

## Connecting Integrated Tourism Networks Post COVID-19 Scenario with Geoinformatics Innovation in Prachuap Khiri Khan Province for Thai Tourists

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### Abstract

Adapting to survive the post-COVID-19 pandemic is challenging for tourism and hospitality businesses. Government agencies play a significant role in assisting entrepreneurs in overcoming crises. The objectives of this study were to examine the situation of the tourism industry in Prachuap Khiri Khan Province, develop integrated tourism innovations utilizing geo-informatics technology to connect tourism networks and evaluate the satisfaction of tourism innovations. This study utilised mixed research methods. The study instruments consisted of an open-ended questionnaire and in-depth interviews to examine the state of the tourism industry in the region, the ArcGIS Online software for developing innovations in geospatial tourism, and an online questionnaire to assess satisfaction with innovation. The questionnaire results were analyzed using descriptive statistics. The sample group for the satisfaction evaluation was comprised of 410 Thai tourists. The results of the study found that 1) there was a problem with the lack of connection of tourism database systems within the province, making it difficult for tourists to access information, 2) innovations developed to become a central database that collects information on tourism businesses sectors in the prototype area and interactive data analysis tools for users at any time and 3) the satisfaction assessment results indicated that tourists were satisfied with the database.

**Keywords:** Tourism innovation, Integrated tourism, Geographic information system, Regional tourism network, Post Covid-19 Scenario

## Introduction

The COVID-19 outbreak has affected the economy, society and people's minds. The tourism and hospitality industry is the most affected as it is related and relies heavily on travel (Dube et al., 2021). Specifically, the government's lockdown order aims to prevent the spread of COVID-19. Instead, it causes rapid and severe damage to the tourism and hospitality industry (Sheresheva et al., 2021). International travel restrictions had an immediate impact on the tourism industry, including the disruption of the aviation industry, the cancellation of tour sales and hotel reservations, the sharp decline in leisure and entertainment establishments and the lowest drop in tourist demand for tourism-related services (Ntounis et al., 2022; Tsionas, 2021). As stated previously, 30 to 40 percent of the global travel and service market is forced to shut down because their expenses exceed their income (Haywood, 2020).

After measures and restrictions were relaxed, stakeholders involved in the tourism industry had to adapt to new social distancing guidelines. Especially in the small and medium-sized business sector, it is challenging to adapt to survive the COVID-19 pandemic. Most countries have used economic stimulus measures from the government to maintain their tourism economy (Huynh et al., 2022). World Trade Organization (WTO) has outlined four measures that most countries worldwide are taking action in response to the COVID-19 pandemic, consisting of 1) financial support measures, 2) measures for employment and skills training, 3) measures to create marketing alliances and 4) to restart the tourism industry (UNWTO, 2020). These measures aim to revitalize tourism and encourage tourists to visit again. It shows that the government and agencies are essential in supporting more effective proactive crisis resolution.

Thailand's tourism and hospitality industry has also been severely affected by the COVID-19 pandemic, including a massive loss of tourism revenue and a sharp drop in foreign tourists. The sharp decline in Thai and foreign tourists in 2021 has significantly impacted Prachuap Khiri Khan Province, the country's tourism hub. In 2021, there were 2,673,519 Thai tourists and 3,597 foreign tourists. While in 2019, it was found that there were 5,924,708 Thai tourists and 1,243,443 foreign tourists (Manager Online, 2020). However, it is anticipated that when the COVID-19 epidemic subsides, tourists will pay greater attention to tourism standards and hygiene safety in Thailand (Parliamentary Budget Office, 2020). Travelers will turn to digital technology and travel platforms for their travel planning. Online travel market trends will significantly influence the tourism and hospitality industry's potential centred on travel technology. The strategy of conducting business in a digital environment, known as digital marketing, has spawned a new business model in the tourism industry (Palos-Sanchez et al., 2021). Internet-connected electronic devices are utilised to aid tourists during their travels. It also resulted in the creation of an integrated social media platform and tourism website to increase economic opportunities within the local community (Jattamart et al., 2023; Saura, 2021; Zhou et al., 2020).

Rural tourism has become a strategy for revitalising rural regions' economies because it can generate jobs, incomes, and improvements in the quality of life for the community's residents (Ariyani & Fauzi, 2023; Gohori & van der Merwe, 2020). Tourism integration is a new and innovative business model that aims to provide users with a positive travel experience, given the increasing popularity of Internet use while travelling and engaging in tourism-related activities. Tourism industry stakeholders should develop the concept of developing alternative tourism and utilising technological innovation to satisfy tourists following the context of the area. It will lead to the development a sustainable tourism industry by utilising technology effectively.

This study is designed to fill the study gap to develop an innovative geospatial integrated geospatial to connect the tourism network of Prachuap Khiri Khan Province after the COVID-19 situation. This study focuses on the involvement of many sectors, including local government agencies, namely sub-district local governments, the private sector in tourism and small-scale services to link tourism. The distribution of popularity and attraction of tourists from Hua-Hin Subdistrict considered the primary tourist destination of Pak Nam Pran Subdistrict, results in a plan to develop tourist attractions in the region to support the expansion of tourism links throughout Prachuap Khiri Khan Province. The highlight of the developed tourism innovation is a tool to recommend travel routes and tools to analyze and search for resorts and restaurants according to desired conditions. It also displays the location, information and pictures of the place online. This will help tourists plan their trips and make decisions more conveniently. It also helps solve problems for the small private sector to survive in the post-COVID-19 situation.

### **Objectives**

1. To examine the situation of the tourism industry in Prachuap Khiri Khan province.
2. To develop tourism innovation integrated with geo-informatics technology to connect the tourism network in Prachuap Khiri Khan Province.
3. To evaluate the satisfaction with integrated tourism innovation utilizing geo-informatics to connect the tourism network in Prachuap Khiri Khan Province.

### **Literature and theoretical background**

#### **Challenges facing businesses during the COVID-19 pandemic**

With the global economy slowing down and long-term affected by the COVID-19 pandemic, the tourism and hospitality industries are inevitably affected directly (Crick & Crick, 2020). Especially the businesses that were affected before other businesses, namely the tourism business, accommodation and restaurants (Anusonphat, 2020). Experts suggest that the pandemic is more likely to affect small businesses than large ones (Bartik et al., 2020; Juergensen et al., 2020; Shafi et al., 2020). This is because small companies have limitations in managing risks such as lack of capital and liquidity, fixed costs but reduced or no revenue, decreased customer demand and technology limitations. At the same time, the smallest businesses are trying to adapt to survive this crisis by postponing investment, reducing labor costs through forced reductions in staff or wages, cutting costs, and changing marketing strategies, including the use of digital technology to increase market opportunities (Anthony & Abbas, 2021; Priyono et al., 2020). It has responded to the crisis by seeking cooperation with all sectors to improve the potential of community tourism by promoting both local and private sectors, sharing local resources, and increasing community tourism standards to build tourists' confidence. Developing and expanding the community's competitiveness will help local tourism adapt sustainably.

#### **Changing travel behavior of tourists**

In efforts to revitalize the tourism and hospitality industry, all sectors must understand the tourism behavior of tourists in the post-COVID-19 situation. Research has found that planned travel behavior after the pandemic relates to traveler perceptions. The travel intent primarily focuses on the facility's safety and hygiene standards, such as hotel hygiene and privacy (Kourgiantakis et al., 2021; J. Li, Nguyen, & Coca-Stefaniak, 2020), or favoring less interactive forms of tourism such as nature and adventure tourism (Cristina-Andrada et al., 2020). In addition, the quality of service is another factor in creating satisfaction and an experience that meets the expectations of tourists. There are 5 components: 1) attractions and nearby areas, 2) facilities and services, 3) accessibility, 4) destination image, and 5) price (Schlesinger et al., 2020). Therefore, if all sectors understand the perceptions and expectations

of tourists and use them to improve services that align with each area's critical situation and specific context. It will help tourists be satisfied with the service, affect the loyalty to use the service in the future and lead to the foundation of sustainable tourism.

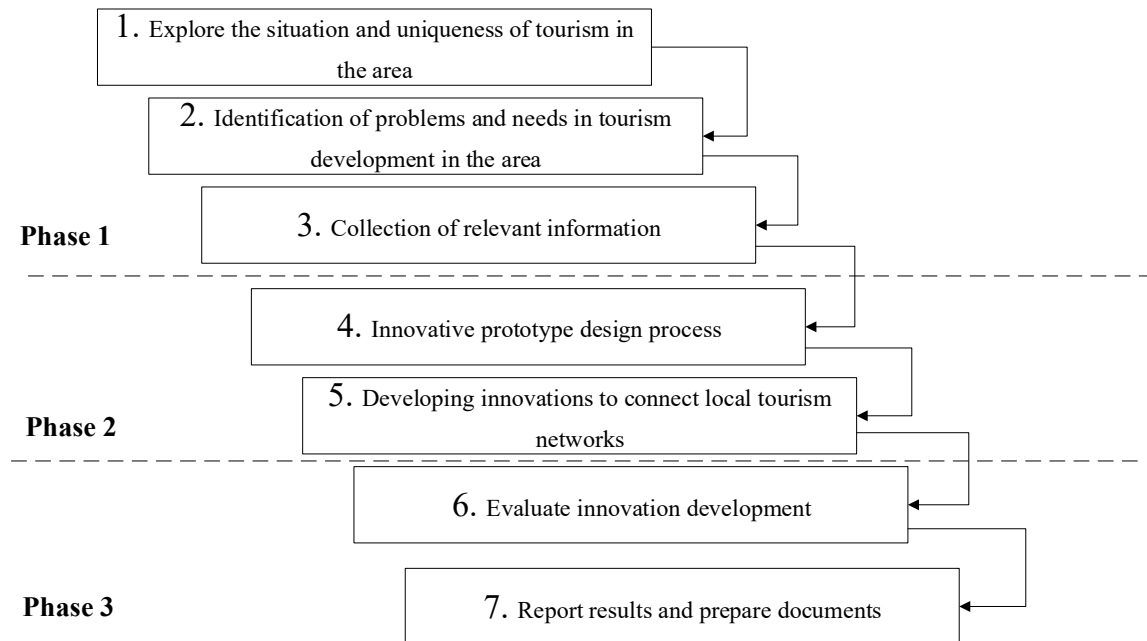
### **Technological innovation and the recovery of the tourism and service industry**

Technological innovation plays a crucial role in recovering the tourism and hospitality industry during the COVID-19 pandemic, starting with users turning to social media to find health information (Z. Li, Wang, Abbas, Hassan, & Mubeen, 2022). While the business sector has introduced technological innovations to reduce the interaction between users and employees to confirm safety and hygiene standards in providing services (Shin & Kang, 2020) or implementation of web technologies, development of applications using artificial intelligence (AI), application of IOT (Internet of Things) technologies for intelligent services (Orîndaru et al., 2021). The goal is to want to recover the tourism and service industries. However, using technological innovations to improve services will not be problematic for medium and large enterprises without financial constraints. Adopting innovative technology may not be worth the cost if it is a small business sector with many fragmented operations. In addition, the inability to accept new technologies for service use is a significant obstacle in service development (Sung et al., 2020).

Therefore, helping small tourism and service businesses to recover after the COVID-19 crisis requires cooperation from all sectors. Starting with government agencies in the area to explore the situation of the tourism industry in the area, gather information about establishments that operate tourism and service businesses, and develop technological innovations to create a tourism database suitable for the site. This will help facilitate today's tourists who use digital technology and travel platforms to plan their trips. It also increases market opportunities for the small business sector to compete with medium and large business sectors. Meanwhile, the private sector should participate in marketing promotion activities organized by local government agencies in response to sustainable economic recovery strategies in the area.

## **Methodology**

This research employed mixed methods research as follows: Qualitative research describes objective 1, an examination of the situation of the tourism industry in Prachuap Khiri Khan province. Quantitative research describes Objective 3, which evaluates the satisfaction with the developed innovations. The research methodology was developed within the system development life cycle (SDLC) framework, partitioning the research process into three phases, as depicted in Figure 1.



**Figure 1** Research process  
(Source: Researcher, 2023)

### **Phase 1: Surveying and collecting data on tourism situations**

#### **1. Explore the situation and uniqueness of tourism in the area**

Entering the prototype area is Pak Nam Pran Subdistrict Pranburi District Prachuap Khiri Khan Province to explore the situation and uniqueness of tourism in the area. The northern boundary of the Pak Nam Pran sub-district connects to Nong Kae Sub-district, Hua-Hin District, along with a 12-kilometer-long beach line. Pak Nam Pran Subdistrict is a popular tourist destination with numerous hotels and other tourism-related business investments. Make individuals work as farmers, fishermen, merchants, contractors, and business owners, among other occupations.

#### **2. Identification of problems and needs in tourism development in the area**

The research team met with administrators and related persons of Pak Nam Pran Subdistrict Administrative Organization to clarify the project's objectives and inquire about the problems and needs of tourism development in the area through an open-ended questionnaire. Additionally, The Pak Nam Pran Subdistrict Administrative Organization will help contact and publicize resort accommodation operators, pool villas and restaurants the local people operate to join the project. The Pak Nam Pran Subdistrict Administrative Organization clarified the reasons for public relations only to resort accommodation operators, as follows:

- Resort and pool villa operators are small operators who are directly affected and affect the employment of people in the community. Therefore, it should help support and give importance to small entrepreneurs to be able to operate their businesses to survive in the COVID-19 outbreak situation as a priority.

- Consistent with the tourism development strategy of Pak Nam Pran Subdistrict Administrative Organization in the first approach: developing, supporting and promoting tourism promotion activities, and the third approach: community development for conservation and tourism.

The reasons for Pak Nam Pran Subdistrict Administrative Organization above it align with the research project's objectives with the concept of focusing on the stakeholders in the area to get the most benefit from the research results. Therefore, it concludes the data collection issue by collecting data from accommodation operators such as resorts, pool villas and restaurants operated by local people who voluntarily participate in the research project and will collect data in the next step.



**Figure 2** Consult with the administrators of the Pak Nam Pran Subdistrict Administrative Organization (Source: Researcher, 2023)

### 3. Collection of relevant information

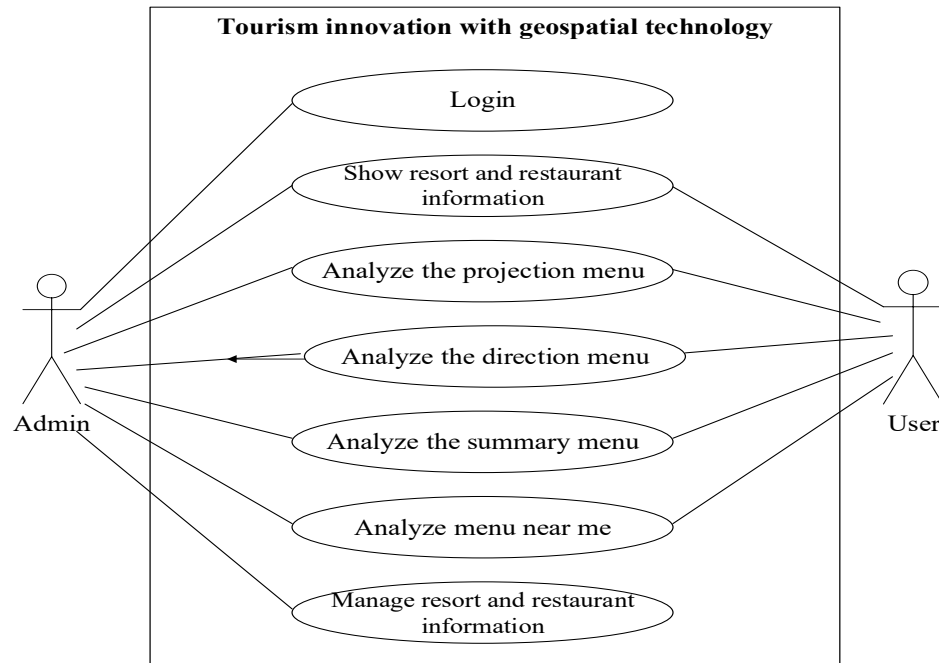
The research team traveled to the area depicted in Figure 3 to collect data for the project.



**Figure 3** Visit the area to collect data with entrepreneurs (Source: Researcher, 2023)

### 4. Innovative prototype design process

Use Case Diagrams are used for designing innovations to 1) summarize the capabilities of the system, 2) present the internal components of the system and 3) describe the interactions between the operators of the system and the activities of the system as a whole. The use case diagram of the innovative design is shown in Figure 4.



**Figure 4** Shows a Use Case Diagram of an innovative prototype design  
(Source: Researcher, 2023)

From Figure 4, it can be explained that the innovation design divides the operator and the system into two parts as follows:

- Section 1 Admin: Administrators will interact with system activities, such as entering login information to manage innovation data, configuring menus for analyzing results, and personalizing display formats for easy access.
- Section 2 Users: Users can interact with internal activities without entering login credentials and have access to the resort and restaurant-specific information. Includes selecting the type of data analysis from each of the four menus.

### 5. Developing innovations to connect local tourism networks

Developing tourism innovations with ArcGIS Online supports spatial data analysis, displays online maps, and uses the Survey123 for ArcGIS application to collect resort and restaurant location coordinates. The information shown through the innovation consists of 1) place name, 2) location, 3) latitude and longitude, 4) type, 5) owner's name, 6) starting price, 7) contact method, 8) picture, 9) websites and 10) notes. The developed innovation can analyze data in four menus: 1) projection menu, 2) direction menu, 3) data summary menu and 4) near me menu.

### Phase 3: Assessment of Satisfaction with Tourism Innovation

#### 6. Evaluate innovation development

Assessment of satisfaction towards the development of tourism innovation uses an online questionnaire to collect data. There are applications of the Technology Acceptance Model (TAM), which describes information technology user behavior that is assessed by the user's level of perception of the system (Davis, 1989), and the Information System Success Model (IS Success Model), which is used to evaluate the success of information systems (DeLone & McLean, 1992), as a conceptual framework for developing the questionnaire.

The questionnaire was divided into three parts as follows: part 1, respondent information, part 2, satisfaction with the innovation, which consisted of 6 questions: 1) perceived usefulness of use, 2) perceived usefulness ease of use, 3) user attitude, 4) service quality, 5) information quality, and 6) system quality, and part 3, recommendations. The criteria for answering the questionnaire are Rating Scale 5 levels. The questionnaire was examined for the quality of the tool by evaluating the questionnaire's consistency with the study objectives (IOC) from three experts and testing the questionnaire's confidence with Cronbach's alpha coefficient of 0.92 (Cronbach, 1970).

The sample group for satisfaction assessment was Thai tourists who traveled in Pak Nam Pran sub-district. Cochran (1977) established the criteria for choosing a random sample of an undetermined sample size. Because the estimated number of tourists is 385 in the case of an unknown population, 410 is the number. Data from the samples were collected following the Principles of Human Research Ethics. The institutional review board of Rajamangala University of Technology Rattanakosin, Thailand (RMUTR-IRB, COA No. 003/2023) approved the research protocol.

Data collection commenced with selecting research participants who arrived to travel at "Tan Sam Ton", the primary check-in point for the Pak Nam Pran Subdistrict in March 2023. The research assistant will explain the purpose of the study and the data protection measures and provide the respondent's online contact information for the researcher and the research assistant in case the respondent has any questions. Including clarification that survey responses will not identify the respondent's identity to increase confidence in providing accurate information. The research assistant will send respondents an online questionnaire to complete if they volunteer to participate. Respondents are free to withdraw at any time from the questionnaire and study. The data were subsequently analyzed qualitatively using descriptive statistics. In the final step, all survey information will be deleted.

## **7. Report results and prepare documents**

Explain the evaluation data following the tourism innovation satisfaction test to summarize the project's outcomes and prepare the concluding report.

## **Results**

### **Results of the examine of the situation of the tourism industry in Prachuap Khiri Khan Province**

From the Prachuap Khiri Khan Province Tourism Development Board meeting to drive the implementation of the Prachuap Khiri Khan Province Development Strategic Plan, the 3rd National Tourism Development Plan (2023-2027) and the 20-year national strategy on March 14, 2022. The province of Prachuap Khiri Khan's tourist statistics for the past three years has been reported (Manager Online, 2020), as shown in Table 1.

**Table 1** Displays a report from tourist data for the past three years

<b>Years</b>	<b>Total number of tourists (people)</b>	<b>Thai tourists (people)</b>	<b>Income from tourism of Thai people (million baht)</b>	<b>Foreign tourists (people)</b>	<b>Income from tourism of foreigners (million baht)</b>
2019	7,168,424	5,924,708	28,601	1,243,443	13,790
2020	4,108,941	3,920,292	16,135	188,649	1,885
2021	2,677,116	2,673,519	10,494	3,597	36

Report information on tourists traveling in Prachuap Khiri Khan Province during 2019-2021 shows that the tourism economy of Prachuap Khiri Khan Province has significantly been affected by the COVID-19 virus epidemic. Therefore, to revitalize the tourism business to generate income again, the Prachuap Khiri Khan Governor has assigned every district to proceed in the following ways: 1) exploring the area's strengths and identity, 2) developing tourist attractions and 3) developing exciting products to create tourism programs according to the potential of the district group. The tourism program is divided into 3 zones: 1) Hua Hin – Pranburi, 2) Sam Roi Yot - Kui Buri - Prachuap Khiri Khan City and 3) Thap Sakae - Bang Saphan - Bang Saphan Noi. A tourism program focuses on staying at least 1-2 nights for tourists to have a longer time to spend in the area and to promote distribution in various districts and leading to income from tourism covering the whole province and giving importance to organizing activities that cater to different groups of tourists.

Based on a survey and interviews with entrepreneurs, resort businesses and restaurants in Pak Nam Pran Sub-district, it was found that in addition to the main problem of the decrease in tourists due to the COVID-19 epidemic situation. There are also problems in creating advantages and opportunities for competition between operators as follows:

1) Use the method of reducing prices to attract customers, but instead cut prices between operators. This event will directly affect small entrepreneurs with limited capital, causing some businesses to close because they cannot bear the cost of various expenses.

2) Using modern online media to assist with advertising is a form of incorporating information technology. However, entrepreneurs who lack expertise in information technology or are pioneers without a successor may be directly impacted by the lack of channels or public relations media that can reach more customers. Before deciding to use a service, modern tourists prefer to search online media for information and reviews from previous tourists, causing some business owners to miss out on increasing their income.

3) Using the method of combining public relations groups with government agencies, the Pak Nam Pran Subdistrict Administrative Organization will recommend resorts and restaurants that offer discounts to government agencies visiting the area in exceptional circumstances. If a customer desires to stay at a resort with multiple rooms but insufficient rooms available, the government agency will assist in recommending an alternative resort with sufficient rooms or an adjacent resort. It is possible to share rooms because most resorts in the area are neighboring and most resort operators are locals or relatives. This will increase exposure and entice more tourists to utilize the service.

## Results of the development of integrated tourism innovation with geo-informatics technology

Integrated tourism innovation supports display via web and mobile applications, as shown in Figure 5.

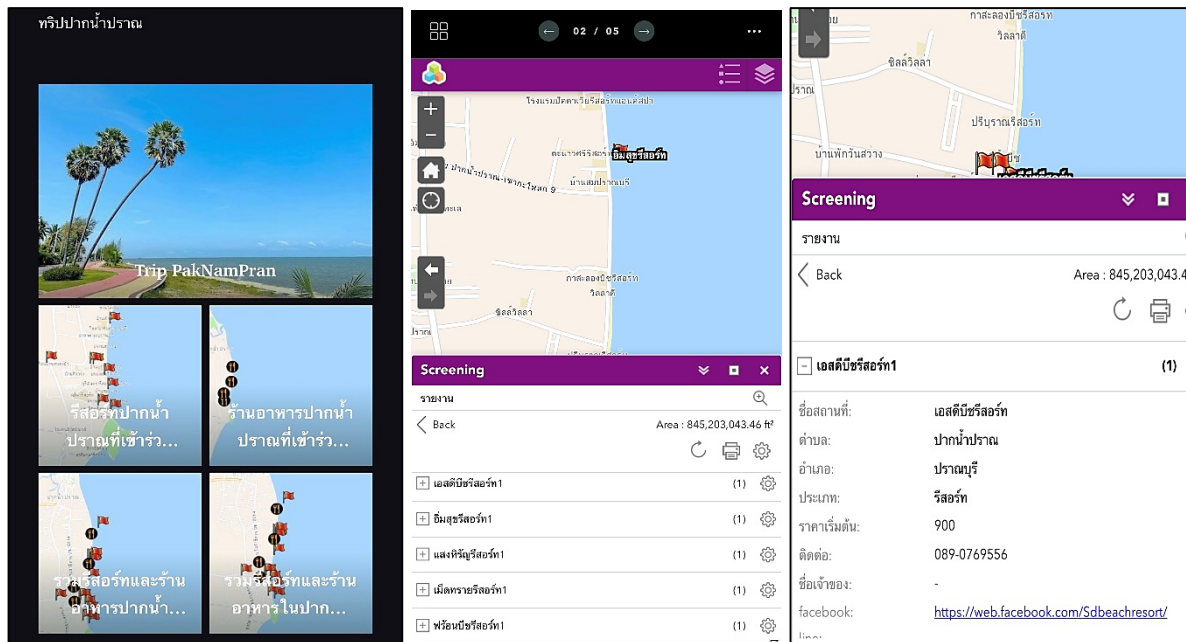


Figure 5 Display the display screen via Mobile Application  
(Source: Researcher, 2023)

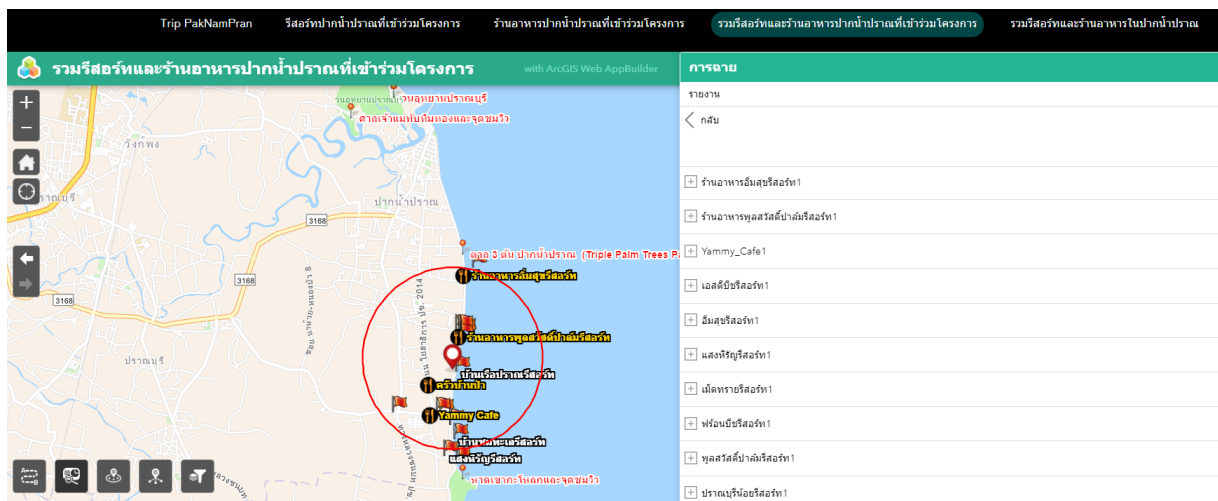
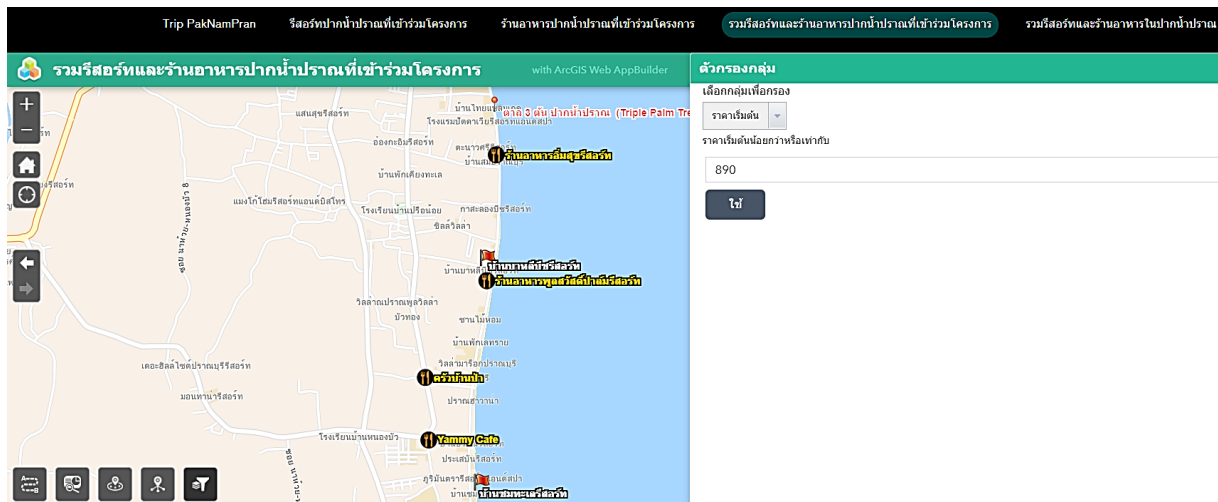




Figure 6 Show location search with projection tool  
(Source: Researcher, 2023)

Figure 6 illustrates locating a location with the "Projection" tool. Within a specified radius, users can search for resorts and restaurants. Innovation will provide an inventory of new hotels and restaurants.



**Figure 7** Displays location searches with the group filter tool  
(Source: Researcher, 2023)

Figure 7 shows the search for places with the "Group Filter" widget. Users can search for resorts and restaurants to display results based on their preferences, such as searching for resorts with nightly room rates below 890 baht. The innovation will display a list of found hotels and restaurants. Users can press to view the information about the place.

✕	✕
<b>ครัวบ้านป่า</b>	<b>เลสดิย์รีสอร์ท</b>
ชื่อสถานที่ ครัวบ้านป่า	ชื่อสถานที่ เลสดิย์รีสอร์ท
ตำบล ปากน้ำปาด	ตำบล ปากน้ำปาด
อำเภอ ป่าแดด	อำเภอ ป่าแดด
ประเภท ร้านอาหาร	ประเภท รีสอร์ท
ราคาเริ่มต้น 100	ราคาเริ่มต้น 900
ติดต่อ 089-0250785	ติดต่อ 089-0769556
ชื่อเจ้าของ -	ชื่อเจ้าของ -
facebook <a href="#">ข้อมูลเพิ่มเติม</a>	facebook <a href="#">ข้อมูลเพิ่มเติม</a>
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เว็บไซต์ -	เว็บไซต์ -
เวลาเปิด-ปิด 10:00 - 22:00	เวลาเปิด-ปิด 24 ชม.
รับรองคุณภาพ -	รับรองคุณภาพ 3 ดาว
หมายเหตุ -	หมายเหตุ ราคาห้องพักต่อรองได้
<b>รูปภาพ 5</b>	<b>รูปภาพ 3</b>
	

**Figure 8** Shows a database of resorts  
(Source: Researcher, 2023)

Figure 8 shows the database of each resort and restaurant that has been compiled. The innovation will display detailed information about the location, including name location, location, latitude, longitude, type, name of a business owner, starting price, contact channel, picture, website and remarks.

## Satisfaction evaluation results for tourism innovation integrated with geospatial technology

**Table 2** Displays satisfaction assessment results for innovations

Assessment Items	Number of samples (n = 410)	
	Average	Meaning
1. Perceived usefulness	4.49	Agree
2. Perception of ease of use	4.27	Agree
3. Attitude toward usage	4.02	Agree
4. Service quality	4.00	Agree
5. Information quality	4.16	Agree
6. Quality of the system	4.07	Agree
<b>Total</b>	<b>4.15</b>	<b>Agree</b>

Table 2 shows the satisfaction assessment results of 410 tourists traveling in Prachuap Khiri Khan Province. The following explains: With an average score of 4.49, travelers were happiest with the perceived usefulness. The highest-scoring criterion in this field is the accessibility of geospatial innovations, which makes obtaining information about tourism in Prachuap Khiri Khan Province easier. With an average score of 4.27, the perception of usability comes next. Accessibility received the highest rating in this category for evaluation criteria. Innovation can be utilized without memorizing specific instructions. The average quality of the data was 4.16. The measure with the highest rating in this category is the dependability of innovative insider information.

## Discussions

### The situation of the tourism industry in Prachuap Khiri Khan Province

Although Prachuap Khiri Khan Province is advantageous regarding the land area, tourism, and fishing industry potential, the province faces several challenges. In addition, Prachuap Khiri Khan is also regarded as the southern gateway connecting the central and south regions. There are numerous tourist attractions of interest. However, it was discovered that most tourists prefer to travel within the Hua Hin municipality, resulting in income inequality and distribution. In comparison, other sub-districts in Prachuap Khiri Khan Province are equally outstanding.

According to a survey of the tourism industry in Prachuap Khiri Khan Province, there is a problem with the lack of connection to the tourism database system within the province and tourists are still unfamiliar with several tourist attractions. When analyzing the causes, it was found that communities and businesses fail to recognize the significance of their participation in integrating tourism in the region, resulting in different occupations in various areas. This affects the development of entrepreneurial capabilities. Therefore, government agencies in the region have established strategies for tourism development, with the first approach being to develop, support, and promote tourism promotion activities, the second approach being to create and improve tourist attractions to meet quality standards, and the third approach being community development for conservation and tourism.

As the government prepared to open the country to foreign tourists on October 1, 2021, they can visit Thailand without restriction. The Ministry of Tourism and Sports, led by the Tourism Authority of Thailand (TAT), has prepared a plan to welcome foreigners. In the second phase plan leading to preparation, the district of Hua-Hin was designated as the pilot

area for the province of Prachuap Khiri Khan. The "Hua-Hin Recharge Project" is a government, public health, and private sector collaboration in tourism and service businesses in the Hua-Hin municipal area, based on the "Phuket Sandbox Project" model. This project aims to effectively administer the vaccination to residents and ensure that employees in the hospitality and tourism sectors are fully vaccinated to welcome foreign tourists and build confidence among tourists (Anusonphat, 2020; Chaiprasert, 2021).

Sustainable development still presents challenges for integrated tourism. Poorly established regulatory bodies and planning can impede the efficacy of rural tourism and limit stakeholder participation, especially in developing nations where rural tourism capacity is lacking (Ariyani & Fauzi, 2023). Consequently, establishing a network of stakeholders in the region is a sustainable integrated tourism development policy that must be expedited. Starting with local governments must establish a clear strategy for tourism in the area, from tools to providing tailored solutions for each city, to overcome the stagnation of tourism in secondary cities and to facilitate technology or information management oversight. The subsequent step is to raise awareness and build the capacity of local communities to reduce barriers to the transition to sustainable tourism. Lastly, it is necessary to develop an integrated policy between local tourism operators and the private sector to develop a tourism zone based on the natural and cultural resources of the region, resulting in increased income distribution and economic sustainability.

### **Integrated tourism innovation with geo-informatics technology to connect the tourism network in Prachuap Khiri Khan Province**

This study aims to develop a tourism innovation that can be displayed using a web application and geo-information technology to display spatial results from a central database. Future data linkages throughout the province of Prachuap Khiri Khan will rely on the data collected from the tourism and service sectors in the model area. The innovation's standout feature is a tool that analyzes location data, suggests routes to nearby locations and searches for location data based on user-specified criteria. Incorporating displays that can interact with users in web and mobile applications facilitates use and helps users make decisions because geospatial technology is outstanding in presenting spatial information for users to plan and design their travel (Jattamart & Kwangsawas, 2022). Previous researchers have used GIS to promote tourism through spatial analysis and presentation, such as designing and creating GIS web maps, mapping and planning natural tourism routes (Maaiah et al., 2021; Mango et al., 2022), analyzing and mapping the potential for sustainable ecotourism development (Omarzadeh et al., 2022).

The tourism industry is adopting geographical tools to create management and promotion opportunities for tourism resources. According to tourists, the utilisation of travel applications is growing. It is the combination of apps e-Tourism or apps m-Tourism with ICTs (Information and Communication Technologies) (Anthony & Abbas, 2021; Palos-Sanchez et al., 2021; Priyono et al., 2020). The strength of travel apps is that they enable users to utilize travel guides, GPS, searching for information, gaining access to travel services, and engaging in travel activities during the journey or at the destination (Saura, 2021). Previous research has demonstrated that the use and acceptance of travel applications are contingent on the application's design or user experience (Saura & Bennett, 2019). Therefore, innovative designers should pay greater attention to tourism innovation capacity. Incorporating innovative designs that highlight the distinctive geographical features of destinations to provide users with an enjoyable travel experience will contribute to the sustainability of innovation use.

### **Satisfaction with Geospatial Integrated Tourism Innovation**

According to the satisfaction assessment results for tourism innovation, users were most satisfied with the creation in terms of perceived utility. Due to innovations, obtaining information about Prachuap Khiri Khan Province tourism is easier. The perception of usability follows. Users are pleased with the innovative use that requires no memorization of complicated steps. This is consistent with previous research suggesting that perceived usefulness and ease of use influence user acceptance of innovations and will play a more significant role if the user has traveled previously (Saura & Bennett, 2019; Taufik & Hanafiah, 2019; Tavitiyaman et al., 2022). These findings will be useful to designers of innovative travel apps, who should prioritise user-friendliness and perceived usefulness. These factors play a significant role in creating a memorable travel experience and lead to the willingness to reuse innovations, contributing to innovation sustainability (Kim et al., 2021).

In addition, users are pleased with the information's caliber. Due to the perception that the data presented in the innovation is trustworthy, there is a more positive attitude toward using new technologies or innovations. Consistent with the findings of (Palos-Sanchez et al., 2021), which demonstrate that the reliability of a travel application significantly impacts the performance expectations of its users. It shows that the primary purpose of user innovation is to search for travel information and use it to plan future trips or make decisions. Therefore, developing interesting innovations and presenting a multidimensional travel experience will increase positive attitudes toward innovation (Lin et al., 2020). This has a direct impact on the intent of sustainable use.

### **Conclusion and suggestions**

This study focuses on developing geospatial innovations after the outbreak of COVID-19 for the recovery of the local tourism and service industries. The model area is Pak Nam Pran Sub-district, which borders Hua-Hin municipality. The study's strength is its collaboration with the tourism industry and the closest local government organizations to the community, including a thorough understanding of the area's context to determine guidelines for developing tourism according to the area's context. In addition to formulating plans to deal with unforeseen circumstances to prepare for the arrival of tourists, the consultant will assist with preparing the location for their arrival.

The future research strategy is as follows: Step One: Develop innovations with Virtual Reality (VR) technology to attract tourists or adopt travel live-streaming (TLS) for real-time interactions to reduce physical and spatial travel restrictions, as well as sharing travel experiences; Step 2: Enhance innovation to support English displays for foreign tourists. Finally, evaluate satisfaction with tourism innovations to improve innovations to meet user needs and develop measures to help tourists following the outbreak of COVID-19 that are suited to the region. In addition, in evaluating tourists' innovation usage behaviour, advanced statistics, such as structural equation modelling (SEM), should be used to analyse the results to understand better user behaviour and the relationship between relevant factors and tourists' innovation usage. This results in innovative improvements that cater to user needs and help create memorable travel experiences.

## New knowledge and the effects on society and communities

The study's results led to the development of tourism promotion innovations and a central database that collects tourism and service sector data in the prototype area to facilitate the connection of tourism databases throughout the province. This benefits all parties involved in the tourism process chain from the upstream, i.e., small business owners have more opportunities to market their companies and increase their competitiveness. Travelers can access information from a central database more conveniently. In addition, the innovation includes data analytics tools that can interact with the user at any time. Government agencies in the region can use the central database to develop tourism programs linked to the region's potential. It is considered that the presentation of information and the community's identity will increase opportunities for the community, affecting the recovery of the tourism industry after the COVID-19 epidemic so that it can generate income once more and lead to income distribution in the area.

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