Hidden Gem South Kuta Tourist Destination Mapping Using Geographic Information System as Information Media For Tourists

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Abstract. A hidden gem refers to a place whose location is not widely known. Although Bali has many popular tourist destinations, there are also numerous hidden gems that attract visitors. South Kuta, located in the Badung Regency, is one such area with a variety of tourist attractions, including both well-known spots and hidden gems that remain largely undiscovered by many tourists. One of the main challenges for tourists interested in these hidden gems is the difficulty in finding information about them due to the lack of sufficient media coverage. The solution to this problem is to develop a Geographic Information System (GIS). GIS is a tool that can visualize spatial data, assisting in the mapping of South Kuta's hidden gem destinations through a digital map that provides detailed information about each location. This research focuses on mapping South Kuta's hidden gem tourist spots using GIS as an information resource for tourists. With this system, tourists can easily access information about South Kuta's hidden gems, including location, descriptions, distances, and routes between destinations, all displayed on a digital map. The research follows the waterfall method, a structured approach to software development that involves stages of requirements analysis, design, system development, and system testing.

Keywords: Hidden Gem, Mapping, Geographic Information System

1 Introduction

Bali is one of the world's most popular tourist destinations. Tourist destinations are locations that attract visitors as their primary vacation spots. Bali offers a wide variety of attractions, including nature, culture, adventure, and more, which draw many tourists to the island. A current trend shows that tourists who frequently visit Bali and have already explored its main attractions now seek new and more private experiences. Despite the abundance of well-known tourist spots, many hidden gems in Bali attract visitors. A hidden gem refers to a place that is relatively unknown or secluded, and this trend has led to rapid development among entrepreneurs, and increasing competition.

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South Kuta, located in Badung Regency, is an area rich in tourist destinations. In addition to popular sites such as Kuta Beach and Pandawa Beach, South Kuta boasts many hidden gems that remain undiscovered by most tourists. However, one of the challenges tourists face regarding these hidden gem destinations is the difficulty of finding information about them. This is due to the limited availability of information resources focused on these lesser-known spots. Despite their potential to become new tourist attractions in Bali, hidden gems can accommodate tourists seeking more remote and exclusive destinations compared to the well-visited areas.

Several studies have explored regions with hidden gems, such as Bangli Regency (Suputra, 2022), Jembrana Regency (Suhendra, 2023) and Karangasem Regency (Susanti & Hardina, 2021). Information about hidden gems can be more easily accessed if these locations are mapped using an information system. In today's digital world, social media and tourism websites are essential information channels for tourists (Sianipar et al., 2022; Dwiningwarni et al., 2021). Additionally, Geographic Information Systems (GIS) can also serve as a valuable tool for conveying information (Tangge et al., 2023).

A Geographic Information System (GIS) is a computer-based system used to store, manage, analyze, and retrieve geographically referenced data (Saing et al., 2021; Ningsih, 2023). One of the advantages of GIS is that it enables users or decision-makers to make informed decisions, especially in spatial aspects (Amri & Sularno, 2023). The use of GIS for mapping tourism potential has been previously studied by (Nurdin et al., 2021; Olii et al., 2023; Dewi, 2022; Dakwah & Abdurrahman, 2023; Sardiana et al., 2021). GIS can assist in mapping South Kuta’s hidden gem tourist destinations in the form of a digital map, providing detailed information about each destination.

Based on these issues, this research focused on mapping South Kuta's hidden gem tourist destinations using GIS as an information resource for tourists. With this system, tourists can easily obtain information about South Kuta's hidden gems, including their location, descriptions, as well as the distance and route between destinations, all presented through a digital map.

2 Methodology

This section outlines the stages of the research to be conducted. The stages of this research follow the waterfall method, which is commonly used in software development. The stages carried out in this research, as shown in Figure 1, can be explained as follows:

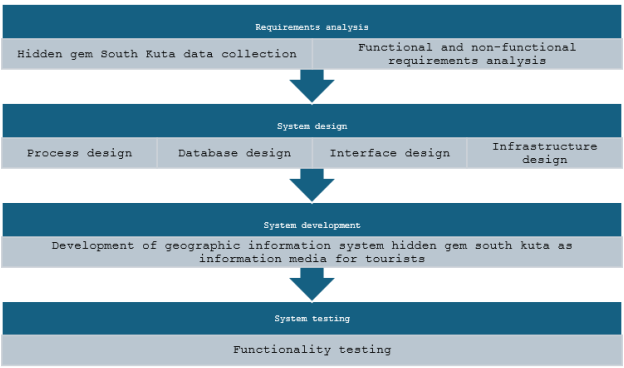

Figure 1. Research methodology

Requirements Analysis. This stage involves several processes, including data collection and analysis of functional and non-functional requirements. The data collection process focuses on gathering information about hidden gem tourist destinations in South Kuta. Then, an analysis is conducted on the functional and non-functional requirements of the geographic information system to be developed.

System Design. Based on the results of the requirements analysis, a geographic information system for hidden gem tourist destinations is designed. The outcome of this design stage is a blueprint for the geographic information system, which includes process design, database design, interface design, and infrastructure design to support the system for South Kuta's hidden gem tourist destinations.

System Development. Based on the completed design, a geographic information system is developed for the hidden gem tourist destinations in South Kuta.

System Testing. Throughout the system development process, each feature undergoes testing. The testing process ensures that each feature functions according to the original design. If discrepancies are found, corrections are made, and the feature is tested again. Testing at this stage is conducted using a black-box testing approach.

3 Result and Discussion

3.1 Result

Needs Analysis. This section explains the process of collecting data related to hidden gem tourist destinations in South Kuta, followed by an analysis of the functional and non-functional requirements for the geographic information system to be developed. Based on the analysis, there are three main actors in this system: Users: Users are general visitors who can access the main page without logging in. They can view the locations of hidden gems in South Kuta; Manager: Managers are users who can manage

tourist attraction data; Admin: Admins are users who can manage system settings, tourism types, and tourist attractions.

Design. This section explains the outcomes of the design stage, which include a blueprint for the geographic information system. The design consists of process design, database design, interface design, and infrastructure design required to run the system for South Kuta's hidden gem tourist destinations, using UML (Unified Modeling Language). The relationship between user roles and access rights is modeled using a use case diagram, as shown in Figure 2.

Figure 2. Use case diagram

There are three types of actors: Admin, Manager, and Website Visitor. The Admin actor has access to all use cases. The Manager actor can access use cases such as Change Password, Edit Tourist Attraction, View Tourist Attraction Details, Edit Tourist Attraction Photos, Search Nearest Destinations, and Search Destinations. Website Visitors, on the other hand, can only access the Search Nearest Destination and Search Destination use cases. All use cases require the user to be logged in, except for the Search Nearest Destination and Search Destination features.

System Development. This section explains the development of the hidden gems system, where the system is divided based on the actors or roles, as described below:

Admin: The Admin can manage all the menus on the website, which are located on the left side of the admin dashboard. Admins can also change their password if needed. The Admin has features to manage managers, types of tours, and tourist attractions as shown in Figure 3.

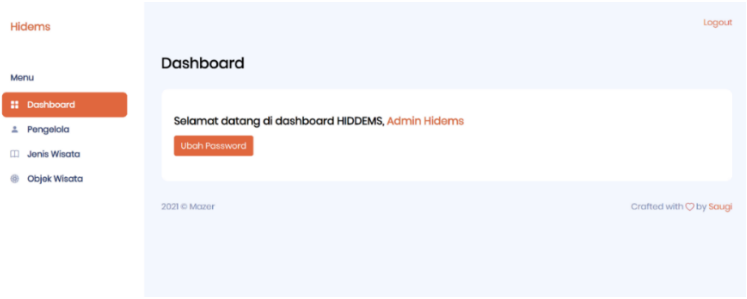

Figure 3. Admin dashboard (in Indonesia language)
Photograph and permission by I Putu Krisna Arta Widana

Manager: Managers are users who have access rights to manage tourist attraction data as shown in Figure 4.

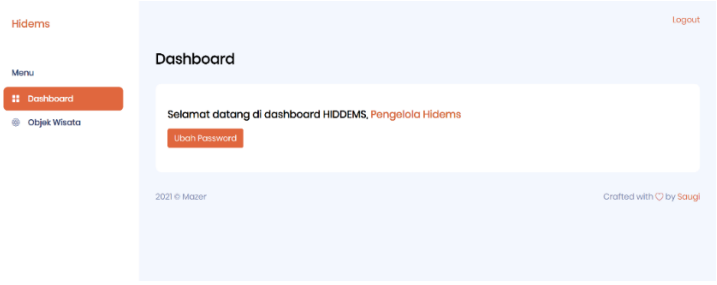

Figure 4. Manager dashboard (in Indonesia language)
Photograph and permission by I Putu Krisna Arta Widana

Tourists: Tourists are users who can view tourist information on the hidden gem website without having to log in as shown in Figure 5.

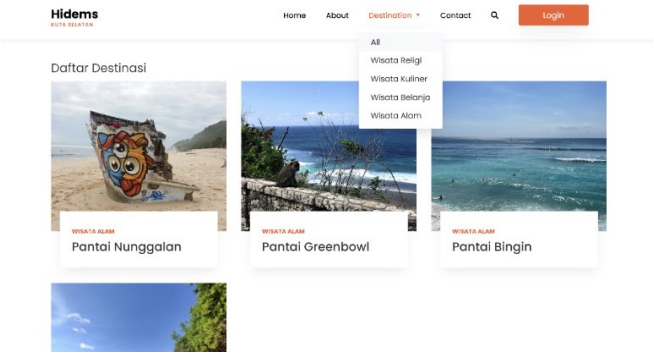

Figure 5. Tourist dashboard (in Indonesia language)
Photograph and permission by I Putu Krisna Arta Widana

3.2 Discussion

Admin Dashboard Testing. The following are the results of admin dashboard testing (in Table 1) where testing was carried out for the login feature, management menu, tourist type menu and tourist attractions.

Table 1. Admin dashboard testing

No	Tested page	Action	Reaction	Result
1	Admin Login	Enter the correct password and username	Go to the appropriate login page	success
		Typo when entering password and username	Error and will re-enter accordingly	success
2	Manage management	Management data CRUD	Successfully adds or changes appropriate management data	success
3	Manage type tourism	Carry out data collection on types of tourism	Successfully add or change data on appropriate types of tourism	success
		When adding and editing data, inputting the same data or existing	Errors, a notification appears asking you to re-enter it accordingly.	success
4	Manage tourism	Carry out data collection on tourism	Successfully add or change data on appropriate tourism	success
		When adding and editing data, inputting the same data or existing	Errors, a notification appears asking you to re-enter it accordingly.	success

Management Dashboard Testing. The following are the results of testing the management dashboard (in Table 2) where testing was carried out for the login and tourist attraction management features.

Table 2. Management Dashboard Testing

No	Tested page	Action	Reaction	Result
1	Manage login	Enter the correct password and username	Go to the appropriate login page	success
		Typo when entering password and username	Error and will re-enter accordingly	success
2	Manage tourism	Carry out data collection on tourism	Successfully edit data on appropriate tourism	success
		When editing data, inputting the same data or existing	Errors, a notification appears asking you to re-enter it accordingly.	success

Tourist Dashboard Testing. The following are the results of testing the tourist dashboard (in Table 3) where testing was carried out for the search feature and search for nearby destinations.

Table 3. Tourist Dashboard Testing

No	Tested page	Action	Reaction	Result
1	Search	Search for a location with existing data	Successful, brings up the data you are looking for	success
		Search for a location with no data	Error, the message No Data Yet appears	success
2	Search Nearest Tourism	Gives coordinates	Successful, the locations of the 3 closest destinations appear	success
		Does not provide coordinates	An error alert appears to provide a location point	success

4 Conclusion

The development of a mapping system for South Kuta Hidden Gem tourist destinations using a Geographic Information System (GIS) as an information medium helps provide tourists with information about lesser-known destinations. Additionally, it assists stakeholders and managers in promoting their tourist attractions. Based on test results using the black-box testing method for admin, manager, and tourist pages, it can be concluded that the mapping system for South Kuta Hidden Gem tourist destinations, using GIS as an information medium, is functioning well as intended.

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