water-based routes, through which tourists engage in self-guided activities such as cycling and boating while learning about the local way of life. The area is a green landscape with abundant natural resources and native plant species, including rattan, sea holly, freshwater mangrove species, sesbania, *lamphu*, *lamphaen*, devil tree, and nipa palm. In addition, each route includes wellness-related activities such as herbal compress making, foot spa experiences, and healthy food and beverages.

Bang Kobua functions as a canal-based community with strong links between local ecology, community lifestyle, and tourism activities. Community members contributed ideas for designing wellness tourism activities consistent with local identity, including cycling, boating, herbal compress making, natural dyeing, and foot spa massage. As a result, the research team and the community jointly developed two wellness tourism routes to respond to emerging tourist demands: a land route and a water route.

4.1.1 Land-based wellness tourism route

The land-based route consists of five main destinations (Figures 3 and 4). Point 1: Baan Klang Suan offers wellness activities such as herbal compress making, natural dyeing using locally available materials, herbal foot spa treatment, and cycling. Point 2: Wat Bang Kobua is an old Mon

temple and an important cultural site in the community. Point 3: Khlong Bon Community Museum serves as a local learning center where tourists can study community history, local ways of life, and historical objects such as old currency, agricultural tools, and household utensils. Point 4: Khlong Bon Herbal Garden is a learning space for medicinal herbs used in daily healthcare and food-based healing practices. Point 5: Baan Onlamun represents a modified central Thai architectural style and allows visitors to learn about local lifestyles, plant species, and traditional water-level control practices.

4.1.2 Water-based wellness tourism route

The water-based route consists of three main destinations (Figures 3 and 4). Point 1: Baan Klang Suan serves as the starting point for boating activities. Point 2: Nipa Palm Tunnel passes through a scenic canal corridor lined with drooping banyan branches and nipa palms, creating a tunnel-like landscape and reflecting local ecological knowledge. Point 3: Chao Phraya River Viewpoint provides a panoramic riverside view and a view of Khlong Toei Port, while also offering a relaxing atmosphere along the Chao Phraya River.

4.2 Development of the GIS-Based Wellness Tourism Promotion System

The GIS-based system developed for community wellness tourism promotion comprised three major components: spatial data management, system architecture and technology, and core system functions.

First, spatial data were collected using GPS and Google Maps to identify the latitude and longitude of

key tourism destinations at the community level. The system organized information into several layers, including land and water transportation routes, wellness tourism attractions, and supporting facilities.

Second, the system architecture adopted a server-side scripting approach. PHP was used for server-side processing, and MySQL served as the database management system. For map visualization, the system integrated Google Maps API, allowing interactive functions such as zooming, route display, and location comparison between users and attractions. The user interface followed a responsive design approach to support smartphone-based access during actual travel.

Third, the system contained three major functional groups: database management, route optimization, and interactive storytelling maps. The back-end management system allowed administrators to add and edit destination coordinates and details. Route optimization enabled the calculation and display of suitable travel routes for land-based and water-based tourism. The storytelling function extended beyond location display by embedding community lifestyle

identity into the map through contextual information such as herbal knowledge and local narratives.

4.3 Expert Evaluation of System Quality

The system quality was evaluated by experts in information technology and computer science. The evaluation results are presented in Table 2.

As shown in Table 2, the overall system quality was rated at the highest level ($\bar{x} = 4.56$, S.D. = 0.53). Among the five evaluation dimensions, security received the highest score ($\bar{x} = 4.80$, S.D. = 0.45), followed by system requirements and ease of use ($\bar{x} = 4.60$, S.D. = 0.55 for both). Functional accuracy and processing speed were both rated at a high level ($\bar{x} = 4.40$, S.D. = 0.55).

4.4 Demographic Characteristics of Participants

The demographic characteristics of the 411 tourist participants are presented in Tables 3 and 4. Table 3 shows that the sample consisted of 411 participants, of whom 338 were male (82.24%) and 73 were female (17.76%). As presented in Table 4, the largest age group was 21–30 years (29.93%), followed by 51–60 years (26.03%), 41–50 years (20.19%), over 60 years (13.63%), and 31–40 years (10.22%).

Table 2: Expert evaluation of GIS system quality for wellness tourism promotion

Evaluation Dimension	Mean (\bar{x})	S.D.	Interpretation
System requirements	4.60	0.55	Highest
Functional accuracy	4.40	0.55	High
Ease of use	4.60	0.55	Highest
Processing speed	4.40	0.55	High
Security	4.80	0.45	Highest
Overall	4.56	0.53	Highest

Table 3: Demographic profile of participants by gender

Gender	Frequency	Percentage (%)
Male	338	82.24
Female	73	17.76
Total	411	100.00

Table 4: Demographic profile of participants by age

Age Group (years)	Frequency	Percentage (%)
21–30	123	29.93
31–40	42	10.22
41–50	83	20.19
51–60	107	26.03
Over 60	56	13.63
Total	411	100.00

Table 4: Demographic profile of participants by age

Age Group (years)	Frequency	Percentage (%)
21–30	123	29.93
31–40	42	10.22
41–50	83	20.19
51–60	107	26.03
Over 60	56	13.63
Total	411	100.00

Table 5: User Evaluation of the effectiveness of the GIS-based wellness tourism information system

Evaluation Dimension / Item	Mean (\bar{x})	S.D.	Interpretation
Content	4.42	0.58	High
Accuracy of wellness tourism information in reflecting local identity	4.56	0.51	Highest
Appropriateness of route arrangement in relation to geographic conditions	4.42	0.60	High
Completeness of information in relation to community lifestyle and wellness tourism management	4.27	0.64	High
System design	4.38	0.68	High
Accuracy and completeness of content and images in representing community identity	4.46	0.65	High
Overall attractiveness and support for learning community identity	4.35	0.68	High
Readability and suitability of text display for wellness tourists' stress relief	4.33	0.69	High
System usability	4.47	0.60	High
Convenient and secure accessibility	4.56	0.60	Highest
Appropriate use of technology	4.44	0.59	High
Speed of display and response	4.42	0.61	High
Overall	4.42	0.62	High

Table 6: User technology acceptance of the GIS-based wellness tourism information system

Evaluation Dimension / Item	Mean (\bar{x})	S.D.	Interpretation
Perceived usefulness	4.32	0.69	High
The system helps users find relevant wellness tourism information	4.28	0.71	High
The system saves time in planning wellness tourism trips	4.33	0.71	High
Overall usefulness of the system for wellness tourists	4.35	0.63	High
Perceived ease of use	4.33	0.66	High
The system is clear and easy to understand	4.33	0.67	High
System interaction is not complicated	4.25	0.70	High
The manual is easy to learn and requires little time to study	4.42	0.62	High
Attitude toward use	4.34	0.67	High
Positive feelings toward using technology to plan wellness tourism	4.27	0.72	High
Confidence that the system supports relaxation along wellness tourism routes	4.35	0.67	High
Willingness to recommend the system to others	4.41	0.64	High
Overall	4.33	0.67	High

4.5 User Evaluation of System Effectiveness

The effectiveness of the GIS-based wellness tourism information system was evaluated by users in terms of content, system design, and usability. The results are shown in Table 5. The table indicates that the overall effectiveness of the GIS-based system was rated at a high level ($\bar{x} = 4.42$, S.D. = 0.62). Among the three major dimensions, system usability received the highest mean score ($\bar{x} = 4.47$, S.D. = 0.60), followed by content ($\bar{x} = 4.42$, S.D. = 0.58) and system design ($\bar{x} = 4.38$, S.D. = 0.68). Within the content dimension, the highest-rated item was the accuracy of wellness tourism information in reflecting local identity ($\bar{x} = 4.56$, S.D. = 0.51), which reached the highest level. The appropriateness of route arrangement in relation to geographic conditions was rated at a high level ($\bar{x} = 4.42$, S.D. = 0.60), as was the completeness of information in relation to community lifestyle and wellness tourism management ($\bar{x} = 4.27$, S.D. = 0.64). Within the system design dimension, the highest-rated item was the accuracy and completeness of content and images in representing community identity ($\bar{x} = 4.46$, S.D. = 0.65). The overall attractiveness of the system and its

support for learning community identity was rated high ($\bar{x} = 4.35$, S.D. = 0.68), as was the readability and suitability of text display for stress-relief-oriented wellness tourism ($\bar{x} = 4.33$, S.D. = 0.69). Within the usability dimension, convenient and secure accessibility received the highest score ($\bar{x} = 4.56$, S.D. = 0.60), reaching the highest level. Appropriate use of technology ($\bar{x} = 4.44$, S.D. = 0.59) and speed of display and response ($\bar{x} = 4.42$, S.D. = 0.61) were both rated at a high level.

4.6 User Technology Acceptance

Technology acceptance of the GIS-based system was evaluated using the Technology Acceptance Model (TAM). The results are presented in Table 6. As shown in Table 6, the overall level of technology acceptance was high ($\bar{x} = 4.33$, S.D. = 0.67). Among the three major dimensions, attitude toward use received the highest mean score ($\bar{x} = 4.34$, S.D. = 0.67), followed closely by perceived ease of use ($\bar{x} = 4.33$, S.D. = 0.66) and perceived usefulness ($\bar{x} = 4.32$, S.D. = 0.69). For perceived usefulness, the highest-rated item was the overall usefulness of the system for wellness tourists ($\bar{x} = 4.35$, S.D. = 0.63), followed

by time savings in trip planning ($\bar{x} = 4.33$, S.D. = 0.71) and the system's ability to help users find relevant wellness tourism information ($\bar{x} = 4.28$, S.D. = 0.71).

For perceived ease of use, the highest-rated item was the availability of an easy-to-learn manual requiring little study time ($\bar{x} = 4.42$, S.D. = 0.62), followed by the clarity and understandability of the system ($\bar{x} = 4.33$, S.D. = 0.67) and the simplicity of system interaction ($\bar{x} = 4.25$, S.D. = 0.70). For attitude toward use, the highest-rated item was the willingness to recommend the system to others ($\bar{x} = 4.41$, S.D. = 0.64), followed by confidence that the system supports relaxation along wellness tourism routes ($\bar{x} = 4.35$, S.D. = 0.67), and positive feelings toward using technology to plan wellness tourism ($\bar{x} = 4.27$, S.D. = 0.72).

4.7 Summary of Findings

Overall, the findings indicate that Bang Kobua possesses strong potential for community-based wellness tourism supported by both land-based and water-based routes. The developed GIS successfully integrated spatial data, destination information, route visualization, and interactive storytelling into a responsive digital platform. Both expert and user evaluations were favorable, with particularly strong performance in security, usability, content accuracy, and technology acceptance. These results suggest that the developed GIS can function as an effective digital tool for promoting wellness tourism while strengthening local visibility, visitor access, and community-based destination experiences.

5. Discussion

The results indicate that Bang Kobua possesses strong potential for community-based wellness tourism supported by digital spatial communication. The identification of both land-based and water-based routes suggests that wellness tourism in this setting is not organized around a single attraction, but rather around an integrated experiential network that combines mobility, local ecology, cultural interpretation, and wellness-oriented activities. This finding is consistent with previous geoinformatics studies showing that GIS can improve destination planning and tourism communication by transforming dispersed attractions into accessible and intelligible route systems [1][2] and [3]. It also aligns with digital tourism scholarship emphasizing that contemporary destination competitiveness increasingly depends on the ability to deliver structured, location-based, and user-oriented digital information [4] and [5].

A second important finding is that the wellness value of Bang Kobua is deeply embedded in

community lifestyle identity rather than in stand-alone health facilities. Activities such as cycling, boating, herbal compress making, natural dyeing, and foot spa treatment are not isolated tourism products; they are expressions of local knowledge, environmental resources, and canal-based ways of life. This interpretation is in line with recent wellness tourism literature, which argues that wellness experiences emerge through the interaction of destination atmosphere, restorative qualities, emotional recovery, and meaningful engagement with place [6][7][8] and [9]. In particular, the perceived destination restorative qualities can enhance psychological recovery in wellness tourism contexts [8], which supports the present finding that Bang Kobua's green environment, riverside landscape, and slow-paced community activities can contribute to stress-relief-oriented travel experiences.

The system-development findings further confirm the practical role of GIS as a tourism communication infrastructure. The developed platform integrated spatial data management, route visualization, database functions, and interactive storytelling maps into a single responsive interface. The results showed that WebGIS can strengthen destination communication through virtual tours, spatial interfaces, and digital content integration [1], and the results also show that GIS-based cartography can improve tourism planning by structuring attractions spatially [2]. In the Bang Kobua case, the GIS system extended these functions into a wellness tourism context by embedding local lifestyle identity and contextual knowledge into the map interface. Therefore, the contribution of the system lies not only in technical mapping, but in enabling visitors to interpret community-based wellness experiences through spatially organized information [1][2] and [3].

The expert evaluation results also reinforce the technical credibility of the developed platform. The overall quality of the system was rated at the highest level, with particularly strong scores for security, system requirements, and ease of use. These results suggest that the platform was not only conceptually relevant but also operationally reliable. This point is important because destination technologies are effective only when they are usable, secure, and stable in real-world settings. The present findings are therefore compatible with prior work on geospatial tourism applications, which emphasizes that system quality, functional accuracy, and contextual suitability are essential to successful digital destination management [3] and [18].

The user evaluation results provide further support for the effectiveness of the platform. Overall

system effectiveness was rated at a high level, and the highest scores were observed in usability and content accuracy. Particularly notable is the finding that users valued the system's ability to represent local identity accurately, arrange tourism routes appropriately, and provide convenient and secure access. These results indicate that users did not perceive the platform as merely a technical interface; instead, they experienced it as a meaningful communication tool that improved their understanding of the destination. This is consistent with digital tourism studies showing that digital platforms generate value when they enhance discoverability, navigability, and interpretability rather than simply reproducing static promotional content [4][5] and [17].

Technology acceptance results strengthen this interpretation. Users reported high levels of perceived usefulness, perceived ease of use, and positive attitudes toward the system. In particular, they viewed the system as useful for planning wellness tourism, easy to learn, and worth recommending to others. These outcomes are important because they indicate not only technical functionality but also practical legitimacy from the user perspective. Such findings are broadly compatible with GIS adoption research, which suggests that perceived ease of use, usefulness, and system clarity are central to continued acceptance of geospatial technologies [18]. In the context of Bang Kobua, the results imply that GIS-based platforms can support self-guided wellness tourism effectively, especially where visitors rely on mobile-based route navigation and place-specific information during actual travel.

Another important implication concerns community-level value creation. The results suggest that the GIS system may help redirect tourist flows toward smaller local businesses and wellness-related services that might otherwise remain overlooked. This is particularly relevant in community-based tourism, where the success of tourism development depends not only on visitor numbers, but also on whether tourism benefits are distributed across local actors. The present findings are consistent with community-based tourism scholarship emphasizing participation, benefit sharing, and local ownership as central conditions for sustainable tourism development [10][11] and [19]. Although the current study did not directly measure long-term income growth, the positive evaluation of route accessibility, content completeness, and user engagement suggests that the system can support more inclusive local tourism economies by improving the visibility of community assets. The findings of this study are further supported by recent studies in the

International Journal of Geoinformatics that are not duplicated in the literature review section. Green tourism planning in sensitive coastal and geopark environments should integrate conservation, community participation, sustainable travel, local economic benefits, and place-based visitor experiences [32]. This is consistent with the present study because Bang Kobua's wellness tourism value depends not only on tourist attractions, but also on the ability to organize green landscapes, canal environments, local lifestyles, and wellness activities into a sustainable community-based tourism experience.

The route and accessibility findings are also consistent with recent geospatial planning studies. A GIS-based multi-criteria decision-making approach was used to identify suitable e-scooter shared station locations by considering proximity to recreation, tourist areas, green spaces, transport facilities, and population density [24]. Although their study focused on micromobility rather than tourism routes, it supports the present study's use of GIS to organize movement, accessibility, and route-based tourism information. Similarly, GIS, AHP, and multi-criteria decision analysis can support bridge and road site selection by integrating accessibility, environmental, and service-related criteria, including access to tourist attractions [25]. This supports the present study's argument that land-based and water-based wellness tourism routes require spatially informed planning rather than simple descriptive mapping.

In addition, potential surface analysis can be used with GIS overlay techniques to classify development potential based on physical, infrastructural, and risk-related factors [26]. This is relevant to the present study because the GIS-based wellness tourism system also depends on the integration of spatial layers, tourism nodes, accessibility, supporting facilities, and environmental conditions. Land-use and land-cover change analysis can help explain local traditional living changes and tourism-related spatial transformation [27]. This supports the interpretation that community lifestyle identity should be treated as a spatially embedded tourism resource. Therefore, the present study contributes to geoinformatics research by extending GIS-based planning approaches into a digital spatial communication model for wellness tourism, where routes, community identity, restorative environments, and tourist decision-making are integrated into a web-based GIS platform. From the health-related geoinformatics perspective, the role of GIS in spatial analysis, real-time monitoring, data integration, and health preparedness [28]. Although their study focused on public health surveillance rather than tourism, it supports the broader argument

that GIS can organize health-related spatial information for decision-making. This strengthens the interpretation of the present study as a wellness-oriented spatial communication system rather than only a tourism information system.

Taken together, the findings suggest that the contribution of this study lies in integrating wellness tourism, community lifestyle identity, and GIS-based spatial communication into a single applied model. Existing studies have separately demonstrated the value of GIS in tourism planning [1][2] and [3], digital platforms in destination communication [4] and [5], restorative qualities in wellness tourism [8][9][12] and [15], and community participation in sustainable local tourism [10][11] and [19]. However, fewer studies have combined these dimensions in a community-based destination model focused explicitly on wellness promotion and tourists' stress relief. The Bang Kobua case therefore contributes practical evidence that geoinformatics can support not only tourism management, but also the experiential, interpretive, and restorative dimensions of community-based wellness tourism.

Despite these contributions, several limitations should be acknowledged. First, the study was conducted in a single destination, which may limit broader generalizability. Second, the evaluation relied primarily on descriptive statistics and user perceptions rather than on behavioral tracking or longitudinal measurement. Third, although the system was positively evaluated, future studies should examine actual navigation behavior, repeat use, physiological or psychological stress-reduction outcomes, and long-term economic impacts at the community level. Even so, the present findings provide a strong basis for extending GIS-supported wellness tourism development to other community destinations with comparable ecological and cultural characteristics [3][8] and [11].

6. Conclusions

This study examined community-based wellness tourism routes in Bang Kobua Subdistrict, Phra Pradaeng District, Samut Prakan Province, Thailand; developed a geographic information system (GIS) for wellness tourism promotion; and evaluated the effectiveness of the developed system. The findings confirm that Bang Kobua has strong potential for community-based wellness tourism because its tourism resources combine a green landscape, canal-based mobility, local cultural identity, and wellness-related activities. Two tourism routes were identified, namely land-based and water-based routes, both of which connect local attractions and community experiences that support health promotion, relaxation, and stress relief. The study

also demonstrated that the developed GIS can serve as an effective digital platform for organizing and communicating wellness tourism information. The system integrated spatial data management, route display, destination search, destination information presentation, and Google Maps-based visualization into a user-accessible interface. In doing so, the platform supported not only route-based navigation, but also the communication of community lifestyle identity through place-based information and local wellness experiences.

The evaluation results further indicate that the developed system performed well from both expert and user perspectives. Expert assessment showed that the overall system quality was at the highest level, particularly in terms of security, system requirements, and ease of use. User evaluation likewise showed a high level of effectiveness, especially in system usability, content accuracy, and accessibility. In addition, technology acceptance was rated at a high level, suggesting that users perceived the system as useful, easy to use, and worthy of recommendation to others.

Overall, this study contributes an applied model for integrating geoinformatics, digital tourism communication, and community-based wellness tourism. The findings suggest that GIS can function as more than a technical mapping tool; it can also support destination visibility, self-guided travel, and the communication of local identity in ways that enhance wellness-oriented tourism experiences. For local communities, this approach offers practical value by increasing access to tourism information, improving the visibility of community attractions, and supporting more inclusive and sustainable tourism development.

Despite these contributions, the study was conducted in a single community setting and relied primarily on descriptive evaluation data. Future research should therefore examine system use in other destinations, measure long-term community and economic outcomes, and explore more direct indicators of tourist well-being and stress reduction. Even so, the present study provides a strong foundation for the continued development of GIS-based wellness tourism systems in community destinations.

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