

Design of a Web-Based Savings Recording Application at Usaha Bersama Multifungsi (UB. MUFI) Koja, North Jakarta

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A B S T R A C T

Purpose. This study aims to design and build a web-based savings recording application at Usaha Bersama Multifungsi (UB. MUFI) Koja, North Jakarta, to replace the manual recording that still relies on books and Microsoft Excel. **Method.** The study uses a qualitative approach with data collection through observation, interviews, and literature study, and applies the Waterfall software development method. The application was built using the PHP programming language, a MySQL database, and the Bootstrap framework, then tested using the Black Box Testing method. **Findings.** The resulting application is able to manage member data, deposit and withdrawal transactions, calculate balances automatically, store transaction histories, and generate reports by period. All main functions (register, login, member management, transactions, history, report printing, and change password) worked as expected during testing. **Conclusion.** This web-based application makes the savings recording process faster, more accurate, and more transparent, while reducing the risk of errors and data loss.

INTRODUCTION

The rapid development of information technology has driven financial data management to shift from manual recording toward computerized systems that are faster, more accurate, and more efficient [6]. In the financial field, recording that was previously done manually can now be carried out in a computerized way, thus reducing errors, improving transparency, and simplifying report generation. One form of its application is the web-based application, namely software accessed through a browser to support data processing and online information delivery [8], [10].

Usaha Bersama Multifungsi (UB. MUFI) Koja is a sharia-based financial institution under the auspices of Al-Husein Mosque, Rawa Badak Utara, Koja, North Jakarta, which provides savings services for its members. Savings are an activity of storing money whose withdrawal is carried out according to certain agreed conditions [12], [13]. In its operations, savings recording at UB. MUFI Koja is still carried out manually using administration books and Microsoft Excel.

This manual system creates several obstacles, namely a high risk of errors in recording amounts and calculating balances, slow searching of member data, and lengthy

report preparation. In addition, members cannot yet determine their balance or savings history independently because all information is stored only in the treasurer's records, so transparency is low.

Several previous studies have built similar systems to overcome savings recording problems. Sitopu et al. designed a web-based accounting information system for student savings management to improve effectiveness and efficiency [1]. Abid and Darmanto implemented the digitalization of student savings management to improve school administrative efficiency using the Waterfall method [2]. Yulliandari et al. developed a website-based financial recording system at a school mini bank that improved the security and speed of reporting [3]. Rinaldi et al. built a web-based student savings application using the Waterfall method [4], while Delima designed a web-based school savings system with PHP and MySQL [5]. These studies show that web-based systems effectively replace manual recording; however, they are generally applied in school environments and have not targeted community-based financial institutions such as UB. MUFI.

Based on these problems, this study aims to design and build a web-based savings recording application at UB. MUFI Koja that is able to store data in a structured and integrated manner, calculate balances automatically, and

generate fast and accurate reports. The application is expected to make it easier for the admin to manage savings data and to provide convenience for members in obtaining their savings information, so that the recording process becomes more effective, accurate, and transparent.

1.1. Literature Review

Information system design is the process of building a computerized facility so that data processing becomes easier, faster, and more accurate, while improving user effectiveness and efficiency in searching, creating, and storing data [6], [7]. A website is a collection of interconnected web pages within a domain that functions as an internet-based information delivery medium accessible through a browser [8], [9]. A web-based application is therefore software run through a browser to support data processing and online information delivery [10], [11].

In its development, this application makes use of several technologies. *PHP* (*Hypertext Preprocessor*) is used as the server-side programming language, while *MySQL* serves as the database management system that stores data in a structured way [15], [20]. *XAMPP* provides a local Apache and MySQL server during the development process [17], and *Visual Studio Code* is used as a lightweight code editor that supports various operating systems [14], [16]. The interface is built using *HTML*, *CSS*, *JavaScript*, and the *Bootstrap* framework so that the application display is responsive and easy to use.

The development method used is *Waterfall*, a software development model carried out sequentially and in a structured manner from requirements analysis to maintenance [19]. System testing uses *Black Box Testing*, a testing method that focuses on the software functions without examining its internal code structure, making it suitable for ensuring that each feature works according to user needs [18].

METHOD

This study uses a qualitative paradigm, in which the researcher focuses on direct observation and interviews with parties involved at the research site to obtain a deep understanding. The research was conducted at UB. MUFI Koja, North Jakarta, over four months, from February to May 2026, from the preparation stage to report writing. The research subjects were the management and staff of UB. MUFI Koja, while the research object was the application developed to support the institution's operational needs.

1.2. Data Collection Techniques

The data collection techniques used consist of three methods. *Observation* was carried out by directly visiting

the research site to observe the ongoing savings recording process. *Interviews* were conducted with the management to explore the problems and system requirements. *Literature study* was carried out by collecting relevant references from books, journals, and digital literature as a theoretical basis. The data used include primary data from observation and interviews, and secondary data from related journals and references.

1.3. Tools Used

The application was built using the *PHP* programming language on the server side and a *MySQL* database as the database management system [15], [20]. The application interface was developed using the *Bootstrap* framework so that it is responsive and easy to use. Coding was carried out in the *Visual Studio Code* editor [14], [16], while *XAMPP* was used as a local server providing Apache and MySQL during development [17]. Testing was carried out using the *Black Box Testing* method, which focuses on the conformity of system functions with the expected results [18], [23].

1.4. System Development Method

The software was developed using the *Waterfall* method because the research site wanted a coherent, clear, and structured system workflow [19], [21], [22]. The stages of the Waterfall method used are shown in Figure 1.

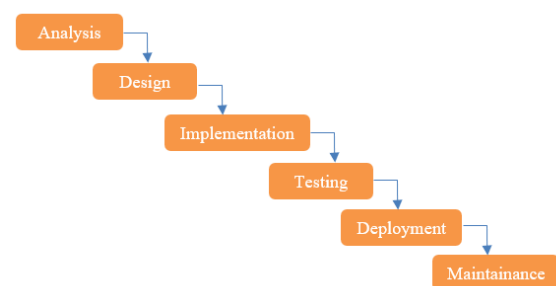


Figure 1. The Waterfall Software Development Method

These stages include: (a) *Analysis*, analyzing requirements and identifying problems in the existing system; (b) *Design*, designing the system structure, database, interface, and flow diagrams using UML; (c) *Implementation*, translating the design into program code using PHP and MySQL; (d) *Testing*, testing all application functions using Black Box Testing; (e) *Deployment*, applying the application to the work environment; and (f) *Maintenance*, performing maintenance and feature development when needed.

RESULTS AND DISCUSSION

1.5. Evaluation of the Existing System

Based on the results of observation and interviews, savings recording at UB. MUFI Koja still relies on savings books, cash books, and Microsoft Excel without an

integrated database. The existing recording flow is shown in Figure 2. The process begins when a member comes to make a transaction; the treasurer checks the member data, then records the transaction in the savings book and cash book, and afterward transfers it to Microsoft Excel and updates the balance manually.

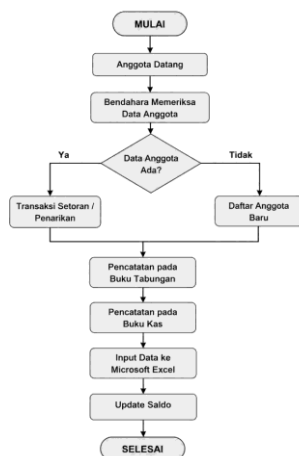


Figure 2. The Existing Savings Recording Flow

This condition causes data entry and searching to be slow, prone to errors in balance calculation, and makes it difficult for members to know their balance independently. The evaluation of the existing procedures and the proposed solutions is summarized in Table 1.

Table 1. Evaluation of the Existing Procedures and Proposed Solutions

Problem	Proposed Solution
Transactions are still recorded manually with books and Excel	The web application stores all transactions to the database automatically
Searching for member data takes a long time	A search feature based on member name or number
Report preparation is done manually	An automatic report feature based on a specific period
Balance calculation is done manually	The system calculates the balance automatically for each transaction
Members cannot yet view savings information	User accounts to view balance and history according to access rights
The risk of data loss is quite high	All data is stored in the MySQL database
Recording errors often occur	Data validation before a transaction is saved

1.6. Proposed System

The proposed system replaces manual recording with a web-based application. The flow of the proposed system is shown in Figure 3. The admin logs in, the system performs authentication, and then displays the dashboard. The admin can manage member data, deposit and withdrawal transactions, transaction history, and reports. Each transaction is immediately saved to the database and the balance is updated automatically.

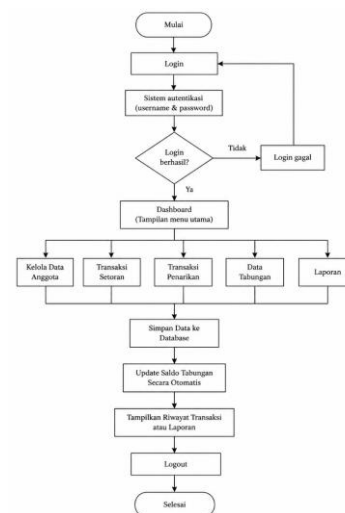


Figure 3. Flowchart of the Proposed System

The system involves two types of users, namely Admin and Member, with different access rights. The admin has full access to manage member data, transactions, history, report printing, and password changes. The member has limited access for registration, login, viewing their own balance and transaction history, and changing their password. The needs of both users are summarized in Table 2.

Table 2. System User Requirements

User	Functional Requirements
Admin	Login; manage member data; add, edit, and delete savings data; deposit and withdrawal transactions; view and print reports; change password; logout
Member	Registration; login; view savings balance; view transaction history; change password; logout

1.7. System Requirements Analysis

The functional requirements cover all functions that the system must be able to perform, such as login, management of member and savings data, deposit and withdrawal transactions, report management, and password changes. The non-functional requirements cover the system's ability to run through various browsers, an easy-to-understand interface, fast response time, a login mechanism for data security, the ability to generate automatic reports, and automatic balance calculation after a transaction. The software and hardware requirements used are presented in Table 3 and Table 4.

Table 3. Software Requirements

Software	Description
Windows 10/11	Development operating system
Visual Studio Code	Program code editor
XAMPP	Apache web server and MySQL database
PHP	Server-side programming language
MySQL	Database management system

Google Chrome / Edge	Browser for application testing
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Table 4. Hardware Requirements

Requirement	Specification
Monitor	14 inches or larger
Processor	Intel Core i5 10th generation or equivalent
RAM	8 GB
Storage	256 GB SSD
Input devices	Standard keyboard and optical mouse

1.8. Use Case Diagram

The interaction between the actors and the system is depicted through the Use Case Diagram in Figure 4. This diagram shows the main functions that each actor can access according to their access rights. The admin can perform login, member data management, savings transactions, transaction history, report printing, password changes, and logout. The member can perform registration, login, viewing of their own transaction history, password changes, and logout.

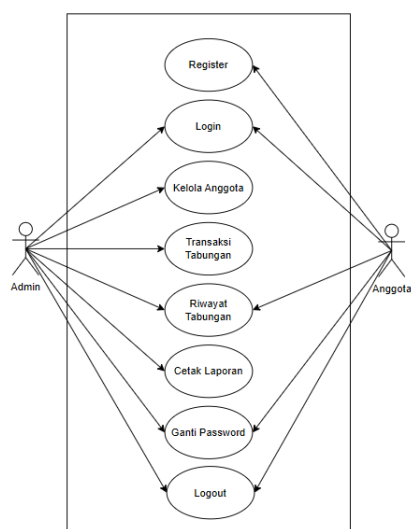


Figure 4. Use Case Diagram of the Proposed System

There are eight main functions in the proposed system, namely: (1) Register, the account registration process by the member; (2) Login, the process of entering the system according to access rights; (3) Manage Member Data, to add, edit, and delete member data; (4) Savings Transaction, to make deposits and withdrawals that immediately update the balance; (5) Transaction History, to display the transactions that have been carried out; (6) Print Report, to print reports by period; (7) Change Password, to change the account password; and (8) Logout, to end the usage session safely.

1.9. Activity Diagram

The activity diagram illustrates the flow of user activities in each system function. Figure 5 shows the member registration flow, in which a prospective member fills in the form and the system validates the username before saving the data. Figure 6 shows the login flow,

which validates the username and password before directing the user to the dashboard according to access rights. Figure 7 shows the add-member flow, in which the admin fills in the member data on the Member Management page and the system validates it before saving.

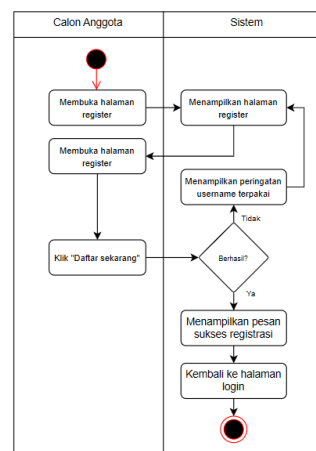


Figure 5. Activity Diagram of Register

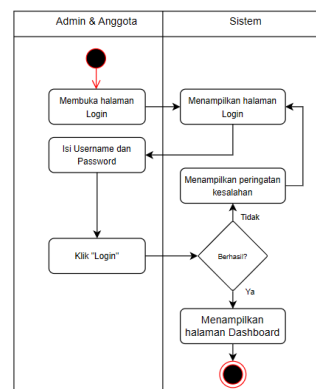


Figure 6. Activity Diagram of Login

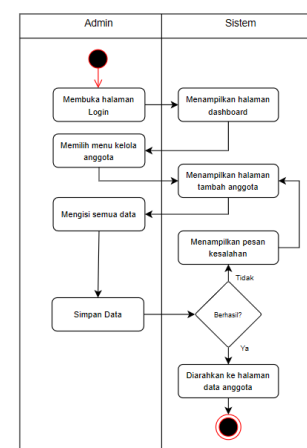


Figure 7. Activity Diagram of Add Member

Figures 8 and 9 show the deposit and withdrawal transaction flows. In a deposit, the system saves the transaction and increases the member's balance. In a withdrawal, the system first checks the balance; if it is sufficient, the transaction is processed and the balance decreases, whereas if it is insufficient, the system displays the message "Insufficient balance."

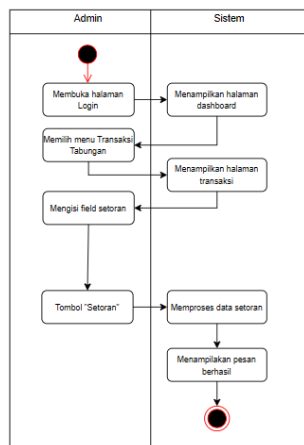


Figure 8. Activity Diagram of Deposit Transaction

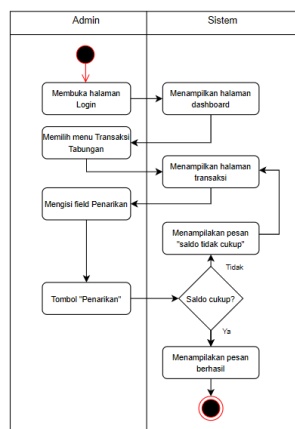


Figure 9. Activity Diagram of Withdrawal Transaction

Figures 10, 11, and 12 show the flows for report printing, password changes, and logout. In report printing, the admin selects a period and the system displays and downloads the report. In changing a password, the system validates the old password before saving the new one. In logout, the system deletes the user session and redirects back to the login page after confirmation.

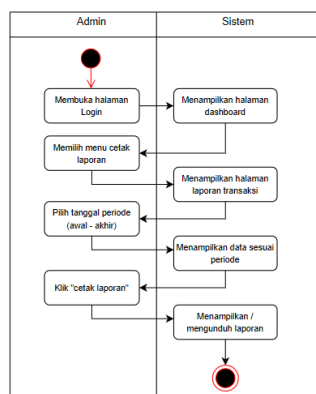


Figure 10. Activity Diagram of Print Report

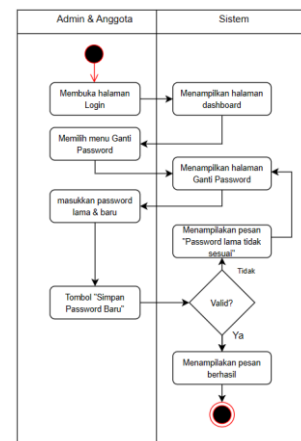


Figure 11. Activity Diagram of Change Password

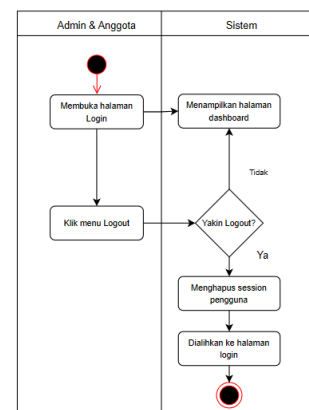


Figure 12. Activity Diagram of Logout

1.10. Sequence Diagram

The sequence diagram illustrates the order of interaction between the user and the system. Figure 13 shows the admin sequence diagram, from login, retrieving data from the database, to saving changes to member data. Figure 14 shows the member sequence diagram, which includes login, viewing transaction history, changing the password, and logout.

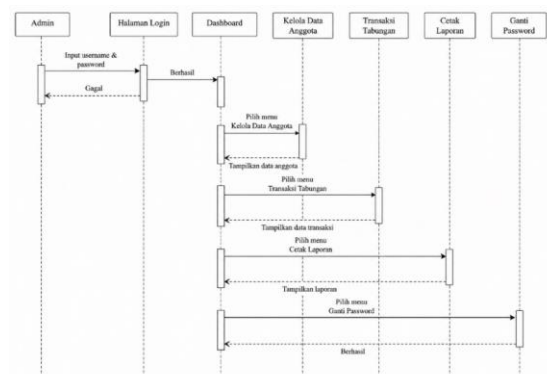


Figure 13. Sequence Diagram of Admin

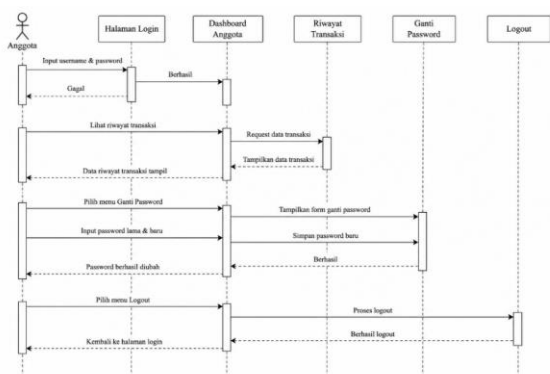


Figure 14. Sequence Diagram of Member

1.11. Class Diagram and Database Design

The class structure and relationships between data are depicted through the class diagram in Figure 15. There are four main classes, namely User, Member Data, Savings Transaction, and Transaction History, each of which has Create, Read, Update, and Delete (CRUD) operations. The savings balance is updated automatically by the system whenever a transaction occurs, so that the data in the MySQL database remains consistent.

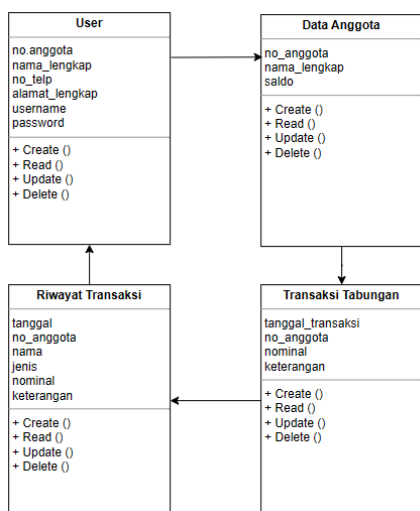


Figure 15. Class Diagram of the Proposed System

The database design consists of four main tables. The structures of the User and Member Data tables are presented in Table 5 and Table 6, while the structures of the Savings Transaction and Transaction History tables are presented in Table 7 and Table 8.

Table 5. Structure of the User Table

Field Name	Type	Size	Description
no_anggota	VARCHAR	20	Primary Key
nama_lengkap	VARCHAR	100	Member full name
no_telp	VARCHAR	15	Phone number
alamat_lengkap	TEXT	-	Member address
username	VARCHAR	50	Login username
password	VARCHAR	255	Login password

Table 6. Structure of the Member Data Table

Field Name	Type	Size	Description
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no_anggota	VARCHAR	20	Primary Key
nama_lengkap	VARCHAR	100	Member name
saldo	DECIMAL	15,2	Savings balance

Table 7. Structure of the Savings Transaction Table

Field Name	Type	Size	Description
id_transaksi	INT	11	Primary Key, Auto Increment
tanggal_transaksi	DATE	-	Transaction date
no_anggota	VARCHAR	20	Foreign Key
nominal	DECIMAL	15,2	Transaction amount
keterangan	VARCHAR	100	Transaction description

Table 8. Structure of the Transaction History Table

Field Name	Type	Size	Description
id_riwayat	INT	11	Primary Key, Auto Increment
tanggal	DATE	-	Transaction date
no_anggota	VARCHAR	20	Member number
nama	VARCHAR	100	Member name
jenis	VARCHAR	20	Transaction type
nominal	DECIMAL	15,2	Transaction amount
keterangan	VARCHAR	100	Transaction description

1.12. System Implementation

The design results were implemented into a web-based application using PHP, MySQL, and the Bootstrap framework. Figure 16 shows the login page used by both admin and members to enter the system according to their access rights. After a successful login, the admin is directed to the dashboard page in Figure 17, which contains the total number of members, the total balance, the latest transactions, and the main menu.

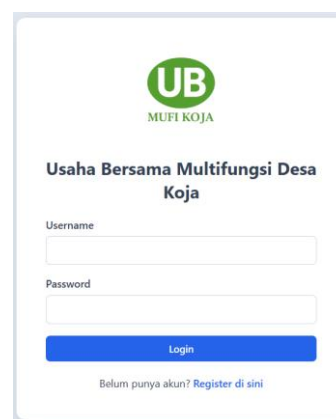


Figure 16. Implementation of the Login Page

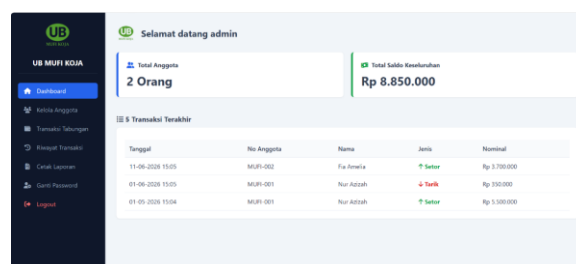


Figure 17. Implementation of the Admin Dashboard Page

Figure 18 shows the Member Management page used by the admin to add, edit, delete, and search member data. Figure 19 shows the Savings Transaction page for making deposits and withdrawals; each saved transaction immediately updates the member's balance automatically.

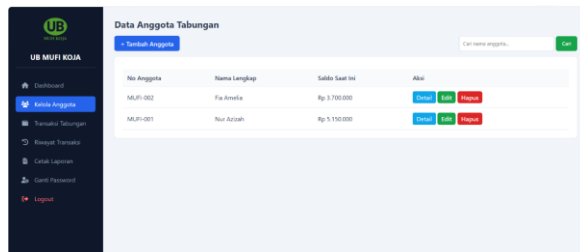


Figure 18. Implementation of the Member Management Page

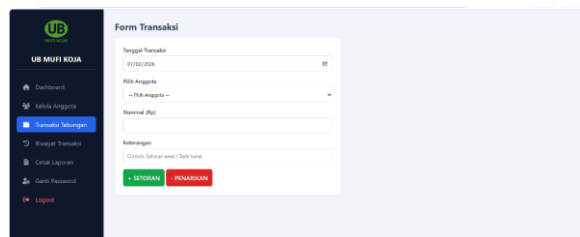


Figure 19. Implementation of the Savings Transaction Page

Figure 20 shows the Transaction History page, which contains all transaction data along with search, edit, and delete features. Figure 21 shows the Print Report page, which generates a transaction report based on a date range in PDF form. Figure 22 shows the Member Dashboard page, which displays the savings balance and the history menu, while Figure 23 shows the Change Password page.

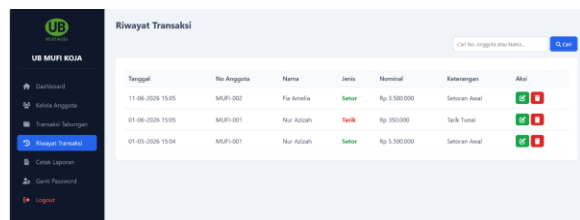


Figure 20. Implementation of the Transaction History Page

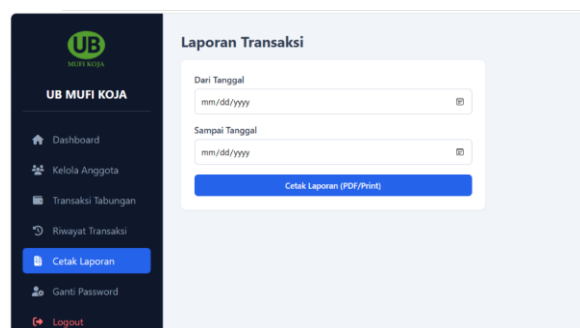


Figure 21. Implementation of the Print Report Page

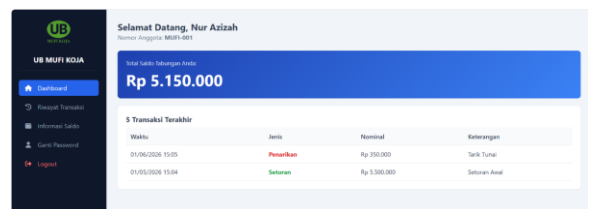


Figure 22. Implementation of the Member Dashboard Page

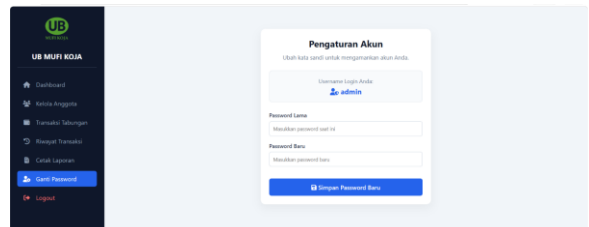


Figure 23. Implementation of the Change Password Page

1.1.3. System Testing

Testing was carried out using the Black Box Testing method, which focuses on the conformity of the application functions with the expected results, involving both admin and members. The test results for the register and login features are presented in Table 9, for the member management and transaction features in Table 10, and for the history, report printing, and change password features in Table 11.

Table 9. Testing of the Register and Login Pages

No	Scenario	Expected Result	Result
1	Register with empty fields	The system requires all data to be filled in	Pass
2	Register with an existing username	Displays a message that the username is already in use	Pass
3	Register with correct data	Data is saved and the user is directed to the login page	Pass
4	Login with empty fields	The system requires the fields to be filled in	Pass
5	Login with an unregistered username	Displays a message that the username is not registered	Pass
6	Login with a wrong password	Displays a wrong-password message	Pass
7	Login with correct data	Directed to the dashboard according to access rights	Pass

Table 10. Testing of Member Management and Savings Transactions

No	Scenario	Expected Result	Result
1	Add a member with empty fields	The system requires the fields to be filled in	Pass
2	Add a member with correct data	Data is saved and appears in the list	Pass
3	Edit and delete member data	Data is updated and removed from the list	Pass
4	Transaction with empty fields	The system requires the fields to be filled in	Pass
5	Deposit with correct data	Data is saved and the balance increases	Pass

6	Withdrawal exceeding the balance	Displays the message "Insufficient balance"	Pass
7	Withdrawal with correct data	Data is saved and the balance decreases	Pass

Table 11. Testing of History, Print Report, and Change Password

No	Scenario	Expected Result	Result
1	Open the transaction history page	Displays all history data	Pass
2	Search, edit, and delete history	Data is displayed, updated, and deleted	Pass
3	Print a report without a period	The system requires the period dates to be filled in	Pass
4	Print a report for a period with data	The report is displayed and can be printed	Pass
5	Change password with empty fields	The system requires the fields to be filled in	Pass
6	Change password with a wrong old password	Displays a message that the old password does not match	Pass
7	Change password with correct data	The password is updated and a success message appears	Pass

All test scenarios produced results that matched the expectations. This shows that the register, login, member management, savings transaction, transaction history, report printing, and change password functions have worked well. Compared with the previous manual system, this application speeds up the recording process, reduces the risk of calculation errors, and improves transparency because members can monitor their savings balance and history independently, consistent with the findings of previous studies [1], [3], [5].

The findings of this study reinforce previous research stating that the application of web-based systems is effective in replacing manual recording in savings management [2], [4]. However, this study makes a different contribution because it is applied to a community-based sharia financial institution (UB. MUFI), rather than a school environment as in most previous studies. The automatic balance calculation and transaction validation applied are shown to reduce the input errors that previously occurred frequently in manual recording using books and Microsoft Excel.

Nevertheless, this study still has limitations. The application focuses only on savings management and does not yet cover other services such as sharia financing or share management that the institution also runs. In addition, the application is still web-based, so its use depends on the availability of a browser and an internet connection. These limitations present opportunities for development in future research so that the coverage and accessibility of the system can be broadened.

CONCLUSION

This study successfully designed and built a web-based savings recording application at Usaha Bersama Multifungsi (UB. MUFI) Koja, North Jakarta, using the PHP programming language, a MySQL database, and the Bootstrap framework. The application is able to manage member data, deposit and withdrawal transactions, store transaction histories, calculate balances automatically, and generate reports by period, so that the recording process becomes more effective and structured.

The Black Box Testing results show that all main application functions work according to the system requirements. With this application, the previously manual savings recording can be minimized, reducing the risk of errors and data loss, and making it easier for both admin and members to obtain savings information quickly and accurately. Future research is advised to add transaction notification features, an Android version, automatic database backup, and charts as well as report export to Microsoft Excel.

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