Design and Development of a Web-Based Mosque Management Information System: A Case Study of Darul Amal Mosque

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Abstract

Many mosques in Indonesia face challenges in managing their operational activities, such as construction donations, donations to orphans, funeral donations, and religious assemblies as well as other financial administration. Conventionally, the recording of these activities is still done manually through financial recording in books and socializing the information using loudspeakers or utilizing mosque bulletin boards. To overcome these limitations, this research proposes the development of a Web-based Mosque Management Information System that aims to improve operational efficiency, transparency, and accessibility. The system was developed by taking a case study at Darul Amal Mosque which is a mosque in West Sumatra, Indonesia. The system was developed using PHP programming language and Laravel framework, with an online donation feature that allows donors to make donations without the need to be physically present. The research successfully developed a mosque management platform as expected. And it has been proven that a centralized and easily accessible online management process facilitates financial management, improves services to worshipers and donors, and provides better accountability in mosque operations.

Keywords: Management Information System, Transparency, PHP, Laravel Framework, Online Donations.

1. Introduction

The rapid advancement of information and communication technology has successfully helped various aspects of human activity. In a fast-paced world, everyone is trying to find solutions to complete tasks in a short time, accurately, and produce high-quality output. Information technology has become an integral part of almost all areas of life, ranging from education, health, government, business, to social services. This is due to its ability to process data efficiently and effectively, meeting standards of speed and accuracy. In addition, this technology allows various processes that were previously done manually to be automated, thereby increasing productivity, reducing human error, and expanding the range of services.

The impact of the use of information technology can not only be felt by large institutions and corporate organizations, but also benefits community-based communities, including religious, social, and cultural institutions [1]. Communities are now starting to adopt information technology to manage administration, finance, communication, and services to their members. This shows that technology adoption is no longer a secondary need, but has become an important component in improving efficiency, transparency, and service quality at various organizational scales, including community-based organizations.

The mosque is not only a place of prayer for Muslims, but also acts as a center for religious education, community empowerment, and a center for social activities. In addition to prayers, formal and informal activities that take place in mosques include organizing an Al-Quran schools (TPQ), organizing religious meetings for mosque congregations, monthly fundraising activities for various purposes such as social assistance, operational costs such as honorarium for mosque guards (Garin), and mosques are also used to distribute routine daily and or weekly announcements [2]. The number of these

activities makes the mosque an important means of strengthening social relations, a center for educating the younger generation, and encouraging the involvement of the worshipper community in religious life as well as social activities.

However, the management of these activities does not always run smoothly and has opportunities to be improved and developed. As a case in point, Darul Amal Mosque, located in Bunga Mas Phase 3 housing complex, Koto Panjang Ikua Koto, Koto Tangah Sub-district, Padang City, West Sumatra, faces various challenges in managing its activities. These challenges include managing funeral assistance, orphan compensation, financial recording and reporting, and organizing religious studies. Currently, the mosque still relies on manual methods in financial recording and activity management, while information dissemination is done through loudspeakers, mosque notice boards or printed invitations sent manually to neighboring residents. This condition is not only inefficient, but also makes it difficult for administrators to optimally allocate time and resources for mosque management.

This research was conducted to overcome this problem. In this research, the development of a web-based Mosque Management Information System is proposed. This system is designed to be accessed by mosque administrators anytime and anywhere, utilizing PHP-based technology and the Laravel framework. It is expected that this system will simplify various administrative processes of the mosque, ranging from financial records, management of activities, to dissemination of information to worshipers. With the implementation of this system, mosque administrators can manage all activities more effectively, efficiently, transparently, and improve the quality of service to worshipers and the surrounding community.

As a system that functions to generate, manage and distribute information, understanding the basic concepts of systems and information is important. Information systems are not just software, but an integration of technology, procedures, and human resources that work together to produce relevant and useful information for organizational decision-making and management. Therefore, a systematic approach in the design and implementation of information systems in the mosque environment is a must to ensure that the goal of modernizing mosque management can be achieved optimally [3].

Several studies have been conducted to support the development of web-based mosque management information systems. Siregar, Suharjo, and Oktavia [4] developed a comprehensive mosque management system for Masjid Al-Ikhlas, which features financial management, activity scheduling, and reporting modules, aiming to facilitate the digital administration of mosque affairs. Similarly, Rahman [5] utilized the waterfall development method to build a web-based information system for Masjid Al-Ikhsan Belik, focusing on documenting activities and financial reporting. Octavianti [6] also proposed a web-based cash management system for Baitul Hikmah Mosque, emphasizing efficiency in financial documentation and transparency.

Sitorus and Silalahi [7] introduced a web-based administrative system tailored for Asy-Syuhada Mosque in Batam, which improves data management and administrative workflows. Rahmawati [8] contributed to the enhancement of mosque information dissemination by implementing a web-based application following the System Development Life Cycle (SDLC) methodology. Meanwhile, Firdaus et al. [9] focused on increasing community access to mosque activities by designing a website-based information system for Masjid Ar Rahman.

A broader approach was adopted by Imawan, Eosina, and Primasari [10], who developed a management system for Baiturrahman Mosque that includes qurban savings features and announcements of mosque events, offering a more community-centered design. On the frontier of smart mosque development, Blasi et al. [11] proposed an intelligent dome control mechanism using CSRNet and fuzzy logic, aimed at enhancing the comfort of worshippers through automated movement of mosque domes. In a related effort, Al Lababede et al. [12] applied machine learning algorithms to develop a ventilation system embedded in mosque domes, showcasing the integration of AI in mosque infrastructure.

Furthermore, Zamroni and Fahana [13] implemented the MVC (Model-View-Controller) framework in the development of a web-based mosque information system to streamline the modification and scalability of system features. This architectural pattern enables clearer separation of logic and presentation, which is crucial for maintainable and extensible systems.

This paper is methodically organized to lead the reader through the study process and findings in a coherent and logical fashion. The introduction commences by providing the study's history and delineating various fundamental theoretical frameworks that underpin the investigation. The

introduction aims to establish the topic's relevance and context while identifying the research gap being addressed. The methodology section delineates the approach, instruments, and processes employed in the investigation, so assuring reproducibility and transparency. The results and discussion section thereafter delivers the findings and interprets them in accordance with the previously articulated theories and aims. Ultimately, the essay culminates in a conclusion that encapsulates the primary findings of the study and offers insights into their ramifications, along with prospective avenues for further research.

1.1 *MySQL*

MySQL is a widely-used open-source Relational Database Management System (RDBMS) that stores data in structured tables and allows efficient data management through SQL (Structured Query Language). SQL is a standard programming language used to create, read, update, and delete data within relational databases. MySQL functions not only as a query language but also as a server that handles multiple databases simultaneously. It plays a crucial role in web development, particularly when user data is submitted through HTML forms and processed using server-side languages like PHP. In this context, PHP captures input data and interacts with MySQL to store or retrieve data using SQL commands. Known for its speed, reliability, cross-platform compatibility, and strong integration with PHP, MySQL remains a core component in dynamic web applications [14].

1.2 *Framework*

A framework is a pre-built set of tools, components, and libraries that provide a standardized way to build and organize software applications. Rather than writing repetitive and redundant code for every new project, developers can utilize frameworks to streamline development processes and improve code consistency. At its core, a framework contains a structured collection of classes, functions, and predefined logic that can be reused across different parts of an application. This allows for faster development, easier maintenance, and better scalability. Additionally, frameworks enforce best practices and architectural patterns such as separation of concerns, modularity, and code reusability. By offering these built-in features and guidelines, frameworks reduce the likelihood of bugs and security vulnerabilities while enhancing collaboration among development teams. Whether for frontend, backend, or full-stack development, frameworks serve as a foundation upon which robust and efficient applications are built [15].

1.3 *Laravel*

Laravel is an elegant and expressive PHP-based web application framework that simplifies the process of developing modern web applications. Introduced by Taylor Otwell in 2011, Laravel is built upon the Model-View-Controller (MVC) architectural pattern, which promotes the separation of business logic, user interface, and data management. One of Laravel's distinguishing features is its refined routing system, which acts as an intermediary between HTTP requests and controller logic. Unlike traditional MVC frameworks where the controller may directly handle incoming requests, Laravel introduces a routing layer that improves request handling and enhances flexibility in defining application behavior. Laravel also includes a powerful templating engine (Blade), an ORM (Eloquent), middleware, authentication scaffolding, and robust tools for database migrations and unit testing. Its developer-friendly syntax and rich ecosystem of packages make it a preferred choice for PHP developers aiming to build scalable, secure, and maintainable web applications [15].

1.4 *Bootstrap*

Bootstrap is a widely adopted front-end development framework that facilitates the design and development of responsive and visually appealing web interfaces. Originally developed by Twitter, Bootstrap offers a comprehensive suite of pre-designed HTML, CSS, and JavaScript components that significantly reduce the time required to develop a modern website or web application. Its core philosophy revolves around the principles of responsiveness and mobile-first design, allowing developers to create layouts that adapt seamlessly to different screen sizes and devices. Bootstrap includes a grid system, typography tools, form controls, navigation elements, and interactive components such as modals, dropdowns, and carousels—all of which can be customized to fit the branding and functional needs of a project. Due to its simplicity, consistency, and compatibility with all major browsers, Bootstrap has become one of the most trusted and commonly used frameworks in

frontend web development. It empowers developers, including those with limited design experience, to build professional-grade UIs with minimal effort [16].

2. Method

The methodology used in the process of collecting information data needed for this research is the waterfall method. Definition of the waterfall method is often called the classic life cycle, which describes a systematic and sequential approach to software development, not all waterfall stages used in the creation of this final project are only several stages used, namely the requirements analysis stage, the design stage (design), coding stage and testing stage of the waterfall method stage can be seen in the following description [17].

▪ Requirement Analysis

This stage of the system developer requires communication aimed at understanding the software expected by the user and the limitations of that software. Then collect data by conducting direct research in the form of interviews and discussions conducted with the management of the Darul Amal Mosque, then processed and analyzed so that complete data or information is obtained regarding the specifications of user needs.

▪ Design

At this stage, the application design is carried out based on the system function. This design includes databases, interface representations and coding procedures. This stage aims to design or make an overview of the information system of the Darul Amal Mosque that will be made so that it can be implemented into a program at the next stage.

▪ Coding (Implementation)

The implementation stage is translating the design in the form of a programming language that is understood by the computer. The result of this stage is a computer program according to the design that has been created at the design stage.

▪ Testing

At this stage, tests are carried out on the programs that have been created to find out the shortcomings of the programs that have been made.

2.1 Use Case Diagram

Use case diagrams describe the various actions or activities (use cases) that can be carried out by the actors involved in the system. This diagram provides a visual representation of the interactions between actors, such as users and systems, as well as the functions available within the system. In the context of the Darul Amal Mosque management information system, [18] the use case diagram is very important to illustrate how various actors, such as mosque administrators and donors, are involved. The management information system of the Darul Amal Mosque is seen in Figure 1.

A description of the actors involved in the use case diagram above can be seen in Table 1.

Table 1. Actor Description

No.	Actor	Description
1	Mosque Manager	Actors who have full access to manage The entire information system is built, starting from data input , data editing , data deletion and printing reports.
2	Donors	Actors who have access rights to add mosque donation data and view data mosque production

2.2 Class Diagram

Class diagrams are a type of diagram used in software modeling to illustrate the structure and relationships between classes in a system. This diagram is part of the Unified Modeling Language (UML) modeling language that is popularly used in software development [18]. Class diagram of the Darul Amal Mosque management information system can be seen in Figure 2.
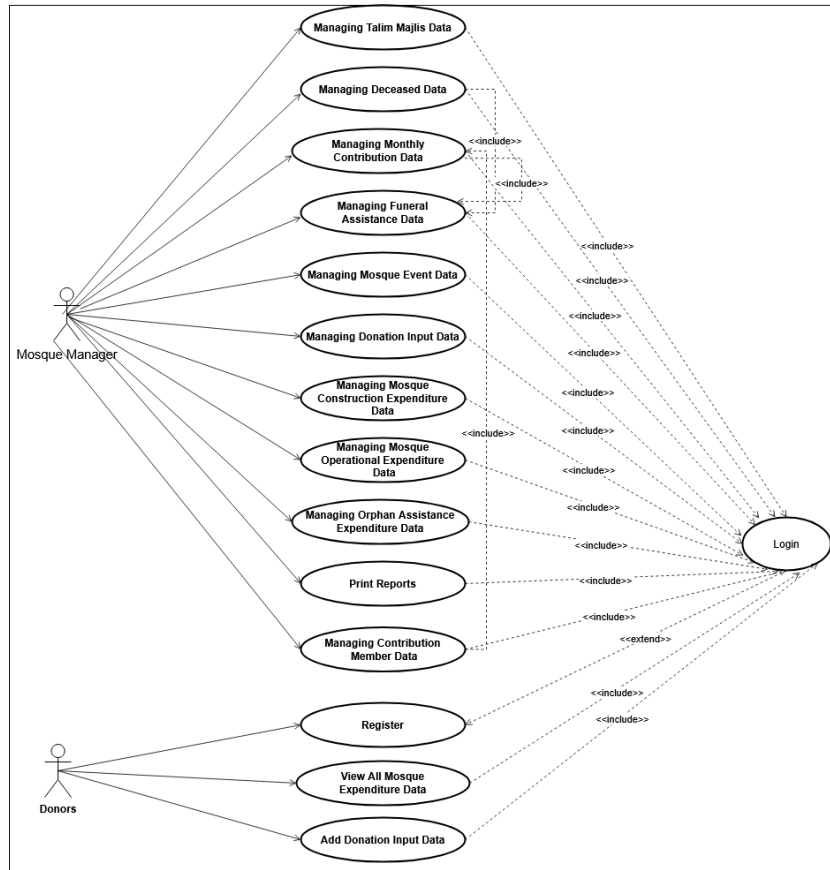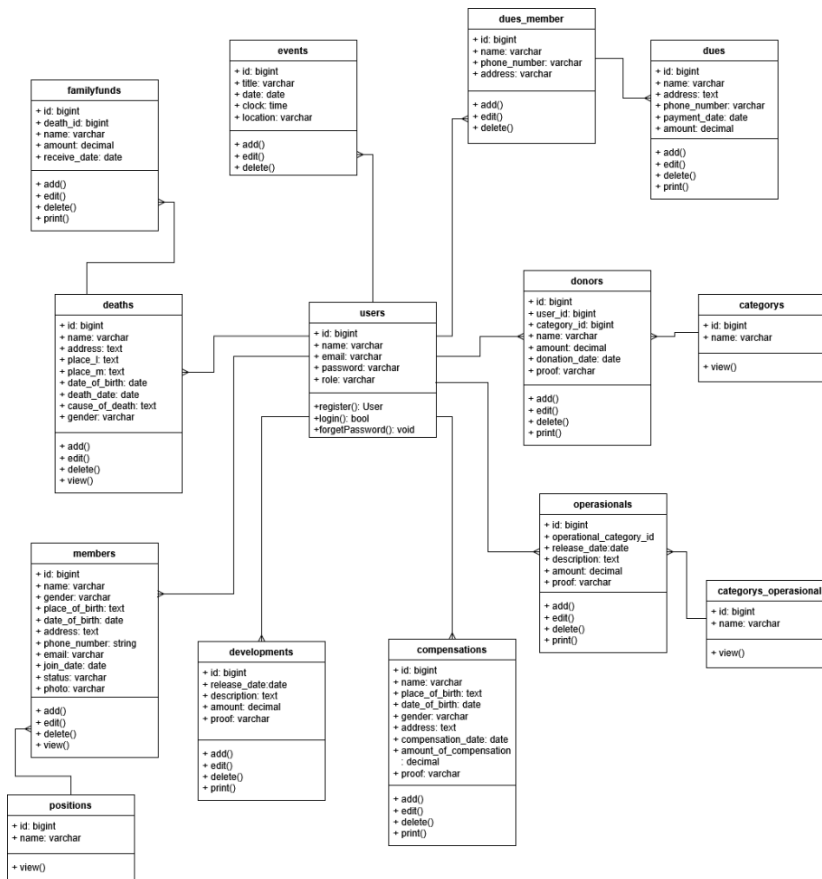
Figure 1. Use Case Diagram

Figure 2. Class Diagram

2.3   *Activity Diagram*

Activity diagram is a type of diagram in UML that can model what processes occur in the system. Activity Diagram is a technique for describing procedural logic, business processes, and work paths. In some ways, activity diagrams play a similar role to flowcharts, but the principle difference between flowchart notation is [18].

2.3.1 Activity Diagram for Mosque Administrators

The mosque management logs in, if the login data is incorrect, the mosque management cannot enter the system, then they must log in again, if the login data entered is correct, the mosque management can process the deceased's data, death compensation data, monthly contribution data, ta'lim assembly data, mosque activity data, donation fund input data, operational fund expenditure data, orphan compensation fund expenditure data, and development fund expenditure data. Mosque administrators can also print all reports on the system. Then the mosque administrator logged out of the system. The process of the mosque administrator's activity diagram can be seen in Figure 3.
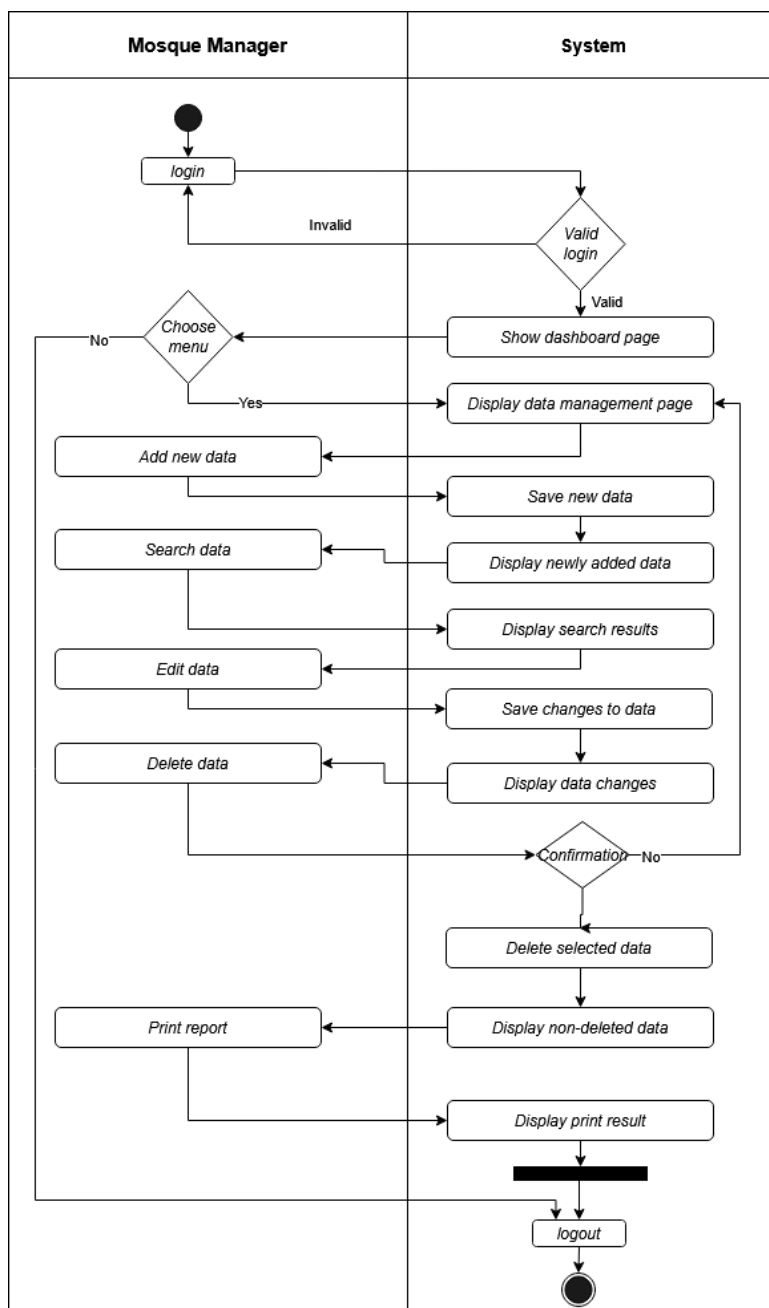

Figure 3. Activity Diagram for Mosque Administrators

2.3.2 Donor Diagram Activity

The donor registers first if he does not have an account by entering his name, email, password, and confirm password, after that the donor logs in, if the login data is incorrect, the donor cannot log in to the system, then he must log in again, if the login dataIf it is entered correctly, donors can process and edit donation fund income data and can see mosque expenses. Then the donor logs out of the system. The donor Activity Diagram process can be seen in Figure 4.
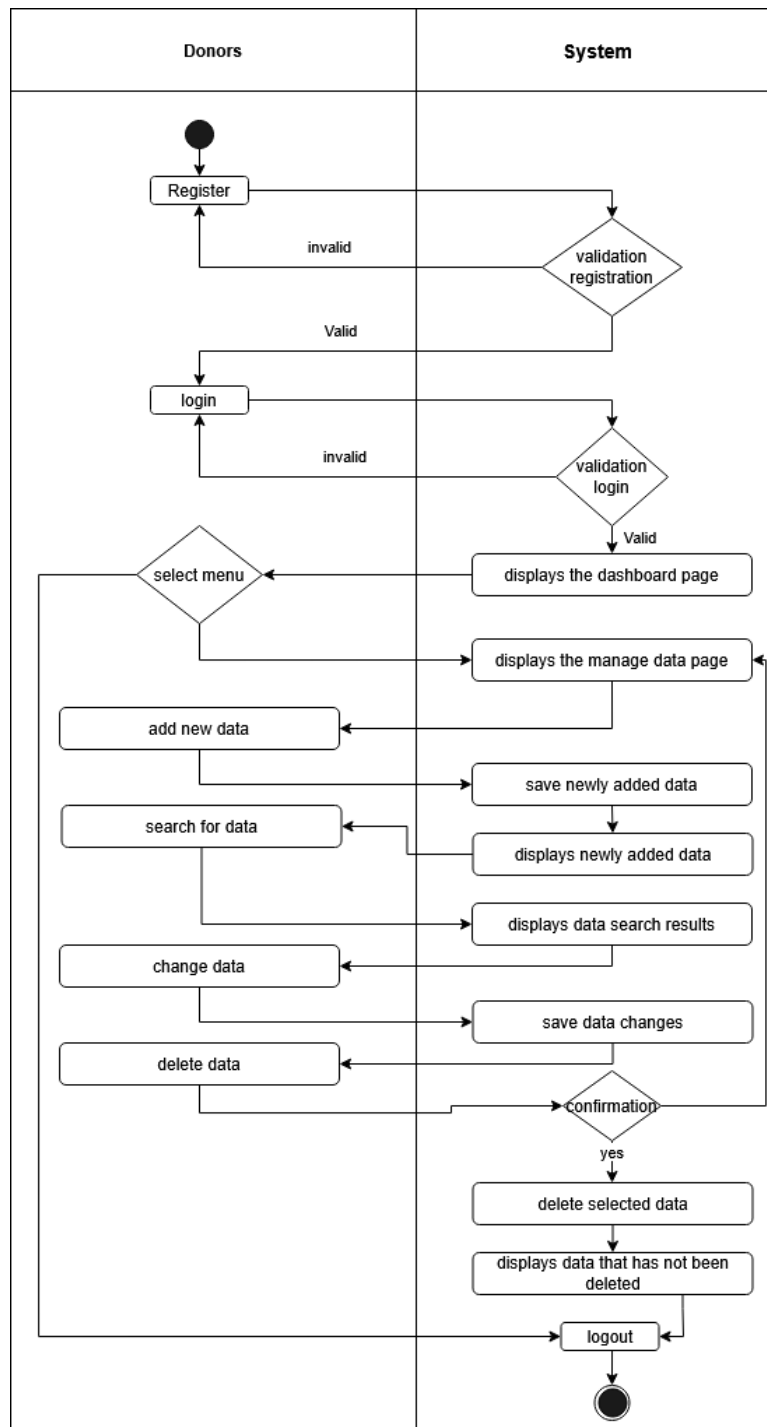

Figure 4. Donor Activity Diagram

3. Result and Discussion

The following are the results of the implementation of the Mosque Management Information System design.

3.1   Result

3.1.1 Website Home Page

The main page is the first page displayed when visiting the Darul Amal Mosque website. This page is designed to provide relevant and interesting information to visitors. The main page display can be seen in Figure 5.

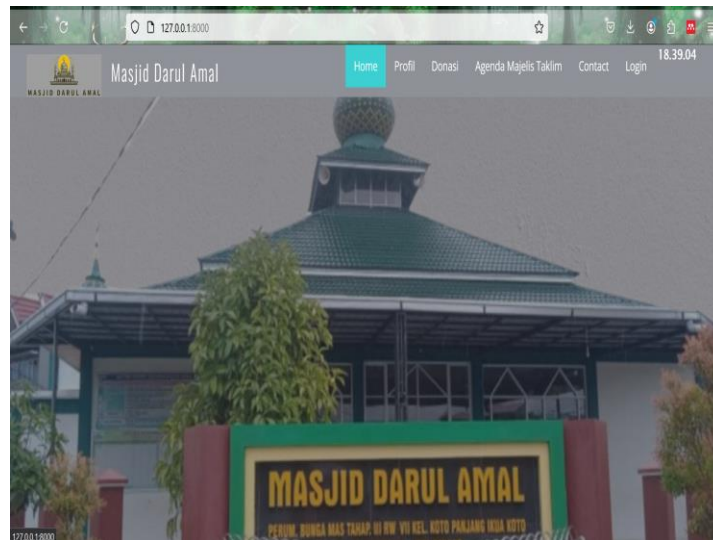Figure 5. Main Page

3.1.2 Mosque Management and Donor Login Page

The login page is a display provided to allow mosque administrators and donors who already have an account to log in to the system. On this page, users are asked to enter the email address and password associated with their account. Once valid login information is verified, mosque administrators and donors will be directed to the page that corresponds to their respective access rights. The login page can be seen in Figure 6.
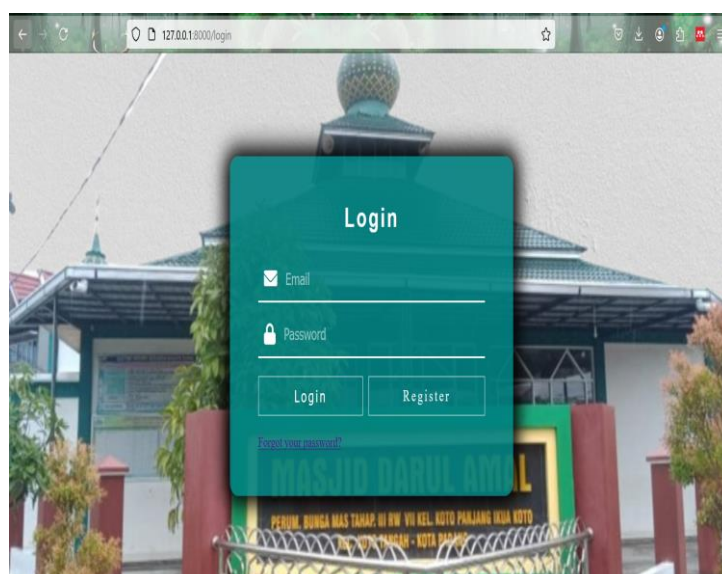

Figure 6. Login

3.1.3 Mosque Management and Donors Dashboard Page

The dashboard page is the main display provided for mosque administrators and donors after they successfully log in to the system. On this page, users can access information on the total mosque funds along with the graph. The dashboard display can be seen in Figure 7.
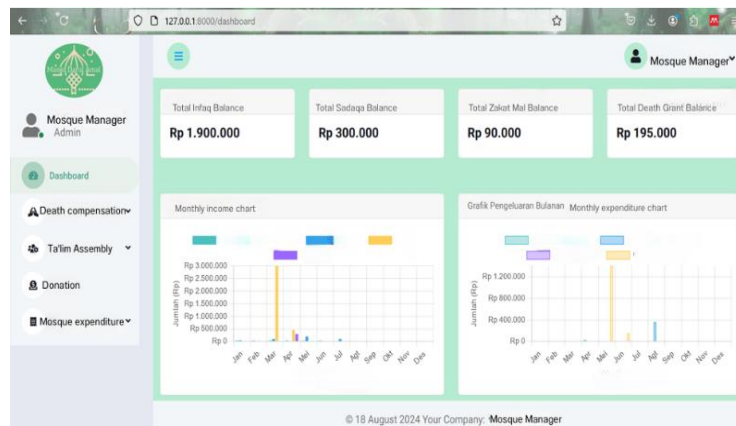
Figure 7. Dashboard

3.1.4 Ta'lim Council Member Data List Page

The list of members of the ta'lim assembly is designed to display information about the data of the members of the ta'lim assembly, on this page, the mosque administrator has access rights to add, change, view details, and delete member data as needed. With this feature, mosque administrators can easily manage member data, ensuring that the information available is always accurate and up-to-date. The page of the members of the ta'lim assembly can be seen in Figure 8.
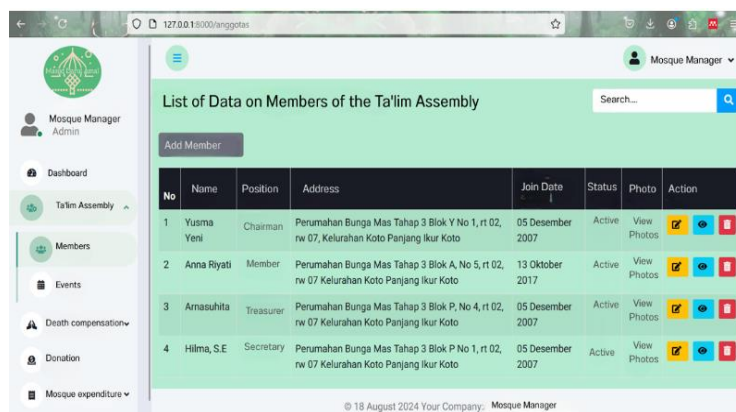

Figure 8. List of Data on Members of the Ta'lim Assembly

3.1.5 Ta'lim Assembly Event List Page

The list of events of the Ta'lim assembly is designed to display information about the event data of the Ta'lim assembly, on this page, the mosque management has access rights to add, change, and delete event data as needed. With this feature, mosque administrators can easily manage event data, ensuring that the information available is always accurate and up-to-date. The display of the list of Ta'lim assembly event data can be seen in Figure 9.

3.1.6 Deceased Data List Page

The list of the deceased is designed to display information about the deceased's data, On this page, the mosque administrator has access rights to add, change, view details, and delete the deceased's data as needed. With this feature, mosque administrators can easily manage the data of the deceased, ensuring that the information available is always accurate and up-to-date. The display of the deceased's page can be seen in Figure 10.

3.1.7 Death Compensation Fund Data List Page

The death compensation fund list page is designed to display information about compensation fund data for heirs, on this page, mosque administrators have access rights to add, change and delete compensation fund data as needed. With this feature, mosque administrators can easily manage death

compensation fund data, ensuring that the information available is always accurate and up-to-date. The display of the death compensation fund page can be seen in Figure 11.
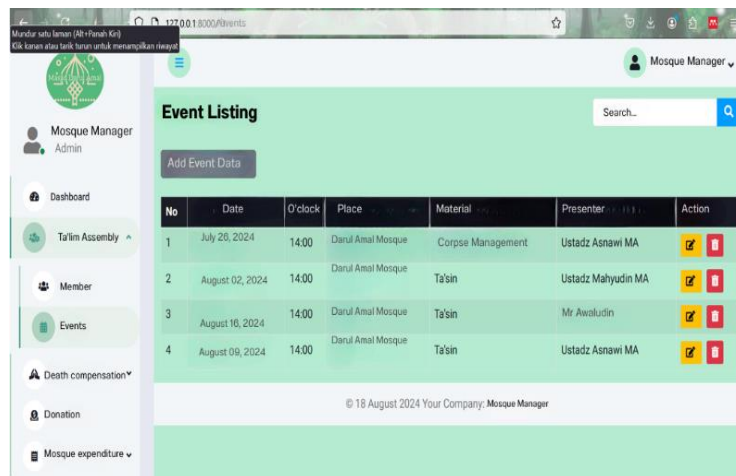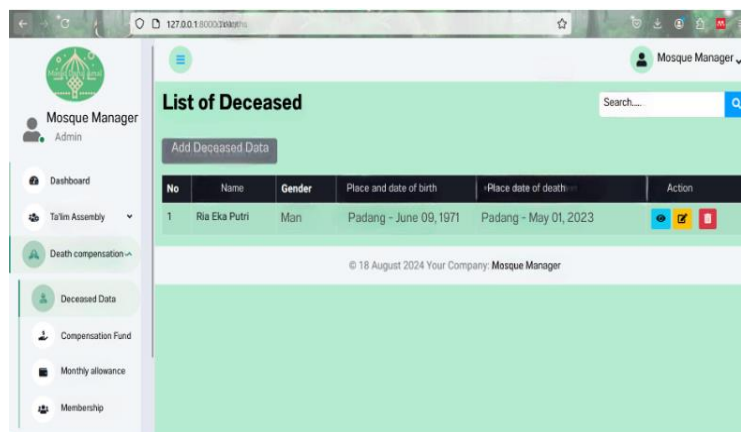

Figure 9. List of Events of the Ta'lim Assembly
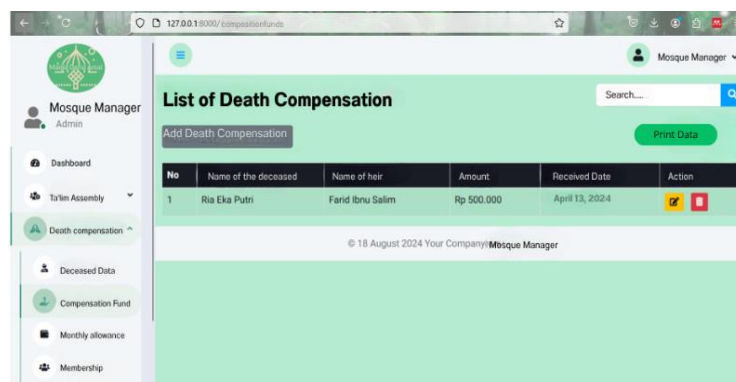

Figure 10. List of Deceased Data

Figure 11. List of Death Compensation Fund Data

3.1.8 Donor Donation List Page

The donation data list page is designed to display information about data that gives donations to mosques, on this page, donors have access rights to add, change and delete mosque donation data according to the donor's own data while donors cannot manage other donation data. With this feature, donors can easily manage donation data, ensuring that the information available is always accurate and up-to-date. The donation page can be seen in Figure 12.
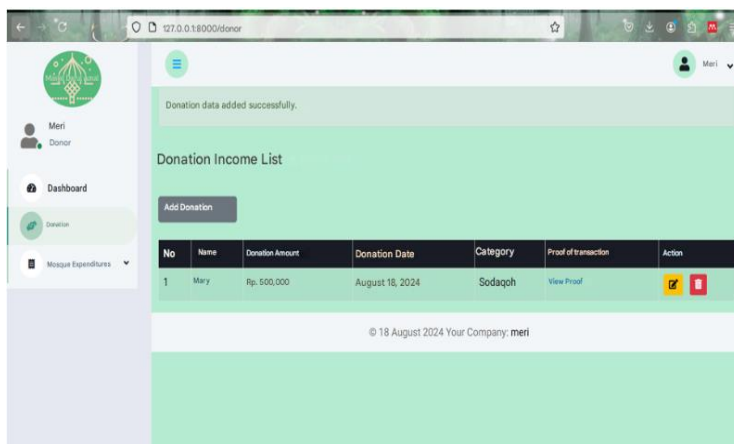
Figure 12. Donor Donation List

3.1.9 Print Data

Based on Figure 13, it shows that print donation data and other data if it is correct. Because before printing, the administrator selects the month and category that you want to print as shown in Figure 14.
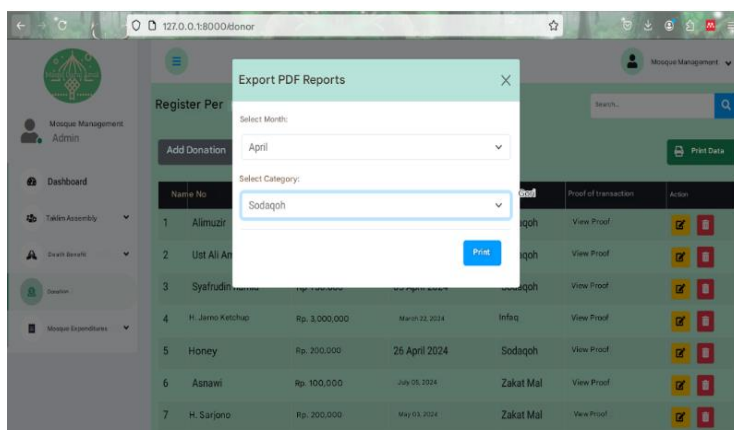

Figure 13. Month Display and Data Print Category
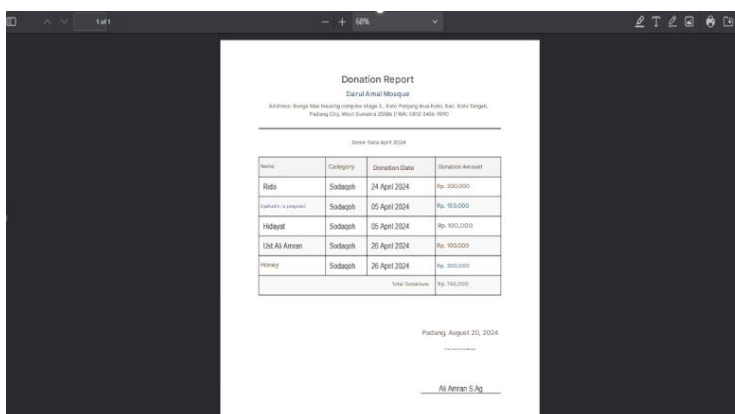
Figure 14. Print Data Display Successful

3.2 Discussion

The results of the tests that have been carried out on the system show that all system functions are running as expected. Starting from the login page, each user can access the system based on their respective roles, such as mosque administrators and donors. The data management system related to mosque operations, such as donations, death records, and compensation for orphans, has also been successfully implemented (Table 2).

Table 2. Experimental Test from User

Test Case	Role	Test Description	Expected Outcome	Result
Login Functionality	Administrator, Donor	Users log in with correct credentials based on their assigned roles.	Access granted to appropriate dashboard features.	Pass
Donation Management	Administrator	Add, edit, and view donation records.	Data saved accurately and displayed in the donation report.	Pass
Orphan Compensation Records	Administrator	Register, update, and view compensation records for orphans.	Records stored correctly and accessible in the system.	Pass
Death Record Management	Administrator	Add and update death records with associated details.	Data saved without errors and available in system reports.	Pass
Sermon Schedule Information	Administrator, Donor	Display sermon schedule on user dashboard.	Schedule displayed based on current and upcoming events.	Pass
Notification System	Administrator, Donor	Send announcements via the system.	Notifications sent to all users based on selected criteria.	Pass
User Role Restrictions	Donor	Verify that donors cannot access administrative features.	Donor dashboard restricted to donation-related features.	Pass
System Responsiveness	All Users	Access system via mobile and desktop browsers.	System layout adapts appropriately to the device screen size.	Pass

The integration of the system for the management of monthly contributions and death compensation funds has also been successfully implemented, allowing mosque administrators to add, change, and delete data easily. Any changes made to the data will bring up a notification, and any deletion of the data will require prior confirmation, ensuring that the deletion was done correctly. The test also shows that all the implemented features, such as development data management, operations, and data printing, run according to the planned test scenario.

4. Conclusion

Based on the description and discussion in the previous chapters, the following conclusions are emphasized:

- The Darul Amal Mosque Management Information System integrates donation management and mosque expense tracking, allowing donors to manage their donation data and view financial transactions transparently.
- The system's reporting feature facilitates the generation of monthly financial reports in PDF format, enhancing transparency and efficiency in mosque financial management.
- Role-based access control is implemented, distinguishing between mosque administrators and donors, ensuring structured, efficient, and secure data management.
- Mosque administrators can efficiently manage donations, including zakat, alms, and infak, as well as organize ta'lim activities, death compensations, orphan compensations, and mosque expenses within a single integrated system.
- The system is developed using the Laravel framework and MySQL database, ensuring ease of access, implementation, and maintainability for mosque administrators.

- This system significantly improves transparency, efficiency, and accessibility in managing mosque finances and administrative tasks, ultimately supporting better financial governance and community engagement.

The system still has a lot to develop from this system. Therefore, it is hoped that the system can be the basis for the development of the next system. Here are some suggestions for the development of the next system:

- For further development, it is hoped that the system in the menu section of the ta'lim assembly can add to the monthly cash menu and expenditure menu.
- For further development, it is hoped that this system will add a monthly cash feature to the ta'lim assembly menu.
- In the next development, it is expected to pay attention to data security aspects by implementing strict encryption systems and access controls to protect sensitive information.
- For further development, it is hoped that the system in the death sharing menu can add a feature to spread the death sharing event.

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