

Design of a Geographic Information System (GIS) for Mapping Tourist Attractions in Bandung City Using Leaflet JavaScript to Optimize the Development of Bandung City's Tourism Potential

Yenni Fatman¹, Astri Nurazizah², Fais Fadilah Prastyo³, Linda Handayani⁴,
Nurul Dwi Pajriah⁵, Pitri Sri Rahayu⁶

^{1,2,3,4,5,6}Fakultas Teknik, Universitas Islam Nusantara, Bandung, Indonesia

Corresponding Author: Yenni Fatman

DOI: <https://doi.org/10.52403/ijrr.20240854>

ABSTRACT

Bandung is one of the favorite tourist destinations in Indonesia. Despite its popularity, the development of Bandung's tourism potential remains constrained, particularly concerning the availability of tourist information within the existing system. To address this issue, the development of a Geographic Information System (GIS) for mapping tourism in Bandung City aims to provide more comprehensive information compared to the current website. The research employs data collection methods such as observation, literature review, and surveys, complemented by system design methodologies. This research utilizes the agile development methodology, encompassing stages such as planning, design, development, testing, deployment, and review. During the testing stage, BlackBox testing was employed to ensure the system's functionality, demonstrating its effective operation. In the subsequent user review stage, conducted through distributed questionnaires, an average score of 81.23% indicates a high level of user acceptance. Therefore, based on these findings, it is concluded that the developed Bandung City Tourism Mapping Geographic Information System (GIS) has the potential to optimize

tourism development in Bandung, attracting more visitors to the city.

Keywords: GIS, Bandung City Tourism, Leaflet JavaScript, Agile Development, and Blackbox Testing.

INTRODUCTION

Bandung is one of the favorite tourist destinations in Indonesia. According to data from the Department of Culture and Tourism of Bandung City (Dinas Kebudayaan dan Pariwisata Kota Bandung) that in June 2023, the number of tourists visiting Bandung reached 2.252.966 people (Humas Kota Bandung, 2023). That number has increased compared to the first quarter of 2023, where the number of tourists visiting reached around 1,422,673 people (Humas Kota Bandung, 2023). Although Bandung's categorized as a favored tourist destination in Indonesia, the development of Bandung's tourism potential is faced with issues, particularly in terms of the availability of tourism data in the current Bandung City Tourism Geographic Information System (GIS). The impact of this issue, tourists find it difficult to find out the complete tourist destinations in Bandung City. This indicates the necessity to overcome this issue in order to optimize the development of Bandung's tourism

potential. By designing a Geographic Information System (GIS) specifically designed for mapping Bandung's tourism equipped with more comprehensive data compared to the current website, constitutes a favorable initiative towards augmenting the tourism potential of Bandung City. The implementation of a Geographic Information System (GIS) can facilitate the growth of tourism and assist tourists in accessing more comprehensive information (Scalabrini et al., 2022).

During the implementation of designing a geographic information system, the selection of the right technology is important. In this research, the technology used is Leaflet JavaScript. The utilization of online-based and open-source Leaflet JavaScript technology in designing a geographic information system (GIS) can enhance the dynamism and flexibility of its development (Abdillah, Nawangnugraeni, & Yuniarto, 2021). This research is expected to make a positive contribution to the development of Bandung City's tourism potential.

LITERATURE REVIEW

The following paragraph outlines several relevant theories to this research:

1. Geographic Information System (GIS)

A Geographic Information System (GIS) is an information system based on computing designed, and operated utilizing spatial data (Jannah et al., 2022). The spatial components of entities are typically represented as points, lines, polygons, or variations of the data type. A principal

function of GIS is to visualize information through the use of maps that arrange the displayed data into layers (Alvarado, Cortiñas, Luaces, Pedreira, & Places, 2020). GIS is used to access, analyze, scrutinize, integrate, manage or process, and visualize spatial data, which pertains to the shape or state of the Earth's surface (Jannah et al., 2022).

2. Tourism

Tourism is a dynamic activity that involves many people and revives various business fields. According to Indonesian Law No. 10 of 2009 on Tourism, tourism is defined as the travel efforts of individuals or groups to specific destinations for recreation, personal enrichment, or exploration of the unique features of the visited tourist attractions within a temporary timeframe (Ismayanti, 2021).

3. Leaflet JavaScript

Leaflet is an open-source JavaScript library for interactive maps, adaptable for implementation on web or mobile platforms. JavaScript is a programming language utilized by developers for the creation of interactive websites (Kafando et al., 2024). Using the online and open-source Leaflet JavaScript technology in the design of a geographic information system (GIS) can enhance its development with increased dynamism and flexibility (Abdillah et al., 2021).

4. Agile Development Method

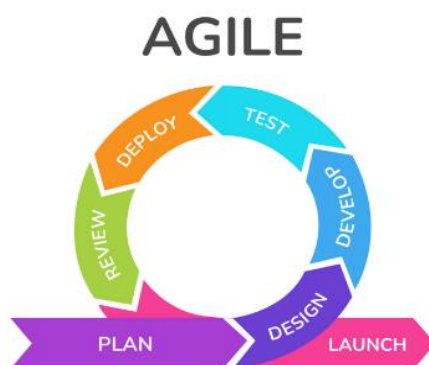


Figure. 1 Agile Development (Binar Academy, 2024)

According to Pressman as cited in (Alvino & Riskiono, 2021), agile software development refers to a collection of software development methodologies based on iterative processes in which requirements and solutions evolve through the collaborative efforts of organized teams. Agile development involves several primary stages, as follows:

a. Planning

This stage represents the initial phase of the agile method, wherein all team members aim to understand the project goals, identify requirements, and devise strategies to facilitate the achievement of the predefined goals.

b. Design

At this stage, the design process for the system to be developed is undertaken. This design phase typically includes UML Diagram, visual elements, such as user interfaces and related components.

c. Develop

Development stage represents the implementation stage of the previously designed user interface.

d. Test

Testing is the stage wherein the system undergoes examination to determine the level of success and user satisfaction in utilizing the designed system.

e. Deploy

After testing, the subsequent stage is deployment. This deployment stage involves the direct implementation of the successfully developed system to the end-users.

f. Review

Once the system has been successfully deployed, the subsequent step involves gathering feedback that can serve as a reference for making improvements aimed at enhancing the system optimal functionality.

g. Launch

When the product is ready or has achieved a quality level deemed sufficient for users, the system can be released to end-users.

5. Black Box Testing

BlackBox testing is a testing method utilized to evaluate whether the input and output functionalities of the software meet the specified requirements, without considering or having knowledge of the internal workings of the software (Hasanah & Untari, 2020).

6. Unified Modeling Language (UML)

According to Pressman as cited in (Pressman, 2012), the unified modeling language (UML) is a standardized language for software design. UML facilitates the visualization, definition, development, and documentation of software systems. UML is divided into several components, as follows:

a. Use Case Diagram

The use case diagram is a technique for capturing the functional requirements of a system, describing the expected functionality of a system (Hasanah & Untari, 2020). Use case diagrams emphasize “what” the system does, rather than “how” it does it. The utilization of use case diagrams will assist researchers in compiling the needs or requirements analysis of a system.

b. Sequence Diagram

A sequence diagram is a type of diagram in UML that illustrates object interactions based on time sequence. It represents a sequence of multiple object interactions that occur within the created application or system (Jannah et al., 2022). The creation of a sequence diagram is essential for the description of the sequence, the illustration of the lifetime and usability of objects (Andrunyk & Shostak, 2021).

c. Class Diagram

Class diagram describes the system’s structure by defining the classes created to construct the system. Programmers or developers use class diagrams to create classes according to the design, ensuring synchronization between design documentation and software (Findawati & Taurusta, 2018).

d. Activity Diagram

Activity diagrams are utilized to delineate the steps or activities within a system (Hasanah & Untari, 2020). Activity diagram

describes the various activity flows in the system being designed, illustrating how each flow initiates, potential decision point, and their conclusions.

MATERIALS & METHODS

1. Data Collection Method

The data collection methods utilized in this research are as follows:

a. Observation

At this stage, researchers observed the website of the department of culture and tourism of Bandung to analyze and identify various aspects related to the services and location point data provided. Through this observation, researchers could obtain direct information related to the actual conditions and various existing issues.

b. Literature Review

At this stage, researchers collected data by reviewing several books and research publications, such as a journal, to serve as references in compiling this report on the design of a geographic information system for mapping tourist attractions in Bandung city. Additionally, for the data required in designing this information system, researchers submit data requests related to tourist attractions information in Bandung City through the official website of the department of culture and tourism of Bandung City. The purpose of these data requests is to ensure that the displayed tourist information is accurate and appropriate.

c. Survey

At this stage, researchers distributed questionnaires to a number of respondents to gather feedback regarding the system that has been developed.

2. System Design Method

In this research, the system build used design method used in this research is the agile development method. The agile development method consists of 7 main stages: planning, design, develop, testing, deploy, review, and launch. However, in this research, researchers will carry out the agile stages only up to stage 6, the review

stage, and will not proceed to the launch stage.

RESULT

This research process will be explained by referring to the stages of the agile methodology utilized in this research. The adaptive and flexible nature of the agile method is the reason why researchers opted to utilize agile methods in this research. Furthermore, the adoption of agile methods in the development of web-based geographic information systems can offer effectiveness, convenience, and user satisfaction (Pratomo & PN, 2022). Below is a detailed explanation of each stage of the agile methodology, which is conducted as follows:

1. Planning

The planning stage is the initial stage in the agile method. At this stage, researchers identify the necessary elements and tasks required in designing the Bandung City Tourist Mapping Geographic Information system. Some of the tasks conducted by researchers at this stage include determining the timeline of conducting research and designing the system, selecting the programming language and framework to be used in developing the system, devising strategies for obtaining curated data of tourist attractions in Bandung City, and planning product features such as functionality and application workflow.

2. Design

At this stage, the design plan for the information system is presented and outlined in the form of unified modeling language (UML) diagrams and user designs. There are 4 types of UML diagram utilized to describe the design plan of this information system, as follows:

a. Use Case Diagram

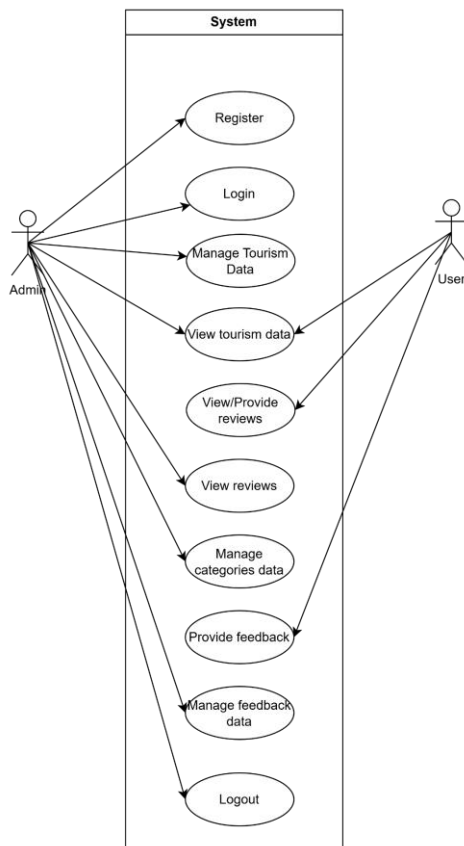


Figure. 2 Use Case Diagram

In the use case diagram above, it is explained that there are two types of users in this Bandung Geowisata information system, namely Admin and User. Each user has several activities that can be performed in this information system. Admin can register an account, log in, manage tourist and tourism data, view tourist and tourism data, view and leave reviews, and log out. As for users they cannot register an account, login or log out. However they can still perform activities such as viewing tourist and tourism data and viewing and posting reviews.

b. Activity Diagram

Below are several activity diagrams that illustrate the main activities performed by admin and users, including the following:

1) Admin

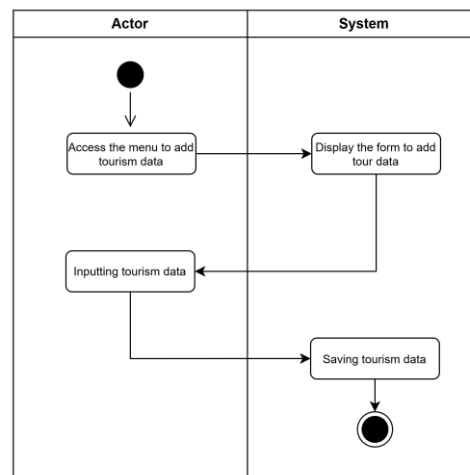


Figure. 3 Activity Diagram Admin Input Tourism Data

Figure 3 illustrates that the main task of Admin is to manage tourist and tourism data, which includes entering, modifying or updating, and deleting tourist and tourism data.

2) Users

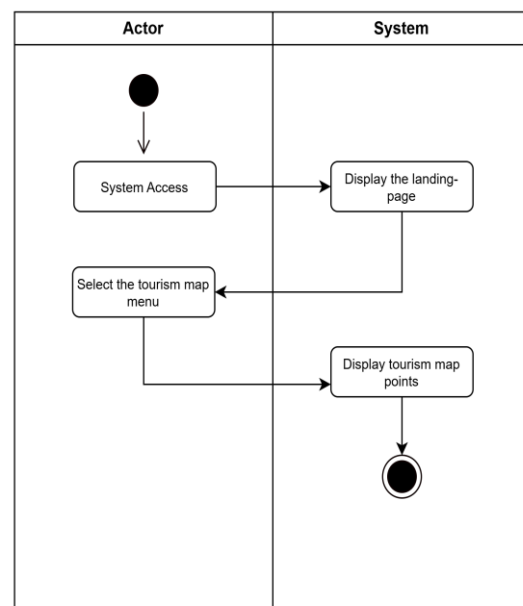


Figure. 4 Activity Diagram User Searching a Tourist Attraction

The main task for users to view information about tourist attractions. This process can be done by accessing the tourist map section on the landing page and searching for the attractions they want to know more about.

c. Sequence Diagram

1) Admin

This diagram illustrates how the system responds to activities performed by Admin and Users, as follows:

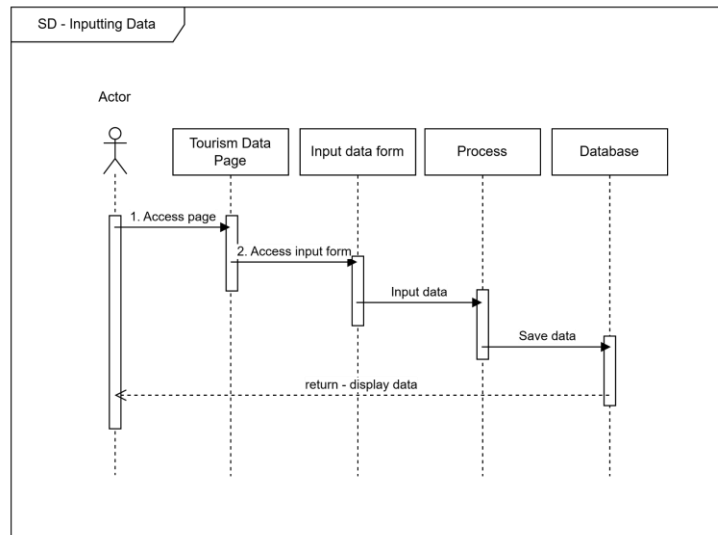


Figure. 5 Sequence Diagram Admin Input Tourism Data

Figure 5 illustrates the steps the Admin follows to enter data and how the system responds. To input data the process begins with the admin accessing the tourism data

page. The admin then enters data and saves it to the database.

2) Users

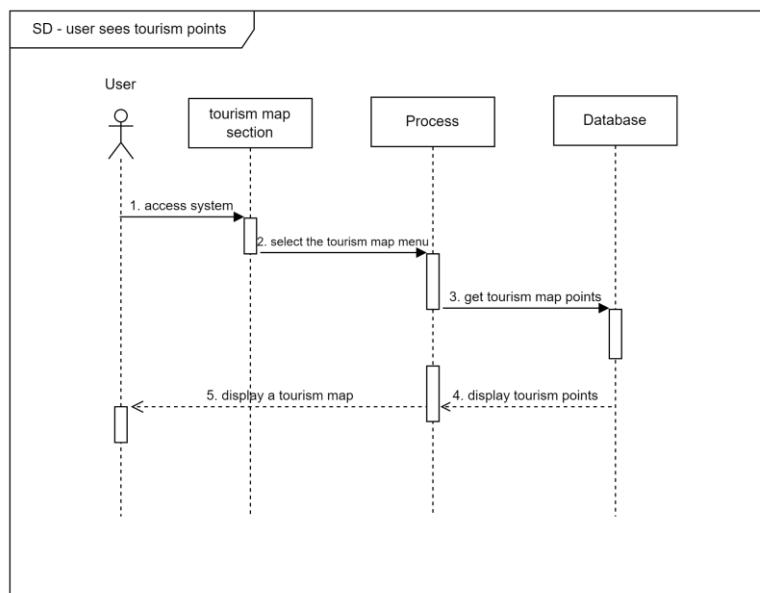


Figure. 6 Sequence Diagram View Tourist Attraction Points

When the user wants to see a tourism point, the user must access the system, then select the tourist map menu, then the system will direct them to the tourist map selection.

Next, the user clicks on one of the attractions, and displays a modal with brief information about the selected attraction.

d. Class Diagram

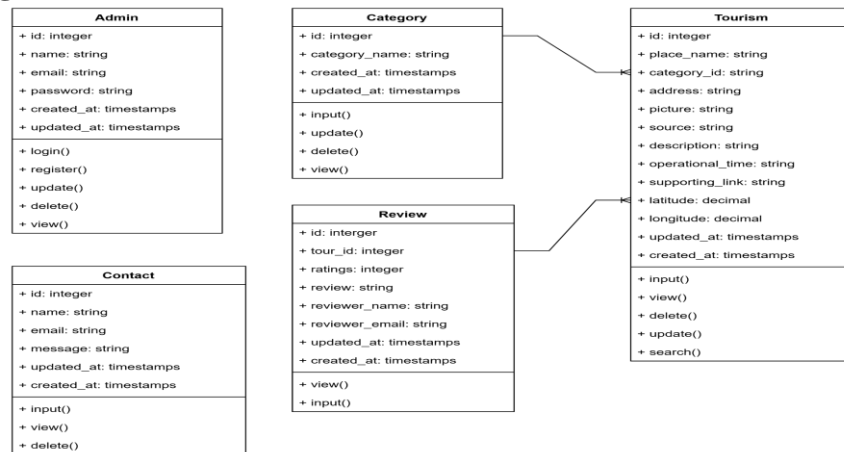


Figure. 7 Class Diagram

The information system employs 5 classes: Admin, Category, Tourism, Review, and Contact. As illustrated in the diagram, the Category and Review classes are linked to the Tourism class due to the interrelated nature of the required data.

1) User Interface Design

The user interface design of this information system is as follows:

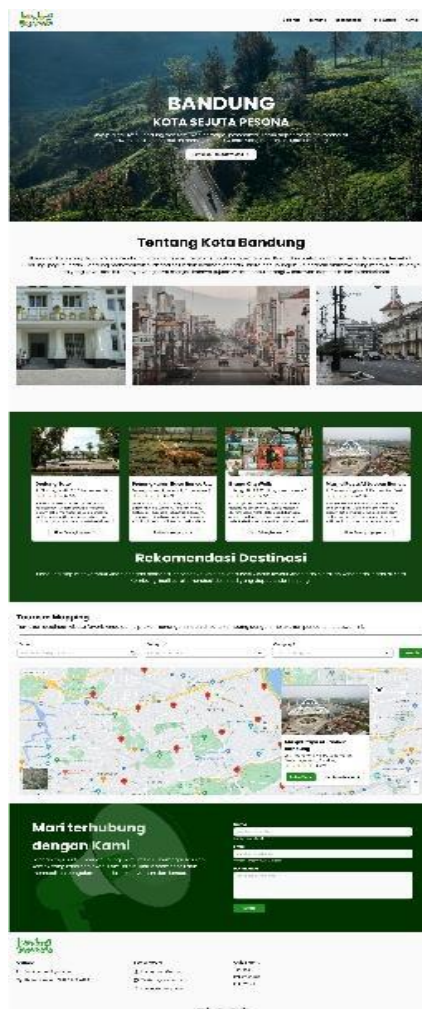


Figure. 8 User Interface Landing Page

Figure 8, user interface design for the user landing page. On this page, there is brief information about the city of Bandung and the main features that users can utilize, such as searching for attractions in the city of Bandung. Please note that the design above is specifically for the visitor's main page only. For admin, researchers utilize the standard Admin LTE template for its appearance.

3. Develop

This stage involves the implementation of the UML diagram and user interface design created in the previous stage. In this stage, there are several technologies used in the system build process such as Visual Studio Code, XAMPP for database storage, and Github. As for programming languages and frameworks used, MySQL, HTML, CSS, JavaScript, PHP, Laravel, Admin LTE, Bootstrap specifically for all admin pages, and Tailwind for the user's main page.

For the tourism map, the technology used in the implementation process is Leaflet JavaScript. According to Santynawan et al. as cited in (Abdillah et al., 2021), the Leaflet JavaScript library offers comprehensive functionality in both the core library and community, and provides various plugins that can enhance Leaflet JavaScript. The utilization of Leaflet JavaScript is also attributed to its open-source nature and interactivity, suitable for both mobile and web applications. The following are the results of the implementation of the user interface and UML diagram design that has been made, as follows:

a. Landing Page

The landing page is the main page that users access when visiting this website address. This website is named "Bandung Geowisata", encompassing several features that users can utilize with the main objective of optimizing the development of Bandung City tourism through the design of this geographic information system.

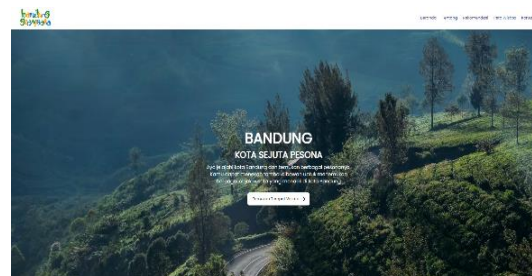


Figure. 9 Dashboard

In the home section, there are several navigation menus such as *Tentang* (About), *Rekomendasi* (Recommendations), *Peta Wisata* (Tourism Map), and *Kontak* (Contacts). The navigation menu allows users to directly access the desired section without scrolling down the page. Additionally, this section has a "Temukan Peta Wisata" button, functioning identically to the "Peta Wisata" navigation menu, directing users to the Tourist Map section.



Figure. 10 About Section

This section provides brief information about Bandung and includes a photo gallery showcasing several locations within the city.

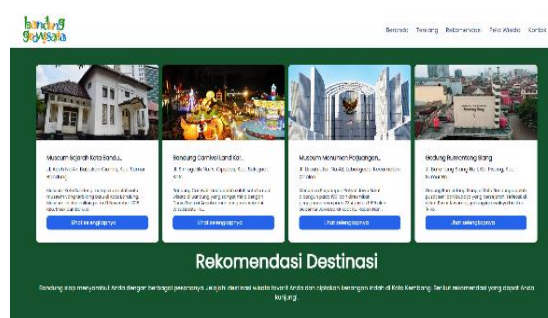


Figure. 11 Recommendation Section

The Recommendations section enables users to receive suggestions for tourist attractions in Bandung. Each map includes a "Lihat

"Selengkapnya" button that directs users to a detailed page about the place.



Figure. 12 Tourism Map Section

In the Tourist Map section illustrated above, users have the capability to search for tourist attractions in Bandung based on place names and tourism categories.

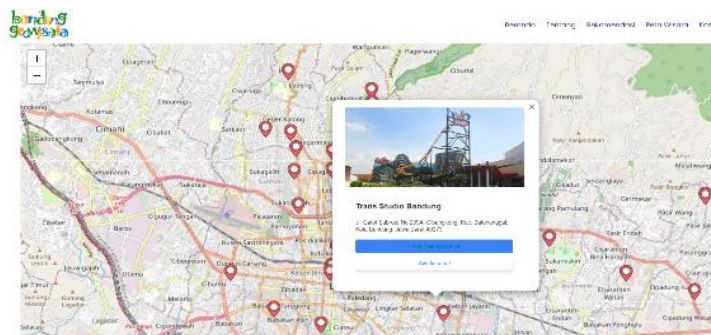


Figure. 13 Tourist Attraction Point Modal

On the tourist map, various tourist attraction points are displayed. When a user clicks on one of these points, a pop-up modal appears with brief information about the selected

tourist attraction. This modal includes a "Lihat Selengkapnya" button. When the user clicks the button, it directs the user to the details information page of the place.

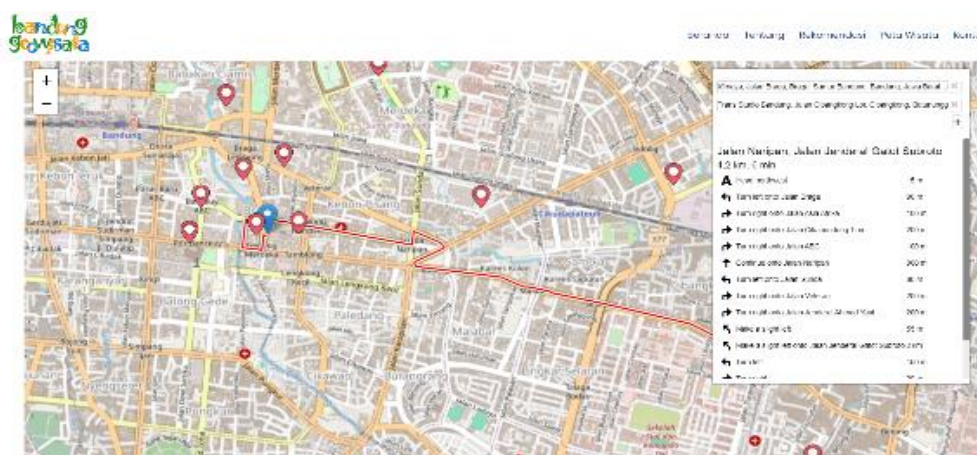


Figure. 14 Tourist Attraction Route

Additionally, there is a "Ayo Kesana" button within the pop-up modal for each tourist attraction, which detects the user's current location and provides directions to the

selected tourist attraction. This feature offers users detailed information about the travel route to reach their desired destination.

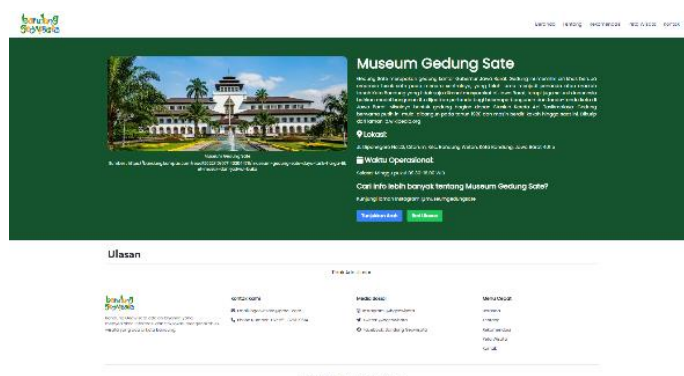


Figure. 15 Tourist Attraction Detail Page

The Tourist Detail page provides comprehensive information about each attraction, including a brief description, address, hours of operation, and links to the attraction's website or social media. Additionally, this page allows users to view and post reviews about the attraction.

b. Admin Features

The Admin Features provide the management of all data on the Bandung Geowisata website.

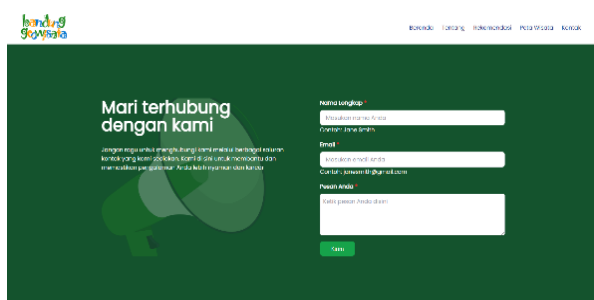


Figure. 16 Contact Section

The contact section on this landing page enables users to send messages or provide feedback regarding the Bandung Geowisata Information System.

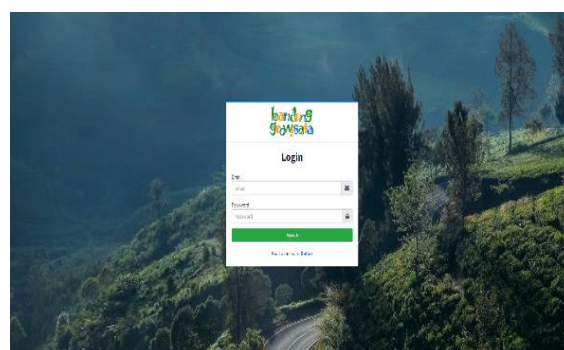


Figure. 17 Admin Login Page

Admin are required to have an authenticated account and log in to access the Admin menu. Unauthorized individuals without an active account will be unable to access this menu.

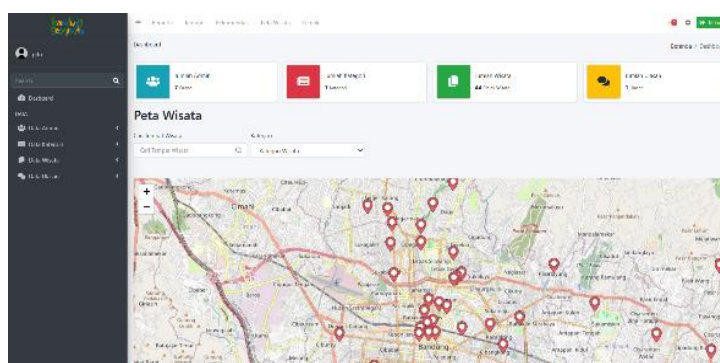


Figure. 18 Admin Dashboard Page

Upon successful authentication, the administrator will be directed to the dashboard page. This dashboard provides an overview of essential data such as the count

of administrators, category information, tourist data, review statistics, and other relevant metrics.

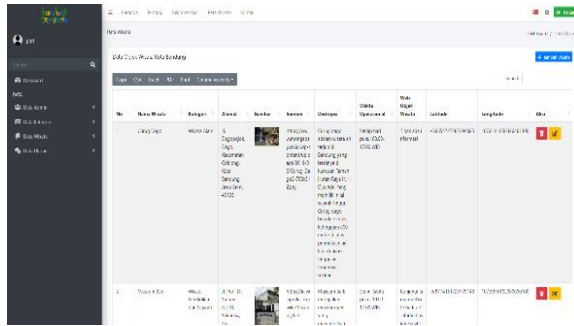


Figure. 19 Admin Manage Tourism Data Page

The image depicted above showcases the implementation outcome of the Admin Data menu. Within this menu, administrators possess the capability to manage tourism data by adding, updating, and deleting the data. Furthermore, each administrative section includes a data search feature and

functionality for exporting data into various document formats such as PDF, Excel, etc.

4. Testing

At this stage, the system undergoes testing to verify that all functionalities and features operate as expected. The testing methodology employed in this study is BlackBox testing, where the process is to divide several test cases and each test case has an expected output criterion. A test case is deemed successful if the actual results align with the anticipated outcomes otherwise, it is considered unsuccessful. The following is a detailed account of the system testing outcomes using the BlackBox testing approach.

Table 1. 20 BlackBox Testing Result

No	Test Case	Output	Result
1	Testing every link button on Navbar	Direct to every section on landing page	Success
	Testing button "Temukan Tempat Wisata"	Direct to Tourism Map Section on Landing Page	Success
	Testing icon button chevron on About Section	Photo Gallery Changed	Success
	Testing every button "Lihat Selengkapnya" on each card in Recommendation Section	Shows Detail Tourist Attraction Information Page	Success
	Searching the tourist attraction on Torism Map Section	Shows Tourist Attraction Pointer on the Map	Success
	Clicking the tourist pointer on the map	Shows Pop Up Tourist Attraction Information	Success
	Testing button "Lihat Selengkapnya" on Pop Up Tourist Attraction	Direct to Detail Tourist Attraction Information that has been chosen	Success
	Testing button "Ayo Kesana" on Pop Up Tourist Attraction	Shows our current location and rute to the Place	Success
	Sending a Message through Contact Section	Shows a success message	Success
	Testing every Link Button on Footer		Success
2	Testing every Link Button on Navbar	Direct to each section on landing page	Success
	Testing button "Tunjukkan Arah"	Direct to Tourism Map	Success
	Testing button "Berikan Ulasan"	Shows Review Form	Success
	Add Review	Shows a success message	Success
3	Register an Account	Shows a success message	Success
	Testing button "Masuk"	Direct to Login Page	Success
4	Login	Shows a success message	Success
	Testing button "Daftar"	Direct to Register Page	Success
5	Testing every Link Menu an icon on Navbar	Direct to each section on landing page	Success
	Testing button Logout on Navbar	Shows a confirmation message to Logout	Success
	Testing every Link Menu on Sidebar	Direct to each page on Dashboard Admin	Success
6	Click "Data Kategori" menu	Showa Category Data	Success
	Click button "Tambah Kategori"	Shows Add Category Data Form	Success

	Click button Submit on Add Category Form	Shows a success message	Success
	Click icon edit on one of Category Data	Shows Edit Data Form	Success
	Click button Update on Edit Category Form	Shows a success message	Success
	Click icon Delete on one of Category Data	Shows a confirmation message to Delete	Success
	Delete a Category Data based on ID	Shows a success message	Success
	Search a Category Data	Shows data that has been searched	Success
	Click pagination button on Category Data page	Switch pages if the category data displayed is more than 10 data	Success
	Testing every Download button on Category Data	Copy category data, download category data with CSV, xlsx, pdf file formats	Success
7	Click "Data Wisata" menu	Shows all tourist attraction data	Success
	Click button "Tambah Wisata"	Shows Add Tourist Attraction Data Form	Success
	Click Submit button on Add Tourist Attraction Data Form	Shows a success message	Success
	Click icon Edit on one of Tourist Attraction Data	Shows Edit Data Form	Success
	Click Update button on Edit Tourist Attraction Data Form	Shows a success message	Success
	Click icon Delete on one of Tourist Attraction Data	Shows a confirmation message to Delete	Success
	Delete a Tourist Attraction Data based on ID	Shows a success message	Success
	Search a Tourist Attraction	Display the search results of tourism data	Success
	Click pagination button on Tourist Attraction Data Page	Switch pages if the category data displayed is more than 10 data	Success
	Testing every Download button on Tourist Attraction Data	Copy tourism data, download category data with csv, xlsx, pdf file formats	Success
8	Click Review Data Menu	Shows all review data	Success
	Search a Review Data	Display the search results of review data	Success
	Click pagination on Review Data Page	Switch pages if the category data displayed is more than 10 data	Success
	Testing every Download button on Review Data Page	Menyalin data ulasan, mendownload data ulasan dengan format file esv, xlsx, pdf	Success
9	Click Admin Data Menu	Shows all Admin Data	Success
	Click icon Edit on one of Admin Data	Shows Edit Data Form	Success
	Click button Update on Edit Admin Data Form	Shows a success message	Success
	Click icon Delete on one of Admin Data	Shows a confirmation message to Delete	Success
	Delete a Admin Data based on ID	Shows a success message	Success
	Search a Admin Data	Display the search result of Admin Data	Success
	Click pagination on Admin Data Page	Switch pages if the category data displayed is more than 10 data	Success
	Testing every Download button on Admin Data Page	Copy admin data, download category data with CSV, xlsx, pdf file formats	Success
10	Click icon Message on Naybar	Shows all message	Success
	Click icon Delete on one of Message Data	Shows a confirmation message to Delete	Success
	Delete a message based on ID	Shows a success message	Success
	Search a message	Display the search result of Message Data	Success
	Click pagination on message data page	Switch pages if the category data displayed is more than 10 data	Success
	Testing every Download button on Message Data Page	Switch pages if the category data displayed is more than 10 data	Success

5. Deploy

The deployment phase involves the implementation of the successfully developed system for end-users. Preceding this, researchers hosted the system on the web, making it accessible via the Internet through the URL <https://bandunggeowisata.infinityfreeapp.com/>. Hosting provides a repository for storing all files and data, ensuring accessibility for users.

6. Review

Following the implementation stage, the subsequent stage involves user review.

Activities in this stage include distributing questionnaires to 60 respondents to assess the system's usability. The respondents in this study were required to be Indonesian citizens with proficient Indonesian language skills and a willingness to travel to the city of Bandung. Additionally, respondents were grouped by age, occupation, and domicile. Users are instructed to access and interact with the system previously hosted. They are then prompted to complete a questionnaire evaluating aspects such as ease of use, usability, satisfaction, reliability, and user interface. The evaluation results are outlined below:

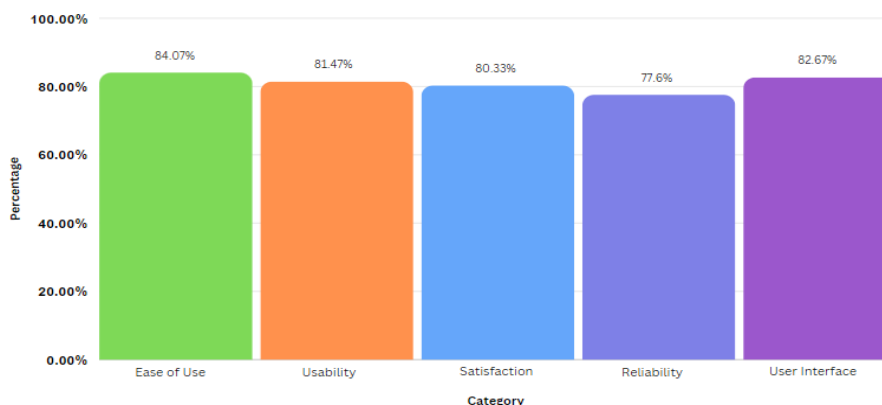


Figure 20. Graphic of User Review Result

Figure 20 shows information about feedback obtained from users and obtained results from each aspect assessed such as Ease of Use reaching 84.07%, Usability reaching 81.47%, Satisfaction reaching 80.33%, Reliability reaching 77.6%, and User Interface reaching 82.67%. From these results, an average of 81.23% can be obtained, which indicates a high level of user acceptance.

This study demonstrates that the system developed using the agile development method and Leaflet JavaScript technology operates effectively as intended. Verification was achieved through BlackBox testing and user evaluation via distributed questionnaires, yielding an average score of 81.23%. This score indicates a high level of user acceptance for the system.

CONCLUSION

Based on the conducted research, it can be concluded that the Bandung City Tourism Mapping Geographic Information System (GIS) can be effectively designed using the agile development method, which provides flexibility and allows for adjustments during the design process, resulting in a more efficient system. Essential components for designing this system include relevant spatial data, a thorough understanding of user requirements, proficiency in GIS software usage, and the capability to craft responsive and user-friendly interfaces. The implementation of Leaflet JavaScript in this GIS design involves integrating Bandung City's geographical data with the Leaflet library, enhanced by plugins for functionality such as location markers and navigation pathways.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Abdillah, M. Z., Nawangnugraeni, D. A., & Yuniarto, A. H. P. (2021). Geographic information system (GIS) for mapping greenpark using leaflet JS. *JTIK (Jurnal Teknik Informatika Kaputama)*, 5(2), 259–266.
2. Alvarado, S. H., Cortiñas, A., Luaces, M. R., Pedreira, O., & Places, Á. S. (2020). Developing web-based geographic information systems with a dsl: proposal and case study. *Journal of Web Engineering*, 19(2), 167–193.
3. Alvino, I. W. D., & Riskiono, S. D. (2021). Sistem Informasi Geografis Pemetaan Sekolah Dasar Berbasis Android Pada Kecamatan Sidomulyo. *Jurnal Ilmiah Infrastruktur Teknologi Informasi*, 2(1).
4. Andrunyk, V., & Shostak, D. (2021). Information System for Finding Inclusive Places for People with Disabilities. *MoMLeT+ DS*, 525–564.
5. Binar Academy. (2024). Metode Agile: Pengertian, Tujuan, dan Prinsipnya. Retrieved from Binar Academy website: <https://www.binaracademy.com/blog/metode-agile-adalah>
6. Findawati, Y., & Taurusta, C. (2018). Buku Ajar Rekayasa Perangkat Lunak. *Umsida Press*, 1–131.
7. Hasanah, F. N., & Untari, R. S. (2020). Buku Ajar Rekayasa Perangkat Lunak. *Umsida Press*, 1–119.
8. Humas Kota Bandung. (2023). Plh Wali Kota Optimis Ekonomi dan Pariwisata Kota Bandung Meningkatkan. Retrieved from bandung.go.id website: <https://www.bandung.go.id/news/read/8244/>
9. Ismayanti, M. (2021). *Dasar-Dasar Pariwisata Sebuah Pengantar*. Jakarta: Universitas Sahid Jakarta.
10. Jannah, M., Muthmainnah, M., Safwandi, S., Saptari, M. A., Muhammad, M., Wahyudi, R., & Farhan, M. (2022). Implementation of Geographic Information System for Tourist Locations and Lodging Services in Lhokseumawe City Based on Android. *International Journal of Engineering, Science and Information Technology*, 2(4), 39–47.
11. Kafando, H., Ouedraogo, B., Ojeh, V. N., Rienow, A., Gadiaga, A., & Garba, I. E. M. (2024). Development of a Web-Based GIS of Flood Zones in the Municipality of Ouagadougou in Burkina Faso. *Journal of Geographic Information System*, 16(01), 32–43.
12. Pratomo, T. N., & PN, T. R. T. (2022). Penerapan Metode Agile dalam Pembuat Aplikasi WebGIS Wisata di Brebes Selatan. *BATIRSI-Bahari Teknik Informatika Dan Sistem Informasi*, 6(1), 15–19.
13. Pressman, R. S. (2012). *Rekayasa perangkat lunak: pendekatan praktisi*. Andi.
14. Scalabrini, E. C. B., Correia, A. I., Fonseca, M., Nunes, A. N., Veloso, C. M., Vieira, E., ... Santos, S. (2022). The use of a geographic information system to increase outdoor tourism. *European Journal of Applied Business and Management*, 1–13.

How to cite this article: Yenni Fatman, Astri Nurazizah, Fais Fadilah Prastyo, Linda Handayani, Nurul Dwi Pajriah, Pitri Sri Rahayu. Design of a geographic information system (GIS) for mapping tourist attractions in Bandung city using leaflet JavaScript to optimize the development of Bandung city's tourism potential. *International Journal of Research and Review*. 2024; 11(8): 513-526. DOI: <https://doi.org/10.52403/ijrr.20240854>
