Faculty of Computer Science and Information Technology

# *I-PUSARA: Community Funeral Management Platform*

Final Year Project

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**I-PUSARA: Community Funeral Management Platform**

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This project is submitted in partial fulfilment of the

requirements for the degree of Bachelor of

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## DECLARATION OF ORIGINALITY

I hereby declare that this research together with all its content is none other than that of my own work, with consideration of the exception of research-based information and relative materials that were adapted and extracted from other resources, which have evidently been quoted or stated respectively.

Signed,

صلحين

……

MUHAMMAD SOLEHIN BIN SHAHRULIZAM

Faculty of Computer Science and Information Technology 24th July 2025

University Malaysia Sarawak

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بِسۡمِ ٱللَّهِ ٱلرَّحۡمَٰنِ ٱلرَّحِيمِ

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## ABSTRACT

The I-PUSARA Community Funeral Management Platform aims to revolutionize funeral planning and coordination for Malaysian communities, particularly in rural and underserved areas. This platform provides families with a centralized, digital solution to share funeral details, such as dates, times, locations, and services, while enabling obituary posting, condolence sharing, and service coordination. By addressing the fragmented communication often associated with traditional methods like word-of-mouth or social media, I-PUSARA seeks to streamline funeral logistics and foster community support during grieving periods.



**Keywords:** Funeral Management, Community Platform, Digital Inclusion, Agile Development, Obituary Posting

## *ABSTRAK*

*Platform Pengurusan Pengebumian Komuniti I-PUSARA bertujuan untuk merevolusikan perancangan dan penyelarasan pengebumian bagi komuniti di Malaysia, terutamanya di kawasan luar bandar dan kurang mendapat perkhidmatan. Platform ini menyediakan penyelesaian digital berpusat kepada keluarga untuk berkongsi maklumat pengebumian seperti tarikh, masa, lokasi, dan perkhidmatan, serta membolehkan penerbitan obituari, perkongsian ucapan takziah, dan penyelarasan perkhidmatan. Dengan menangani komunikasi yang sering terpecah-pecah melalui kaedah tradisional seperti dari mulut ke mulut atau media sosial, I-PUSARA berhasrat untuk memperkemas logistik pengebumian dan memupuk sokongan komuniti semasa tempoh berkabung.*



***Kata kunci:*** *Pengurusan Pengebumian, Platform Komuniti, Inklusi Digital, Pembangunan Agile, Penerbitan Obituari*

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| UNIMAS | Universiti Malaysia Sarawak |
| GIS | Geographic Information Sytem |
| CSS | Cascading Style Sheets |
| PHP | Hypertext Preprocessor |
| SQL | Structured Query Language |
| HTML | Hypertext Markup Language |
| CRUD | Create, Read, Update, Delete |
| ERD | Entity Relation Diagram |
| TPIB | Tanah Perkuburan Islam Bako |

# CHAPTER 1

# INTRODUCTION

## 1.1 1.1 Overview

The goal of this project is to provide a funeral platform that will help Malaysian communities get information on funerals easily. Sharing details of the funerals, including dates, times, locations, and service arrangements by the families themselves, is permitted on this platform. It is also an avenue for obituaries, condolences, and service coordination. The aim is to make funeral preparations and communication easier, and to help grieving families cope with the logistics under the support of the wider community. Underpinning this, the first deployment of the project will be in Kg Bako, Kuching, Sarawak, to act as a testing ground for the functionality and community engagement of the platform.

## 1.2 Problem Statement

In Malaysia, most funerals involve coordination between families, religious leaders, funeral homes, and community members. Most coordination is made through word-of-mouth or social media platforms like WhatsApp, hence, it leads to fragmented communication. In addition, people living in rural areas or those in diverse communities may not readily have access to updated funeral information (Lo et al., 2018). A central digital platform can simplify the spread of funeral details, reducing stress from families and ensuring that community members are informed and able to offer support.

## 1.3 Research Questions

The research questions for this study are:

i. How to identify and analyze user requirements for the project by engaging with the community.

ii. How can funeral data be managed effectively without a traditional database, using lightweight JSON storage?

iii. How can a GIS-integrated digital platform improve the process of locating burial plots in the Kg Bako community?

## 1.4 Objectives

This project aims to develop a funeral website that facilitates easy access to funeral-related information for Malaysian communities. This can be achieved through the following set of objectives:

i. To identify and analyze user requirements for the project by engaging with the community.

ii. To implement an admin dashboard for data CRUD operations and approval workflows using JSON-based storage.

iii. To develop an interactive grave locator using QGIS and Leaflet.

## 1.5 Brief Methodology

This will be an Agile Development Methodology project, as it is iterative by nature, thus, it will allow many times for feedback and improvements (Maleki & Ramsin, 2017). It is quite suitable because the community-driven website will need to be adaptive based on user feedback, cultural nuances, and community needs. The project will be broken down into sprints with each sprint focusing on different aspects of the website development process. The flow of Agile Method Development as shown in **Figure 1.1**.

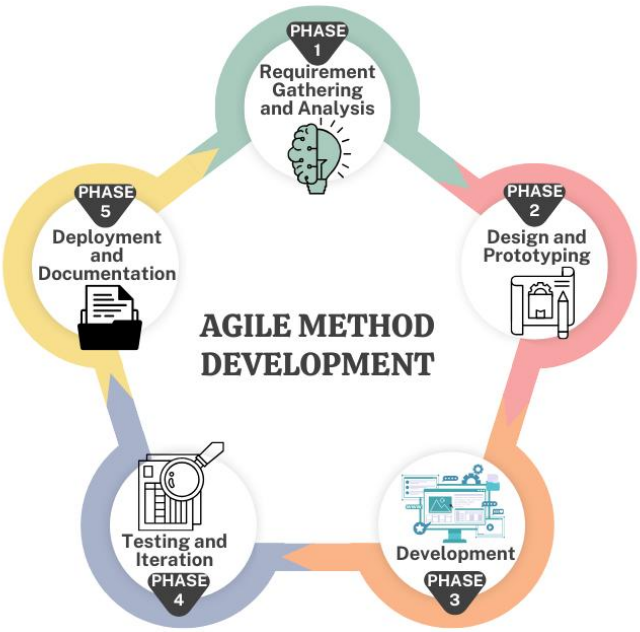


Figure 1.1: Agile Method Development

**Phase 1: Requirement Gathering and Analysis**

- Conduct interviews with PTIB officers, community leaders, and cemetery administrators to gather precise requirements.

- Perform a data audit of existing cemetery records (e.g., Excel sheets from PTIB).

- Identify technical needs, including grave locator mapping, JSON-based data storage, and admin functionalities.

- Prioritize core features: grave locator, funeral application form, and CRUD dashboard.

**Phase 2: Design and Prototyping**

- Design wireframes for key pages: Dashboard, Burial Plot Locator, Application Form, Admin Approval Page.

- Develop diagrams:

  - Flowchart (user interactions)
  - Use Case Diagram (roles and functionalities)

    - Entity Structure Diagram (for JSON file data flow instead of traditional SQL ERD)

- Use QGIS to digitize burial plots, then export them into GeoJSON format for map integration.

- Design user-friendly UI focused on clarity, simple navigation, mobile responsiveness, and Islamic funeral process suitability.

- Review prototypes with stakeholders (PTIB and community representatives) for validation.

**Phase 3: Development**

- Backend: Develop using Laravel, managing data through JSON file-based storage (no SQL).

- Frontend: Build responsive interfaces using HTML, CSS (Bootstrap), and JavaScript.

- Map Integration: Implement an interactive burial plot locator using Leaflet.js + GeoJSON exported from QGIS.

- Key Features Developed:

    - Funeral service online application form.
    - Burial record search with map-based locator.
    - Admin dashboard with full CRUD operations and application approval workflow.

**Phase 4: Testing and Iteration**

- Conduct Functional Testing on features: map locator, CRUD dashboard, and application workflow.

- Perform User Acceptance Testing (UAT) via a structured Likert-scale Google Form, with respondents from PTIB and the Kg Bako community.

- Test for:

    - Burial plot accuracy on the map.
    - Application submission and approval process flow.
    - Data handling integrity using JSON files.

- Address feedback iteratively to improve UX, data accuracy, and feature flow.

**Phase 5: Deployment and Documentation**

- Deploy the system on a local server or community server for Kg Bako.

- Conduct user training for PTIB officers on how to manage records and approve funeral applications via the dashboard.

- Produce full documentation:

  - User manuals for public and admin users.
  - Technical guides for system maintenance, JSON data management, and future expansion.

- Set up continuous feedback mechanisms for future updates.

## 1.6 Scope

The scope of the I-PUSARA project focuses on developing a comprehensive digital funeral management system specifically designed for the Muslim community in Kampung Bako, Kuching, Sarawak. This system aims to streamline the funeral management process by offering features that simplify burial arrangements, grave locating, and the management of deceased records. Unlike the original concept which intended to use SQL-based databases, this project adopts a lightweight JSON file-based storage approach that is more suitable for the scale and infrastructure limitations of rural communities. This transition ensures that the system remains efficient, easy to maintain, and does not require complex database management systems.

A significant component of this platform is the integration of an interactive burial plot locator. By utilizing QGIS to digitize the cemetery layout and Leaflet.js to display the data through GeoJSON, users can accurately search and visually locate grave plots within the Kg Bako cemetery. This feature addresses one of the most common challenges in rural funeral management, where grave information is typically scattered, unrecorded, or difficult to retrieve. Alongside this, the system incorporates a funeral service online application, enabling community members to submit requests for funeral-related services in a digital

format. This replaces the conventional manual paper-based processes, reducing the workload for both applicants and administrators.

The project also includes the development of an admin dashboard that empowers cemetery administrators to manage burial records efficiently. This dashboard features a CRUD (Create, Read, Update, Delete) operation capability, allowing administrators to add, edit, or remove deceased records as needed. Furthermore, it introduces an application approval workflow where every submitted application must be reviewed and verified by an administrator before being published or recorded in the main database. This ensures data integrity and prevents misinformation from entering the system.

In addition to the core functionalities, I-PUSARA provides obituary posting and a simple condolence management feature to support community engagement during times of loss. Users can search for deceased records using a simple search function, and the system will present detailed burial information, including the ability to visually locate the corresponding grave on the map.

The platform is fully web-based and mobile responsive, ensuring that users from various demographics, including elderly community members with limited technological exposure, can access it conveniently from smartphones, tablets, or desktop computers. However, it is important to note that certain features are beyond the current scope of this project. These include the integration of online payment gateways for donation or service fees, linkage to government or third-party databases, and the development of a dedicated mobile application. These functionalities are intentionally excluded from this version but are considered for future enhancements.

Most importantly, I-PUSARA is developed with a deep understanding of and respect for Islamic funeral practices. Every feature is designed to comply with cultural and religious expectations, ensuring that the community perceives the system not only as a technological tool but as an aid that supports religious traditions and communal harmony. By offering a culturally sensitive, efficient, and user-friendly funeral management system, I-PUSARA stands as a vital tool that bridges traditional practices with modern technology for the benefit of the Kg Bako Muslim community.

## 1.7 Significance of Study

The significance of the I-PUSARA project lies in its ability to bridge the gap between traditional funeral management practices and modern digital solutions within the Muslim community of Kampung Bako. For decades, the management of funeral-related information in this community has been heavily reliant on manual processes, word-of-mouth communication, and physical records, which often leads to inefficiencies, miscommunication, and difficulties in accessing vital information. This project introduces a much-needed transformation by offering a centralized and digital platform that simplifies and organizes the entire funeral management process.

One of the key contributions of I-PUSARA is its capacity to alleviate the logistical challenges faced by grieving families. By digitizing funeral service applications, deceased record management, and burial plot locating, the platform significantly reduces the stress and confusion that typically occur during funeral arrangements. This allows family members to focus more on the grieving and healing process rather than being burdened with administrative complications.

Furthermore, the adoption of a web-based platform that operates using lightweight JSON file storage rather than a conventional database ensures that the system remains accessible, sustainable, and manageable even for a small rural community with limited technological infrastructure. This approach supports digital inclusion, enabling community members and cemetery administrators, regardless of their level of technological literacy, to interact with the system easily and effectively.

Cultural and religious sensitivity is another critical aspect that elevates the importance of this project. Every component of I-PUSARA has been designed with a deep understanding of Islamic funeral traditions, ensuring that the system aligns with religious values and community expectations. This cultural appropriateness fosters trust among users and encourages wider acceptance of the technology within the community.

Beyond facilitating individual funeral arrangements, the platform also plays a broader role in strengthening community bonds. Features such as obituary sharing, condolence messages, and a grave locator not only serve practical needs but also help preserve the memory of the deceased and maintain community connections. It promotes a sense of solidarity, especially during times of grief, by providing tools that allow the community to come together virtually in support of one another.

Ultimately, I-PUSARA serves as more than just a technological tool. It represents a shift towards a more organized, transparent, and compassionate approach to funeral management. By addressing both operational challenges and emotional needs, the project delivers a lasting impact on how the community of Kampung Bako manages and honors the memories of their loved ones while embracing the benefits of digital transformation in a culturally respectful manner.

## 1.8 Project Schedule

The entire I-PUSARA project is divided into five major phases that span over twenty weeks. Each phase is carefully structured to ensure a smooth development process while meeting the needs of the Kg Bako community. The workflow is designed to allow flexibility and continuous improvements throughout the development cycle. The Gantt chart of the project schedule shown in **Figure 1.2**.

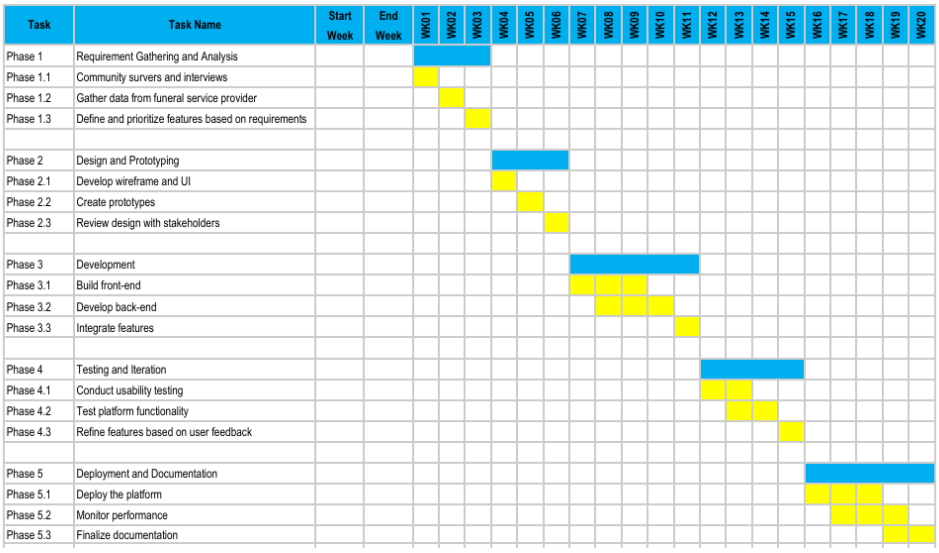


Figure 1.2: Gantt Chart

The first phase is Requirement Gathering and Analysis, which takes place over weeks one to three. This phase involves engaging with stakeholders, including PTIB officers, cemetery administrators, and community members, to gather detailed information about the existing funeral management process and their expectations for the digital system. During this period, the project team conducts data assessments, particularly reviewing the unstructured burial records that exist in Excel format, to better understand the data cleaning requirements and system scope. In addition, this phase focuses on formulating user stories that will guide development priorities. Activities in this phase include:

- Conduct community surveys and interviews to identify user needs and expectations.
- Gather input from families, religious leaders, and PTIB funeral service providers.
- Perform data collection and cleaning, particularly for burial records that will be converted into a JSON format.
- Define user stories and prioritize features based on the requirements identified.

Moving forward to Design and Prototyping, which takes place during weeks four to six, the project shifts from information gathering to the visual and structural planning of the system. In this phase, the interface for both the public and the admin dashboard is designed to be user-friendly, mobile responsive, and culturally appropriate for Islamic funeral practices. One of the key deliverables during this phase is the digitization of the burial plot using QGIS, which is then exported into GeoJSON for map integration. System diagrams are also developed to guide the backend and frontend structure. Key activities include:

- Develop wireframes and user interface (UI) mockups focusing on accessibility and cultural sensitivity.
- Design system diagrams, including the use case diagram, flowchart, and entity-relationship diagram tailored for JSON file storage rather than a relational database.
- Create prototypes to visualize key features, including the burial plot locator, application form, and admin dashboard functionalities.
- Review designs with stakeholders to collect feedback and refine the prototypes based on their input.

The third phase, Development, covers weeks seven to twelve and represents the core of the project execution. In this phase, the frontend and backend components of the system are built. The backend is developed using the Laravel framework with a focus on JSON-

based data management, replacing the previously planned SQL database. The frontend leverages HTML, CSS (Bootstrap), and JavaScript to ensure the platform is functional across various devices. The burial plot locator is integrated using Leaflet with the digitized GeoJSON data from QGIS. The admin dashboard is also developed to include CRUD operations and a funeral application approval workflow. Key activities during this phase include:

- Build the frontend interface using HTML, CSS, and JavaScript to ensure a responsive and intuitive experience.
- Develop the backend system using Laravel and JSON file storage for lightweight data handling suitable for the community.
- Integrate the burial plot locator using Leaflet.js with GeoJSON from QGIS for accurate grave mapping.
- Develop core features such as the online funeral service application, obituary creation, record management, and the admin approval workflow.

Once development is complete, the project enters the Testing and Iteration phase, which occurs during weeks thirteen to fifteen. This phase is crucial for identifying and correcting any errors, improving usability, and ensuring that the system meets the needs of its users. Testing is carried out with both PTIB officers and selected community members through User Acceptance Testing (UAT) utilizing structured Likert-scale questionnaires. This process ensures that the platform functions correctly and is easy to use. The key activities in this phase include:

- Conduct usability testing with target users, including PTIB administrators and community members.
- Test the accuracy and performance of key features such as the burial plot locator, application submission, and CRUD operations in the admin dashboard.
- Verify platform compatibility across various devices and browsers.

- Refine features based on user feedback, focusing on resolving usability challenges and improving data accuracy.

The final stage is Deployment and Documentation, which spans weeks sixteen to twenty. During this phase, the platform is launched for a pilot run in the Kg Bako community. The deployment process includes configuring the system for live use, importing the cleaned burial plot data and deceased records into JSON format, and providing training for PTIB officers who will maintain the system. Alongside deployment, comprehensive documentation is prepared to support system operation, including user manuals for both administrators and the public, as well as technical documentation for future maintenance and scalability. Activities in this phase include:

- Deploy the platform for a pilot run within the Kg Bako community, ensuring the burial plot locator and funeral application system are fully functional.
- Monitor system performance during live usage and collect feedback for further refinement.
- Train PTIB officers and relevant stakeholders on how to operate the admin dashboard, manage records, and handle funeral service applications.
- Finalize comprehensive documentation, including user guides, technical setup instructions, and procedures for managing JSON-based data storage.

This structured project schedule ensures that the I-PUSARA platform is developed methodically, with each phase building upon the previous one while maintaining flexibility for improvements based on stakeholder feedback. The schedule balances technical development with community involvement to ensure the final system is practical, culturally appropriate, and sustainable for long-term use in the Kg Bako community.

## 1.9 Expected Outcome

The expected outcome of the I-PUSARA project is the successful development and deployment of a web-based funeral management system specifically designed for the Muslim community in Kampung Bako, Kuching. This system is intended to transform the current manual and fragmented funeral management process into a structured, accessible, and efficient digital platform. By offering an integrated solution that combines burial record management, an online funeral service application, and an interactive grave locator, I-PUSARA aims to reduce the logistical challenges typically faced by grieving families and cemetery administrators.

The platform will enable users to search for deceased records with ease, retrieve accurate burial information, and visually locate graves through a GIS-based map powered by QGIS and Leaflet with GeoJSON integration. This addresses one of the most pressing issues in the community, the lack of a reliable system to help families identify grave locations, especially over time as memories fade and manual records deteriorate.

In addition, the development of an admin dashboard will empower cemetery administrators, specifically PTIB officers, to efficiently manage burial records. This dashboard will include full CRUD (Create, Read, Update, Delete) functionalities and an approval workflow for funeral service applications submitted by the public. The use of JSON file-based storage offers a lightweight and sustainable data management solution that does not rely on complex database systems, making it perfectly suited for the technological constraints of a rural setting like Kg Bako.

The expected result is a culturally sensitive platform designed in alignment with Islamic funeral practices. It will not only assist in logistical processes but also serve as a

communal tool for sharing obituaries and fostering community involvement during times of loss. Its user-friendly interface, designed to be mobile-responsive, ensures accessibility for users of all age groups and technological backgrounds, thereby bridging the digital divide within the community.

Moreover, I-PUSARA is expected to become a valuable resource for PTIB in their operational workflow. It will eliminate the need for cumbersome manual record-keeping, minimize errors, and provide a reliable archive of burial information for future generations. For the community, it offers peace of mind, knowing that vital information regarding their loved ones is securely stored and easily accessible.

Ultimately, the I-PUSARA platform will deliver a sustainable, practical, and compassionate solution that modernizes the funeral management process without compromising the cultural and religious values that are central to the Kg Bako Muslim community. It stands as a model that could potentially be scaled and adapted for use in other communities facing similar challenges in funeral management.

## 1.10 Thesis Outline

This thesis is structured into five main chapters, each systematically presenting the research, development process, and findings related to the I-PUSARA Community Funeral Management Platform. The structure is designed to capture the journey from problem identification to the deployment of the digital solution for the Kg Bako community. Chapters One through Three lay the foundation of the project, offering insights into the problem statement, relevant literature, and the methodological approaches adopted. The later chapters

focus on the implementation, testing, evaluation, and final conclusions drawn from the project.

The first chapter sets the stage for the study by providing an overview of the I-PUSARA platform and its primary purpose. It highlights the pressing issues faced by the Kg Bako Muslim community, such as fragmented communication, outdated burial records, and the challenges of manually locating graves or managing funeral arrangements. The problem statement elaborates on the inadequacies of the current approach, which relies heavily on word-of-mouth, unstructured data, and social media communication. This often leads to confusion, misinformation, and inefficiency during times that are already emotionally difficult. The chapter further outlines the research questions, which are: (i) How to identify and analyze user requirements for the project by engaging with the community? (ii) How can funeral data be managed effectively without a traditional database, using lightweight JSON storage? and (iii) How can a GIS-integrated digital platform improve the process of locating burial plots in the Kg Bako community? Correspondingly, the research objectives aim to: (i) identify and analyze user requirements through community engagement, (ii) implement an admin dashboard for data CRUD operations and approval workflows using JSON-based storage, and (iii) develop an interactive grave locator using QGIS and Leaflet. A summary of the Agile methodology is also introduced, highlighting its role in enabling iterative development with continuous user feedback. The chapter concludes by defining the scope and the significance of the project, which emphasizes its alignment with Islamic funeral practices and its focus on improving community support systems.

Chapter Two delves into the theoretical and contextual background of the study. This chapter provides a comprehensive review of existing funeral management systems, including

platforms such as ePusara and Ipusara MBSA. While these systems offer functionalities like obituary creation and simple cemetery searches, they fall short in areas such as real-time map integration using GIS, lightweight database handling suited for rural communities, and culturally enriched community features. This chapter discusses the necessity for culturally sensitive systems that honor Islamic traditions and community dynamics. It explores the technological foundations relevant to the project, particularly the benefits of using QGIS for grave plot digitization and Leaflet for map visualization. It also examines the shift from traditional SQL-based databases to JSON file-based storage, which is a more scalable and lightweight option for rural settings like Kg Bako. Furthermore, it emphasizes the adoption of Agile Development methodologies, which support iterative refinement based on stakeholder feedback. The chapter concludes by identifying the research gap, pointing out that existing solutions do not sufficiently combine GIS technologies, community-centric features, and culturally sensitive design, gaps that I-PUSARA is specifically designed to address.

Chapter Three presents the methodology and tools employed in the design, development, and evaluation of the I-PUSARA platform. It begins by detailing the Agile development approach used, structured around multiple sprints that each focus on different aspects of the system, from requirements gathering to deployment. The methodology encompasses wireframing, system prototyping, and the development of a lightweight backend using the Laravel framework in combination with JSON file storage rather than the initially planned Django or Node.js with SQL databases. The chapter also discusses the design of the front-end using HTML, CSS (Bootstrap), and JavaScript to ensure a responsive and accessible user interface. One of the standout components of the methodology is the integration of a GIS-based burial plot locator, created through QGIS and displayed via

Leaflet with GeoJSON data. Functionalities such as the admin dashboard with CRUD capabilities, a funeral application form with an approval workflow, and obituary sharing are outlined in this chapter. The testing process, including both functionality testing and User Acceptance Testing (UAT) with the Kg Bako community, is also described. The chapter concludes by discussing the deployment process, which involves a pilot run of the platform and the collection of user feedback to refine the system further.

Chapter Four focuses on the implementation and results of the I-PUSARA system. It details how each component, from the backend structure to the interactive map, was developed and deployed. This chapter also presents the testing outcomes, highlighting the platform's performance, reliability, and user satisfaction based on the feedback collected during UAT sessions. Screenshots of the system, including the admin dashboard, burial plot map, and application form, are provided to visually demonstrate the functionality of the system. The chapter assesses how the platform met the initial objectives, and research questions and discusses the practical impact it has had on funeral management processes within the Kg Bako community.

Finally, Chapter Five offers an evaluation of the project, drawing conclusions from the implementation and testing phases. It summarizes the key achievements of the I-PUSARA platform, such as its successful integration of GIS technologies with lightweight JSON-based data management, and its usability within the target community. The chapter reflects on the strengths and limitations of the project. Strengths include the accurate grave locator, the efficiency of JSON file handling, and the simplicity of the admin dashboard. Limitations primarily involve the absence of a mobile app and potential scalability issues with JSON if the system is expanded to much larger communities. The chapter concludes by

outlining recommendations for future work, which may include transitioning to an SQL-based database for scalability, developing a dedicated mobile application, and expanding the system to other communities beyond Kg Bako.

In summary, this thesis offers a comprehensive narrative of the I-PUSARA project, from the initial problem identification to the development of a culturally sensitive, GIS-enabled funeral management system that is both innovative and highly relevant to the needs of the Kg Bako community.

# CHAPTER 2

# LITERATURE REVIEW

This chapter reviews related literature to funeral management systems, cultural and religious considerations of death and dying, website development using the Agile methodology, within the setting of the I-PUSARA platform. This shall set a theoretical framework within which the study will be based, determine existing gaps, and place this study among prior researches. This review also identifies best practices that can guide the development of a culturally sensitive and user-friendly funeral management system to meet the needs of the Kg Bako community.

## 2.1 Background Study

The digitization of funeral management services represents a significant culture shift in the way communities approach end-of-life arrangements and the management of funerals (Al, 2021). Over the last couple of years, several digital platforms have been put into operation for most of the urban areas in Peninsular Malaysia, including but not limited to epusara.mbs.gov, ipusara.mbsa.gov, and epusara.jawi.gov. However, Sarawak differs geographically, culturally, and technically in various ways from states in Peninsular Malaysia (Shukri & Masri, 2024).

With its designation as the largest state in Malaysia, Sarawak obviously faces insurmountable challenges in the effective implementation of integrated digitization processes across its huge geographical expanse. This becomes even more highly developed compared with villages such as Kg Bako. Since the current practice of funeral management uses technology platforms that aim almost wholly for Peninsular Malaysia, communities in

Sarawak view huge service gaps. This calls for customized solutioning to articulate specific regional requirements.

The existing digital divide is further exacerbated by cultural and religious considerations. While the existing platforms are designed around the Islamic funeral practices that dominate Peninsular Malaysia, the ethnic and religious diversity of Sarawak requires a more inclusive approach (Shukri & Masri, 2024). The traditional funeral practices and customs of the communities in Sarawak have not been covered by the existing systems. Most importantly, comprehensive multilingual support is lacking, which affects Sarawak's multicultural population in terms of access and understanding for various ethnic groups.

Administrative challenges are still evident in rural areas of Sarawak, where manual recording systems remain the core support for managing funerals. Lack of a centralized database of grave locations and management within cemeteries has brought a situation of inefficiency in service delivery and resource allocation. Coordination of funeral services across far-flung communities is cumbersome, and the limited integration among local authorities and funeral service providers complicates matters further.

This extensive background analysis underlines the severe shortage of digital funeral management services in Sarawak, especially within the Kg Bako community. The limitations of the existing platforms, added to the unique local challenges, create a clear imperative for the development of the I-PUSARA platform as a tailored solution. This new platform should meet specific regional needs while respecting local cultural and technological constraints, serving as a bridge between traditional practices and modern digital convenience

## 2.2 Review on Existing Management Platform

The digitization of funeral management has gained traction in recent years, with platforms like ePusara and similar systems introduced in various regions. These platforms aim to streamline processes such as scheduling, obituary creation, and funeral mapping.

### 2.2.1 epusara.mbs.gov

This platform is a government-managed funeral management system that offers tools for locating graves, scheduling services, and making payments. It features a user-friendly interface with straightforward navigation, although it lacks real-time updates and multilingual support. Its emphasis on accessibility through desktop and mobile platforms ensures usability for a broad audience. Front page of epusara.mbs.gov as shown in **Figure 2.1**.

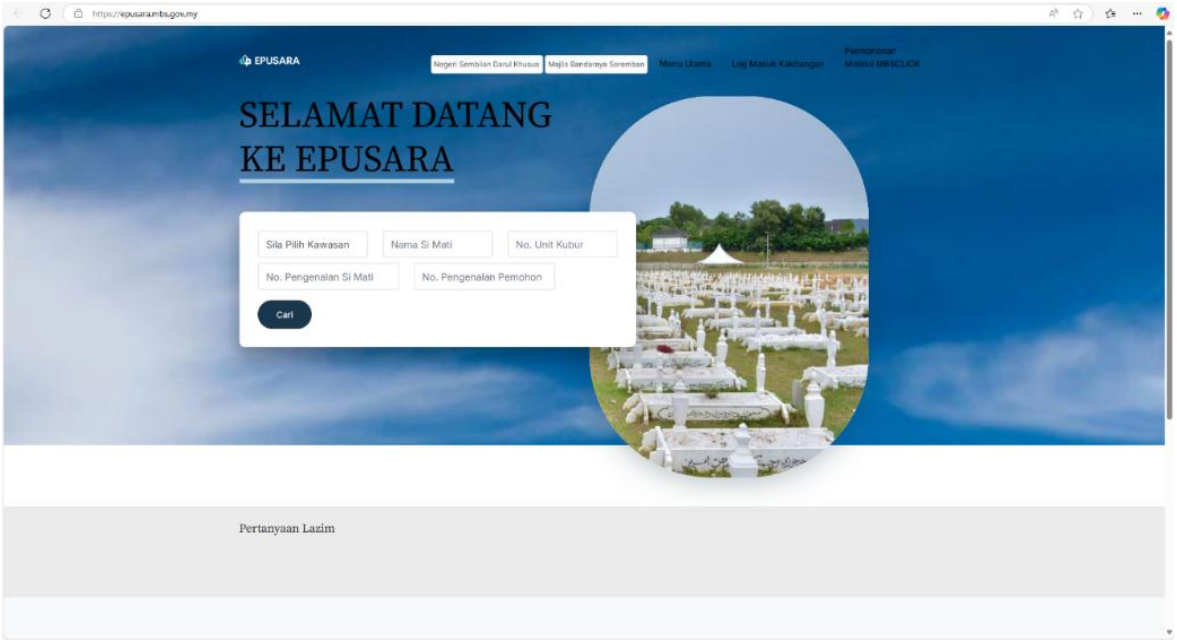


Figure 2.1: Front page of epusara.mbs.gov

### 2.2.2 enquiry.mpsj.gov

Focused primarily on administrative services, this website provides limited functionality for funeral management. It lacks interactive tools and is restricted to a Malay-only interface, which may hinder accessibility for non-Malay speakers. Despite these limitations, it serves as a basic point of contact for cemetery-related queries in its jurisdiction. Front page of enquiry.mpsj.gov as shown in **Figure 2.2**.

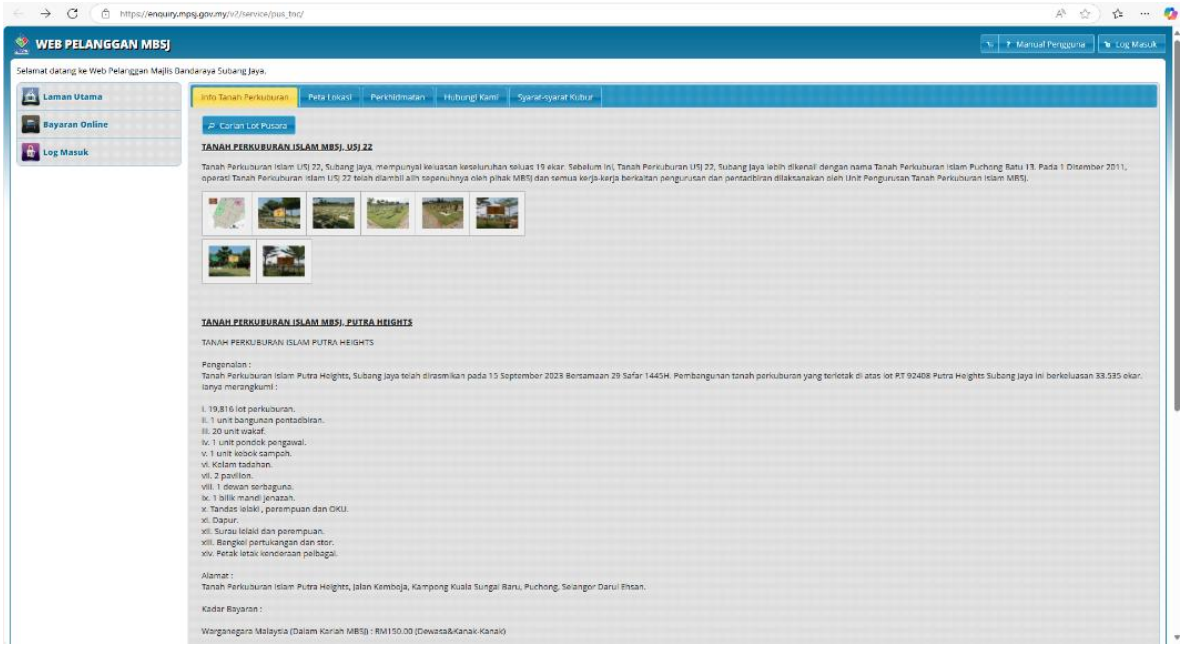


Figure 2.2: Front page of enquiry.mpsj.gov

### 2.2.3 mutmainnahpg.epusara

This platform specializes in services for the Muslim community, including bilingual support and real-time updates. However, it does not integrate community features or advanced tools like mapping and interactive scheduling. Its strengths lie in delivering timely and culturally aligned services to its target demographic. Front page of mutmainnahpg.epusara as shown in **Figure 2.3**.

Figure 2.3: Front page of mutmainnahpg.epusara

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### 2.2.4 ipusara.mbsa.gov

Designed with accessibility in mind, this platform provides comprehensive features such as grave locators and multilingual support. However, it falls short in offering real-time updates or tools to foster community engagement. Its clean interface and focus on mapping functionalities make it a practical option for users seeking location-based information. Front page of ipusara.mbsa.gov as shown in **Figure 2.4**.

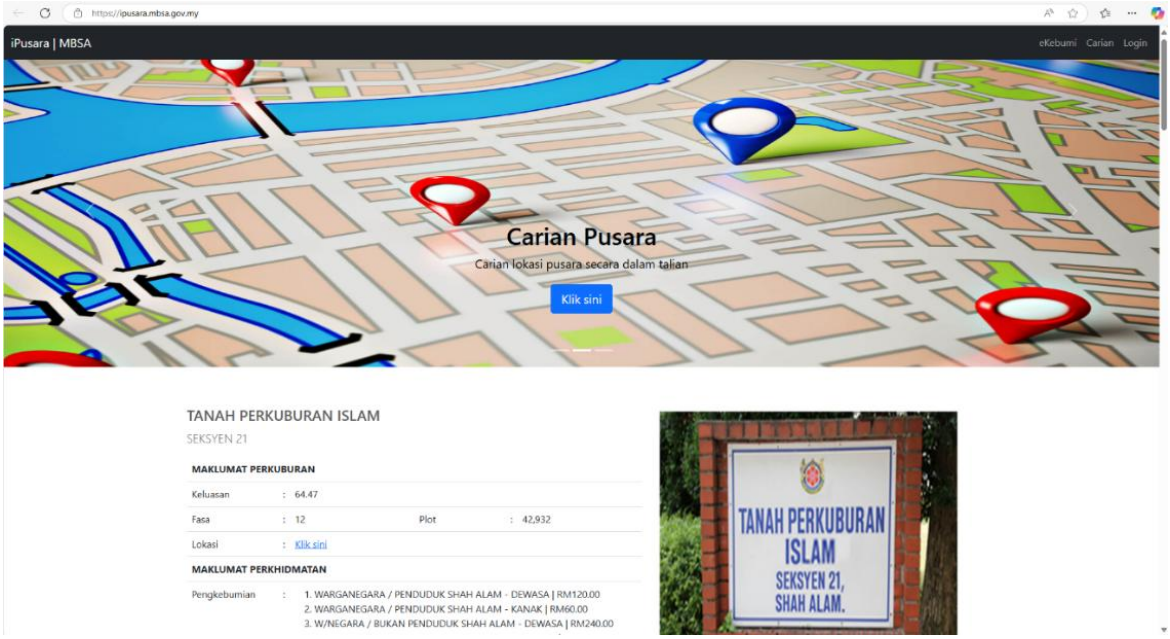



Figure 2.4: Front page of ipusara.mbsa.gov

### 2.2.5 epusara.jawi.gov

Managed by the Federal Territory Islamic Religious Council, this website emphasizes compliance with Islamic principles in funeral management. While it includes tools like grave locators and payment systems, it lacks innovative features such as real-time updates and community functionalities, limiting its modern applicability. Front page of epusara.jawi.gov as shown in **Figure 2.5**.

Figure 2.5: Front page of epusara.jawi.gov

## 2.3 Features of Existing Funeral Management Platform

In the realm of graveyard management systems, numerous platforms have been developed to simplify the process of maintaining burial site records, searching for specific graves, and facilitating communication between administrators and the public. Each system integrates a variety of features to address common challenges, ranging from locating graves to providing community support. This section examines the features of five existing graveyard management systems which are epusara.mbs.gov.my, enquiry.mpsj.gov.my, mutmainnahpg.epusara.com, ipusara.mbsa.gov.my, and epusara.jawi.gov.my, highlighting features of existing system. By understanding these systems, the proposed I-PUSARA platform can be designed to bridge existing gaps and enhance user experience.

### 2.3.1 Registration and Login

The availability of registration and login functionality in a management system determines how personalized and secure the user experience can be. Among the compared systems, enquiry.mpsj.gov.my stands out by providing comprehensive registration and login features for public users, enabling them to access exclusive functionalities such as submitting inquiries and saving personalized data. Users need to log in via Portal Rasmi Majlis Bandaraya Subang Jaya first to access multiple features of the official portal.

In contrast, epusara.mbs.gov.my and ipusara.mbsa.gov.my limit login access strictly to their staff, with no options for user registration or public login. While this ensures operational security, it restricts the public from engaging directly with the system or accessing certain services that might benefit them. Similarly, mutmainnahpg.epusara.com and epusara.jawi.gov.my lack any form of login or registration, offering open access to basic features instead. This approach may simplify access for users but sacrifices personalized

services and secure data handling. The interface of registration and login each website as shown in **Figure 2.6**, **Figure 2.7** and **Figure 2.8**.

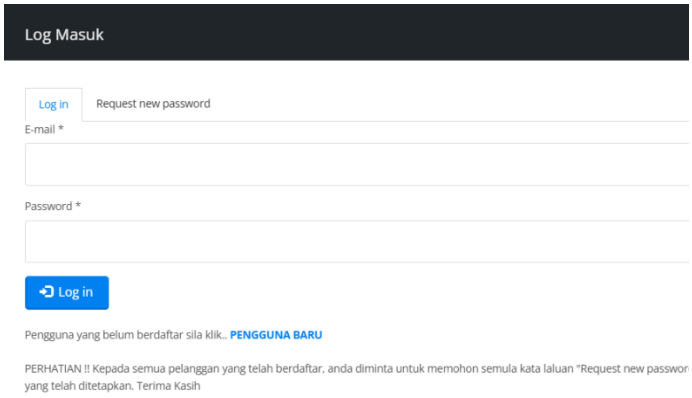



Figure 2.6: Login/Registration of enquiry.mpsj.gov.my

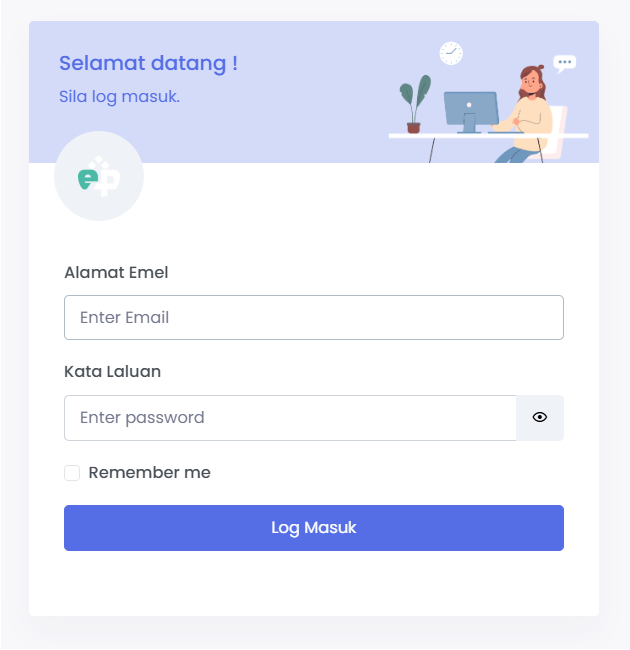



Figure 2.7: Login of epusara.mbs.gov.my

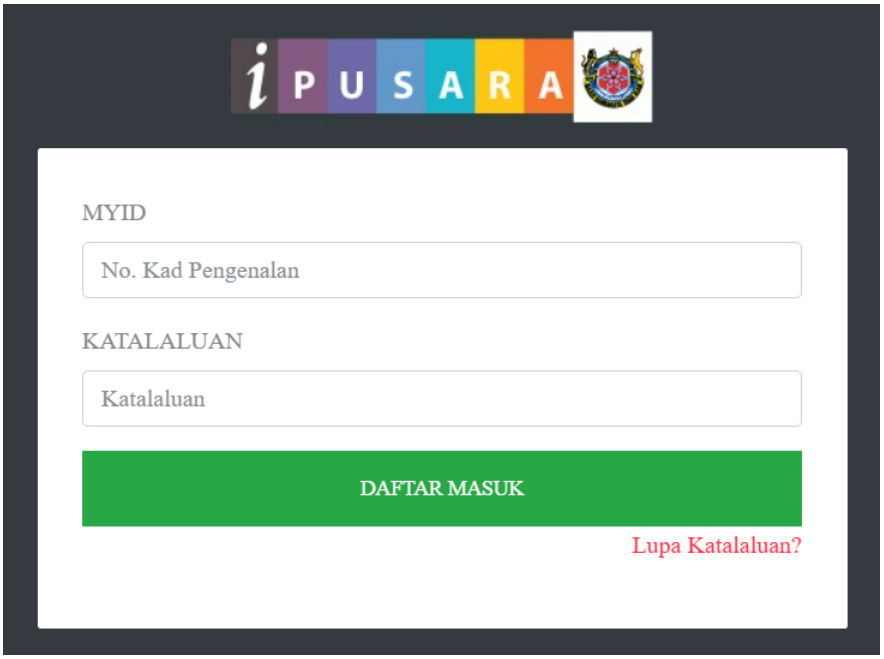



Figure 2.8: Login of ipusara.mbsa.gov.my

### 2.3.2 Grave Search Function

A core feature across all the platforms is the grave search function, allowing users to locate specific graves using information like names or burial dates. This feature ensures quick access to grave locations, making it easier for families and visitors to find loved ones. Its uniform presence across all platforms reflects its importance as a fundamental requirement for graveyard management systems. The interface of grave search function each website as shown in **Figure 2.9**, **Figure 2.10**, **Figure 2.11**, **Figure 2.12** and **Figure 2.13**.

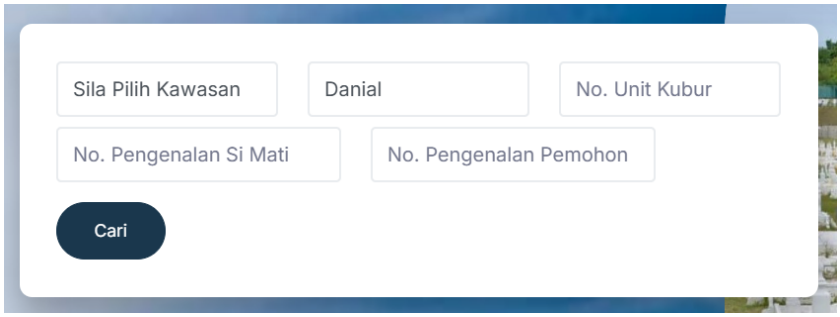



Figure 2.9: Grave Search Function of epusara.mbs.gov.my

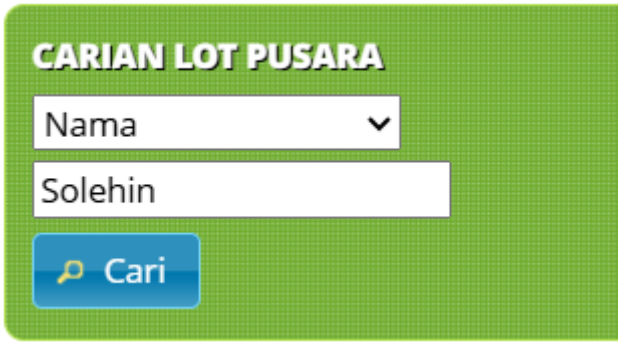



Figure 2.10: Grave Search Function of enquiry.mpsj.gov.my

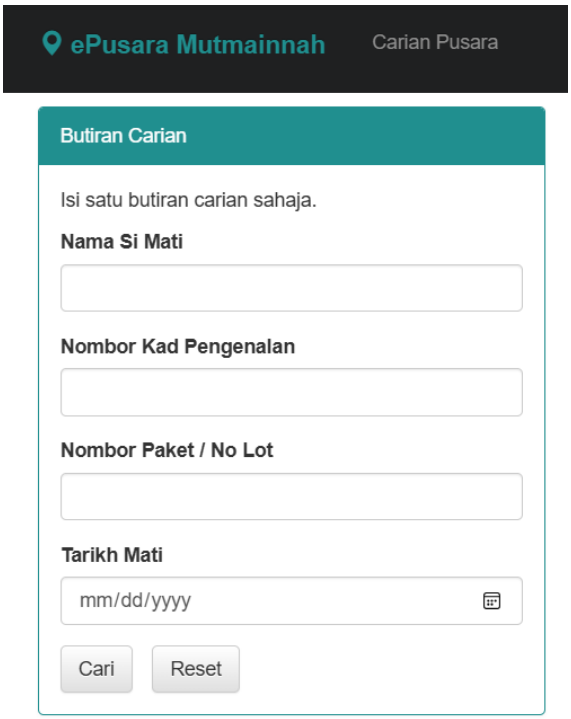


Figure 2.11: Grave Search Function of mutmainnahpg.epusara.com

Figure 2.12: Grave Search Function of ipusara.mbsa.gov.my

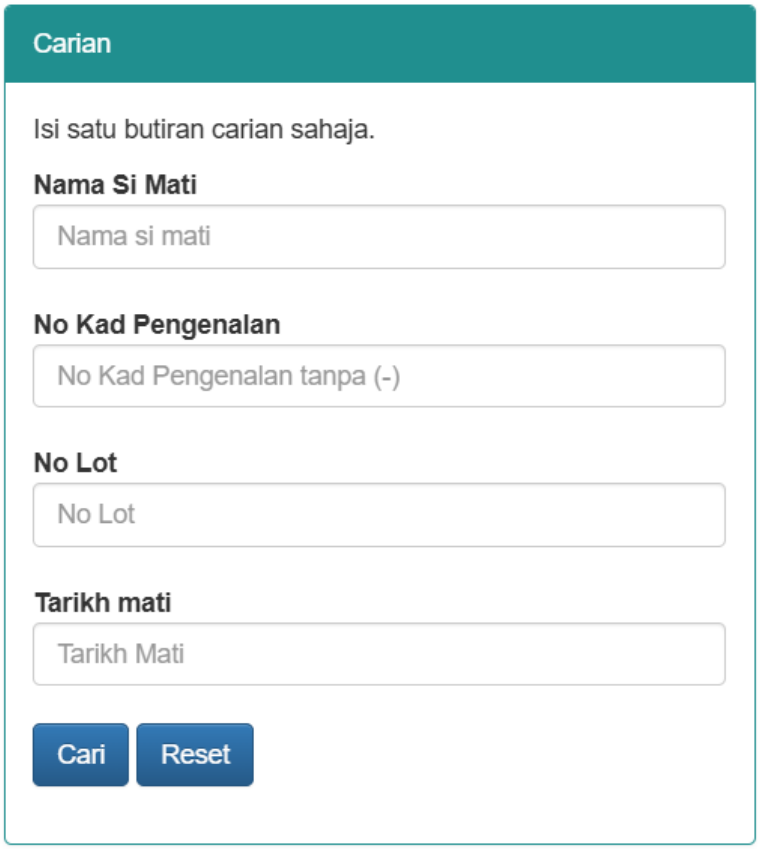



Figure 2.13: Grave Search Function of epusara.jawi.gov.my

### 2.3.3 Grave Information

Providing detailed grave information is another essential feature found in all systems. Information such as the name of the deceased, burial block, and burial date is readily available, which enhances transparency and reliability for users. This uniformity showcases the necessity of detailed records in maintaining trust with users. The interface of grave information each website as shown in **Figure 2.14**, **Figure 2.15**, **Figure 2.16**, **Figure 2.17** and **Figure 2.18**.

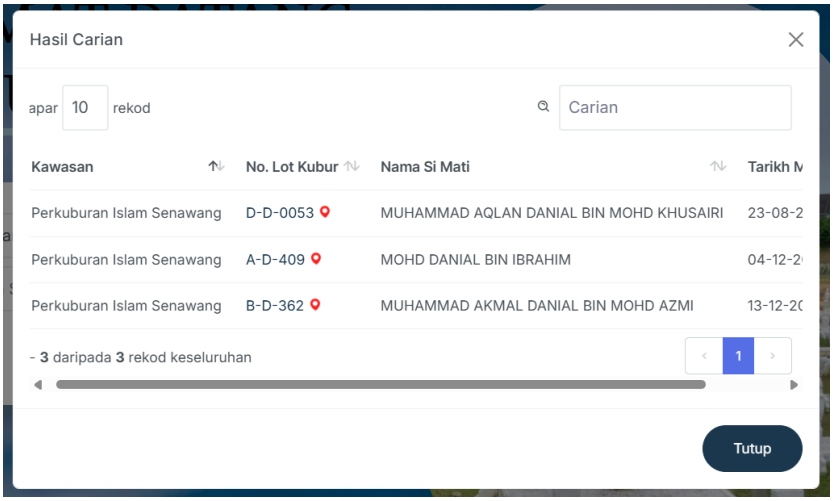



Figure 2.14: Grave Information of epusara.mbs.gov.my

Figure 2.15: Grave Information of enquiry.mpsj.gov.my

Hasil Carian

Klik pada butang untuk mengenal pasti plot kubur di atas peta.

| No Paket | Zone | Nama Si Mati | Tarikh Mati | Action |
|---|---|---|---|---|
| 0153 | | Muhammad Danial Bin Rasyidi | 2003-08-07 | |
| K039 | | Muhd Adam Bin Muhamad Ariff Danial | 2009-01-10 | |
| 481 | | Muhammad Danial Asraf Bin Haslizan | 2010-04-08 | |
| K204 | | Muhammad Harith Danial Bin Sedi | 2012-03-29 | |
| K492 | ZL | Muhamad Aqif Danial Bin Muhamad Hanif | 2017-07-08 | |
| 2562 | C | Meur Danial Bin Meur Johari | 2018-05-05 | |
| 3315 | | Muhammad Danial Bin Faizal | 2020-01-22 | |

Figure 2.16: Grave Information of mutmainnahpg.epusara.com

Senarai

Show 10 entries

Search:

| # | Nama | Tanah Kubur | Fasa | Jalan | No. Plot | Pilih |
|---|---|---|---|---|---|---|
| 1 | AISY DANIAL BIN JOHARI 111026100029 | TANAH PERKUBURAN ISLAM SEKSYEN 21 | FASA 2 KANAK-KANAK | JALAN PUSARA 21/D | 01130 | Cetak |
| 2 | DANIAL AHMAD BIN AHMAD BASTIAN 840420146201 | TANAH PERKUBURAN ISLAM SEKSYEN 21 | FASA 2 KANAK-KANAK | JALAN PUSARA 21/D | 01686 | Cetak |
| 3 | MUHAMAD DANIAL DIN HAKIM BIN MD DIN 911011065721 | TANAH PERKUBURAN ISLAM SEKSYEN 21 | FASA 3 DEWASA | JALAN PUSARA 21/D | 04485 | Cetak |

Figure 2.17: Grave Information of ipusara.mbsa.gov.my

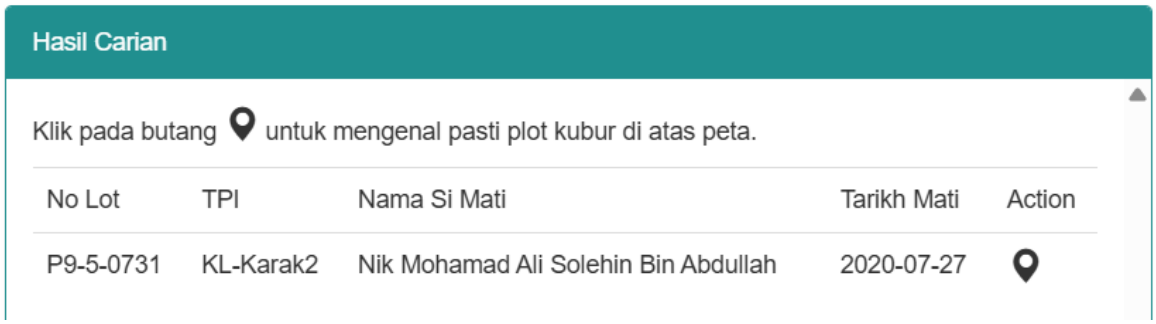



Figure 2.18: Grave Information of epusara.jawi.gov.my

### 2.3.4 Grave Locater

The grave locator feature enhances user convenience by pinpointing the exact location of graves within a burial site. Among the systems reviewed, mutmainnahpg.epusara.com and epusara.jawi.gov.my stand out for offering this functionality. Both systems provide a straightforward tool that allows users to input grave-related information and receive precise location details. Interestingly, the user interface design of these two platforms is notably similar, suggesting a likely shared design approach or inspiration. By clicking on the map icon at action row, it will navigate user to the grave location. Their interfaces are clean and intuitive, focusing on simplicity and ease of navigation, making them accessible to a broad audience.

On the other hand, platforms like epusara.mbs.gov.my, enquiry.mpsj.gov.my, and ipusara.mbsa.gov.my do not offer a grave locator feature. This omission can limit the usability of these systems, particularly for visitors who are unfamiliar with the graveyard layout and rely on precise location details.

### 2.3.5 Map Integration

Map integration allows users to identify the cemetery's location on a digital map, making navigation easier. This feature can be implemented using Google Maps or other

mapping solutions. Among the reviewed platforms, enquiry.mpsj.gov.my, ipusara.mbsa.gov.my, and epusara.jawi.gov.my integrate Google Maps, enabling users to view and navigate to cemetery locations seamlessly. These systems capitalize on Google Maps' reliability and familiarity, ensuring a user-friendly experience.

On the other hand, mutmainnahpg.epusara.com employs a custom mapping plugin instead of Google Maps. While this alternative provides similar functionality, it may lack the widespread recognition and user familiarity associated with Google Maps. Nonetheless, the inclusion of a mapping tool remains a significant feature that enhances the system's usability.

Conversely, epusara.mbs.gov.my does not offer any map integration, limiting its ability to assist users in locating cemeteries. This omission could inconvenience users who depend on mapping tools for navigation. The interface of map integration for each website as shown in **Figure 2.19**, **Figure 2.20**, **Figure 2.21** and **Figure 2.22**.

Figure 2.19: Map Integration of enquiry.mpsj.gov.my

Figure 2.20: Map Integration of mutmainnah.epusara.com

## TANAH PERKUBURAN ISLAM

SEKSYEN 21

**MAKLUMAT PERKUBURAN**

| | | | | | |
|---|---|---|---|---|---|
| Keluasan | : | 64.47 | | | |
| Fasa | : | 12 | Plot | : | 42,932 |
| Lokasi | : | Klik sini | | | |

Figure 2.21: Map Integration of ipusara.mbsa.gov

**ZON 1 – TANAH PERKUBURAN ISLAM KG. SELAYANG LAMA**

**NAMA**

TANAH PERKUBURAN ISLAM KG. SELAYANG

**ALAMAT**

KG.SELAYANG LAMA, BATU 7 JALAN IPOH, 68100 KUALA LUMPUR.

**KELUASAN**

4.5 EKAR

**TAHUN DIBUKA**

1885

**KEBENARAN PENGKEBUMIAN**

MASJID ANAS BIN MALIK

**KARIAH MASJID / SURAU YANG DIBENARKAN UNTUK PENGKEBUMIAN**

1. MASJID AL-ZAKIRIN. TMN WILAYAH SELAYANG
2. SURAU AN-NUR TAMAN SRI MURNI
3. SURAU AL- HIJRAH. PPR INTAN BAIDURI
4. MADRASAH AL- IKHWAN. TAMAN DESA BAKTI
5. SURAU AL-HIDAYAH. TAMAN WILAYAH SELAYANG, FASA 4
6. SURAU MALABAR HIDAYATUL ISLAM. TAMAN WILAYAH SELAYANG

Figure 2.22: Map Integration of epusara.jawi.gov.my

### 2.3.6 Enquiry Form

The enquiry form feature is an integral component of funeral management systems, specifically facilitating requests for funeral or burial ground lots. Among the reviewed platforms, epusara.mbs.gov.my, ipusara.mbsa.gov.my, and epusara.jawi.gov.my provide this functionality, making it easier for users to submit requests and initiate the process of reserving funeral lots. However, epusara.mbs.gov.my requires users to log in via the MBSCLICK platform before accessing the form, which may complicate the process for some users.

On the other hand, enquiry.mpsj.gov.my and mutmainnahpg.epusara.com lack this feature entirely, limiting their usability for those seeking funeral ground reservations. This omission may result in users resorting to alternative, less efficient communication methods, potentially reducing system efficiency and user satisfaction.

In contrast, enquiry.mpsj.gov.my and mutmainnahpg.epusara.com lack an enquiry form altogether. The absence of this feature limits user engagement and prevents users from easily reaching out for support or clarification, potentially leading to frustration. The interface of enquiry form each website as shown in **Figure 2.23**, **Figure 2.24** and **Figure 2.25**.

Figure 2.23: Enquiry Form via MBSCLICK of epusara.mbs.gov.my

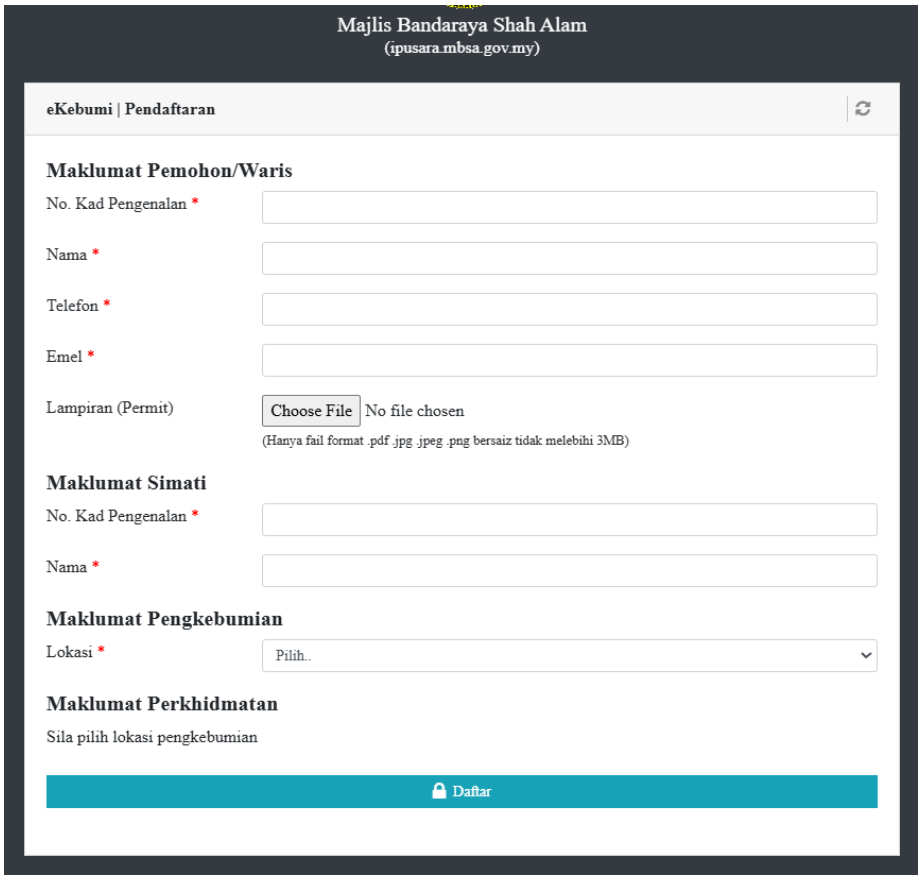



Figure 2.24: Enquiry Form of ipusara.mbsa.gov.my

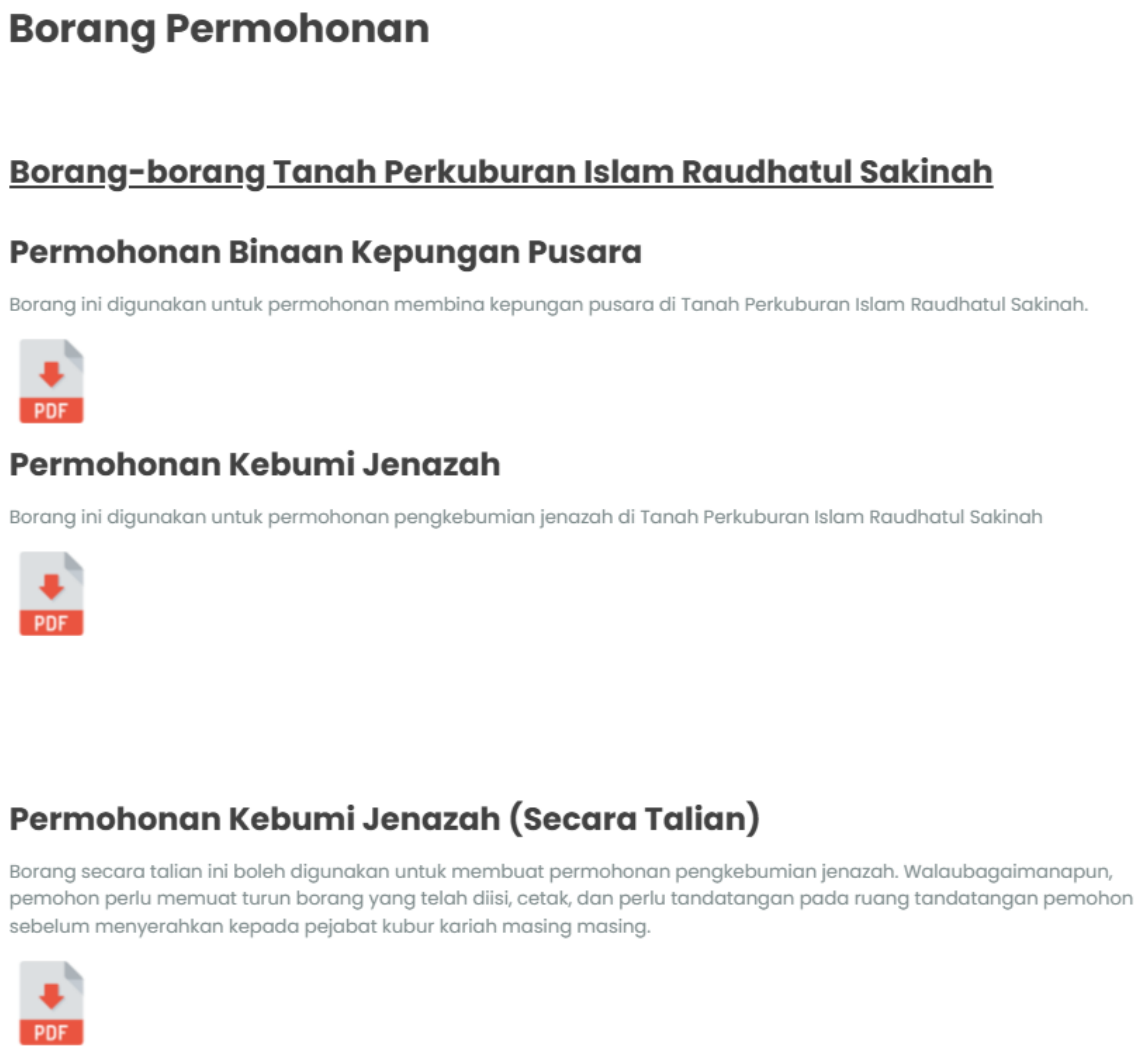



Figure 2.25: Enquiry Form of epusara.jawi.gov.my

### 2.3.7 Community Features

Community features in graveyard management systems serve as a dedicated section for users to access information such as news updates, bulletins, and announcements related to cemetery management or broader community events. Among the platforms reviewed, epusara.jawi.gov.my is the only one that incorporates this feature, providing users with relevant updates and fostering a sense of connection within the community. This feature not

only improves user engagement but also ensures that critical information is easily accessible to users.

In contrast, epusara.mbs.gov.my, enquiry.mpsj.gov.my, mutmainnahpg.epusara.com, and ipusara.mbsa.gov.my lack a dedicated section for community news or bulletins. The absence of such features may limit the portals' ability to effectively disseminate important updates or announcements to their users. The interface of community feature of epusara.jawi.gov as shown in **Figure 2.26**.

Figure 2.26: Community Feature of epusara.jaw

## 2.4 Comparison Features of Existing Funeral Management Platforms

This section compares the features of existing funeral management systems based on key functionalities such as login and registration, grave search, map integration, enquiry forms, and community features. By analysing the strengths and limitations of these platforms through table comparisons, the insights gained will guide the development of the proposed I-PUSARA system to address identified gaps and improve user experience. **Table 1** shows features comparison between existing platform.

Table 2.1: Table Comparison between each Platform

| **Feature** | **epusara.mbs.gov.my** | **enquiry.mpsj.gov.my** | **mutmainnahpg.epusara.com** | **ipusara.mbsa.gov.my** | **epusara.jawi.gov.my** | **I-PUSARA (Proposed)** |
|---|---|---|---|---|---|---|
| Login/Registration | Yes | Yes | No | Yes | No | Yes |
| Grave Search Function | Yes | Yes | Yes | Yes | Yes | Yes |
| Grave Information | Yes | Yes | Yes | Yes | Yes | Yes |
| Grave Locater | No | No | Yes | No | Yes | Yes |
| Map Integration | No | Yes | Yes | Yes | Yes | Yes |
| Enquiry Form | Yes | No | No | Yes | Yes | Yes |

## 2.5 Chapter Summary

This chapter has discussed the current status of digital funeral management systems in Malaysia, with a focus on their applicability to rural communities in Sarawak. The research study will provide a critical analysis of existing platforms, identify gaps, and thus lay the foundation for the development of the I-PUSARA platform.

The digitization of funeral management from the urban areas of Peninsular Malaysia can be seen to be relatively well-advanced through platforms such as epusara.mbs.gov, enquiry.mpsj.gov, mutmainnahpg.epusara, ipusara.mbsa.gov, and epusara.jawi.gov. Each of these has certain advantages, but certain specific limitations as well. For example, epusara.mbs.gov has strong administrative functions, but there is no community engagement feature. enquiry.mpsj.gov excels in user authentication but is restricted to its single-language interface mutmainnahpg.epusara offers effective grave location services but lacks essential registration and enquiry functions. ipusara.mbsa.gov demonstrates strong accessibility features but fails to provide real-time updates. epusara.jawi.gov incorporates cultural sensitivity but lacks modern interactive features.

These platforms, however, cater largely to urban areas, and the technological divide in rural areas is huge, especially in Sarawak. From the background study, it appeared that communities like Kg Bako are at a disadvantage due to geographical isolation, lack of digital infrastructures, and diversity in cultural needs. Continued reliance on manual systems in these areas brings inefficiency in the management of cemeteries and community communication.

The following were the needs that surfaced from this research for rural implementation such as offline capability, support for diverse religious practices, and

multilingual interfaces. These should be supplemented with needs around administrative efficiency, such as digital record-keeping, grave location services, and payment systems, to community engagement through features that allow information sharing and communication.

The proposed I-PUSARA platform will address these identified gaps while leveraging the strengths of the existing systems. The I-PUSARA will introduce a new benchmark in digital funeral management for rural communities by infusing local culture and practice, accessible digital service provision, efficient cemetery management, and community involvement. The results of this chapter will lead to platform development that should serve the concerned community effectively and be able to provide a model for similar implementations in other rural regions.

I-PUSARA can, therefore, bridge the gap in the digital divide of funeral management services, especially among rural areas in Sarawak, if great care is paid to both technological capabilities and cultural sensitivities. This analysis provides a concrete basis for developing a solution that addresses the current limitations while respecting the local customs and technological constraints of the area

# CHAPTER 3

# METHODOLOGY

## 3.1 Overview

Agile Development Methodology will be applied to this project, emphasizing iterative and incremental progress through collaboration of cross-functional teams. Agile works especially well in this project because it allows flexibility to accommodate changes based on user feedback throughout the course of continuous improvement in development (Maleki & Ramsin, 2017).

It starts with the identification of high-level requirements in the form of user stories. Each user story represents a certain functionality or feature, for example, "Users can submit death enquiry forms" or "Admins can verify submitted forms." These stories are then prioritized based on importance and feasibility and organized into iterations or sprints, typically lasting 2 to 4 weeks.

In each phase, only a small set of functionalities is designed, developed, and tested, which is presented to the stakeholders for feedback. For instance, the implementation may be restricted to the user authentication module and just simple form submission during the first phase. Once developed, the sprint review ensures that the stakeholders validate that functionality, and any feedback is integrated into the next phase.

The Agile approach emphasizes continuous testing and iteration. After each phase, rigorous testing identifies bugs or areas for improvement, which are addressed in subsequent iterations. Collaboration among team members, including developers, designers, and testers, ensures that the project remains on track and aligns with user expectations.

This iterative process will continue until all prioritized features are finished. Agile, being a process, is flexible enough to fit in new features or changes along the way without affecting the timeline of the overall project so that the final platform is strong, user-friendly, and reflects community needs (Krishna, 2021).

## 3.2 Methodology

The Agile methodology allows for flexibility and responsiveness throughout the project lifecycle. It emphasizes collaboration, incremental progress, and iterative development, making it suitable for projects requiring user engagement and adaptability to community needs (Krishna, 2021). The diagram of the Agile methodology as shown in **Figure 3.1**.

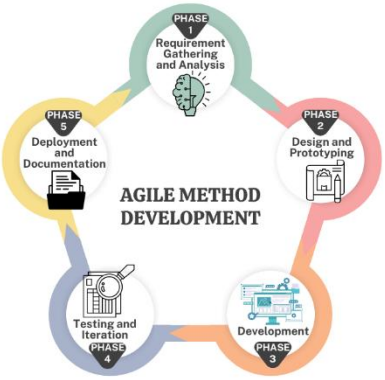



Figure 3.1: Agile Methodology Model

### 3.2.1 Requirement Gathering and Analysis

The Requirement Gathering and Analysis phase is essential for understanding user needs and identifying features for the proposed I-PUSARA Community Funeral Management Platform. A survey was conducted using a Google Form to collect data from various stakeholders, including family members of the deceased, public, community members, and funeral service providers. Collected 30 responses provide valuable insights

into existing challenges, user preferences, and technological requirements. Below is an analysis of the questions asked, and the responses received.

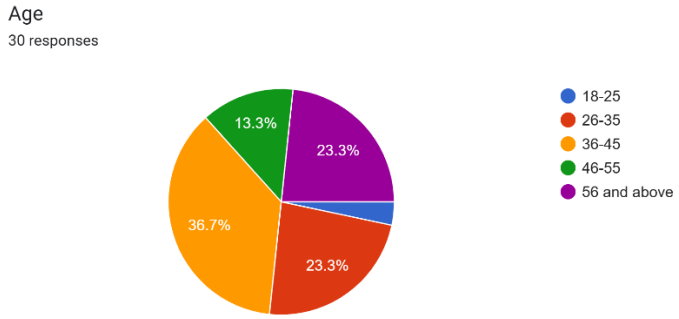



Figure 3.2: Age Fraction of the Respondent

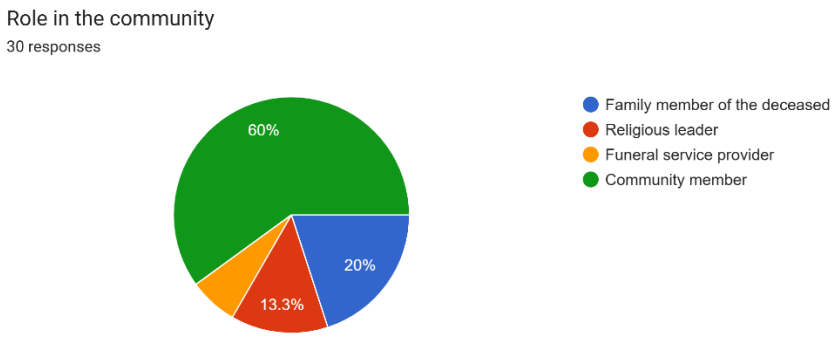



Figure 3.3: Role in the Community Fraction of the Respondent

The first section of the survey gathered demographic data to profile the target audience. Based on the pie chart shown in **Figure 3.2** and **Figure 3.3**, respondents were asked about their age group and role in the community. Most participants fell within the 26–35 and 36–45 age groups, followed by a significant number of respondents aged 56 and above. This diverse age distribution emphasizes the importance of creating a platform that is intuitive for both younger, tech-savvy users and older individuals who may require more straightforward navigation.

In terms of roles, respondents included family members of the deceased, community members, religious leaders, and funeral service providers. Family members and community members represented the largest groups, highlighting the need to prioritize features that directly address their concerns, such as grave locators, funeral scheduling, and condolence sharing.

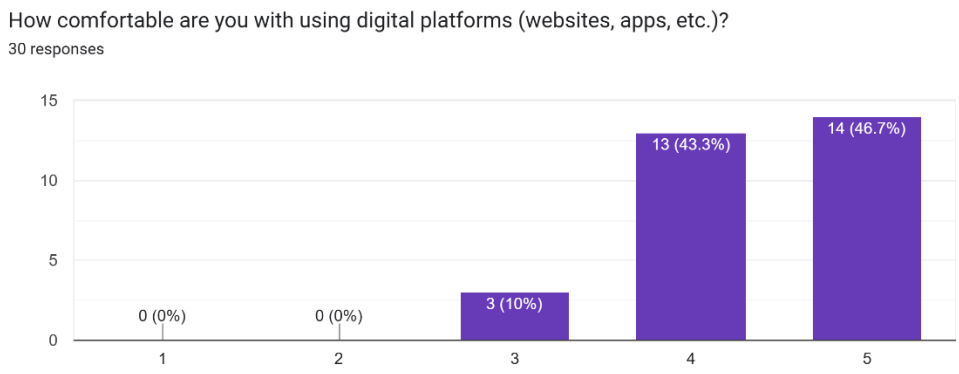



Figure 3.4: Scale of Comfortable using Digital Platform

Based on the **Figure 3.4**, respondents were asked to rate their comfort level with digital platforms on a scale of 1 to 5, with 5 being very comfortable. Most respondents rated their comfort level at 4 or 5, demonstrating a high degree of technological readiness among the target audience. However, a minority rated their comfort level at 3 or below, indicating the need for an interface that is both user-friendly and accessible for individuals with varying levels of digital literacy.

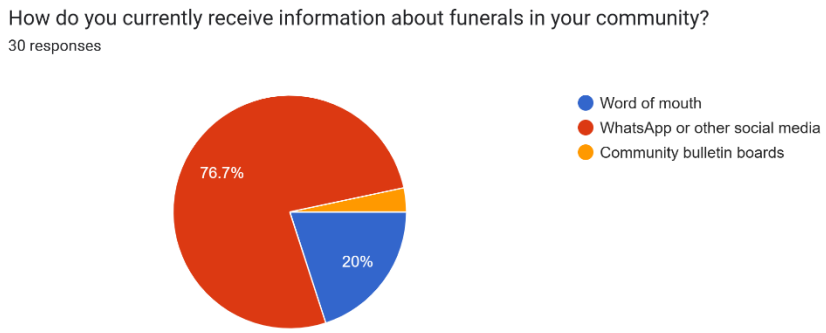



Figure 3.5: Communication Channel of Funeral Information

The survey explored how respondents currently receive funeral-related information. Based on **Figure 3.5**, a majority reported relying on WhatsApp or other social media platforms, while others mentioned word of mouth or community bulletin boards as their primary sources of information. These findings underscore the importance of integrating the proposed platform with WhatsApp to ensure seamless communication and align with existing user habits. Additionally, a centralized bulletin feature could complement these traditional methods by providing consistent updates.

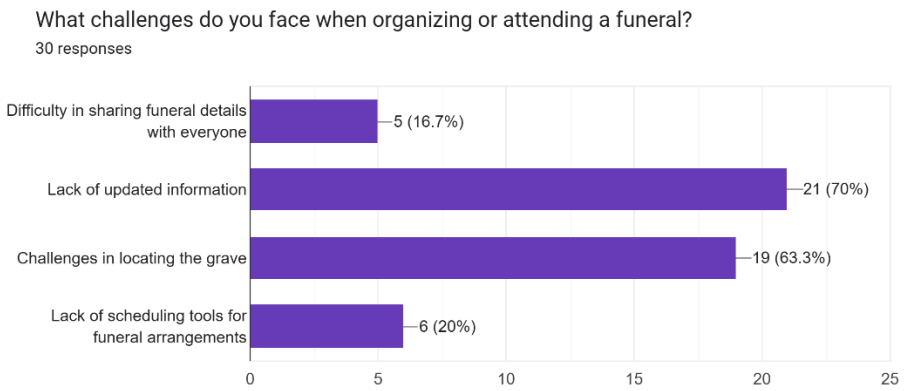



Figure 3.6: Challenges in Funeral Arrangements

When asked about the challenges they face in funeral arrangements, respondents highlighted several recurring issues:

a. **Lack of updated information**: Many participants noted difficulties in obtaining timely updates about funerals.

b. **Challenges in locating graves**: This was a significant concern, particularly for families and attendees unfamiliar with the cemetery layout.

These challenges reveal critical pain points that the I-PUSARA platform must address through features like real-time notifications, grave locators, and streamlined communication tools.

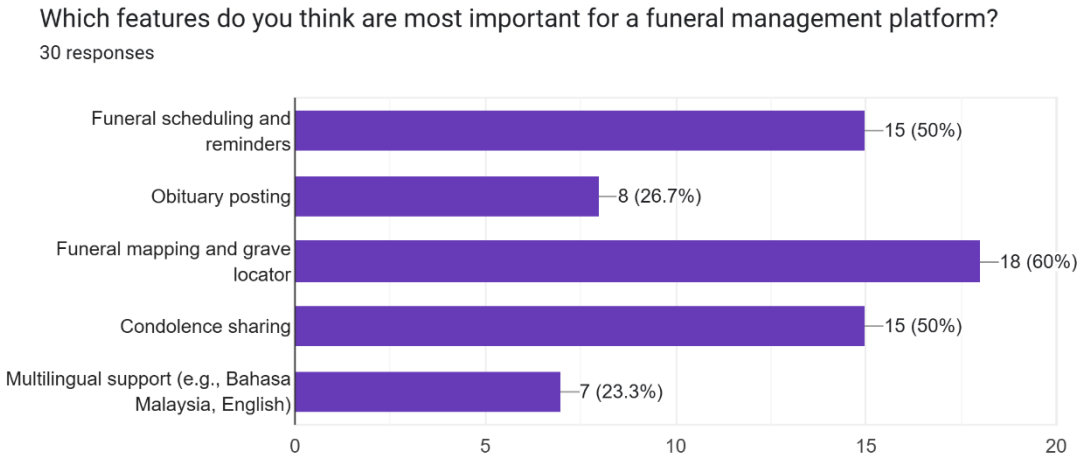



Figure 3.7: Preferred Platform Features

Based on **Figure 3.7**, the survey highlighted several key features that respondents consider essential for a funeral management platform. One of the most requested features was funeral mapping and grave locator, which would help users easily navigate cemeteries and locate specific graves. This feature addresses a common challenge cited by respondents,

difficulty in finding burial sites, particularly for larger cemeteries or attendees unfamiliar with the area.

Another highly valued feature was funeral scheduling and reminders, which would streamline coordination and ensure all attendees are informed of the time and location of funeral events. This functionality is especially important given the time-sensitive nature of funeral arrangements, where clear and timely communication is critical.

Respondents also emphasized the need for condolence sharing and obituary posting as integral components of the platform. These features would allow family members and friends to offer support and express their condolences in a centralized and respectful manner. By fostering a sense of community, these tools would help provide emotional support during difficult times.

Additionally, multilingual support was identified as an important requirement, particularly in Bahasa Malaysia and English. This inclusion ensures that the platform is accessible to a broader audience, catering to the diverse linguistic needs of the community. The ability to switch between languages would make the platform inclusive and user-friendly for all users.

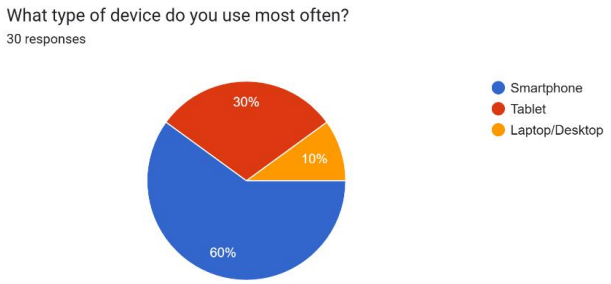



Figure 3.8: Technological Accessibility

Based on the **Figure 3.8**, the survey also assessed respondents' technological habits and preferences. Most participants indicated that they primarily use smartphones for digital interactions, followed by tablets and laptops or desktops. This highlights the importance of adopting a mobile-first design for the platform.

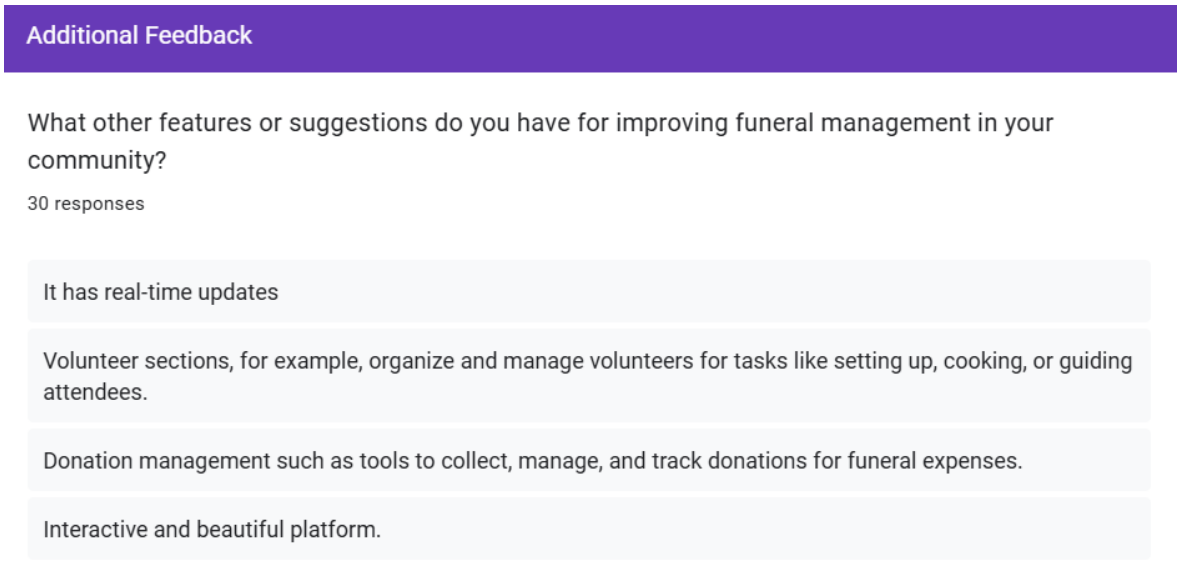



Figure 3.9: Additional Suggestion from Respondent

Based on Figure 3.9, respondents provided valuable suggestions to enhance the platform's functionality and address specific community needs. One notable recommendation was the inclusion of volunteer management tools. These tools could help organize and coordinate volunteers for tasks such as setting up funeral venues, preparing food, or guiding attendees during the ceremonies. Such a feature would streamline the delegation of responsibilities, particularly for larger funerals or events requiring extensive logistical support.

Another important suggestion was a donation management system. This feature would enable families to collect, track, and manage donations for funeral expenses in a transparent

and organized manner. It could include options for digital payment integration, allowing community members to contribute easily, even if they are unable to attend in person.

Respondents also emphasized the need for real-time updates to keep users informed of any changes to funeral schedules, locations, or other critical details. This would ensure attendees receive the latest information promptly, reducing confusion and miscommunication.

Some participants suggested integrating community-centric features, such as announcements for related events (e.g., tahlil gatherings or memorial services) and shared resources for funeral arrangements. Additionally, respondents highlighted the importance of designing an interactive and visually appealing interface, making the platform not only functional but also engaging and easy to use.

These additional suggestions reflect the community's desire for a platform that goes beyond basic functionality to provide comprehensive support during funeral planning. Incorporating these ideas into the I-PUSARA platform would enhance its value, making it a reliable, versatile, and supportive tool for the community.

In conclusion, the analysis of survey responses has provided critical insights into the needs and expectations of the community regarding funeral management. The data reveals a strong demand for features that address logistical challenges, such as funeral mapping, grave locators, and scheduling tools, while also emphasizing the importance of fostering community support through condolence sharing and obituary postings. Additionally, the need for multilingual support and integration with widely used communication platforms like WhatsApp highlights the importance of creating an inclusive and accessible system.

Cultural and religious considerations, particularly adherence to Islamic funeral practices, emerged as a priority, underscoring the need for a platform that respects and integrates these values. Additional suggestions such as volunteer and donation management tools further illustrate the community's desire for a holistic solution that extends beyond basic functionalities.

By addressing these requirements, the I-PUSARA platform can bridge existing gaps in funeral management, providing a user-centric, culturally sensitive, and technologically advanced solution tailored to the needs of the community. This comprehensive approach ensures that the platform not only streamlines funeral arrangements but also strengthens the bonds within the community during times of loss.

### 3.2.2 Design and Prototyping

This section describes the design and prototyping process of the I-PUSARA Community Funeral Management Platform, emphasizing how system functionalities, workflows, and interfaces are structured. The design phase involves visualizing the platform's architecture, while the prototyping phase tests the practicality of these designs to ensure they meet user needs and project goals.

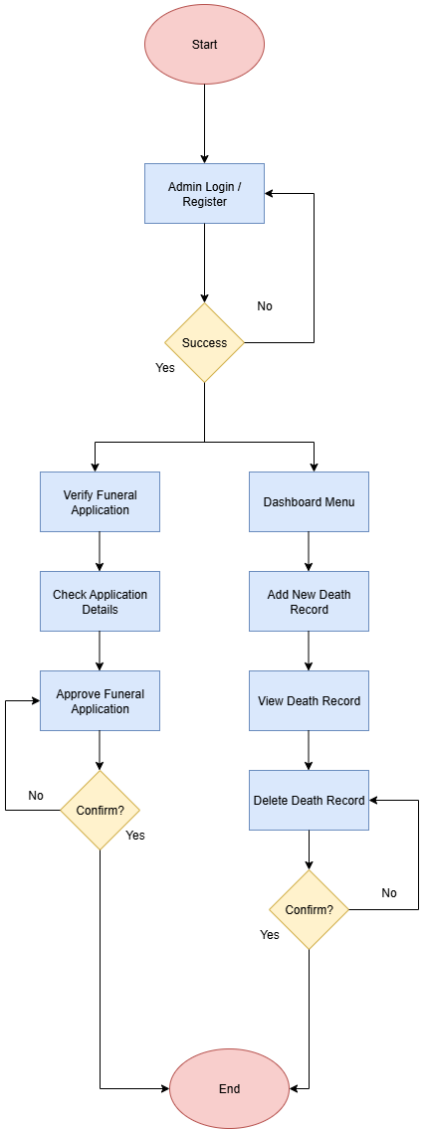



Figure 3.10: Flowchart of I-PUSARA Community Funeral Management Platform (For Admin Only)

The operational flow of the I-PUSARA Community Funeral Management Platform begins with the Start node, where users are first directed to the Admin Login/Register interface. This step is exclusively designed for administrative users, as the platform restricts login and registration capabilities solely to admin personnel. The public does not have access to this authentication system but can use public-facing features without logging in.

When an admin attempts to log in or register, the system checks whether the authentication credentials are correct. If the attempt is unsuccessful, the admin is redirected back to the Admin Login/Register page to retry the process. Only when the credentials are validated does the admin progress through the workflow.

One of the critical tasks performed by the admin is the verification of funeral service applications submitted by the public. This process starts with the "Verify Funeral Application" step, where the admin accesses a list of pending applications.

The admin then proceeds to "Check Application Details", reviewing submitted information such as the applicant's identity, the deceased's information, and any required documentation. After a thorough check, the admin moves to the "Approve Funeral Application" step.

Before finalizing, the system prompts the admin with a "Confirm?" decision point. This serves as a fail-safe mechanism to prevent accidental approvals. If the admin confirms, the application is approved and recorded in the system. If the admin declines at the confirmation stage, the process loops back to the application check stage, allowing for revisions, corrections, or further review.

Parallel to the funeral application workflow, admins also manage death records through the "Dashboard Menu". Here, the admin can initiate the "Add New Death Record" function, inputting essential information such as the deceased's name, date of death, identity number, plot number, and burial location.

After adding records, admins have the option to proceed to the "View Death Record" page, where they can browse, search, or filter through existing entries. If a record needs removal, the admin can navigate to "Delete Death Record".

Similar to the application verification process, a "Confirm?" decision point is triggered before the deletion is finalized. This extra layer of confirmation is crucial to prevent data loss due to accidental deletions. If the admin declines the deletion at the confirmation stage, the process returns to the View Death Record interface without making any changes. If confirmed, the specified death record is permanently removed from the system.

After completing either the funeral application verification or the death record management tasks, the admin may choose to end the session, which leads the process to the "End" node. The design ensures that all administrative actions are deliberate, secure, and auditable, maintaining data integrity while providing operational flexibility.

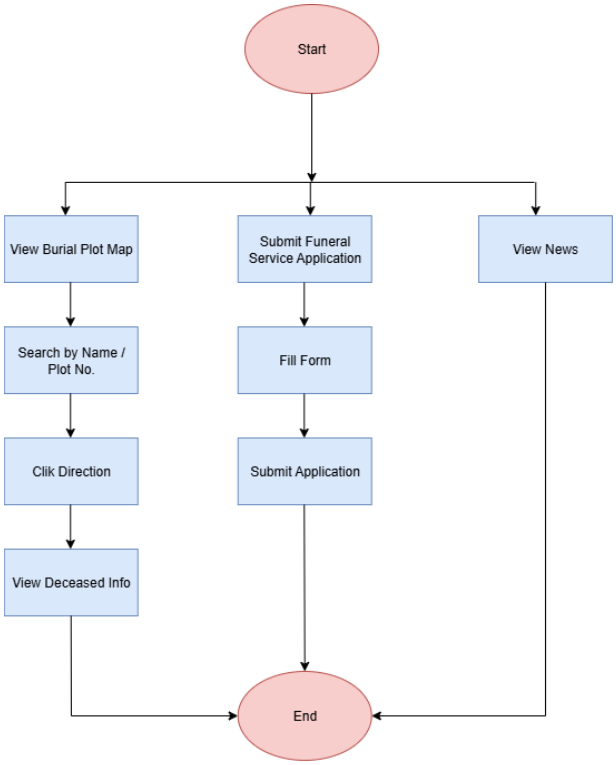



Figure 3.11: Flowchart of I-PUSARA Community Funeral Management Platform (Public User Interface)

The flowchart of the I-PUSARA Community Funeral Management Platform (Public User Interface) represents the complete user journey for members of the public accessing the system without the need for any login or registration. This design was intentionally created to ensure that the platform remains accessible, easy to use, and open to all community members who need to obtain burial information, submit funeral applications, or stay informed about cemetery-related announcements. The process begins at the start point, which symbolizes a visitor arriving at the homepage of the I-PUSARA website. From this point, users are presented with three main functional pathways: viewing the burial plot map, submitting a funeral service application, and accessing the news or obituary board.

When the user chooses the burial plot map option, the system loads an interactive GIS-based map that displays the cemetery layout of Kg Bako. This map, powered by Leaflet.js with data exported from QGIS, provides visual representations of burial plots, allowing users to navigate the cemetery virtually. A key feature in this process is the search functionality, where users can search for graves using either the name of the deceased or the specific plot number. Once the search returns results, the user can select a plot and click on the direction feature, which highlights the location on the map. This directs the user's attention to the exact burial plot, reducing confusion or the need for manual searching in the physical cemetery. After clicking on a plot, the system displays a popup containing detailed information about the deceased, such as their name, plot number, date of death, and any other relevant records available.

Alternatively, users may need to submit a funeral service application. This process begins by selecting the submit funeral service application option, which directs the user to an online form. The form requires the user to fill in key details, including the name of the deceased, the applicant's personal information, date of death, and any relevant burial preferences or notes. Once all fields are completed, the user clicks submit, sending the application directly to the admin dashboard where it awaits verification and approval. This online submission replaces traditional paper-based or verbal methods, making the process more efficient, organized, and accessible to families in need during difficult times.

Another pathway available from the start is the news and obituary board. Selecting this option allows users to view current announcements published by cemetery administrators. This section typically includes recent death notices, funeral schedules, cemetery updates, and community-related events. By offering this feature, I-PUSARA

serves as a community information hub, keeping residents informed of important updates related to cemetery operations and services.

Upon completing any of these tasks, whether it is locating a grave, submitting an application, or reading news, the user can choose to end their session, represented by the end node in the flowchart. This indicates the completion of their interaction with the platform for that session. The flowchart demonstrates how the public interface of I-PUSARA is designed to prioritize user-friendliness, accessibility, and practicality. By eliminating login requirements for general users, the platform lowers the barriers to accessing essential funeral services and information. This approach not only supports efficient cemetery management but also ensures that the platform remains aligned with the cultural values and needs of the Kg Bako community.

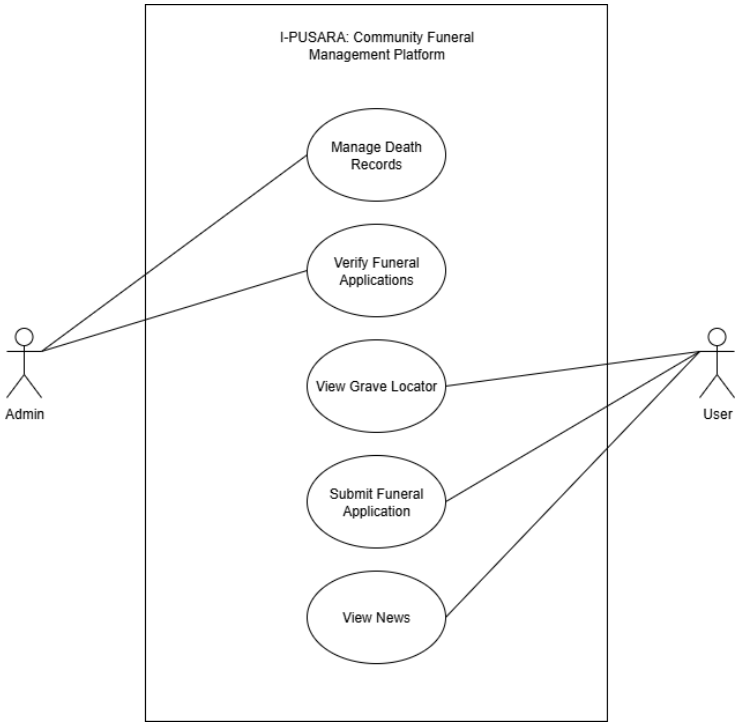



Figure 3.12: Use Case Diagram of I-PUSARA Community Funeral Management Platform

The use case diagram clearly illustrates the functional interactions between two main actors, Admin and User, and the system itself. This diagram provides a simplified yet comprehensive visualization of how each type of user interacts with the platform's core features.

The diagram shows that the Admin has exclusive access to two critical functions within the system. The first is "Manage Death Records", where the admin can perform CRUD (Create, Read, Update, Delete) operations related to deceased records in the community cemetery. This ensures that the burial data is accurate, updated, and well-maintained. The second admin-only use case is "Verify Funeral Applications", a process where the admin reviews submissions made by public users for funeral service requests. The admin verifies the information provided, approves or rejects the application, and manages

the status accordingly. These two tasks are crucial for maintaining the integrity and accuracy of the system's backend data.

On the other side, the User, which refers to the general public, interacts with the platform primarily through three publicly accessible functions. The first is "View Grave Locator", a GIS-based map that allows users to search for burial plots using deceased names or plot numbers. This function is essential for helping visitors locate graves within the Kg Bako cemetery without needing assistance from cemetery caretakers. The second public function is "Submit Funeral Application", where users can digitally fill out and submit a request for funeral services directly through the platform. This streamlines what was previously a manual, time-consuming process into a fast, efficient digital submission that the admin can later verify. The third function accessible to the public is "View News", which displays announcements, obituaries, and community updates relevant to the cemetery and local residents. This ensures transparency and keeps the community informed of recent events, burials, and important notices.

One function, "View Grave Locator", is shared between both Admin and User actors. This indicates that while the public uses the grave locator for search purposes, admins also access this map to verify plot information, cross-check data, or assist with administrative duties.

Overall, the use case diagram highlights the separation of responsibilities and access rights within the I-PUSARA system. The Admin role handles all backend data management and application verification, while the User role focuses on interacting with publicly available information and submitting service requests. This structure supports both operational

efficiency for cemetery administrators and accessibility for the general public, ensuring that the platform serves the needs of the Kg Bako community effectively.

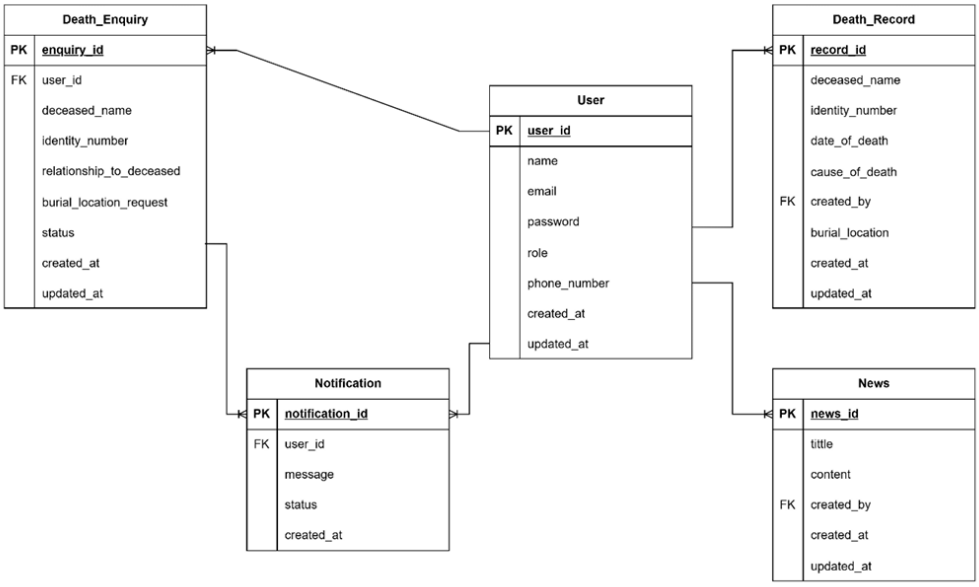



Figure 3.13: Entity Relationship Diagram (ERD) of I-PUSARA Community Funeral Management Platform

The Entity Relationship Diagram (ERD) for the I-PUSARA Community Funeral Management Platform accurately reflects the data structure designed for JSON-based storage, optimized for the needs of a community scale funeral management system serving the Kg Bako community. Even though the design follows a relational structure for clarity, the actual implementation uses structured JSON files stored in the backend directory rather than a conventional SQL database.

At the core of the system is the User entity, which represents administrative users exclusively. This entity contains fields such as user ID, name, email, password, role, phone number, and timestamps for creation and updates. Since the system is designed with restricted login functionality, only admin users are managed through this entity. This ensures

that only authorized administrators can log in to manage backend operations like data entry, verification, and approval.

The Death_Record entity stores comprehensive information about deceased individuals. This includes details such as record ID, deceased name, identity number, date of death, cause of death, burial location, and metadata like who created the record. The created_by foreign key links each death record to the corresponding admin user who manages it. This relationship enforces accountability within the platform, as each record is traceable to the responsible administrator.

The Death_Enquiry entity, representing public funeral service applications, serves as the mechanism through which the public can submit burial service requests without requiring a login. Although regular users are not formally registered in the system, their submissions are recorded with relevant details like the deceased's name, identity number, relationship to the deceased, burial location request, and status. The entity includes timestamps for tracking when the enquiry was created and last updated. These records are then verified, approved, or rejected by the admin through the dashboard.

The Burial_Plot entity, while not visually presented as a standalone table in this ERD diagram, is conceptually integrated through the burial_location field found in both Death_Record and Death_Enquiry. This field ties into the GIS-based cemetery mapping feature powered by Leaflet and GeoJSON. This connection allows users to search for and locate graves via the interactive burial plot map without accessing the admin backend.

The News entity manages community announcements and obituary postings. Fields such as news ID, title, content, and the created_by foreign key link each news item to the admin who authored it. This ensures that only trusted admins are responsible for publishing

public-facing information, maintaining the credibility and reliability of the platform's announcements.

The Notification entity handles system-generated notifications intended for administrators. Each notification includes a notification ID, the associated user ID, the message content, status (such as read or unread), and a creation timestamp. This feature enhances communication within the system, alerting admins about new enquiries, application approvals, or updates to records.

The relationships depicted in the ERD demonstrate a one-to-many structure from the User entity to other entities like Death_Record, News, Notification, and Death_Enquiry. Each admin can manage multiple records, applications, and news posts. This design maintains clarity and simplicity, which is essential for JSON-based storage systems that lack the automatic referential integrity provided by SQL databases.

In summary, while this ERD is formatted in the style of a relational database schema for documentation clarity, the actual data management in I-PUSARA leverages JSON files. Each entity is represented as a JSON file, such as death_record.json, news.json, or death_enquiry.json, stored within the backend directory (/public/data/). The design effectively supports role-based data management for admins while providing seamless public access to the grave locator, obituary board, and funeral application submission system. This ERD continues to be valid and accurately describes the logical structure of the data even under a file-based JSON storage model.

### 3.2.3 Development

The development phase of the I-PUSARA Community Funeral Management Platform involved translating the system design, diagrams, and interface prototypes into a fully functional web-based application. This phase was highly iterative, encompassing coding, module integration, testing, and continuous debugging to ensure that the platform met all functional and non-functional requirements outlined during the design stage.

The development process began with the backend, which was implemented using the Laravel framework. Unlike traditional systems that rely on relational databases such as MySQL, I-PUSARA was designed with a JSON file-based storage system. This choice was driven by the need for a lightweight and easy-to-maintain solution suitable for the scale of the Kg Bako community. Instead of creating database tables, data such as death records, burial plot information, funeral applications, and news announcements are stored in structured JSON files located within the server's file system. This approach eliminates the need for a complex database management system while maintaining data integrity through carefully structured file formats.

Backend development focused on setting up API endpoints for data interaction, handling requests for CRUD operations on death records, funeral applications, burial plot data, and obituary announcements. Laravel's robust routing system was used to manage API paths securely, ensuring that only authenticated administrators could access data modification functionalities, while public endpoints were provided for non-authenticated users to search for records or view the burial plot map.

On the frontend, the platform was developed using HTML, CSS (with Bootstrap framework), and JavaScript to create a clean, modern, and responsive interface. The design

accommodates both desktop and mobile users, ensuring accessibility for various user demographics. The frontend connects seamlessly to the backend APIs, dynamically retrieving data from JSON files. Public-facing pages were developed for searching for deceased records, viewing grave locations through the integrated map, and accessing community news or obituaries. Meanwhile, the admin panel includes pages for login, dashboard management, funeral application approvals, and CRUD functions related to burial records.

A critical part of development was the integration of the burial plot locator map, which uses Leaflet.js combined with GeoJSON files generated from QGIS. The burial plot map allows users to visually locate graves within the cemetery. Interactive features were implemented, such as clicking on a plot to view details or highlighting plots based on search results.

The development followed modular architecture, promoting the reuse of components such as data validation, JSON file reading/writing utilities, and map interaction functions. Laravel controllers were structured to handle different datasets , for example, one controller manages deceased data while another handles funeral applications.

Authentication and authorization were implemented to restrict login and dashboard access exclusively to administrators. There is no login functionality for general users; instead, public users have direct access to essential services like obituary viewing, grave search, and map navigation. This role-based access ensures that sensitive data modifications are performed only by authorized personnel.

Throughout the development process, manual and functional testing were conducted to validate data operations, user interactions, and system reliability. This testing included

file read/write consistency checks for JSON-based storage, validation of API responses, and browser-based testing to ensure cross-device compatibility. Given the use of JSON instead of a relational database, particular attention was paid to handling file locking, data synchronization, and error handling to prevent data corruption during concurrent admin operations.

Security measures were integrated at various levels of the system. Admin passwords are securely hashed using Laravel's built-in encryption methods. Input validation and sanitization are employed across all forms and API requests to protect against common web vulnerabilities, including code injection and cross-site scripting (XSS). Route protection mechanisms ensure that administrative functions are inaccessible without valid authentication.

Table 3.1: Key Development Tools and Technologies

| **Category** | **Tool / Technology** | **Purpose** |
|---|---|---|
| Programming Language | PHP (Laravel), JavaScript | Backend and frontend development |
| Database Management | JSON Files | Lightweight data handling for deceased records, plots, etc. |
| Frontend Framework | Bootstrap | Responsive design |
| Testing Framework | Manual Testing, Functional Testing | API validation, JSON file integrity, cross-device testing |
| Security Tools | Hashing (Laravel Auth), Input Validation | Password encryption, data protection |
| Version Control | Git, GitHub | Version management and collaborative development |
| GIS and Map Integration | QGIS (GeoJSON), Leaflet.js | Interactive burial plot locator |

The development process culminated in a fully operational prototype of the I-PUSARA platform that meets both functional requirements, such as accurate burial plot visualization, funeral application handling, and obituary management, and non-functional requirements, including security, reliability, and user accessibility. By the conclusion of this phase, the platform was successfully prepared for deployment and ready for comprehensive testing within the Kg Bako community.

### 3.2.4 Testing and Iteration

Testing and iteration play a vital role in the development lifecycle of the I-PUSARA Community Funeral Management Platform, ensuring that the system meets functional requirements, operates reliably, and delivers user friendly experience. This process encompasses several layers of testing, including functional testing, integration testing, system testing, and User Acceptance Testing (UAT). The testing process follows an iterative model, where each round of testing leads to improvements and refinements based on feedback and detected issues.

The testing phase began with functional testing, focusing on validating the core components of the platform, particularly those involving data manipulation through JSON-based storage. Individual modules, such as CRUD operations for death records, burial plot management, funeral application processing, and obituary updates, were tested in isolation to verify that each function works correctly. For example, testing ensured that an administrator could reliably add a new deceased record, edit details, or delete entries while maintaining the integrity of the JSON data files.

Following functional tests, integration testing was performed to verify the smooth interaction between modules. This stage checked how the admin dashboard communicates

with the grave locator, how funeral applications are processed and linked to death records, and how the map dynamically reflects changes in burial plot data. The interactions between the backend (Laravel APIs handling JSON) and the frontend (HTML, CSS, JavaScript, Leaflet) were validated to confirm that data updates occur in real time without errors or data loss.

System testing involved evaluating the platform as a whole, ensuring that it met both functional and non-functional requirements. Key system functionalities tested included the accuracy of the burial plot locator map integrated with Leaflet and GeoJSON, the reliability of admin authentication and authorization, and the stability of JSON file handling under typical usage conditions. Given the community-scale deployment, system testing also focused on ensuring that the platform remains responsive and stable without requiring a SQL database backend. Security testing confirmed that password hashing, route protection, and input validation worked correctly to safeguard against unauthorized access and common web vulnerabilities such as injection attacks or file corruption.

A crucial part of the testing phase was User Acceptance Testing (UAT), where the system was evaluated by real users, including PTIB administrators and community members from Kampung Bako. The UAT was designed to assess whether the system aligns with user expectations, is intuitive to navigate, and effectively meets the needs for funeral management and burial plot searching. Respondents participated using a structured feedback form hosted on Google Forms. The form included Likert-scale questions that covered aspects such as usability, system responsiveness, the clarity of the grave locator map, the accuracy of data, and satisfaction with the admin dashboard functionalities.

During UAT, administrators specifically tested workflows such as login authentication, managing deceased records, approving funeral applications, and publishing obituaries. Meanwhile, public users evaluated the effectiveness of the grave search function, the usability of the interactive burial map, and the accessibility of obituary announcements and community news, all of which are available without the need for login. Feedback highlighted minor issues, including interface clarity for certain features and the need for confirmation prompts on some admin actions, which were subsequently addressed in iterative revisions.

The entire testing process was highly iterative, meaning that after each round of testing, especially UAT, improvements were made based on reported issues or usability suggestions. For instance, if participants found it confusing to navigate the burial plot locator or locate certain grave plots, enhancements were made to the map interface, such as improving search filters or adding visual highlights for selected plots. Similarly, JSON data handling was optimized to prevent file conflicts during simultaneous admin operations.

This cycle of testing, feedback collection, issue resolution, and retesting ensured that the final version of the I-PUSARA platform was robust, secure, and aligned with the expectations of both administrators and the broader community. The iterative nature of this approach not only improved system reliability but also enhanced the user experience, reinforcing the platform's role as a vital tool for funeral management within the Kg Bako community.

## 3.3 Chapter Summary

This chapter comprehensively outlined the processes involved in the development of the I-PUSARA Community Funeral Management Platform, covering requirement gathering,

design, development, testing, and deployment. The design phase leveraged flowcharts, use case diagrams, and an entity relationship diagram (ERD) that reflected a JSON-based data structure rather than a traditional SQL database, accurately representing the lightweight and flexible architecture suited for the Kg Bako community.

The development phase emphasized the use of appropriate tools and technologies, particularly Laravel for backend development, JSON file-based storage for data management, and QGIS with Leaflet for the burial plot locator. The decision to use JSON instead of a relational database provided a simple yet effective solution that is highly maintainable for community-scale deployments. Development focused on building key features such as the admin dashboard with CRUD capabilities, funeral application management, obituary posting, and the GIS-integrated grave locator.

Testing was carried out through a rigorous and iterative process that involved functional testing, integration testing, system testing, and User Acceptance Testing (UAT). The UAT, conducted via a structured Google Form, collected valuable feedback from PTIB administrators and community members, which directly contributed to refining the system's usability, functionality, and data accuracy. The iterative testing approach ensured that the platform met both functional requirements and user expectations, resulting in a stable and user-friendly system.

The deployment phase involved configuring the system for live usage within the Kg Bako community. This included setting up the JSON-based data files, integrating burial plot maps, and deploying the Laravel-powered web application on a local server environment suited to the community’s infrastructure. Comprehensive documentation was produced for

both administrators and users, covering operational guides, technical maintenance instructions, and future update pathways.

It is important to note that Chapter 4 will delve deeper into the processes outlined in sections 3.2.3 (Development), 3.2.4 (Testing and Iteration), and 3.2.5 (Deployment and Documentation). These subchapters will provide a detailed exploration of the actual implementation steps, challenges encountered, improvements made during testing, and how the deployment was executed to ensure the I-PUSARA platform effectively serves its intended purpose for the Kg Bako Muslim community.

# CHAPTER 4

# IMPLEMENTATION

## 4.1 Overview

This chapter describes the implementation process of the I-PUSARA Community Funeral Management Platform, which was developed to digitize funeral management for the Muslim community in Kampung Bako, Kuching. This platform includes features such as an admin-managed CRUD system for burial records, funeral service applications, an obituary/news board, and a GIS-integrated burial plot locator. The development involved both backend and frontend components, burial plot digitization, and JSON-based data management. This chapter elaborates on the development environment, backend and frontend functionalities, burial plot map integration, and user interface deployment.

## 4.2 Implementation Environment

### 4.2.1 Development Tools and Platforms

The platform was developed using the Laravel PHP framework for the backend, JavaScript with Leaflet.js for the map interface, and Bootstrap for responsive UI design. Data is managed using JSON file storage, which eliminates the need for SQL-based databases and suits community-level applications. QGIS was used to digitize burial plots, which were exported as GeoJSON files for map integration.

Table 4.1: Tools and Technologies used for the Platform

| Category | Tools/Technologies |
|---|---|
| Backend | Laravel (PHP) |
| Frontend | HTML, CSS (Bootstrap), JavaScript |

| | |
|---|---|
| Data Storage | JSON files |
| GIS & Map Integration | QGIS (GeoJSON), Leaflet.js |
| Development Tools | VS Code, XAMPP |
| Version Control | Git, GitHub |

### 4.2.2 Design Philosophy and Accessibility

The Laravel project consists of typical MVC structure with folders for controllers, views, and routes. The frontend view files for the I-PUSARA Community Funeral Management Platform are stored in \xampp\htdocs\ipusara\resources\views\Frontend.

This directory contains all the Blade template files (.blade.php) responsible for rendering the public-facing user interfaces, including pages such as:

Example File Structure:

- /public/data/deceased.json – Deceased records
- /public/data/burial_plot.geojson – Cemetery map plot polygons
- /public/data/applications.json – Funeral service applications
- /public/data/news.json – Obituary and community announcements

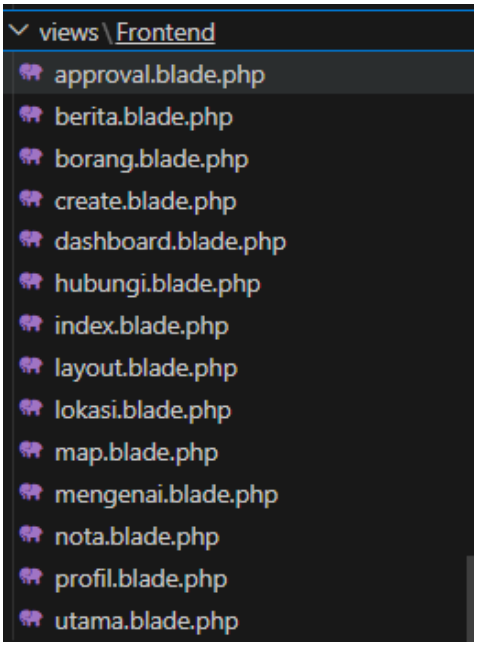



Figure 4.1: Screenshot of File Structure

### 4.2.3 Libraries and Plugins Used

The development of the I-PUSARA Community Funeral Management Platform relies on a combination of libraries and plugins that enhance both frontend interactivity and backend data processing. Each library was selected based on its ability to support lightweight, efficient, and scalable features that align with the needs of a community-level system operating without a complex SQL database.

Leaflet.js is a lightweight and open-source JavaScript library for creating interactive web maps. In I-PUSARA, Leaflet is the core tool that renders the burial plot map, allowing users to visually locate grave plots within the Kg Bako cemetery. It supports displaying GeoJSON files exported from QGIS, enabling the plotting of grave boundaries directly onto the web interface.

Key functionalities powered by Leaflet include:

- Display of burial plot polygons from burial_plot.geojson.

- Interactive popups that show deceased details when a user clicks on a plot.
- Plot highlighting when a user searches for a specific grave
- The map interfaces with active burial plots loaded, showing popups or highlighted plots.

Bootstrap is a CSS framework that helps ensure the website is responsive, mobile-friendly, and consistent in design. Bootstrap's grid system and pre-built components are extensively used across I-PUSARA, including:

- Navigation bars, buttons, modals, and cards for the admin dashboard.
- Responsive layouts for the grave search, application forms, and obituary pages.
- Consistent styling supports clean and modern UI, making the system usable for both administrators and the public.

By leveraging Bootstrap, the platform functions seamlessly across desktops, tablets, and mobile phones.

- A page from the admin dashboard (e.g., CRUD form, dashboard home) showing the Bootstrap style components like tables, buttons, and navigation bars.

Given the decision to use JSON file-based storage instead of a traditional relational database, Laravel's built-in FileSystem API plays a crucial backend role. This tool allows the platform to perform secure and reliable read/write operations on JSON files.

Key functions handled through the FileSystem include:

- Reading: Display deceased records, burial plots, or news from JSON files.

- Writing: Saving new records or updates made by administrators into the JSON files.
- File Locking: Prevents simultaneous writes that could corrupt data during concurrent admin operations.
- Validation: Ensures the JSON structure remains intact and prevents broken records from affecting the system.

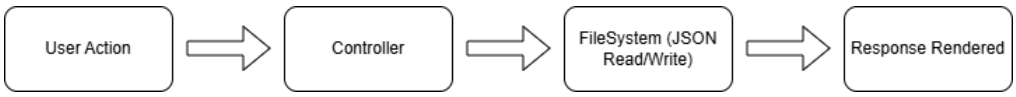
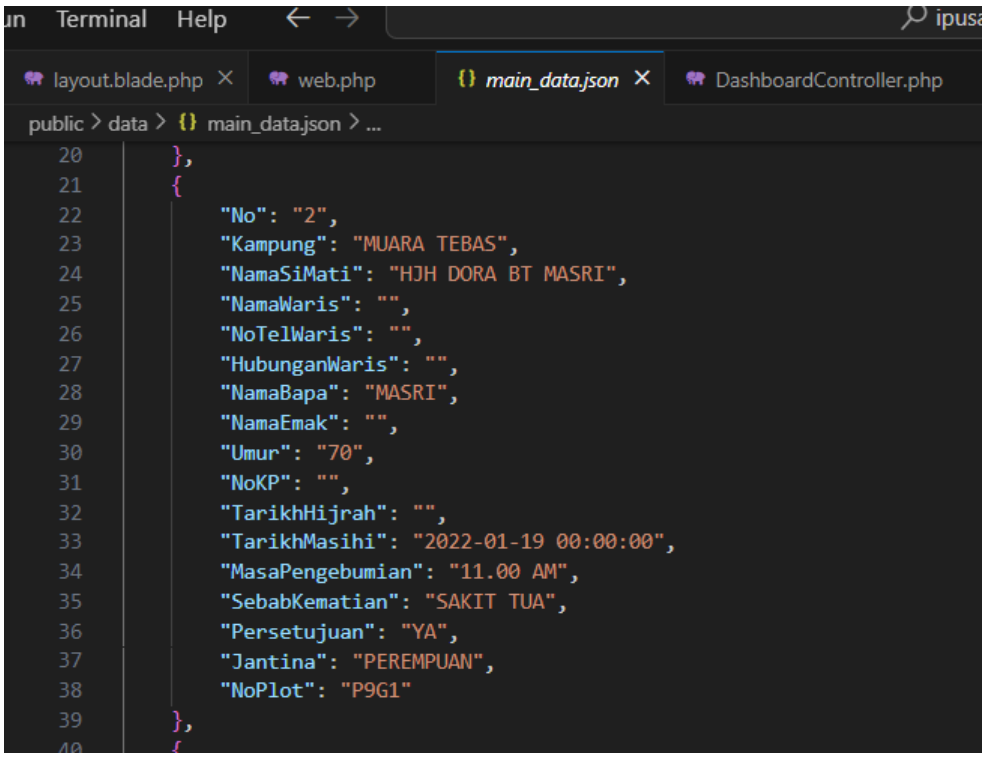



Figure 4.2: Data Flow between Laravel and JSON files





```
20      },
21      {
22          "No": "2",
23          "Kampung": "MUARA TEBAS",
24          "NamaSiMati": "HJH DORA BT MASRI",
25          "NamaWaris": "",
26          "NoTelWaris": "",
27          "HubunganWaris": "",
28          "NamaBapa": "MASRI",
29          "NamaEmak": "",
30          "Umur": "70",
31          "NoKP": "",
32          "TarikhHijrah": "",
33          "TarikhMasihi": "2022-01-19 00:00:00",
34          "MasaPengebumian": "11.00 AM",
35          "SebabKematian": "SAKIT TUA",
36          "Persetujuan": "YA",
37          "Jantina": "PEREMPUAN",
38          "NoPlot": "P9G1"
39      },
```


Figure 4.3: Screenshot of main_data.json file structure

## 4.3 Frontend Map Integration

### 4.3.1 Map Initialisation

The burial plot map is initialized using Leaflet.js, with the cemetery plot exported from QGIS as GeoJSON. The map loads the burial plot polygons with interactive features such as hover highlights and clickable popups displaying deceased information.

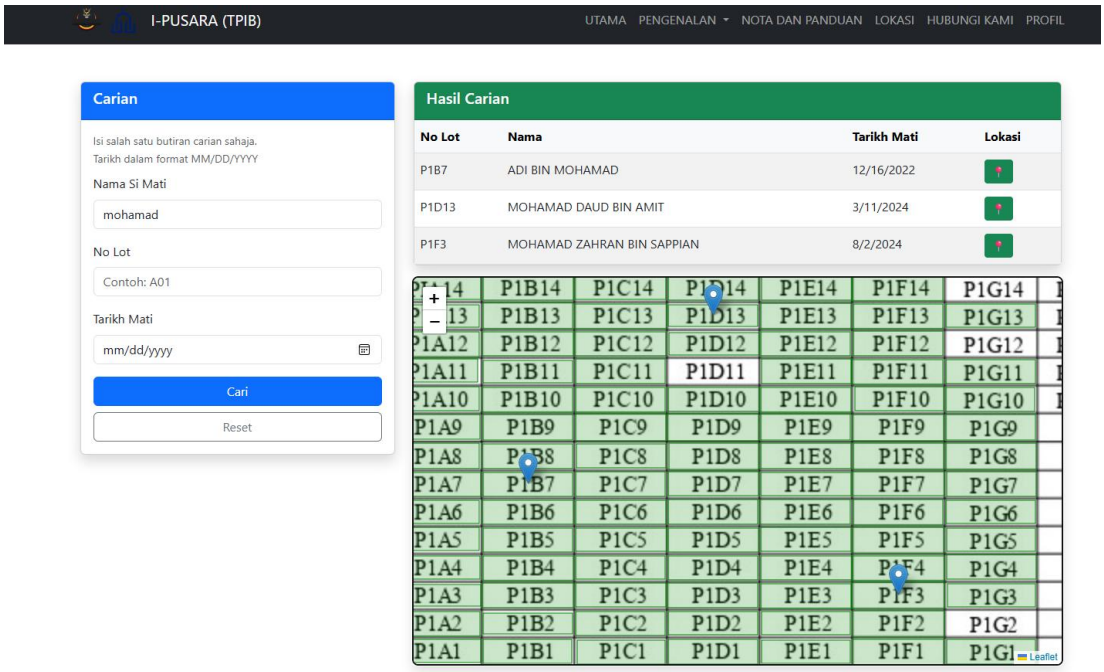



Figure 4.4: User Interface of I-PUSARA

### 4.3.2 Popup Interaction

When a user clicks on a burial plot, a popup displays details such as the deceased's name, date of death, and plot number. The GeoJSON layer dynamically reads from the latest kubur.geojson file.

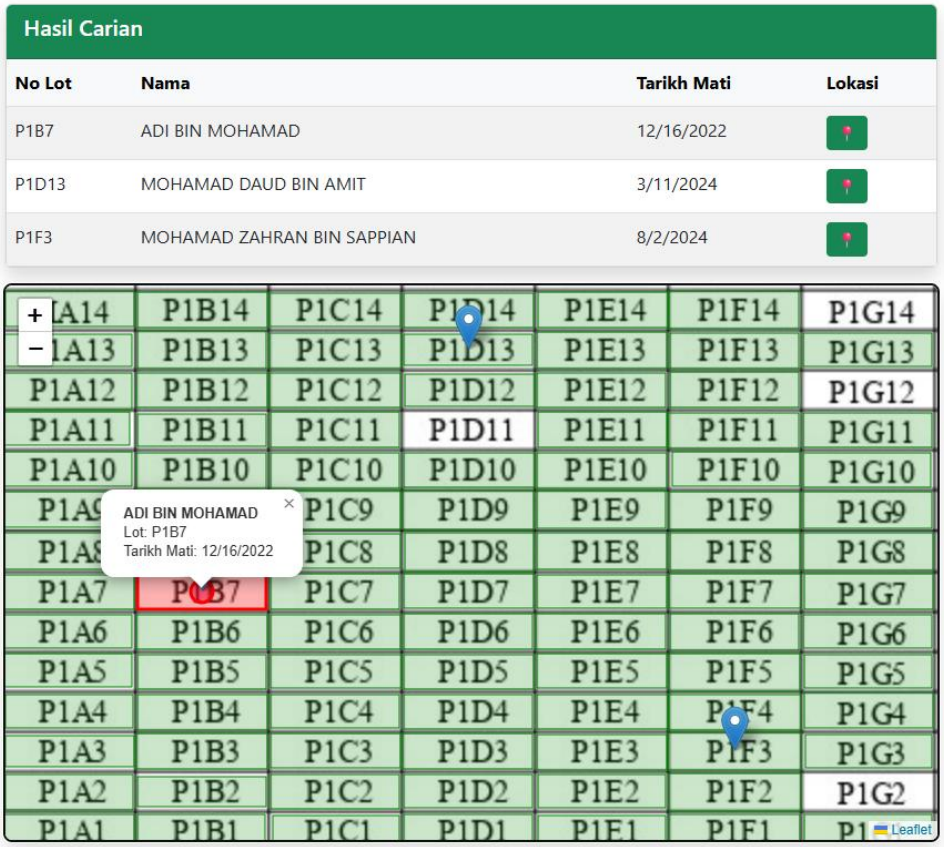



Figure 4.5: Popup Details of Deceased's

### 4.3.3 Dynamic Loading

Deceased records are cross-referenced with burial plots. If a plot is empty, it shows as "Tiada Rekod Dijumpai" in the popup. Once a record is linked, the popup updates to display the deceased's information.

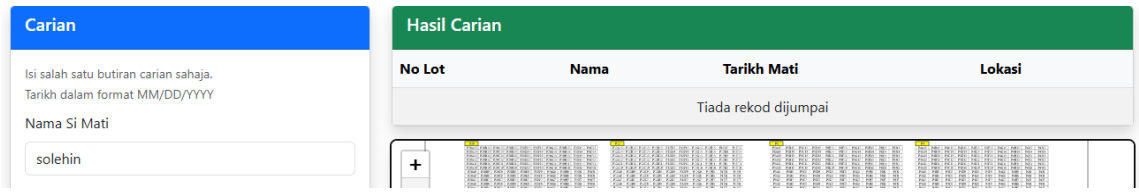



Figure 4.6: Popup Response when No Record Found

## 4.4 Backend Functionality

### 4.4.1 JSON File Handling

The Laravel backend handles CRUD operations by reading and writing JSON files instead of using a SQL database. This includes functions to:

- Creating new deceased records
- Update burial records with new data
- Delete records securely
- Manage funeral service applications (approve/reject)

### 4.4.2 File Locking and Data Integrity

To prevent data corruption, file locking mechanisms are implemented. When an admin writes data to a JSON file, the system locks the file momentarily to avoid conflicts from simultaneous edits.

### 4.4.3 Authentication Logic

The platform restricts login and registration solely to admins. Regular users do not have access to login but can access public features like obituary viewing, burial plot search, and the map interface without authentication.

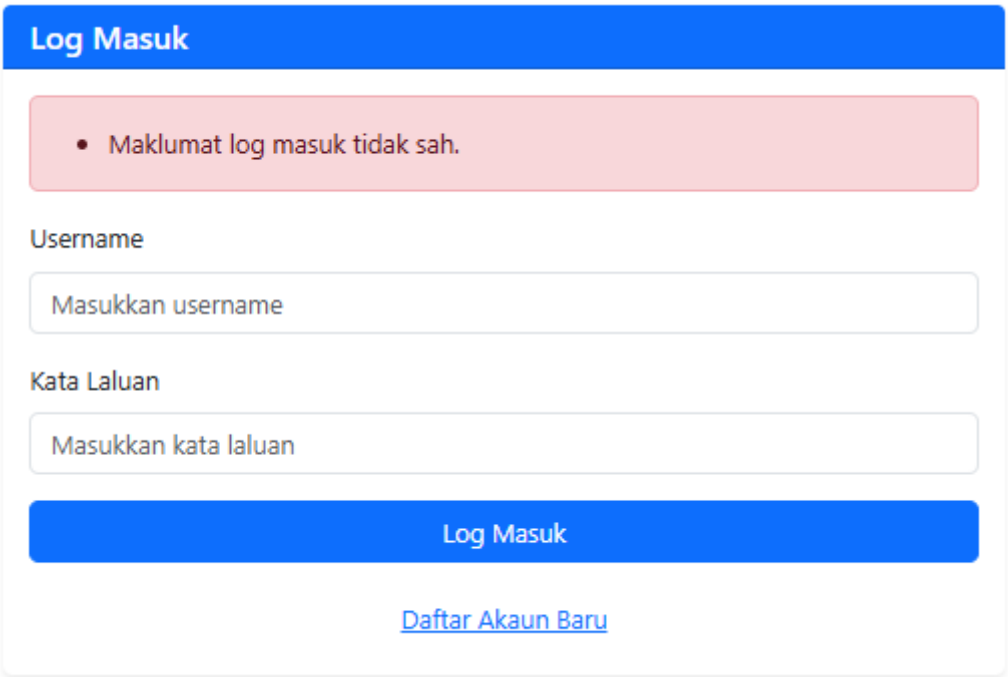



Figure 4.7: Authentication Login for Administrator

## 4.5 Grave Locater Feature

### 4.5.1 Search Functionality

The grave locator allows users to search for burial plots using multiple filters such as deceased name, identification number, or plot number. The search matches with records in main_data.json.

**Hasil Carian**

| No Lot | Nama | Tarikh Mati | Lokasi |
|---|---|---|---|
| P1B7 | ADI BIN MOHAMAD | 12/16/2022 | |
| P1D13 | MOHAMAD DAUD BIN AMIT | 3/11/2024 | |
| P1F3 | MOHAMAD ZAHRAN BIN SAPPIAN | 8/2/2024 | |

Figure 4.8: Output of Search Function

### 4.5.2 Plot Highlighting

When a search result is clicked, the map automatically zooms to the corresponding burial plot, highlighting it with a different color for visual clarity.

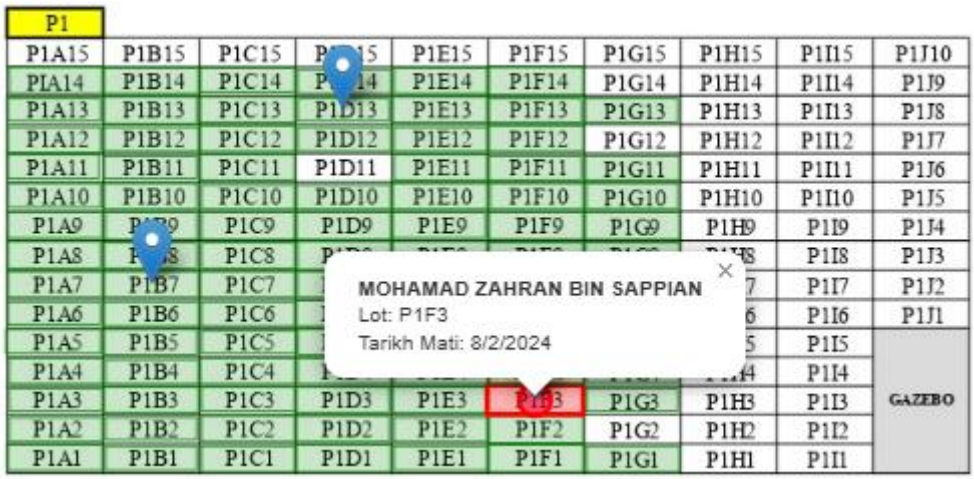



Figure 4.9: Highlighed Deceased's Details

## 4.6 User Interface Development

The user interface (UI) of the I-PUSARA Community Funeral Management Platform was designed to be both intuitive and functional, serving two distinct user groups: administrators and the general public. The interface prioritizes accessibility, cultural sensitivity, and ease of navigation, with the use of modern web design frameworks like

Bootstrap to ensure responsiveness across different devices. The UI seamlessly integrates with backend operations and GIS components, creating a cohesive experience for all users.

### 4.6.1 Admin Dashboard

The administrator dashboard is accessible exclusively to authorized users through a secured login page. This page serves as the entry point for administrators who are responsible for managing burial records, funeral service applications, and community announcements. The login interface itself is simple yet secure, emphasizing clarity in the input fields and providing helpful prompts for incorrect credentials.

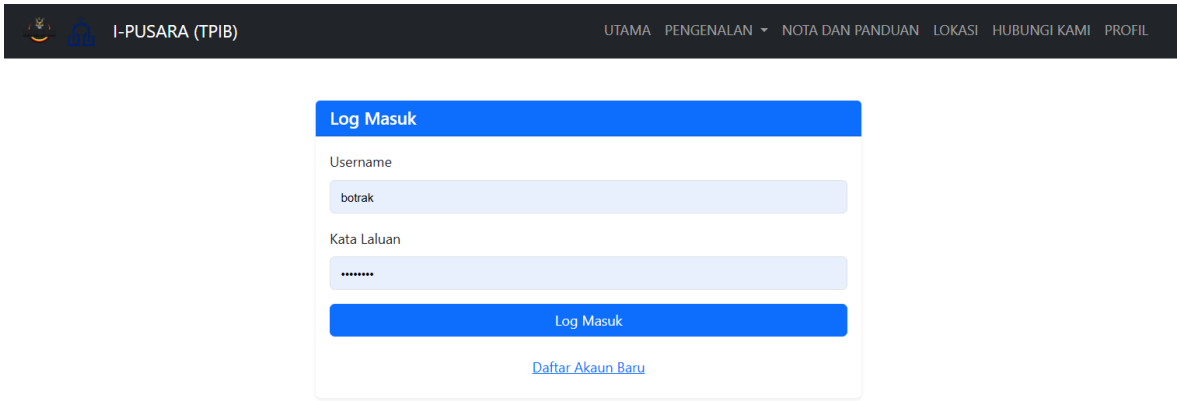



Figure 4.10: Login/Sign Up Page for Administrator

One of the core functionalities available in the dashboard is the management of deceased records. Administrators can add new records, edit existing information, or delete outdated entries. The CRUD interface for deceased records is designed with clarity, featuring well-labeled input fields such as name, date of death, identification number, and burial plot number. A confirmation prompt is integrated into the delete function to prevent accidental data loss.

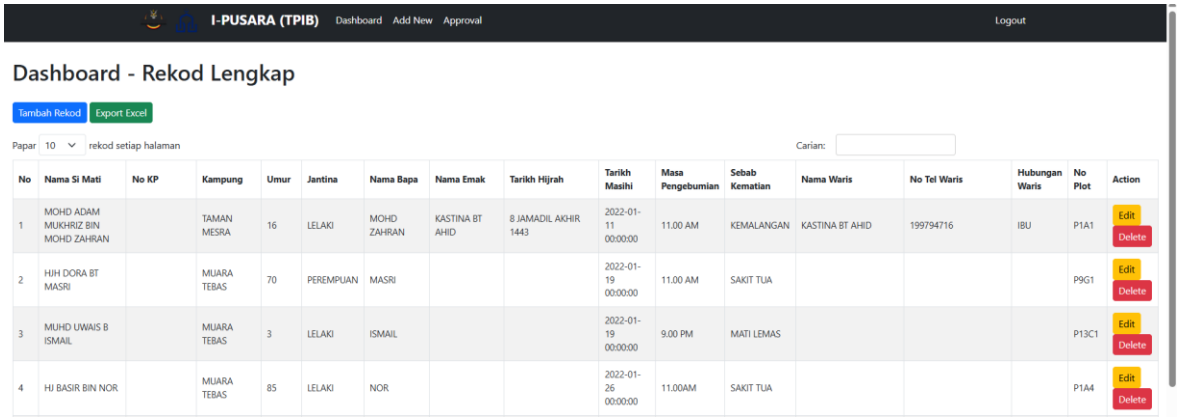



Figure 4.11: Admin Dashboard

In addition to managing records, the dashboard includes a section for reviewing and approving funeral service applications submitted by the public. When an application is submitted, it appears in a pending state within the admin panel, where administrators can view the details, approve valid requests, or reject those that do not meet the required criteria. This approval workflow ensures data accuracy and maintains the integrity of burial information.

Figure 4.12: Approval Page for Admin

### 4.6.2 Public Interface

The public-facing interface of I-PUSARA is designed to be completely open, requiring no login or registration for users to access its core functionalities. The home page welcomes users with a clean layout that features a prominent search bar, allowing quick and

efficient searches for deceased records. This search function accepts input based on the deceased's name, plot number, or date of death, providing flexibility for users who may only have partial information. The layout emphasizes clarity, with minimal distractions and a focus on usability.

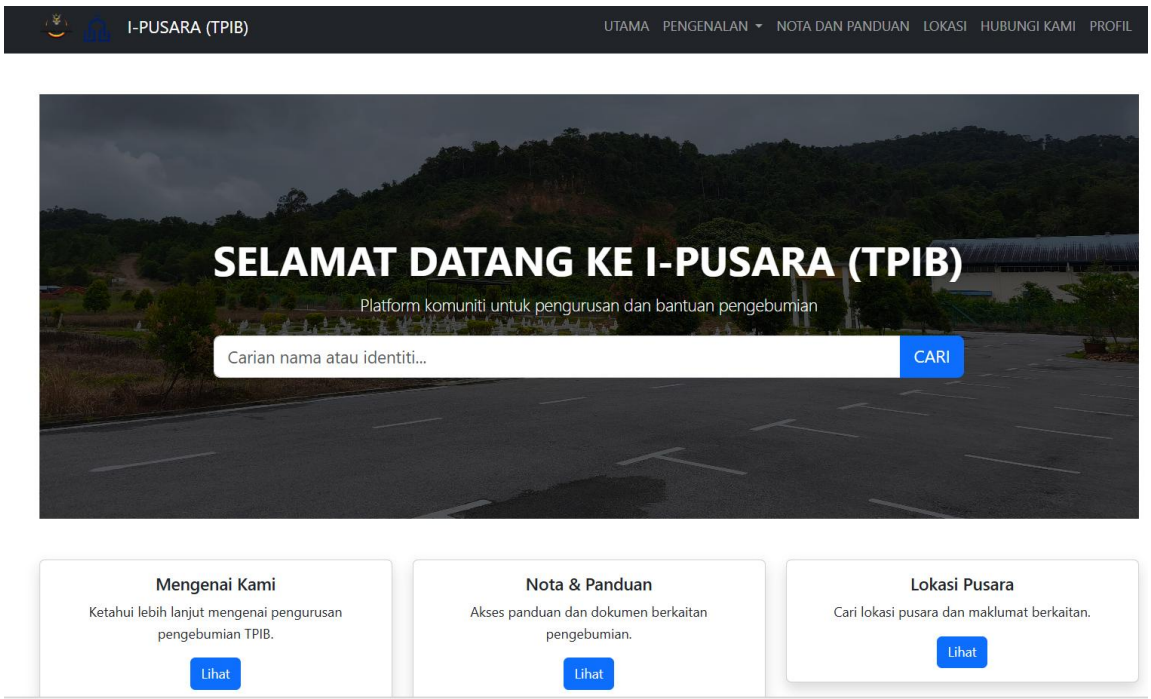



Figure 4.13: Homepage of I-PUSARA

One of the standout features of the public interface is the burial plot locator. This interactive map enables users to visually navigate the cemetery layout, which has been digitized using QGIS and displayed via Leaflet. Users can click on individual plots to retrieve popup information showing details such as the deceased’s name, date of death, and burial plot number. The interface supports smooth zooming, panning, and popup interactions, making it intuitive even for users unfamiliar with map-based systems. The map updates dynamically as the burial plot data evolves, ensuring accuracy over time.

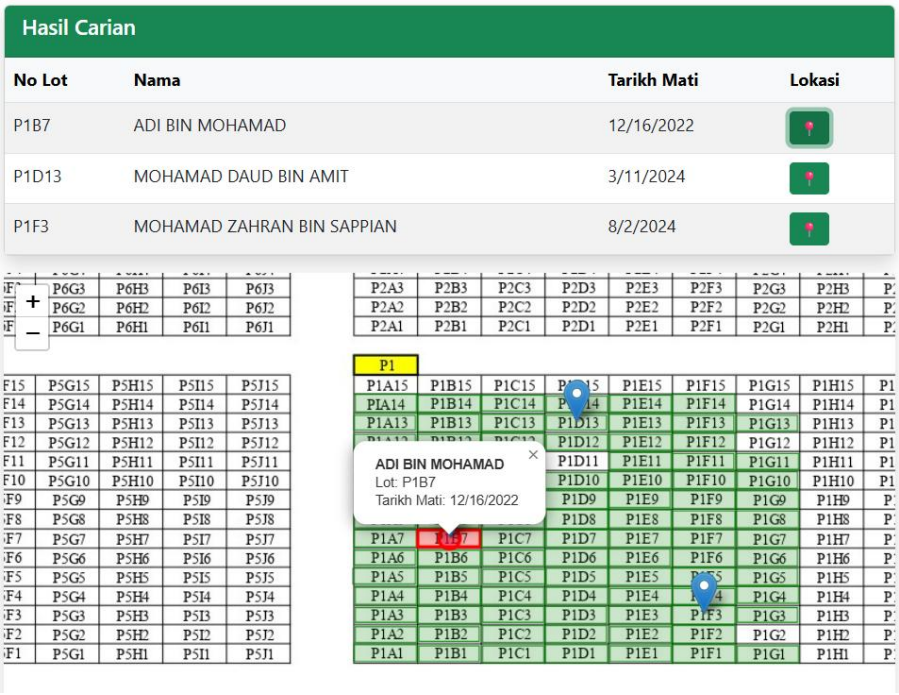



Figure 4.14: Search Result of I-PUSARA

In addition to the search and mapping features, the platform provides an obituary and news page where recent deaths and community announcements are listed. This page serves not only as an informational tool but also as a digital space for the community to stay connected during periods of grief. The interface is styled to resemble a bulletin board, with clearly structured cards or panels displaying each announcement, including the name of the deceased and any relevant funeral details.

Figure 4.15: News Page of I-PUSARA

The funeral service application form is another critical component accessible to the public. This form allows users to submit requests for funeral services directly through the platform. The form includes fields for the applicant's name, the deceased's details, and any relevant documents or information required by the cemetery management. Once submitted, the application is held for review in the admin dashboard until it is verified and approved. The form interface is clean and straightforward, designed to reduce friction for users during what is often an emotionally challenging time.

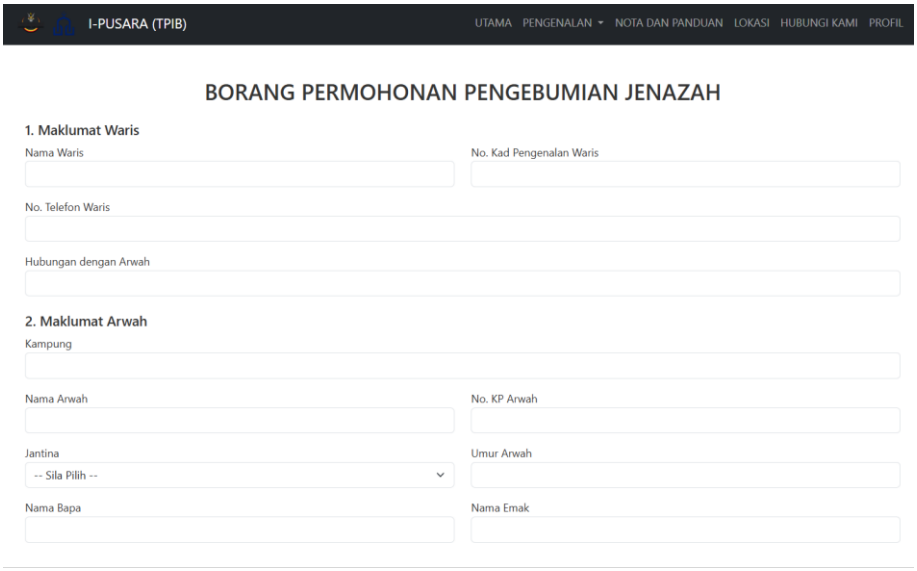



Figure 4.16: Form Page of I-PUSARA

Importantly, the public interface requires no login or registration, reinforcing the platform's commitment to accessibility and ease of use. Users can navigate freely between the search function, the map interface, and the obituary board without encountering barriers that might otherwise discourage usage.

## 4.7 Chapter Summary

This chapter detailed the complete implementation process of the I-PUSARA Community Funeral Management Platform, from setting up the development environment and folder structure to backend JSON data handling, frontend design, and interactive burial plot map integration. It also highlighted the admin-only authentication model, the public-facing grave locator, and the streamlined CRUD operations through the Laravel backend. The testing during implementation ensured that each component worked effectively before moving forward. Chapter 5 will further elaborate on the formal testing, evaluation, and user feedback from the pilot deployment in Kg Bako.

# CHAPTER 5

# RESULTS AND DISCUSSION

## 5.1 Overview

This chapter presents the results of the development, deployment, and evaluation of the I-PUSARA Community Funeral Management Platform, specifically during the pilot deployment in Kg Bako. The evaluation is based on system testing, functionality checks, user feedback, and the results of a User Acceptance Testing (UAT) survey. The discussion provides an in-depth analysis of how well the system meets the project's objectives, its usability, technical performance, and the challenges encountered throughout the process.

This chapter also demonstrates how the digitization of funeral management, coupled with GIS-enabled grave locating, enhances the operational efficiency of the Kg Bako community and simplifies the experience for both administrators and the public.

## 5.2 System Functionality Evaluation

The functionality of the I-PUSARA Community Funeral Management Platform was evaluated using test case execution. Each core function was tested based on its expected output, execution status, and result validity. The evaluation ensures that the system meets the functional requirements established during the design phase.

The following table summarizes the functional testing conducted for each module of the platform:

Table 5.1: Test Case for Functional Testing of each Module

| Test Case ID | Functionality | Test Scenario | Expected Result | Actual Result |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| TC01 | Admin Login | Admin logs in with correct credentials | System grants access to the admin dashboard | Passed |
| TC02 | Admin Login (Invalid) | Admin logs in with wrong password | System rejects login and shows error message | Passed |
| TC03 | Add Deceased Record | Admin fills form with correct data and submits | New deceased record is added to deceased.json and displayed on the dashboard | Passed |
| TC04 | Edit Deceased Record | Admin updates existing deceased information | JSON file updates correctly; changes reflected on dashboard and map | Passed |
| TC05 | Delete Deceased Record | Admin deletes a record | JSON file updates correctly; record is removed from dashboard and map | Passed |
| TC06 | Verify Funeral Application | Admin approves submitted funeral application | Application status updates to "Approved"; user can view confirmation | Passed |
| TC07 | Public Search (By Name/Plot) | Public searches for a deceased by name or plot number | Search result displays correctly; map highlights relevant plot | Passed |
| TC8 | Burial Plot Map – Popup | User clicks on a plot on the map | Popup displays deceased name, plot number, and date of death | Passed |

| | | | | |
|---|---|---|---|---|
| TC9 | Funeral Application Form Submission (Public) | Public submits a funeral application | Data saved in applications.json and appears in admin dashboard for review | Passed |
| TC10 | Data Sync (Map & Records) | Deceased record links correctly to burial plot | Search result matches correct plot with popup info | Passed |
| TC11 | File Lock Handling | Simultaneous CRUD operations from different admins | JSON data integrity maintained without file corruption | Passed |
| TC12 | Responsive Layout (Bootstrap) | Access platform via mobile, tablet, desktop | Layout adapts perfectly; all elements accessible | Passed |
| TC13 | Logout Functionality | Admin clicks logout | Session ends, and user is redirected to login page | Passed |

### 5.3 Pilot Deployment Result in Kg Bako

The platform was deployed in Kg Bako for real-world testing over a set period. The deployment involved real data, including the digitized burial plot layout obtained from QGIS and the actual deceased records provided by PTIB.

During the pilot, administrators transitioned from manual Excel-based records to using the admin dashboard, enabling efficient management of burial records. The pilot also tested the community's ability to access the platform, search for deceased individuals, and locate burial plots visually on the map.

Feedback collected during this pilot indicated several positive outcomes:

- The burial plot locator significantly reduced the time needed to find graves, especially for older records that were previously difficult to retrieve manually.
- PTIB administrators reported that managing burial records was more straightforward, and funeral application approval was faster and more organized.
- Community members expressed appreciation for the obituary and news features, which allowed them to stay informed without relying on word-of-mouth or WhatsApp groups.

## 5.4 User Acceptance Testing (UAT) Result

The User Acceptance Testing (UAT) involved a structured survey conducted through Google Forms. A total of 25 respondents, including PTIB administrators and community members, participated in the UAT. The UAT was conducted using a structured Google Forms questionnaire that employed a Likert scale to evaluate users' experience, understanding, and satisfaction regarding system functionalities, interface, and usability.

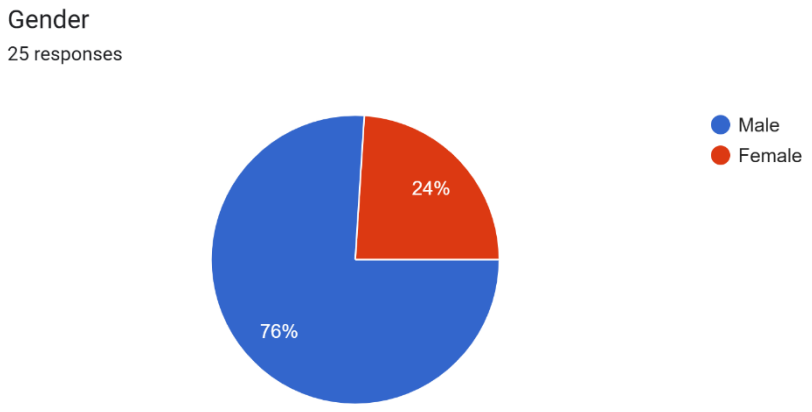



Figure 5.1: Gender of Respondents

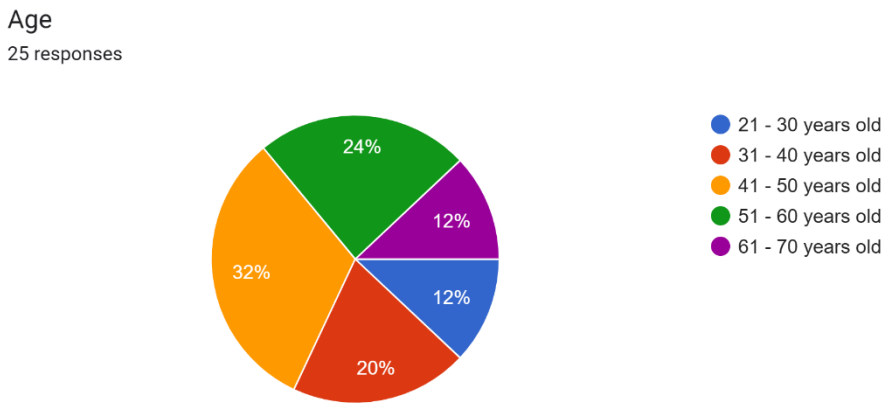



Figure 5.2: Age of Respondents

Demographic data showed that 76% of the respondents were male and 24% were female. In terms of age distribution, 32% of the participants were aged between 41–50 years, followed by 24% aged 51–60, 20% aged 31–40, and smaller groups from 21–30 and 61–70 years old, each representing 12% of the total.

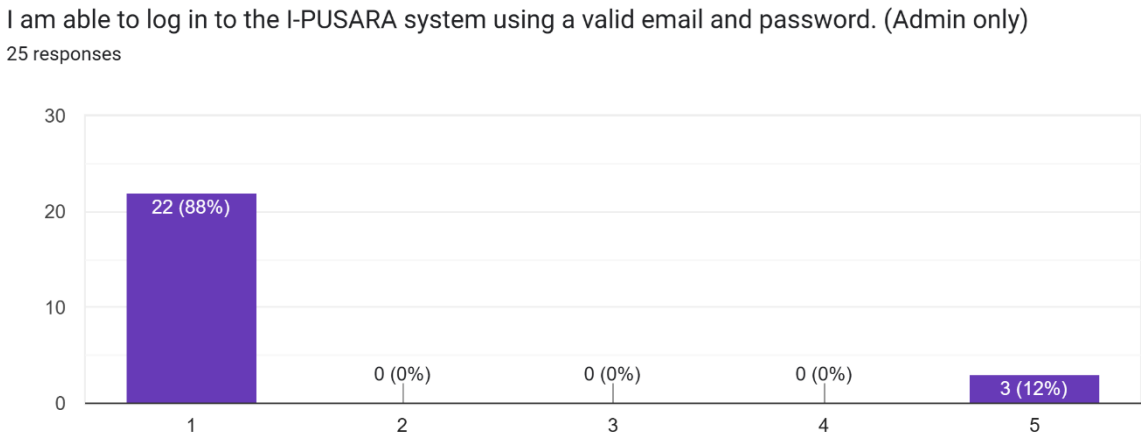



Figure 5.3: Result of Question 1 UAT

The graph illustrates user responses to the statement: "I am able to log in to the I-PUSARA system using a valid email and password (Admin only)." Out of 25 respondents, 88% strongly disagreed (scale 1), while only 12% strongly agreed (scale 5), with no responses in the middle. This indicates that the login functionality is largely irrelevant or inaccessible for most users, likely because the majority are general public users without admin credentials. In other words, the login feature functions like a staff-only entrance in a public building, it's essential for administrators but unused or unnecessary for regular visitors. This outcome reflects that the system's access control is working as intended, restricting dashboard access solely to authorized personnel.

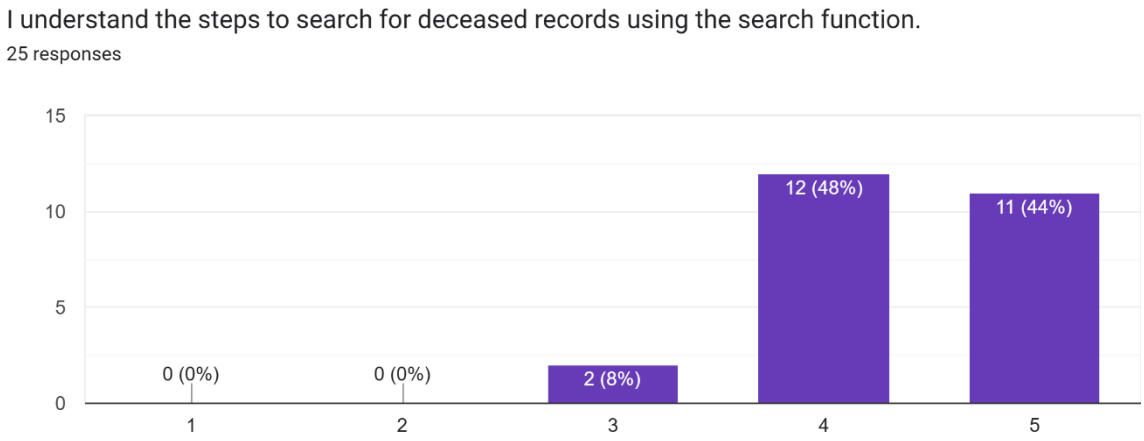



Figure 5.4: Result of Question 2 UAT

The graph shows user feedback on the statement: "I understand the steps to search for deceased records using the search function." From the 25 respondents, 92% selected ratings of 4 or 5, indicating strong agreement, while only 8% gave a neutral rating (3), and no one disagreed. This result suggests that the search function in the I-PUSARA platform is well-designed and user-friendly. Most users clearly understand how to locate deceased records, implying that the interface and search instructions are intuitive and effectively implemented.

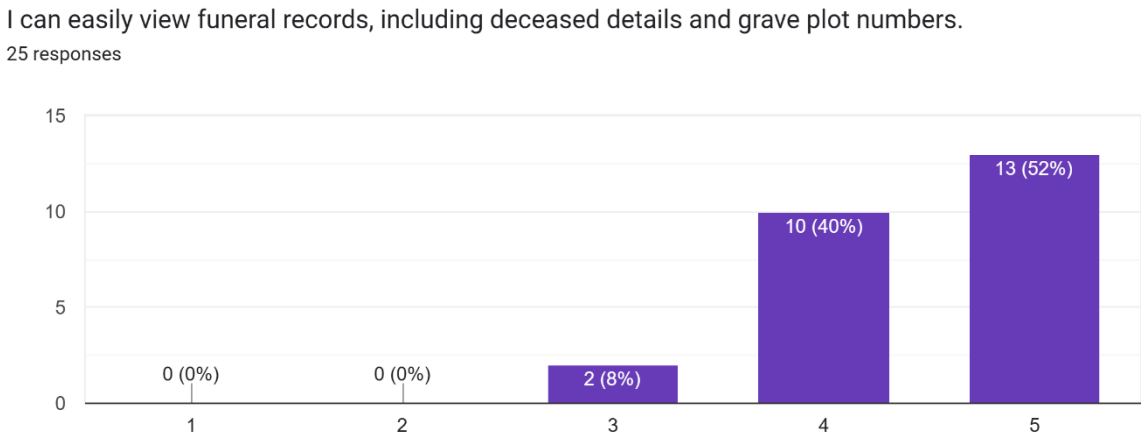



Figure 5.5: Result of Question 3 UAT

The graph indicates user responses to the statement: "I can easily view funeral records, including deceased details and grave plot numbers." Among the 25 respondents, 92% rated their experience as either 4 (40%) or 5 (52%), showing strong agreement with the statement. Only 8% rated it a neutral 3, and there were no negative responses. This suggests that the I-PUSARA platform effectively presents funeral records in a clear and accessible manner. Users generally find the system easy to use when retrieving key information such as names, dates, and grave locations, highlighting the system's efficiency in record presentation.

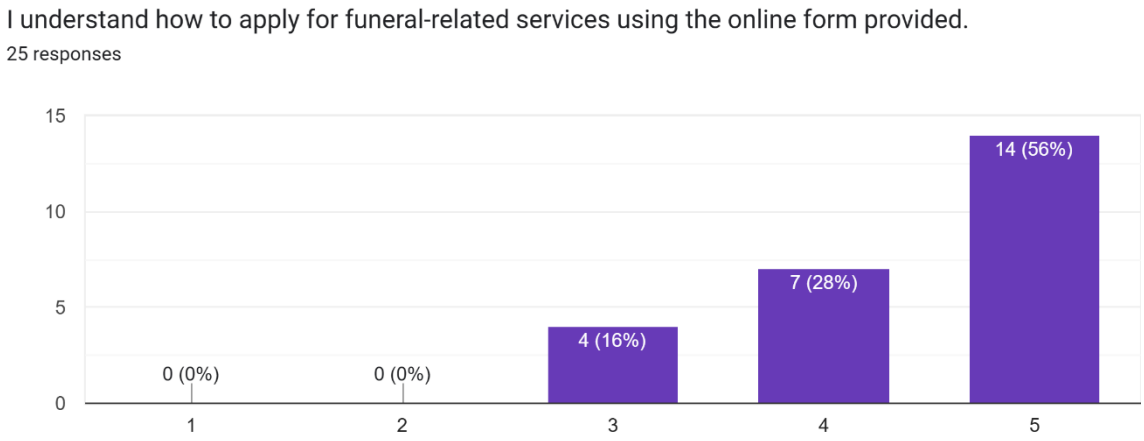



Figure 5.6: Result of Question 4 UAT

The chart reflects responses to the statement: "I understand how to apply for funeral-related services using the online form provided." Out of 25 respondents, 84% expressed clear understanding by selecting ratings 4 (28%) and 5 (56%). Another 16% chose a neutral score of 3, while no participants selected scores indicating confusion or disagreement (1 or 2). This suggests that most users found the online form straightforward and user-friendly, indicating that the digital application process is effectively replacing previous manual methods with greater clarity and convenience.

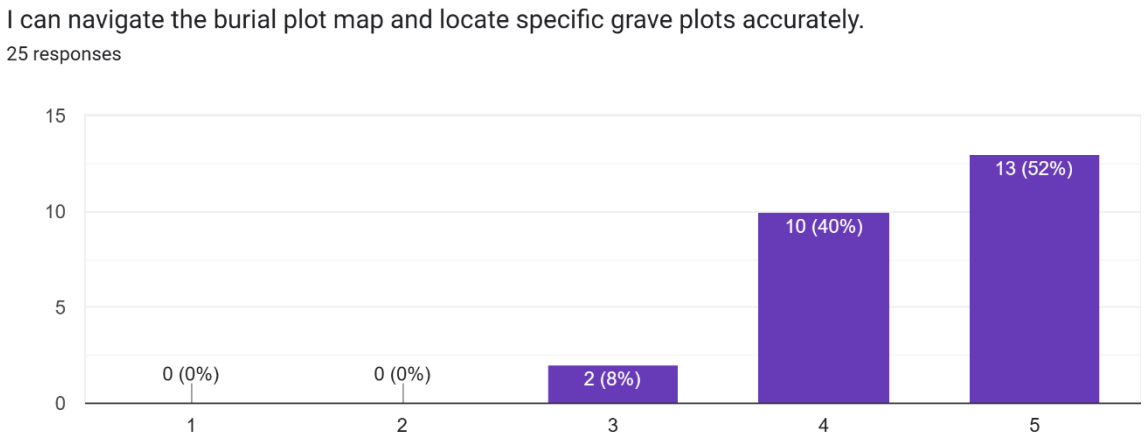



Figure 5.7: Result of Question 5 UAT

This chart evaluates the statement: "I can navigate the burial plot map and locate specific grave plots accurately." Among the 25 respondents, a strong 92% gave positive ratings, 40% rated it as 4 and 52% rated it the highest score of 5. Only 8% responded with a neutral score of 3, and none selected the lowest ratings (1 or 2). This indicates that the vast majority of users found the map navigation tool reliable and effective for identifying specific burial plots, reinforcing the usability of the system's interactive location feature.

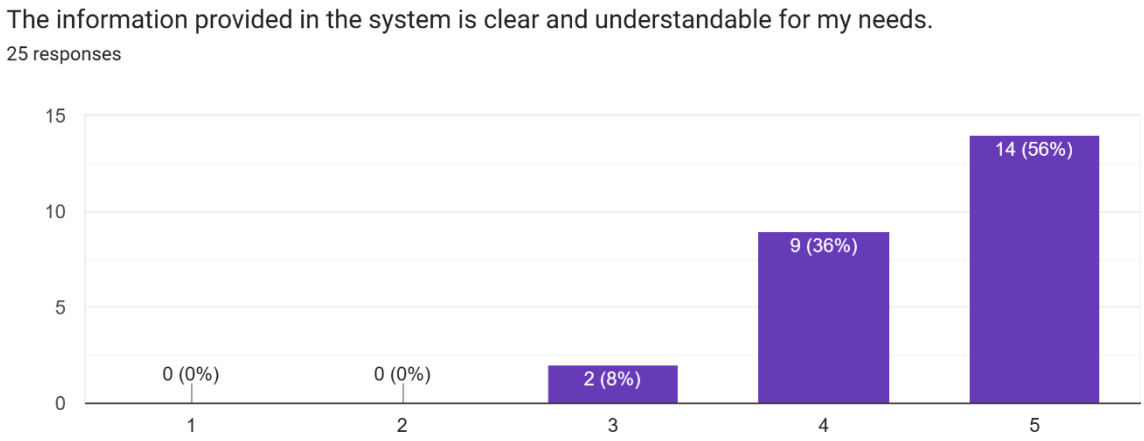



Figure 5.8: Result of Question 6 UAT

This chart presents responses to the statement: "The information provided in the system is clear and understandable for my needs." From the 25 participants, 92% expressed positive feedback, 36% gave a rating of 4, and 56% gave the highest score of 5. Only 8% rated it as 3, and none selected the lower options (1 or 2). These results highlight the effectiveness of the platform in presenting information in a clear, user-friendly manner, fulfilling users' expectations for clarity and relevance.

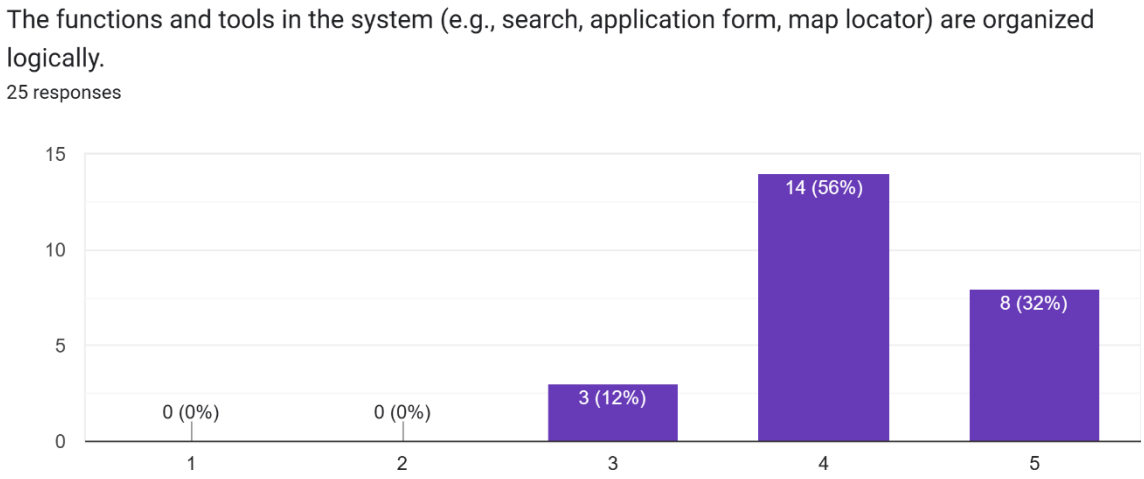



Figure 5.9: Result of Question 7 UAT

This graph represents user responses to the statement: "The functions and tools in the system (e.g., search, application form, map locator) are organized logically." A combined 88% of respondents rated this aspect positively, 56% rated it 4 and 32% rated it 5. Only 12% gave a neutral score of 3, while none gave ratings of 1 or 2. This indicates that the majority of users found the system's interface and functional layout to be logically structured and user-friendly, with minimal confusion in navigation or tool placement.

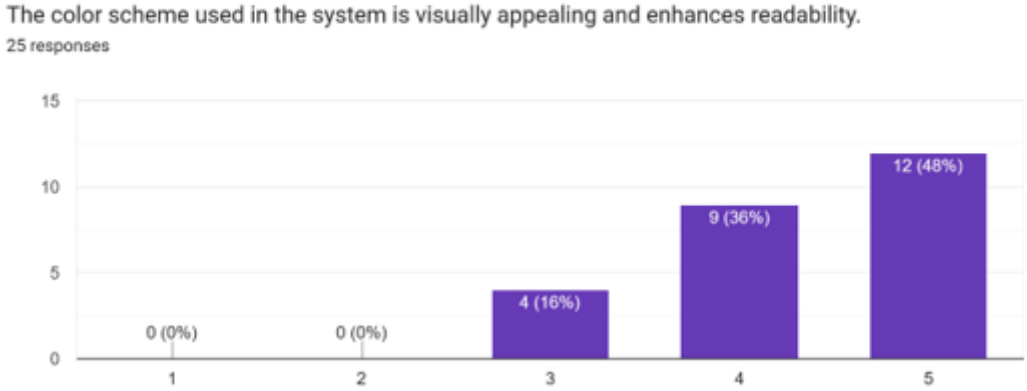



Figure 5.10: Result of Questions UAT

Based on the graph regarding font readability, 88% of respondents rated the fonts as either clear or very clear, with 36% selecting 4 and 52% selecting 5 on the Likert scale. Only 12% rated it neutral (3), and no respondents gave ratings below that. This indicates that the majority of users found the fonts used in the system easy to read and visually appropriate.

Regarding the system's color scheme, 84% of respondents positively rated its visual appeal and contribution to readability, with 36% rating it 4 and 48% rating it 5. Meanwhile, 16% gave a neutral score (3) and none gave a negative rating. This suggests that users generally found the color design to be both attractive and effective in supporting content clarity.

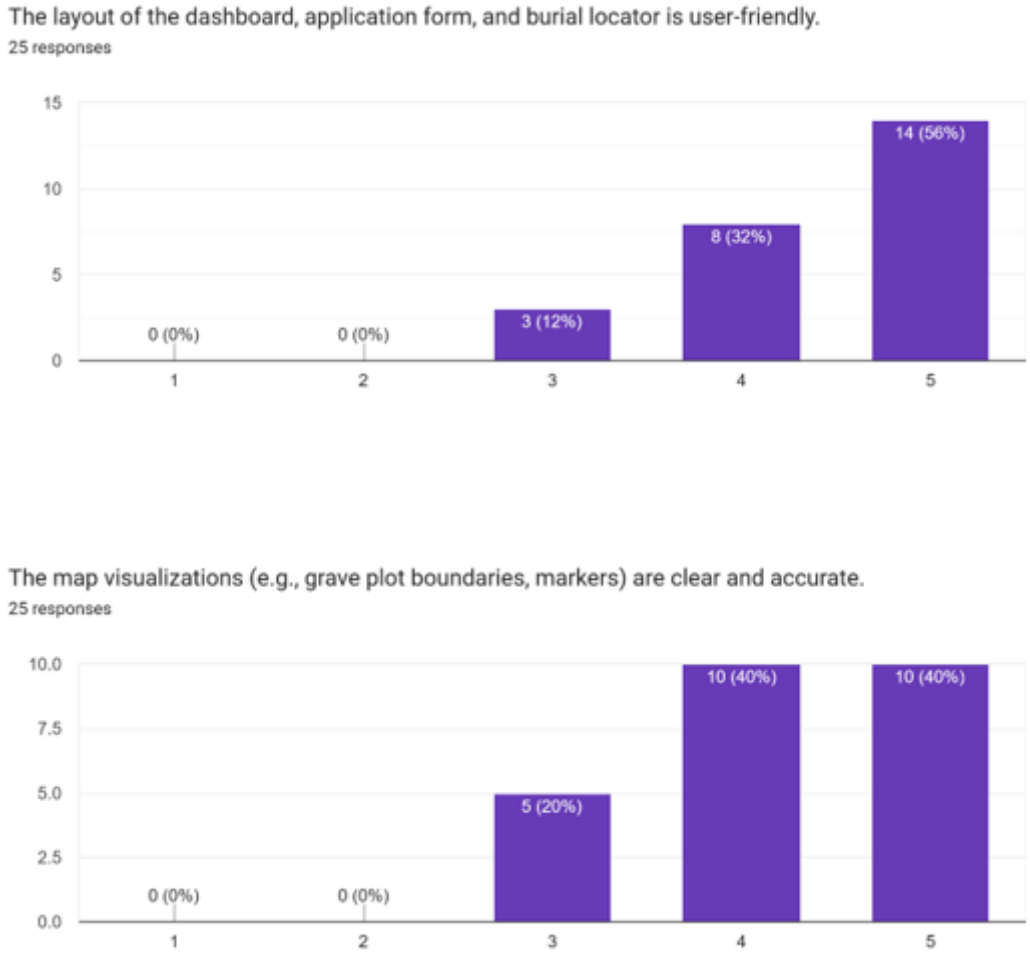
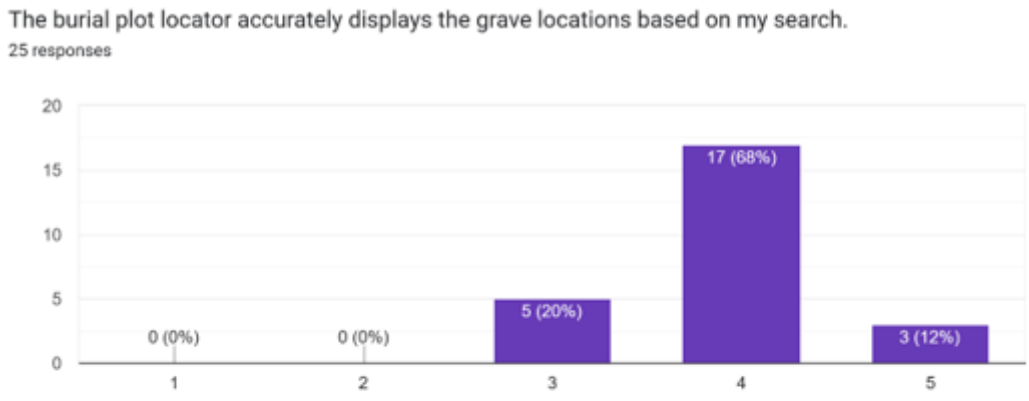



Figure 5.11: Result of Questions UAT

According to the chart, 88% of respondents rated the layout of the dashboard, application form, and burial locator as user-friendly, with 32% giving a score of 4 and 56% selecting the highest score of 5. Only 12% rated it neutral (3), and no users gave negative ratings. This suggests that the system interface is generally intuitive and well-organized for end users.

Feedback on the map visualizations (e.g., grave plot boundaries and markers) shows that 80% of users rated them positively, with 40% giving a score of 4 and another 40% a score of 5. Meanwhile, 20% selected 3, indicating a neutral stance. No respondents gave

negative feedback. Overall, this reflects that the mapping feature is perceived as both clear and functionally reliable, though there may be minor room for improvement in precision.



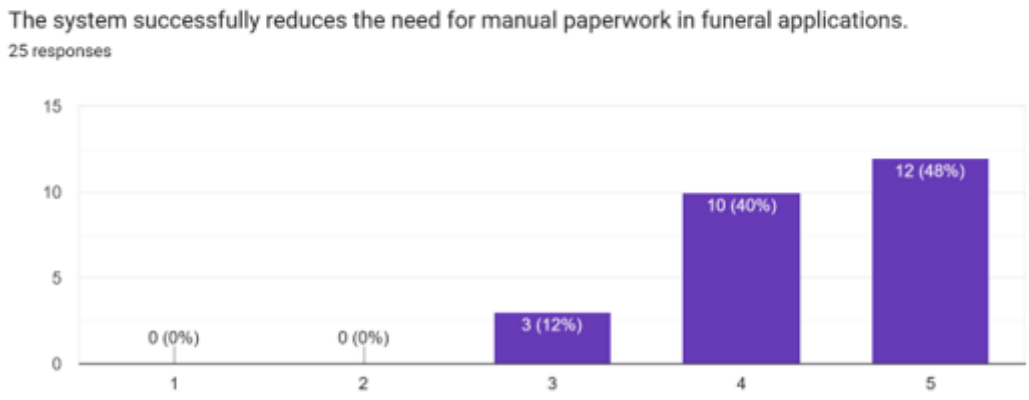
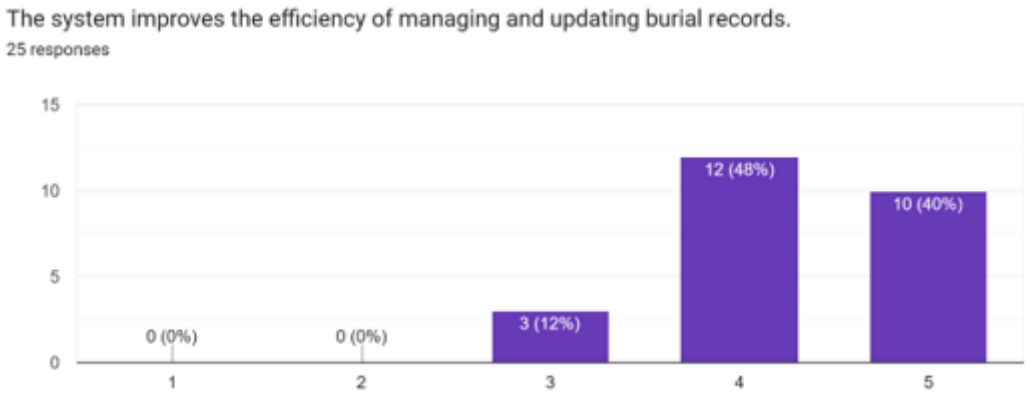




Figure 5.12: Result of Questions UAT

The results indicate that 80% of respondents found the burial plot locator accurate, with 68% rating it 4 and 12% rating it 5. However, 20% of users responded neutrally with a rating of 3, and no respondents gave negative ratings. While generally positive, this result highlights a slight gap in confidence regarding the precision of the grave location feature, which may benefit from future enhancements.

A combined 88% of users agreed that the system reduces the need for manual paperwork in funeral applications, with 48% giving the highest rating (5) and 40% selecting 4. Meanwhile, 12% provided a neutral response (3), and no respondents disagreed. These findings affirm that the platform successfully streamlines administrative tasks and digitizes previously manual processes effectively.



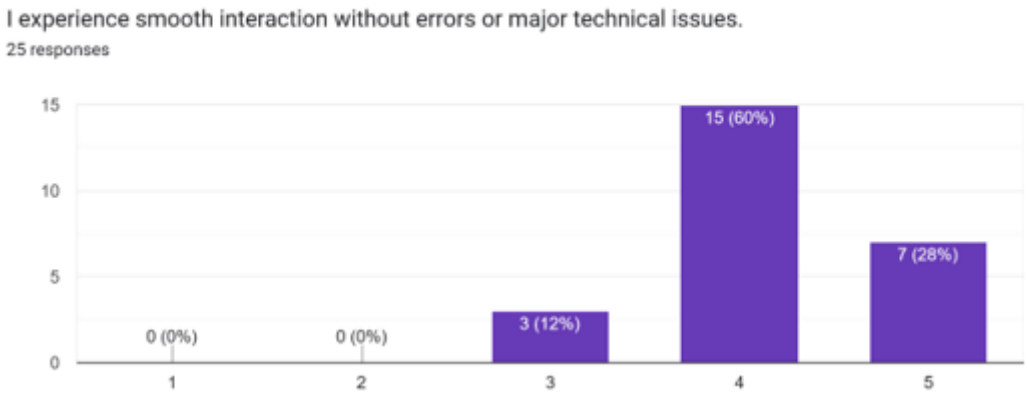
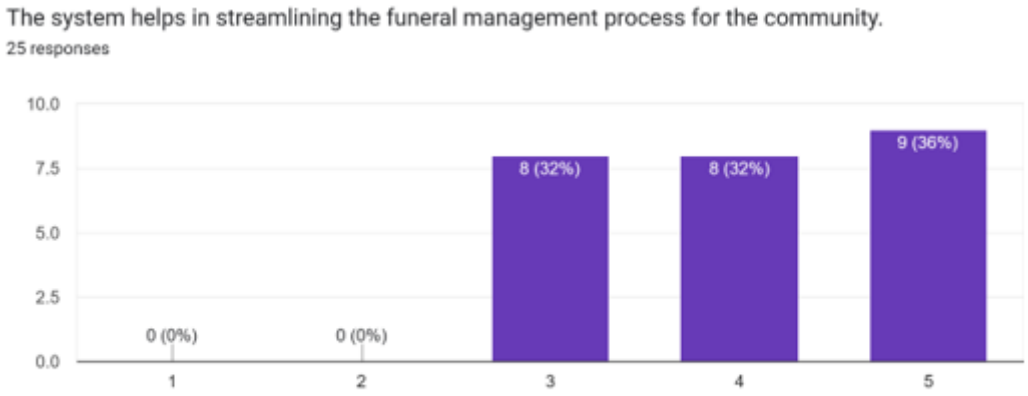




Figure 5.13: Result of Questions UAT

A total of 88% of respondents acknowledged that the system has improved the efficiency of managing and updating burial records. Specifically, 48% rated this feature with a 4, and 40% gave it the highest rating of 5. Only 12% responded neutrally with a score of

3, and no respondents provided negative ratings. This indicates strong satisfaction with the administrative efficiency enabled by the platform.

Regarding technical performance, 88% of users also reported a smooth interaction experience without encountering errors or major issues. A majority of 60% rated it as 4, while 28% gave a perfect score of 5, and 12% remained neutral at 3. The absence of low ratings suggests that the platform is stable and reliable for most users during their interaction.



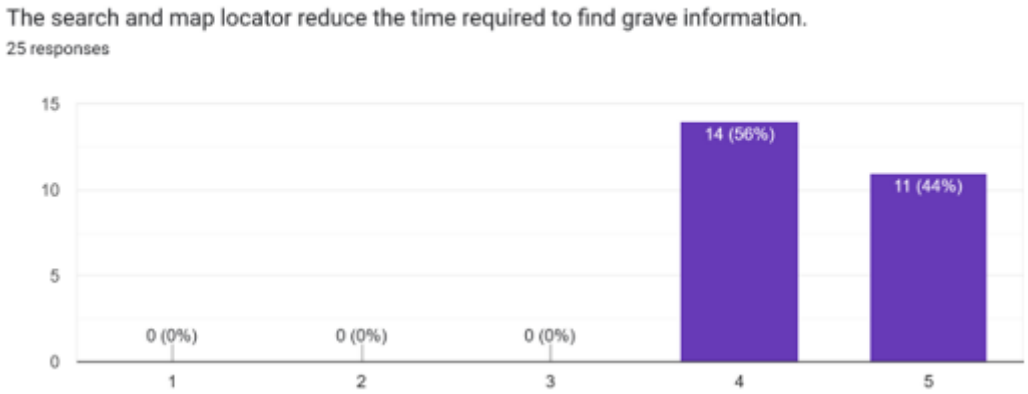
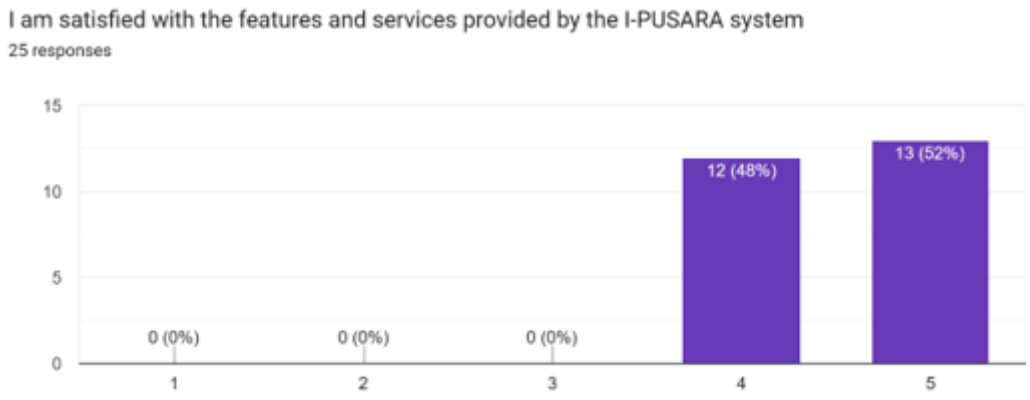




Figure 5.14: Result of Questions UAT

In evaluating how well the system streamlines funeral management for the community, 68% of respondents expressed strong agreement, with 32% selecting 4 and 36%

selecting 5. Another 32% responded neutrally with a score of 3, and no users gave low ratings. This indicates a majority perception that the system contributes positively to improving funeral management efficiency.

All respondents (100%) agreed that the search and map locator feature significantly reduced the time required to find grave information. Among them, 56% gave a rating of 4, and 44% gave a perfect score of 5, demonstrating unanimous approval of this functionality and its impact on accessibility.



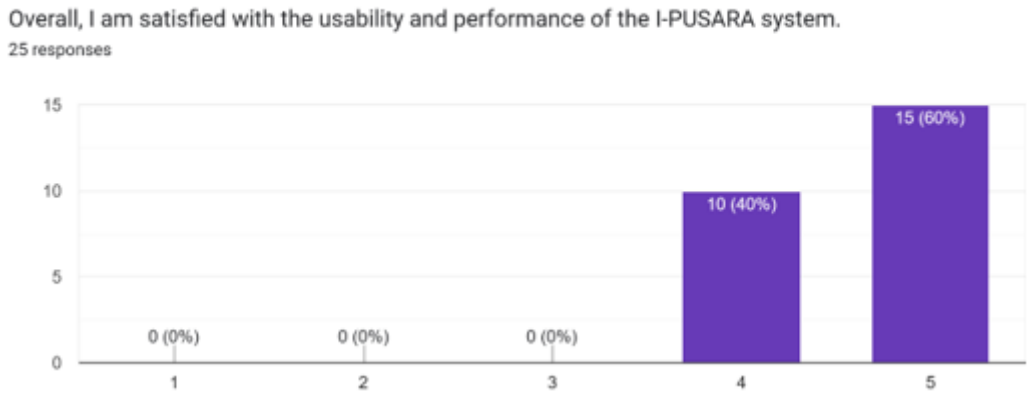




Figure 5.15: Result of Qustions UAT

All respondents (100%) expressed satisfaction with the features and services offered by the I-PUSARA system. Specifically, 48% rated their satisfaction as 4, while the remaining 52% gave a perfect score of 5. This indicates full acceptance and appreciation of the system's service offerings.

Similarly, 100% of users reported being satisfied with the overall usability and performance of the system. Among them, 60% gave the highest rating of 5, and 40% selected 4, showcasing strong endorsement of the system's effectiveness and reliability.

**Qualitative Feedback:**

Respondents praised the system for its simplicity and accessibility, noting that the public interface required no login, which made it easy for the elderly and less tech-savvy users to use. However, some suggested adding more filter options to the search, such as the ability to filter by year or zone within the cemetery.

Administrators also requested future features like bulk data upload for easier onboarding of old records and a notification popup for unapproved funeral applications awaiting review.

## 5.5 Discussion on Challenges and Solutions

### 5.5.1 Data Integrity in JSON File Handling

One of the technical challenges was ensuring that concurrent file write operations did not corrupt the JSON files. This was mitigated by implementing a file-locking mechanism that prevents multiple write attempts at the same time.

### 5.5.2 Map Accuracy and Plot Alignment

Initial exports from QGIS had minor misalignment issues due to projection mismatches between QGIS and Leaflet. This issue was resolved by converting the coordinate system from EPSG:3857 (Web Mercator) to EPSG:4326 (WGS84), which Leaflet uses.

//masukaan gambar

### 5.5.3 User Accessibility

During early testing, some community members, particularly elderly users, struggled with the map interface. Adjustments such as larger fonts, simplified buttons, and clear popup labels were implemented to improve accessibility.

### 5.5.4 Scalability Consideration

While the JSON-based storage worked well for the scale of Kg Bako, it was noted that future expansions to multiple cemeteries or larger datasets may require migration to a relational database like MySQL or PostgreSQL for better data handling at scale.

## 5.6 Achievement of Project Objectives

**Objective 1: Identify and analyze user requirements by engaging with the community.**

Achieved through surveys, interviews, and consultations with PTIB, which directly informed the feature design and prioritization.

**Objective 2: Implement an admin dashboard for CRUD operations and approval workflows using JSON-based storage.**

Fully achieved. Admins can add, update, delete records, and approve funeral applications with a lightweight file-based backend.

**Objective 3: Develop an interactive grave locator using QGIS and Leaflet.**

Successfully implemented. The grave locator accurately displays plots, responds to searches, and provides interactive popups with burial information.

## 5.7 Impact on the Community

The successful deployment of I-PUSARA has introduced significant improvements in funeral management for the Kg Bako community. Families can now locate graves quickly, administrators can process funeral applications digitally, and the entire community benefits from increased transparency and access to timely information. The digitization of cemetery

data preserves historical burial information, ensuring it is maintained accurately for future generations.

## 5.8 Chapter Summary

This chapter outlined the results from system functionality evaluation, pilot deployment, and user acceptance testing. The discussion highlighted that the I-PUSARA platform successfully meets the project's objectives and addresses the longstanding challenges of manual funeral record management in Kg Bako. The combination of JSON-based data handling, an interactive grave locator, and a user-friendly admin dashboard has proven effective. Feedback from UAT confirms the system’s reliability, usability, and community impact. Challenges identified during development were resolved effectively, paving the way for potential enhancements and future scalability.

# CHAPTER 6

# CONCLUSION AND FUTURE WORK

## 6.1 Project Summary

The development of the I-PUSARA Community Funeral Management Platform marks a significant milestone in the digital transformation of cemetery and funeral management for the Muslim community in Kg Bako, Kuching. This project was born out of a real and pressing need to improve how burial records are maintained, how funeral arrangements are managed, and how families can locate the graves of their loved ones with ease and dignity.

From the outset, the project was driven by three main objectives. The first was to understand and analyze the needs of the Kg Bako community by engaging directly with stakeholders such as PTIB administrators, cemetery management, and local residents. The second objective focused on developing an admin dashboard capable of handling CRUD operations for burial records, approving funeral service applications, and managing obituary postings using a lightweight JSON file-based backend. The third was to implement an interactive grave locator utilizing QGIS and Leaflet, enabling users to visually identify and locate burial plots within the Kg Bako cemetery.

The project successfully achieved all these objectives. The system provides an efficient admin dashboard restricted to authorized personnel, where PTIB administrators can manage deceased records, verify funeral applications, and publish community news or obituaries. Simultaneously, the public-facing interface offers an accessible burial plot locator and a search system that does not require user login, ensuring ease of use for the community, especially the elderly or those less familiar with technology.

One of the most significant achievements of this project was the complete digitization of Kg Bako's cemetery plot using QGIS, which was seamlessly integrated into a web interface powered by Leaflet and GeoJSON. This feature allows users to click on any burial plot and retrieve detailed information about the deceased, including their name, date of death, and plot number. Furthermore, the project managed to convert messy, unstructured data from manual Excel sheets into a clean, organized, and interactive digital database.

Beyond technical success, the project has demonstrated its real-world impact. The pilot deployment in Kg Bako showed that the system greatly reduced the time and effort required for both administrators and the public to manage and access burial information. Feedback from users confirmed the platform's utility, accuracy, and ease of use, with overwhelmingly positive responses during the User Acceptance Testing (UAT).

## 6.2 Chanllenges and Lessons Learned

Like any development project, I-PUSARA faced a range of challenges throughout its lifecycle. One of the most prominent technical challenges revolved around data handling using JSON files. Unlike relational databases, JSON file storage lacks built-in concurrency management, raising concerns over data integrity when multiple administrators accessed the same file simultaneously. This issue was resolved by implementing a file-locking mechanism that prevented overlapping write operations, ensuring data consistency even under concurrent use.

Another challenge was related to the GIS component of the system. Initial exports from QGIS did not align correctly on the web map due to projection mismatches between the QGIS coordinate system and Leaflet's map rendering engine. Through several rounds of

troubleshooting, this issue was resolved by converting the spatial data to the correct EPSG:4326 (WGS84) projection, ensuring the burial plots aligned perfectly on the map.

The project also faced hurdles with data quality. The raw burial data provided was unstructured, inconsistent, and in many cases incomplete. Extensive data cleaning was required to standardize plot numbers, names, and dates before the information could be imported into the system. While time-consuming, this process underscored the importance of having clean and reliable data for any digital transformation effort.

On the human side, ensuring accessibility for all users, especially elderly members of the community, was a critical consideration. Feedback from early testers led to UI adjustments, including larger text, simplified buttons, and clearer instructions, greatly enhancing usability.

Despite these challenges, the development process provided an invaluable learning experience. The technical challenges strengthened my understanding of geospatial data handling, web development frameworks like Laravel, and JSON-based storage systems. It also deepened my appreciation for the importance of user-centered design, particularly when deploying digital solutions in close-knit communities with diverse levels of digital literacy.

More importantly, the project demonstrated how technology can serve not just functional needs but also cultural and religious values. Building a platform that respects Islamic funeral practices while delivering technological efficiency required careful consideration, fostering a deep understanding of how to blend cultural sensitivity with software design.

## 6.3 Future Enchancements

While the current implementation of I-PUSARA has successfully served the needs of the Kg Bako community, the project's scalability presents an exciting future direction. A significant next step is the planned collaboration with the Jabatan Agama Islam Sarawak (JAIS). This collaboration aims to extend the platform beyond Kg Bako to serve multiple cemeteries across Sarawak, enabling centralized digital management of burial records for the entire Muslim community in the region.

To support this scalability, one of the immediate technical priorities is the migration from JSON-based storage to a robust relational database such as MySQL or PostgreSQL. This upgrade will allow the system to handle larger datasets, manage complex queries efficiently, and ensure data integrity across multiple cemetery records.

In addition, future development will include the creation of a mobile application, providing on-the-go access to the burial plot locator, search functions, and funeral service applications. This will be especially useful for families visiting cemeteries or administrators working remotely.

Another planned enhancement is the implementation of automated notification systems. For example, families could receive SMS or email updates when funeral applications are approved or when new obituary notices are posted.

A more long-term vision includes building a digital heritage archive, allowing the system to store not only burial records but also photographs, historical documents, and stories related to the deceased, contributing to the preservation of community heritage.

Finally, to accommodate Sarawak's diverse linguistic communities, the addition of multilingual support is highly recommended, with interfaces available in Bahasa Melayu, English, Iban, and Bidayuh, ensuring inclusivity for all users.

## 6.4 Final Remarks

Reflecting on this journey, the development of I-PUSARA has been more than just a technical project. It has been an exploration of how digital solutions can preserve traditions, enhance community services, and bridge the gap between technology and culture. The process of engaging with the Kg Bako community, understanding their needs, and translating those needs into a functional digital platform has been both rewarding and deeply meaningful.

This project has highlighted that technology, when developed with empathy and cultural understanding, can significantly impact how communities preserve their history and manage vital services. The overwhelmingly positive reception from both administrators and the public during the pilot deployment reinforces the belief that the system is not only functional but also transformative for how the community manages its burial records and funeral services.

As the project moves forward with plans to collaborate with Jabatan Agama Islam Sarawak (JAIS), I-PUSARA is poised to become a cornerstone in the digitization of cemetery management throughout Sarawak. This expansion will not only improve operational efficiency but also ensure that the cultural and religious values of the Muslim community are upheld in the digital age.

In closing, the I-PUSARA project stands as a testament to the power of community-centered technology. It represents the fusion of tradition with innovation, offering a solution

that is practical, respectful, and sustainable. The lessons, skills, and relationships gained through this project will continue to guide future initiatives, serving as a reminder that technology can be a profound force for good when built with purpose and care.

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# APPENDICES