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Design of a Web-Based Mosque Cash Management Application

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Abstract−The development of applications and information systems is crucial for improving work productivity. The cash management at Al Azhar Mosque is still done manually, recording all incoming and outgoing transactions in a cash book. This method is inefficient and does not help the treasurer to be more productive. Preparing reports requires extensive record-keeping, which is time-consuming and prone to errors. No application allows the Treasurer and Chairman of Al Azhar Mosque to view financial reports of the mosque's cash. A web-based mosque cash application is expected to assist the treasurer in recording and generating financial reports more efficiently. This application is built using the waterfall method as a foundation, utilizing Unified Modeling Language (UML) and programming languages such as PHP, CSS, and JavaScript, supported by a MySQL database. The result of this application is an online-accessible mosque financial report with valid and continuously updated data, such as mosque cash, social cash, cash recaps, and cash reports.

Keywords: Cash; Application; Waterfall; Unified Modelling Language (UML); PHP; MySQL

1. INTRODUCTION

Information technology has evolved rapidly to meet the needs of a wide range of people for access to information [1][2]. The use of information technology has succeeded in accelerating services and improving educational services for the community [3]. Information plays an important role for individuals, companies, and institutions. With the advancement of time, information has now moved to the digital realm, where data that was previously processed traditionally can be managed using computer technology [4]. Data that used to be stored in books and physical formats can now be processed and stored in digital formats [5]. The use of websites as a medium for disseminating information is one of the forms of information technology utilization in the fields of education, economy and society.

With the development of technology that supports education, the economy and society, many people are using the Internet as a way to share information. The dissemination of information through the Internet is not only limited to the educational, economic and social fields [6]. Web-based information systems offer additional benefits to their users by supporting a wide range of activities. Information systems to support learning have become the norm in modern educational institutions [7].

A website is a collection of web pages integrated with a single domain on the Internet that are designed with a specific purpose to be interconnected and widely accessible through the Web [8] [9]. The types of websites include the simplest, which consists of only a few static HTML pages, and dynamic websites that are built through programs and accessible to everyone [10] [11]. Web-based apps can be found in browsers such as Chrome, Opera Mini, Safari, Mozilla Firefox, and Microsoft Edge [12].

The Al Azhar Padang Grand Mosque has become an icon of worship for Muslims in Padang City, West Sumatra. In addition to worship activities, this mosque also organizes various religious and social community activities. With a large operational scale and a variety of activities, financial management is an important aspect that requires special attention. However, the cash management process at the mosque is still carried out manually, recording income expenses and making financial reports. This manual system is vulnerable to the risk of calculation errors, inefficient recording, and the difficulty of tracking transaction history accurately and in real time. To overcome this problem, the desired solution is to build a web-based cash processing application. This application is designed with user needs in mind and features that can facilitate the process of recording, reporting, and monitoring cash flow transparently and in real-time.

Research conducted by Manja Purnasari et al. (2022), titled "Design of a Web-Based Mosque Fund Management Information System Using Unified Modeling Language (UML)," found that a computerized information system would facilitate fund management tasks and create accurate, fast, and detailed reports, thereby enhancing mosque fund management.

The second study by Okta Ainun Angraini Sitorus and Mesri Silalahi (2001), titled "Design and Development of a Web-Based Mosque Administration Information System at Asy-Syuhada Mosque in Batam City," found that the system was well-designed to meet needs and ease the work of mosque administrators.

The third study by Muh. Syahlan et al. (2021), titled "Design of a Web-Based Financial Management and Zakat Collection Application at the Great Mosque of Pangkep," found that this application design could help mosque administrators manage and organize mosque funds. Additionally, it greatly assisted the zakat committee

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in receiving zakat from muzakki and distributing it to eligible recipients while also providing fast and accurate information.

The fourth study conducted by Cut Keumala Zuhra et al. (2022), titled "Web-Based Mosque Cash Recording System," concluded that the Web-Based Mosque Cash Recording System could record mosque cash inflows and outflows and display up-to-date cash recording information accessible to the public.

This research aims to build a web-based cash management application specifically designed to meet the cash management needs of the Al Azhar Grand Mosque, Padang, West Sumatra. It is hoped that this application can increase efficiency, accuracy, and transparency in the process of recording, reporting, and monitoring cash flow. Thus, the entire financial management process can run more effectively, accountably, and reliably, thereby increasing public trust in the management of funds by the mosque.

2. RESEARCH METHODOLOGY

2.1 Research Stages

Researchers use information collection methods to obtain research data from various sources, including research subjects and samples [13]. A research tool that will support the design of a research application is required. Proper data collection techniques and proper research tools are essential for producing accurate and trustworthy data [14]. The Al Azhar Grand Mosque is located in West Tawar, North Padang District, Padang City, and West Sumatra. Qualitative research, with literature studies, observations, interviews, and document analysis, is used to develop new concepts or theories.

2.2 Stages of the Waterfall Method

One of the most commonly used Software Development Lifecycle (SDLC) methods when building information systems or software is the waterfall model. In this waterfall model, there are five main stages: requirement, design, Implementation, Verification, and Maintenance. This waterfall model uses a systematic approach. The waterfall method is used by researchers in this study to assist in the development of school management application systems [15].

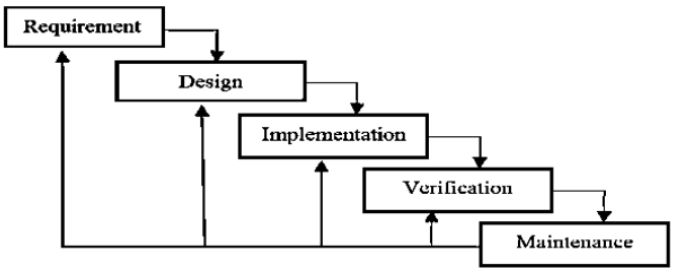

Figure 1. Waterfall Method

Figure 1. The above shows an explanation of the methodology, which consists of various stages that can be explained as follows:

1. Requirement Stage: The first stage is a requirement, where the requirements and specifications of the system are carefully collected and analyzed.
2. Design Stage: Next is the Design stage, where the system design and application architecture are detailed based on pre-defined requirements.
3. Implementation Stage: The third stage is Implementation, where application development is carried out according to a pre-prepared design.
4. Verification Stage: The next stage is Verification, where the system is tested to ensure that it works as desired and according to its specifications.
5. Maintenance Stage: The last stage is Maintenance, where Maintenance and Maintenance of the system is carried out to ensure optimal performance and updates as needed.

2.3 Unified Modeling Language (UML)

Unified Modeling Language (UML) is a language used to visualize, define, build, and document object-based software development systems using graphs or images [16]. The philosophy behind UML is inspired by the pre-existing concept of object-oriented modelling (OO). UML plays a role in explaining and designing software systems, especially those developed with an object-oriented programming approach [17]. The UML used in building mosque cash management applications is a use case diagram, which is one or more actors interacting with the information system being created [18], and an activity diagram is a type of diagram in the Unified Model Language (UML) which is used to model business processes or system workflows [19].

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3. RESULTS AND DISCUSSION

This application development method uses the waterfall method. This Waterfall method consists of several stages, namely the Requirement stage, Design stage, Implementation stage, Verification stage, and Maintenance stage.

3.1 Requirement

The Requirement phase in software development involves using Unified Modeling Language (UML) to document and model system requirements, ensuring that all functional and non-functional needs are clearly defined before proceeding to the design and implementation stages.

3.1.1 Use Case Diagram

In this use case, it can be seen that the mosque cash management application involves 3 main actors, namely Admin, operator and treasurer.

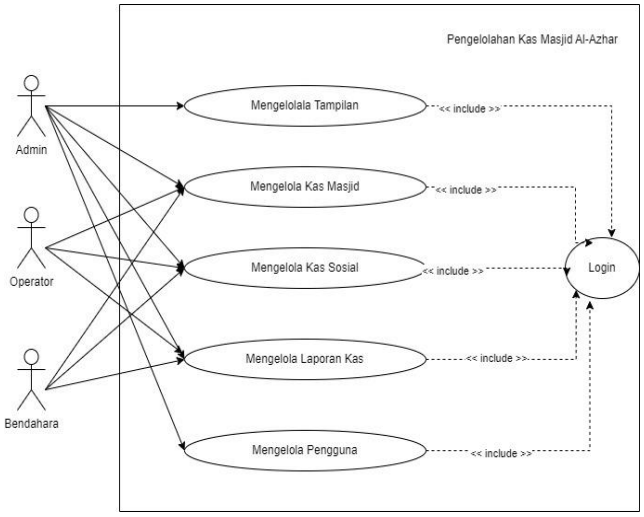

Figure 2. Use Case Diagram

In Figure 2. The use case diagrams describe interactions between users and systems. Activities include display management, mosque cash management, social cash management, cash report management and user management.

3.1.2 Activity Diagram

In Figure 3, the system activity diagram, the Admin logs in to the system, and the system displays the admin dashboard. Then, the Admin can manage mosque cash social cash, view cash reports, and manage users.

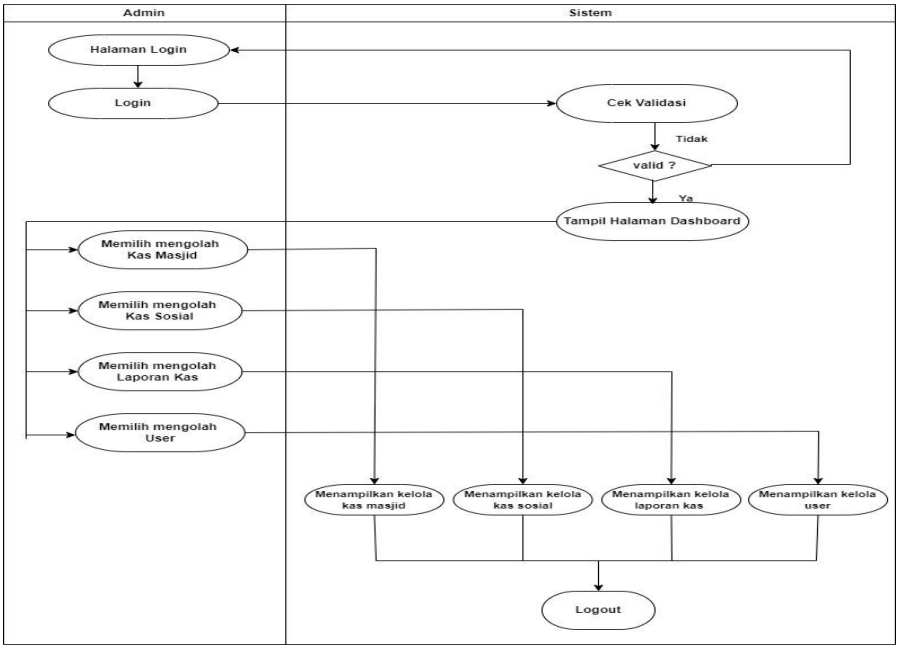

Figure 3. Activity Diagram Admin

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In Figure 4. The user activity diagram depicts the interaction between the user and the system. The activity includes: The user selects a menu, and the system displays the menu. The user then selects the mosque cash, and the system displays the mosque cash information. Next, the user selects social cash, the system displays social cash information, and the user can also select a cash report.

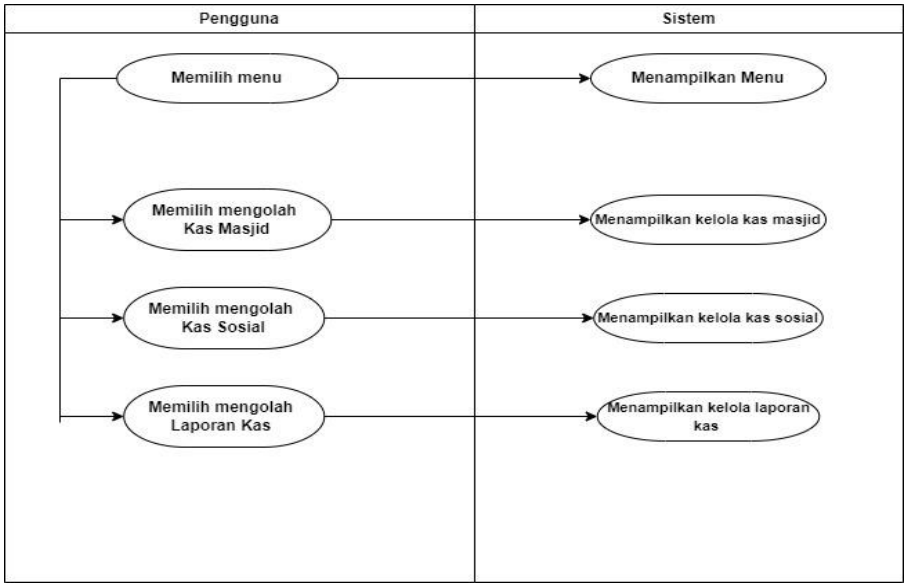

Figure 4. User Activity Diagram

3.2 Implementation

3.2.1 Login Page

In Figure 5. The login page is a system page that serves as the start page. On the login page, users use a username and password input fields to log in to the system according to the role ID in the database.

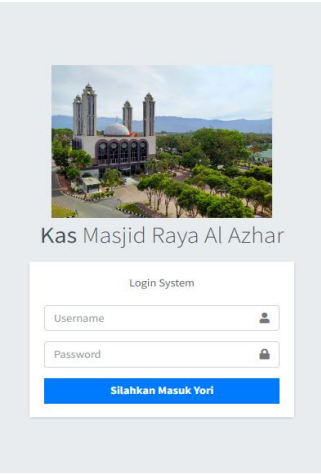

Figure 5. Login Page

3.2.2 Admin Dashboard Page

This page displays a picture of the Al Azhar Mosque as well as menus that can be accessed according to actor level in Figure 6. After the user logs in, the system home page displays the processing process and displays menus.

Figure 6. Dashboard Page

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3.2.3 MOSQUE CASH PAGE

3.2.3.1 Mosque Cash Entry Page

The Mosque Cash Entry Page is a page where a record of all the money income received by the mosque is recorded In Figure 7. Here, all donations and other income received by the mosque are usually recorded.

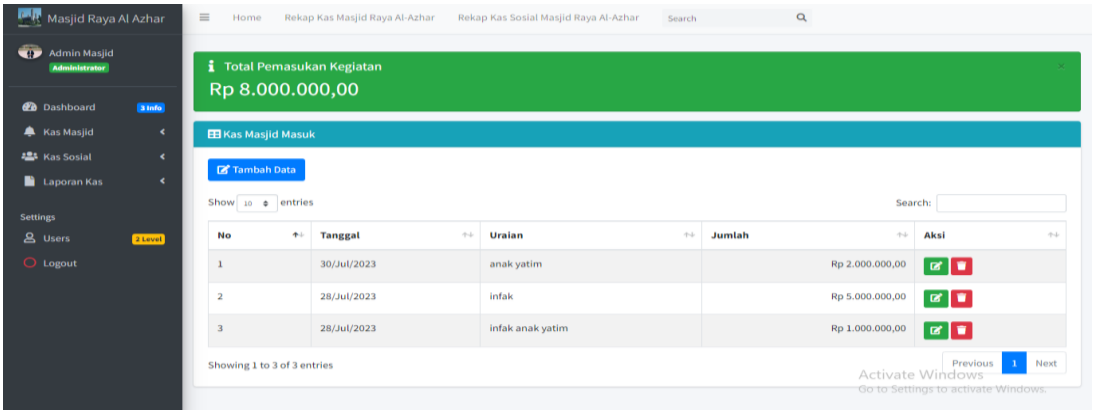

Figure 7. Mosque Cash Entry Page

3.2.3.2 Mosque Cash Withdrawal Page

The Mosque Cash Expenditure page is a place where a record of all money expenditures from the mosque treasury is recorded in Figure 8. This includes all operational costs, purchase of mosque supplies, staff salaries, and any other expenses related to mosque activities.

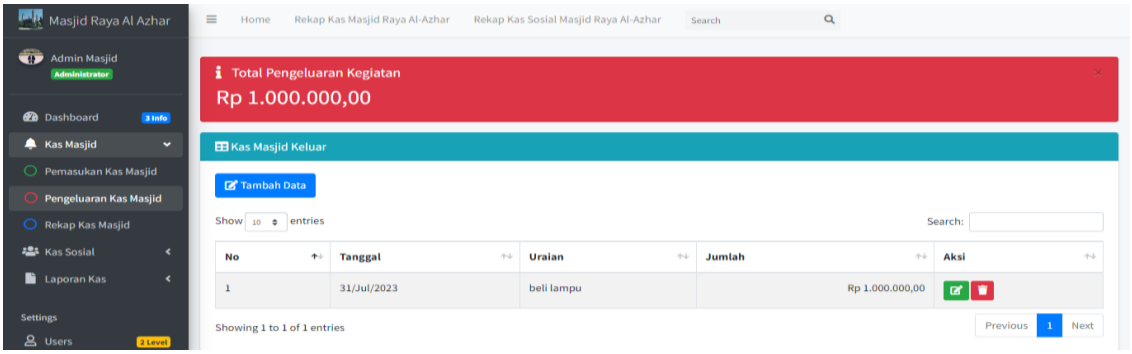

Figure 8. Mosque Cash Withdrawal Page

3.2.3.3 Mosque Cash Recap Page

The Mosque Cash Recap is a summary of all financial transactions that occur in the mosque in a given period, as shown in Figure 9. This recap includes total income, total expenses, and current cash balances. It can also include other financial statements to provide a clear picture of the mosque's financial condition.

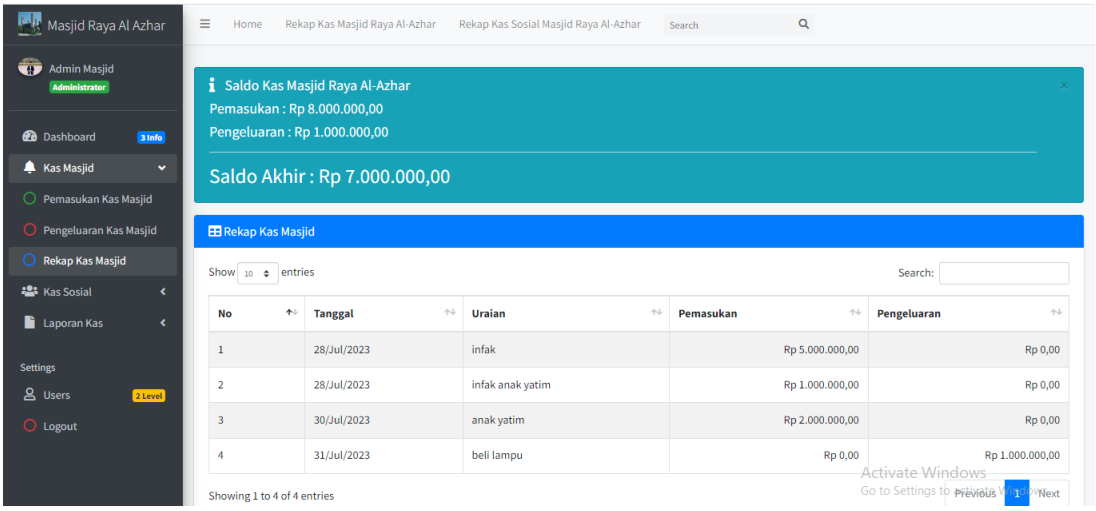

Figure 9. Mosque Cash Recap Page

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3.2.4 SOCIAL CASH PAGE

3.2.4.1 Social Cash Income Page

The Social Cash Entry page is a place where all funds received for social benefits are recorded in Figure 10. On this page, information about sources of income such as donations, donations, or other funds is recorded in detail to monitor the inflow of social funds.

Figure 10. Social Cash Income Page

3.2.4.2 Social Cash Withdrawal Page

The Social Cash Expenditure page is the area where all social fund expenditures are recorded and monitored In Figure 11. Here, every expense transaction, such as social assistance, charitable activities, or administrative fees, is carefully recorded to ensure transparency and accountability in the use of social funds.

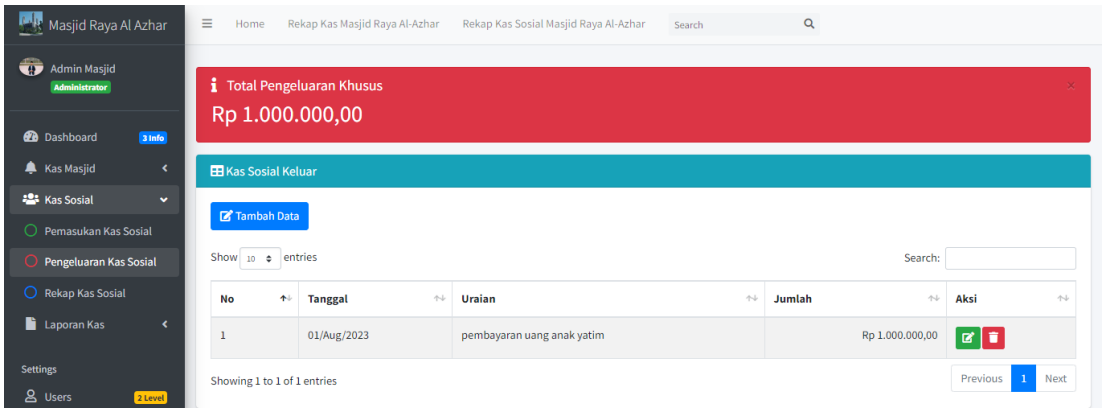

Figure 11. Social Cash Withdrawal Page

3.2.4.3 Social Cash Recap Page

The Social Cash Recap is a summary of all financial activities that occur on the Social Cash Income and Expenditure page in Figure 12. This recap includes important information such as total income, total expenses, final balance, and transaction details to facilitate comprehensive monitoring and reporting of social finances.

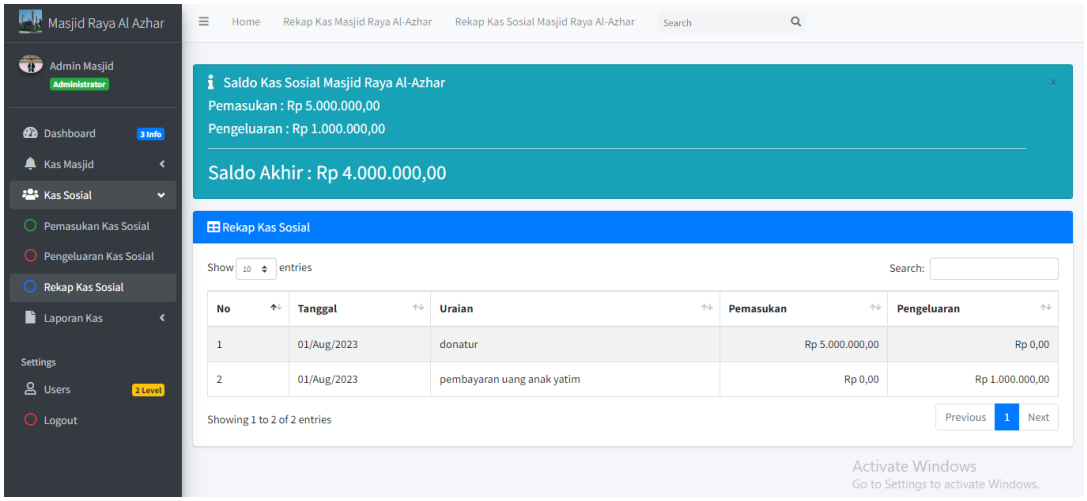

Figure 12. Social Cash Recap Page

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3.2.5 CASH STATEMENT PAGE

3.2.5.1 Mosque Cash Page

The Mosque Cash Recap Page is a place where a summary of all the financial activities that take place in the mosque is recorded and displayed in Figure 13. On this page, information about the income and expenditure of the mosque is presented in detail, including the total funds received, the total funds spent, and the final balance of the mosque's cash.

Figure 13. Mosque Cash Page

3.2.5.2 Social Cash Page

The Social Cash Recap page is an area where a summary of all financial activities that occur in the context of social activities is recorded in figure 14. On this page, information related to the income and expenditure of social funds is presented clearly, including the total funds received for social activities, the total funds spent on social purposes, and the final balance of social cash.

Figure 14. Social Cash Page

3.2.6 USERS SETTINGS PAGE

The User Settings page is a place where three levels of users can enter to manage the income and expenditure of the Al Azhar Grand Mosque Cash in Figure 15, namely:

1. Admin: Has full access to manage all mosque finances and other user roles and permissions.
2. Operator: Responsible for daily operational tasks related to recording mosque cash income and expenditure.
3. Treasurer: Holds a special role in the financial management of the mosque, including monitoring and reporting financial transactions on a regular basis.

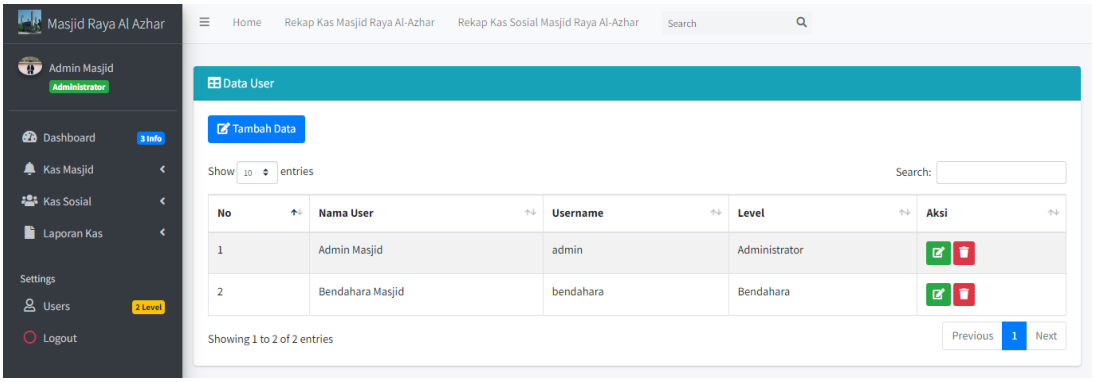

Figure 15. Users Settings Page

3.2.7 OPERATOR DASHBOARD PAGE

On the dashboard page, the operator inputs data and displays only two pieces of info, as shown in Figure 16. Contrasts with the admin dashboard page, which displays three info: **Mosque Cash Balance, Social Cash Balance, and System User.** The difference is that as a treasurer, we can't control how many admins and treasurers can access it.

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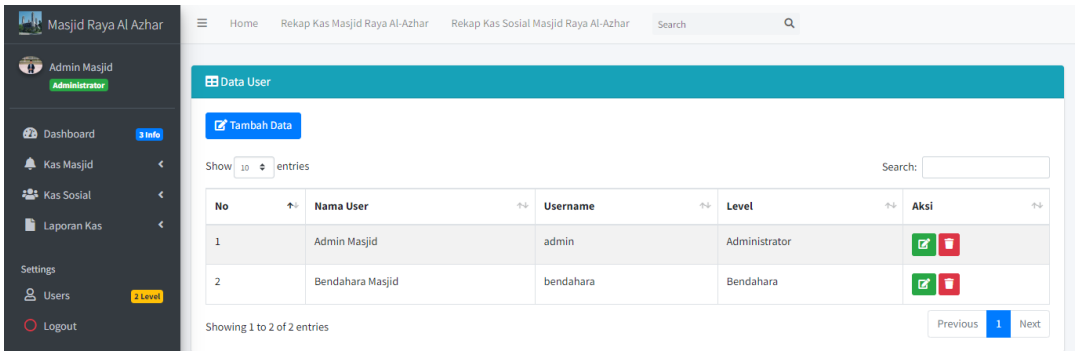

Figure 16. Operator Dashboard Page

3.2.8 TREASURER DASHBOARD PAGE

Only two pieces of info are displayed on the treasurer dashboard page in Figure 17. This is in contrast to the admin dashboard page, which displays three pieces of information: **Mosque Cash Balance, Social Cash Balance, and System User.** The difference is that as a treasurer, we can't control how many admins and treasurers can access it.

Figure 17. Treasurer's Dashboard Page

The difference is that as a treasurer, we can't control how many admins and treasurers can access it. However, the treasurer can manage financial data on incoming and outgoing mosque cash, incoming and outgoing social cash data, and mosque cash financial reports.

3.3 Verification

The Verification stage is where the system is tested to ensure that it works as desired and according to its specifications.

3.4.1 Testing

Developers use the Blackbox Testing method, as shown in Table 1, to test this application. The purpose of this method is to evaluate the functionality of a program without knowing the details of the program code. The purpose of this test is to ensure that the program operates as expected without requiring knowledge of the program's internal structure [24].

Testing is carried out by inputting specific data to test the results of the resulting processing. The results of this test are considered successful if the data entered is as expected so that the data can be received and stored in the information system database. On the other hand, if the data entered does not match, the information system will reject the data or not store it in the database [25].

The test results for the Web-Based Mosque Cash Management Application are detailed in the following table 1. Each test case has been evaluated to assess the system's UI/UX and overall functionality:

Table 1. Black Box Testing

No	Testing	Input	Test Results	Status	Validity Percentage
1	Logging in	A user enters a username and password	Displaying the user dashboard page	Valid	100%
2	Doing Mosque Cash	The user opens the mosque cash menu	Displays the mosque's income, expenses, and recap	Valid	100%
3	Doing Social Cash	The user opens the social cash menu	Displays income, expenses, and social recaps	Valid	100%

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No	Testing	Input	Test Results	Status	Validity Percentage
4	Performing Cash Statements	The user opens the cash statement menu	Displays mosque cash recap and social cash recap	Valid	100%
5	Setting Users	The user opens the user settings menu	Displaying users	Valid	100%

The results indicate that the system performs as expected across all tested scenarios, with each function achieving a 100% validity rate in Table 1. This confirms that the application not only meets its functional requirements but also provides a seamless user experience. The system's effectiveness is supported by these numerical results, reflecting its reliability and accuracy in real-world usage.

3.4 Maintenance

In the maintenance stage, the goal is to maintain, update, and improve the system over time. The maintenance phase can repeat the development process, starting from specification analysis to changes to existing software, but not to create new software.

4. CONCLUSION

The results of the study show that the Al-Azhar Mosque Cash Management System uses PHP, CSS, and JavaScript programming languages. Hopefully, this system will improve the efficiency and effectiveness of mosques and help the treasurer manage the mosque's cash. The Web-Based Application for Al-Azhar Mosque Cash Management will enhance the security of financial data, including mosque cash data, social cash data, and cash recap reports, with database connections that reduce the risk of data corruption, data loss, or human error. For further development, this application is expected to improve its functionality by adding other features or submenus so that it can be used sustainably in mosque institutions. After research and application development, the Web-Based Al-Azhar Mosque Cash Management Application successfully operated according to the expectations and requirements set. Through implementation testing using the black box testing method, the results shown in the table above confirm that the system operates effectively. Each test case achieved a 100% validity rate, demonstrating that the application performs as expected and provides accurate and reliable outputs across all tested scenarios.

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