

Leveraging Cash Mobile-Based Application To Improve The Quality Of Mosque Financial Management System

Putri Angraeni¹, Eka Sabrina Mustakim², Raodatul Fadilah³, Kurnia Prima Putra⁴

¹Putriangraeiny@gmail.com, ²raodatulpadila@gmail.com,
³ekasabrinamustakim@gmail.com, ⁴kurnia.prima@unm.ac.id
^{1,2,3,4}Universitas Negeri Makassar

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Abstract

Abstract: *In the era of technological advancement, the need for ease in data processing has become crucial. Recording mosque funds is one area that requires accurate and reliable information, considering the various types of cash transactions managed by the mosque, such as zakat, sadaqah, infak, wakaf, and others. However, the majority of mosque financial managers still rely on manual methods for recording and calculating finances, using books as reporting tools. This method carries high risks of data and report loss, as well as inefficiency in terms of speed and transparency. Therefore, the "MyCash Masjid" application was developed as a solution to enhance the quality of mosque financial management systems. MyCash Masjid is an application that encompasses income data, expenditure data, data summaries, and comprehensive reports. The use of information technology in the form of this application is expected to provide an effective solution in managing and recording mosque finances, as well as facilitating financial reporting for mosque administrators.*

Keywords: *Mobile Application, Mosque Funds, Funds Recording*

Abstrak

Dalam era perkembangan teknologi informasi, kebutuhan akan kemudahan dalam pengolahan data menjadi sangat penting. Pencatatan kas masjid merupakan salah satu area yang membutuhkan informasi yang akurat dan dapat dipercaya. Mengingat berbagai jenis informasi kas yang dikelola oleh masjid mencakup zakat, sedekah, infak, wakaf, dan lainnya. Namun, sebagian besar pengelola keuangan masjid masih menggunakan metode manual dalam pencatatan dan perhitungan keuangan, serta menggunakan buku sebagai alat pelaporan. Metode ini memiliki risiko tinggi terhadap kehilangan data dan laporan, serta kurang efisiensi dalam hal kecepatan dan transparansi. Oleh karena itu, dirancang aplikasi "MyCash Masjid" sebagai solusi untuk meningkatkan kualitas sistem pengelolaan keuangan masjid. MyCash Masjid merupakan aplikasi sistem pengelolaan keuangan masjid yang mencakup data pemasukan, data pengeluaran, rekap data, dan laporan keseluruhan. Penggunaan teknologi informasi dalam bentuk aplikasi diharapkan dapat memberikan solusi yang efektif dalam mengelola dan membukukan keuangan masjid serta dapat mempermudah pengurus masjid dalam pelaporan keuangan masjid.

Kata kunci: Aplikasi Mobile, Keuangan Masjid, Pencatatan Keuangan

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1. Introduction

Information technology operates effectively when supported by infrastructure and managed by competent human resources, particularly in terms of capacity and competency [1]. In today's advancing technology landscape, the need for easy data processing is crucial [2]. Information is a valuable collection of data or facts that, when managed properly, can provide significant benefits to its recipients. Therefore, accurate and reliable information is vital when it comes to recording mosque funds. Mosque funds encompass various contributions, such as zakat, charity, donations, endowments, and more [3].

In terms of operations, mosques are non-profit institutions that rely on contributions and donations from the congregation to fund their activities. As responsible entities, mosques should regularly announce financial reports based on their management outcomes [4]. However, many mosque financial managers still rely on manual methods for recording and calculating finances, and financial reports are often maintained using physical books. This approach poses risks, including data and report loss, errors, inefficiencies in terms of speed and time, and a lack of transparency among administrators.

Previous research, conducted by Manja Purnasari et al., focused on a web-based mosque fund management information system [5]. This research addressed similar challenges, such as the use of manual calculation methods and book-based records, which can lead to inaccurate data on incoming and outgoing funds, difficulties in retrieving historical data due to scattered files, a lack of overall fund transparency, and frequent data loss causing delays in providing comprehensive information about the funds held by Masjid Al-Istiqomah.

Muhammad Rifqy Fakhrol Hadi et al. also conducted a similar study on mosque cash management information systems [6]. The research highlighted the frequent loss of data in record books. To address this issue, the researchers proposed designing a mosque cash application using the prototype method.

Another study by Marina Elsera et al. focused on the implementation of a web-based E-smart application for mosque information systems [7]. This research identified risks associated with using conventional or manual systems, including errors in cash book calculations, improper delivery of ta'lim schedules to the congregation, and a lack of

communication channels for sharing mosque activities and developments with congregants.

Transparency and efficiency are key factors in effectively managing mosque finances. To address these challenges, the "MyCash Masjid" application was developed. This application is a comprehensive mosque financial management system that includes income and expenditure data, summaries, and overall reports. The development of this application utilized Android Studio, the Java programming language, and the Firebase database.

By leveraging information technology through applications, mosque administrators can effectively manage and record their finances. The "MyCash Masjid" application aims to simplify financial reporting for mosque administrators, ensuring transparency and streamlining processes for the future.

2. Research Methods

2.1. Preliminary Research

A. Literature Reviews

To improve the quality of mosque financial management systems, a literature review process was undertaken. This involved studying various literature materials related to the implementation of MyMasjid Cash. These valuable resources were gathered from the internet, journals, books, magazines, newspapers, reports, documents, and other relevant sources. By conducting this comprehensive literature review, the aim was to gain a deep understanding of the subject matter and extract valuable insights that could be applied in the development of the MyCash Masjid application.

Through the literature review, the author delved into a wealth of knowledge, exploring different perspectives, research findings, and expert opinions. This process helped in acquiring valuable information and understanding the best practices and approaches to improve mosque financial management. It provided a solid foundation to design and develop the MyCash Masjid application with a well-informed and strategic approach.

Furthermore, the author also examined various technologies that aligned with the specific requirements of the system and catered to the needs of the users. This exploration of technological advancements allowed for an informed decision-making process regarding the selection of appropriate tools and platforms for developing a robust and user-friendly system. By considering the available technologies, the aim was to ensure that the final product would effectively meet the needs of the

mosque administrators and enhance the overall financial management processes.

Overall, the literature review played a vital role in enriching the knowledge base and guiding the development of the MyCash Masjid application. It provided valuable insights, best practices, and technological considerations that helped shape the system into an effective solution for mosque financial management, ultimately improving efficiency, accuracy, and transparency in handling the finances of the mosque.

B. Observations

In this stage, the researcher directly observes the field conditions that will be the target of the study, with the aim of collecting data and understanding how the system will operate in the future. The researcher observes the activities involved in the data input process to capture the current workflow of the mosque and to identify the core problems faced by mosque administrators.

The method used in developing the MyMasjid Cash application for the first iteration is the SCRUM framework. SCRUM is an agile software development approach that emphasizes collaboration, adaptability, and iterative development. By utilizing SCRUM, the development process is divided into short iterations called sprints, where specific features and functionalities are implemented.

In the first iteration, the focus is on gathering requirements, conducting initial observations, and understanding the existing workflow and challenges faced by mosque administrators. This information serves as a foundation for subsequent iterations. The SCRUM framework facilitates regular communication and collaboration between the development team and stakeholders, ensuring that the project remains aligned with the needs and expectations of the users.

During the first SCRUM iteration, the research aims to gather valuable insights and data about the mosque's financial management system. This information will guide the development team in formulating a clear vision, defining the product backlog, and setting priorities for future iterations. The iterative nature of SCRUM allows for flexibility and adaptability, ensuring that adjustments can be made based on the findings and feedback from the initial observation phase.

By employing the SCRUM framework in the first iteration, the development team can effectively gather information, understand the existing challenges, and lay the groundwork for subsequent development sprints. This iterative approach fosters

continuous improvement and ensures that the MyMasjid Cash application meets the specific needs of the mosque and its administrators.

2.2. Requirement Analysis

In the process of developing the system, we analyze three key aspects: hardware, software, and data collection through interviews with mosque representatives.

A. Hardware

We assess the hardware requirements by identifying the necessary devices, such as laptops with a minimum of 3 GB RAM and a Ryzen I5 processor, smartphones running on the Android operating system, and USB cables. These hardware components are crucial for ensuring smooth system operation.

B. Software

We analyze the software requirements by determining the necessary tools and platforms for development. This includes using Android Studio as the development environment, utilizing the Java programming language, employing the Firebase database for efficient data management, using Google Chrome as the web browser for testing purposes, and leveraging Figma for design needs.

C. Data Collection through Interviews

In addition to analyzing hardware and software, we conduct interviews with mosque representatives. These interviews provide valuable insights into the specific needs and challenges faced by mosques in managing their finances. We engage with mosque administrators, financial officers, and individuals responsible for financial management to gather firsthand information about current practices, types of contributions managed, manual recording methods used, and any difficulties encountered.

By combining the analysis of hardware and software requirements with insights from interviews, we gain a comprehensive understanding of the system's needs and functionalities. This holistic approach ensures that the developed solution, the MyCash Masjid application, is tailored to address the specific challenges faced by mosques effectively. The data collected through interviews serves as a crucial input for developing a solution that enhances efficiency, accuracy, and transparency in mosque financial management processes.

2.3. Software Design

In the process of developing any software application, it is essential to undergo a comprehensive design phase to ensure the system meets the desired objectives. This design phase involves analyzing the requirements, identifying use cases, and creating data

flow diagrams (DFDs). By meticulously planning the software's structure and functionality, we can lay a solid foundation for a successful development process. Let's explore the software design process, specifically focusing on the use case analysis and the creation of DFDs.

A. Use Case Diagram

A use case provides a detailed description of how actors (users, external systems, or entities) interact with the software system being developed. It captures the various scenarios and actions that actors can perform within the system. In the context of the MyMasjid Cash application, a use case diagram was created to visually represent these interactions.

Figure 1 showcases the use case diagram specifically designed for the MyMasjid Cash application. The diagram outlines the different functionalities and features available to users. Users have the ability to choose from various menus, including the home menu, where they can access general information and navigation options. The record menu allows users to input financial data, such as contributions or expenses. The recap menu provides an overview of the financial data, including summaries or statistical analysis. Lastly, the report menu allows users to generate comprehensive reports related to the mosque's financial management.

By utilizing the use case diagram, the development team gains a clearer understanding of the user's needs and the desired functionality of the MyMasjid Cash application. This diagram serves as a valuable tool for planning and organizing the software design process, ensuring that the final application meets the requirements and expectations of its users.

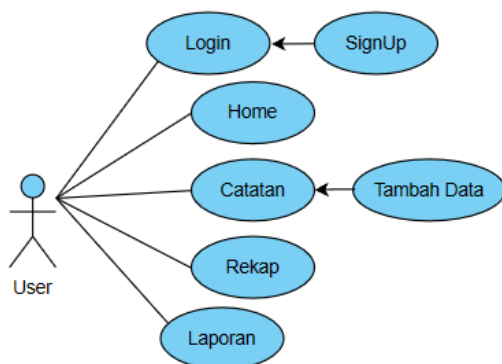


Figure 1. Use Case Diagram

B. Data Flow Diagram

In Figure 2, the Data Flow Diagram (DFD) provides a visual representation of the data flow and interactions within the MyMasjid Cash application. This diagram illustrates the movement of data between different components and processes involved in managing the mosque's financial transactions. By analyzing the DFD, we can gain a comprehensive understanding of how data is processed, transformed, and stored within the application. This helps in identifying data sources, destinations, and dependencies, ensuring a smooth and efficient flow of information. The DFD serves as a crucial reference point throughout the development process, guiding the implementation of an effective and streamlined financial management system for the mosque.

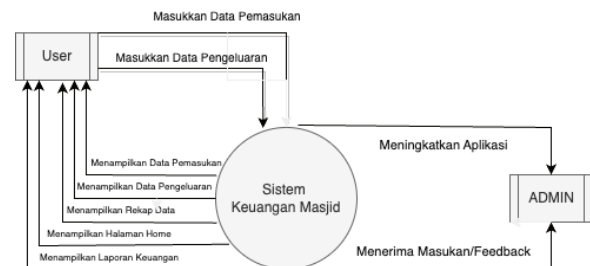


Figure 2. Use Case Diagram

2.4. Implement to Codes

In the current research, the coding phase involves writing program code in Java to translate the designed system into computer-readable commands. Android Studio is the software utilized for writing the code. In this phase, the design specifications are transformed into instructions that the computer can understand and execute. This allows for the development of the desired functionalities and features within the application.

2.5. Testing

In the testing phase, we employ questionnaires with a Likert scale consisting of 5 levels to gather user feedback. This allows us to quantitatively measure user opinions and perceptions regarding various aspects of the application, such as usability, functionality, and overall satisfaction.

Based on the collected feedback, we analyze the responses and generate test results that provide insights into areas where the application performs well and areas that require improvement. These test results serve as valuable input for the backlog of the next iteration.

The identified areas for improvement, suggested enhancements, and reported issues are prioritized and transformed into actionable items in the backlog. The backlog acts as a dynamic to-do list that guides the development team in addressing the identified user feedback and implementing necessary changes in the subsequent iteration.

By using questionnaires with a Likert scale and integrating the test results into the backlog, we ensure that user feedback remains an integral part of the development process. This iterative approach allows us to continuously refine and enhance the application based on user input, leading to an improved user experience and a more robust product with each iteration.

3. Result

3.1 Developed Application

The outcome of this application development is MyCash Masjid, which can be utilized by mosque administrators to report the mosque's income and expenses. The user interface of MyCash Masjid, based on the Android platform, can be described as follows:

A. Login and sign up page

The first page that appears when opening the MyCash Masjid application is the login and sign-up page. On the login page, users are prompted to enter their username and password to log in. Additionally, if a user forgets their password, they can click on the "forgot password" option. The login page can be viewed in Figure 3.

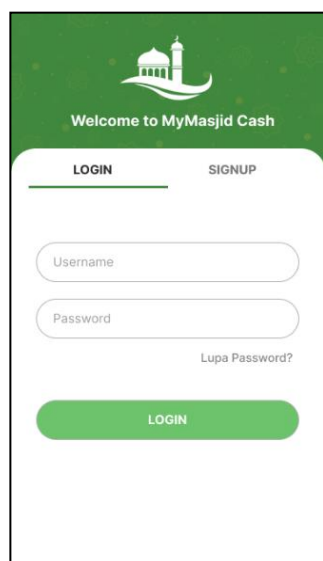


Figure 3. Login Page

On the sign-up page, users are required to enter their username, email, mosque name, and password. If the user successfully registers, a notification saying "You have successfully registered" will appear. The login and sign-up functions are intended to protect user data. The Sign Up page can be viewed in Figure 4.

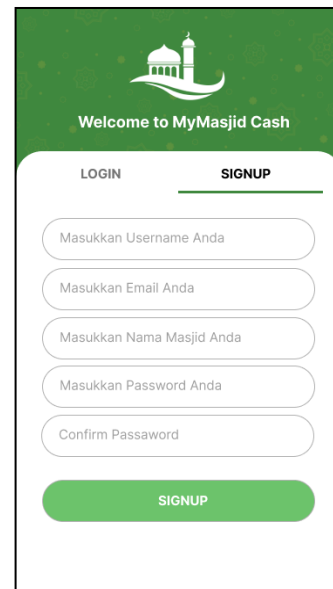


Figure 4. Sign up Page

B. Homepage

After logging in, the main page (home) will be displayed. The home page contains information about the mosque's cash balance and social fund. This page can be seen in Figure 5.

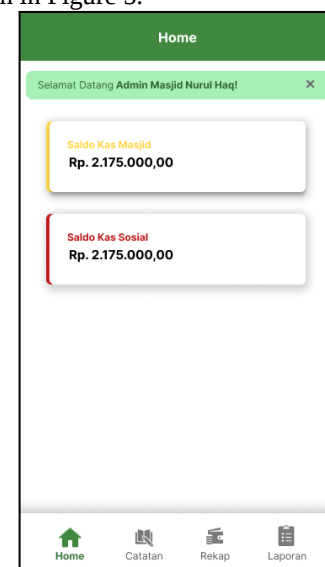


Figure 5. Homepage

C. Record Pages

On this page, users can input data by clicking the "Tambah" button. The "Add Record" feature can be seen in Figure 6.

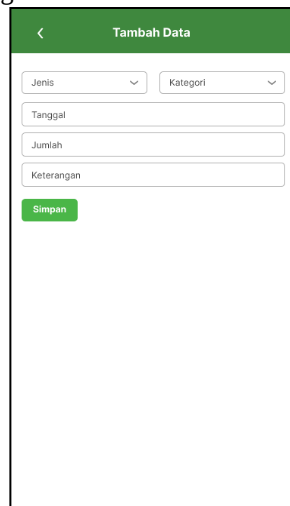


Figure 6. Add record page

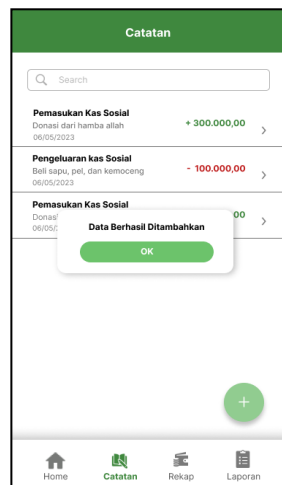


Figure 7. Record List page

After successfully adding the data, a notification saying "Data Successfully Added" will appear, and then the history of the added data will be displayed on the record page. The user-inputted data will be stored in Firebase. Users can modify and delete the inputted data by clicking on one of the data histories that have been added. Users can easily search for the inputted data using the search feature by entering keywords such as dates or descriptions. For further clarification, please refer to Figure 7.

D. Recap Page

This page contains information about the total income, expenses, and final balance of both the mosque's cash and social fund. Users can choose to view the data recap of the mosque's cash or the social fund. The recap page also displays the history of added data from the record page. Users can easily search for the inputted data using the search feature by entering keywords such as dates or descriptions. The recap page can be viewed as follows.



Figure 8. Mosque's Income and Expenses Page

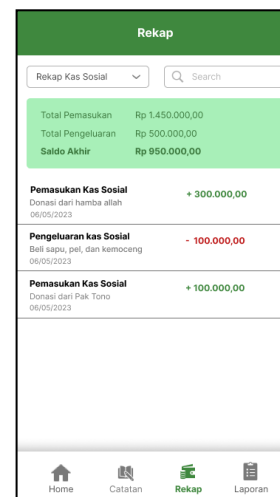


Figure 9. Mosque's Social Funds Recap Page

E. Report Page

This page can print the overall financial reports of the mosque's cash and social funds, as well as reports for specific periods determined by the user. The user is prompted to select the category they want to print, such as the mosque cash report or the social

fund report. Then, the user can specify the start and end dates to print the desired reporting period. If the user wants to print the entire report, they can directly click on 'cetak semua'. The report page can be seen in Figure 10.

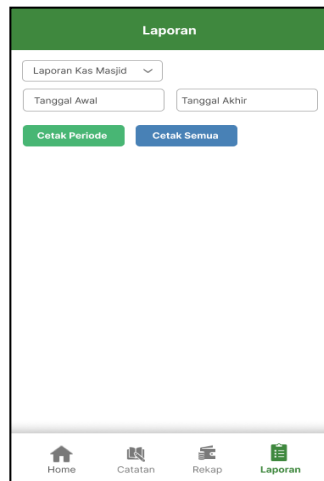


Figure 10. Report Page

3.2 Tests on User

The system testing was conducted using the Likert scale method. The Likert scale presents items expressed in several alternative responses (SS=Strongly Agree, S=Agree, N=Neutral, TS=Disagree, STS=Strongly Disagree) [15]. This testing was carried out to measure the assessment of all attributes by the users.

Table 1. User Feedback Counts

No	PERNYATAAN	PRESENTASE				
		STS	TS	RR	S	SS
1.	Aplikasi MyMasjid Cash mudah digunakan	0	2	4	5	15
2.	Kecepatan aplikasi dalam melakukan tugas dan memberikan respons	0	2	2	7	10
3.	Fitur-fitur yang disediakan oleh aplikasi melakukan tugas sesuai fiturnya.	0	0	2	5	14
4.	Bagaimana penilaian anda terhadap tampilan antarmuka aplikasi?	0	2	2	7	10
5.	Aplikasi ini memiliki performa yang baik.		1	2	8	10
6.	Aplikasi keuangan masjid ini membantu meningkatkan transparansi dalam pengelolaan keuangan masjid	0	0	5	8	8
7.	Aplikasi ini bersifat fleksibel untuk seluruh kalangan	0	0	2	4	15
8.	Aplikasi ini dapat mempermudah dalam mengelola keuangan masjid	0	0	4	7	10
9.	Aplikasi ini menyediakan isi yang sangat sesuai dengan kebutuhan	0	0	2	5	14
10.	Aplikasi ini menyediakan isi yang sangat bermanfaat di bidangnya	0	0	2	8	10
11.	Fitur yang disediakan mudah dipahami	0	0	2	9	15
12.	Sistem yang tersedia bersifat user-friendly	0	0	2	5	10
13.	Pengoperasian aplikasi lancar dan stabil	0	0	1	4	16
14.	Aplikasi ini dapat menjamin keamanan data keuangan masjid	0	0	3	6	10
15.	Hasil perhitungan akurat	0	0	2	9	15
16.	Aplikasi ini cukup interaktif untuk memenuhi kebutuhan user	0	0	2	7	17
17.	Proses tidak membutuhkan waktu yang lama	0	0	4	7	10
18.	User interface pada aplikasi ini menarik	0	0	2	4	15
19.	Desain dan warna sesuai dengan tema aplikasi	0	0	1	4	16
20.	Font yang digunakan sesuai	0	0	1	9	15
21.	Nyaman digunakan	0	0	1	3	17
22.	Validasi sesuai kebutuhan	0	0	1	9	15
23.	Keseluruhan aplikasi menarik dan akurat	0	0	2	8	10
JUMLAH RESPONDEN		20				

Results presented in Table 1 can be summarized as below,

Disagree = 7 statements
Neutral = 49 statements
Agree = 140 statements
Strongly Agree = 272 statements
Total = 468 statements

As the Number of respondents 20, the percentage is shown below,

Strongly Agree: 58.12%
Agree: 29.92%
Neutral: 10.47%
Disagree: 1.49%

4. Conclusion

Based on the discussion presented, it can be concluded that the development of an Android-based mosque financial management system can assist mosque administrators in managing and preparing financial reports, whether on a weekly or monthly basis. Additionally, this system is expected to create efficient and transparent financial management among mosque administrators, allowing easy monitoring of incoming and outgoing funds. The application within this system is equipped with data summary features and provides the ability to print financial income and expenditure reports.

Based on the feedback received from respondents, the following suggestions have been identified as backlog items for the next SCRUM iteration:

- Improve the display of social fund balance and mosque fund balance on the home page to enhance user experience.
- Add more attractive and diverse features to the application, combining and refining certain features for better usability.
- Implement the application in a real-world setting to assess its effectiveness and feasibility.
- Consider implementing user-specific data for multiple mosques, allowing for different data sets based on the user's needs and context.

These suggestions will be prioritized and incorporated into the backlog for the next SCRUM iteration to further enhance the functionality and usability of the MyMasjid Cash application.

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