



Development of a Financial Information System Website at Gkii Muara Asa Church

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Abstract

Financial management in GKII Muara Asa Church has traditionally been conducted manually using physical books and spreadsheets, making it prone to recording errors, reporting delays, and lack of transparency for church members. To address these issues, a web-based Financial Information System (FIS) website was developed to facilitate transaction input, digital data storage, real-time financial reporting, and information access for members. The system was built using the Waterfall model of the System Development Life Cycle (SDLC), including planning, analysis, design, implementation, testing, and maintenance phases. Technologies used include Laravel as the backend, MySQL for database management, and Bootstrap for frontend development. Functional testing showed that all core features such as login, transaction input, data search, and backup operate as expected with an average response time under 2 seconds. The implementation proves that the system successfully improves efficiency, accuracy, and transparency in church financial management.

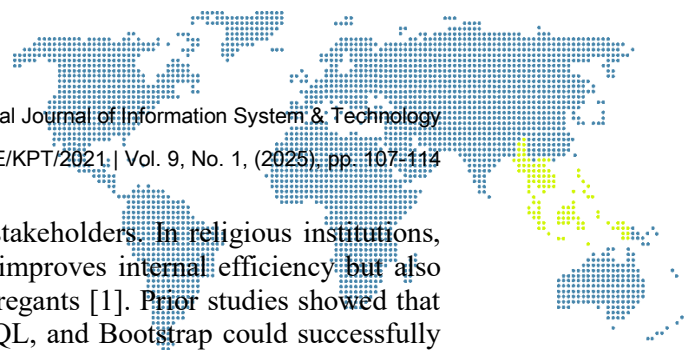
Keywords: Financial information system, website, church, Laravel, SDLC, transp.

1. Introduction

As a center for worship and social service activities, the church carries a significant responsibility in managing congregational funds derived from offerings, donations, and support for various internal programs. However, manual or semi-digital record-keeping practices often lead to challenges such as disorganized documentation, data loss risks, and delays in reporting. Limited transparency in financial management has also become a separate issue, as congregants lack direct access to information on how their contributions are being utilized. In such situations, it is crucial for the church to provide information openness as a form of accountability and professionalism. Congregants should be able to access financial reports from anywhere and at any time especially in the post-pandemic digital era, where ease of access is a necessary component of modern church services.

The development of this Church Information System (SIK) also aims to overcome the limitations of manual systems that are vulnerable to data loss, information duplication, and difficulties in monitoring the overall budget. With features such as centralized transaction input, budget notifications, and digital reporting, church financial management is expected to become more efficient and secure. Data security is prioritized through encryption and regular backups, minimizing the risk of manipulation or loss of critical information. The implementation of this web-based SIK not only brings technical benefits but also supports the strengthening of congregants' trust in professional and spiritually guided financial management. In the post-pandemic context, where digital access has become essential, the system expands congregational participation through online donation features and real-time budget monitoring. This project represents a strategic step for GKII Imanuel Muara Asa in integrating technology with religious values, ensuring responsible, transparent, and sustainable financial management.

Website has become one of the main platforms in developing modern information systems, including within non-profit organizations such as churches. The use of websites allows recording, managing, and presenting information to be carried out more efficiently,



in real-time, and to be easily accessed by various stakeholders. In religious institutions, digitalization through web-based systems not only improves internal efficiency but also strengthens transparency and accountability to congregants [1]. Prior studies showed that web-based financial systems built using PHP, MySQL, and Bootstrap could successfully replace manual processes, automate financial recording, generate daily reports, and provide dashboard access that increases congregational trust [1].

Financial management in religious institutions requires a high level of transparency and accountability, especially since the funds originate from offerings, donations, and grants. Manual systems often suffer from delays, human errors, and data manipulation risks. A study revealed that adopting a web-based accounting information system is an effective solution for these issues. It enables automated transaction logging, real-time financial reporting, and centralized secure data storage [2]. With data validation features and digital report access, financial oversight by internal and external parties becomes more manageable [2].

Web-based financial information systems are also a practical response to the inefficiencies of using spreadsheets like Microsoft Excel, which are prone to errors and inconsistencies in data recap [3]. Developed with PHP and MySQL, such systems typically offer modules for payment input, operational cost tracking, budgeting, and financial report generation [1]. Supporting tools like Use Case, Activity Diagrams, ERD, and DFD further ensure that system design aligns with organizational requirements [3]. Other studies have shown that these systems enhance administrative efficiency, data accuracy, and user satisfaction [4], [5]. Thus, adopting web-based financial systems is an effective strategy for improving transparency and professionalism in the financial management of various institutions, especially those grounded in spiritual values.

2. Research Methodology

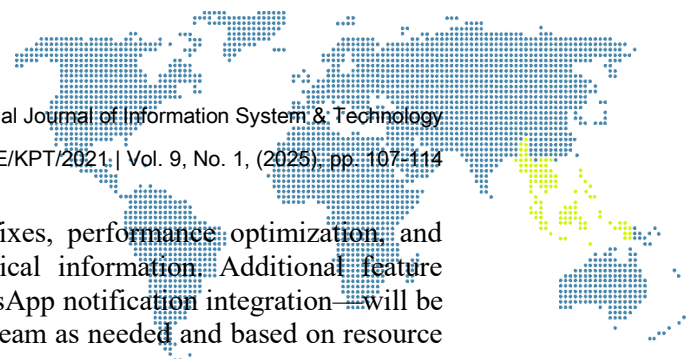
The development process of the Church Financial Information System Website for GKII Muara Asa followed the System Development Life Cycle (SDLC) approach using the Waterfall model. The process began with the Planning phase, where the main objective was to transition from manual financial recording (physical ledgers and spreadsheets) to a digital system. The focus was on features such as transaction input, data search, and digital backup. The project scope was limited to data migration, without involving complex accounting or reporting processes.

In the Analysis phase, issues with the manual system were identified, including difficulties in accessing historical data, risks of losing physical documents, and inaccuracies in record-keeping. Data was collected through direct observation and interviews with church administrators to understand user needs, such as a simple interface and a fast search feature.

The System Design phase involved designing the system architecture, including the creation of a Class Diagram to define the structure and relationships between entities such as transactions, categories, and users; UI mockups for a user-friendly interface; and a Sequence Diagram to illustrate the flow of interactions between users and the system during key processes such as data input and retrieval. This design aimed to ensure the system was easy to use and met the needs of the church administrators.

During the Implementation phase, the system was developed using Laravel (backend), MySQL (database), and Bootstrap (frontend). Key features developed included transaction input (date, category, amount), data search based on specific parameters, and digital backup to prevent data loss.

The Testing phase included functionality testing (input, search, backup) and a User Acceptance Test (UAT) conducted with church administrators to ensure the system aligned with existing manual processes and was free of bugs. Success criteria included system response time (<2 seconds) and data storage accuracy.



Finally, the Maintenance phase includes bug fixes, performance optimization, and regular data backups to prevent the loss of critical information. Additional feature development—such as data export to Excel or WhatsApp notification integration—will be carried out by church administrators or an external team as needed and based on resource availability.

3. Result and Discussion

The process begins with system design and continues through implementation and testing. Each stage is described in detail, supported by visualizations such as the Class Diagram to illustrate the structure and relationships between entities, the Sequence Diagram to depict the flow of interactions within the system, user interface mockups, and application screenshots as concrete evidence of the work completed. Additionally, this chapter discusses the system's success in transitioning manual recording processes to a digital format, as well as the limitations encountered during development.

3.1. Requirement Analysis

During this phase, system requirements were identified by examining the challenges faced in financial management at GKII Imanuel Muara Asa Church. Based on observations and interviews with church administrators, it was found that the processes of recording transactions, financial reporting, and data storage were still performed manually using spreadsheets such as Microsoft Excel. This method led to several issues, including inefficiency in data compilation which consumed considerable time, limited transparency due to the lack of direct access for congregants to financial information, and a high risk of errors caused by potential manipulation or inaccuracies in manual recording.

As a solution to these problems, the development of a web-based financial information system is required to automate the recording and reporting processes in a structured manner. This system is expected to accelerate financial data processing, provide real-time information, and enhance accountability and transparency by granting appropriate data access to relevant parties, including church members.

3.2. System Design

System design is an essential process that aims to outline how the web-based financial information system will be built and implemented. This design serves as a bridge between the requirements analyzed in the previous stage and the actual system development process. In this phase, several system modeling techniques are used to describe the structure, behavior, and interactions within the system.

3.2.1. Use Case Diagram

The Use Case Diagram is used to illustrate the relationships between actors (system users) and the main functionalities of the system. This diagram depicts usage scenarios by administrators and treasurers, such as managing transaction data, viewing financial reports, and performing data backups. It provides an overview of the functions offered by the system and the roles of each involved actor.

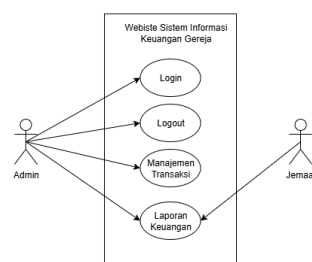


Figure 1. Use Case Diagram

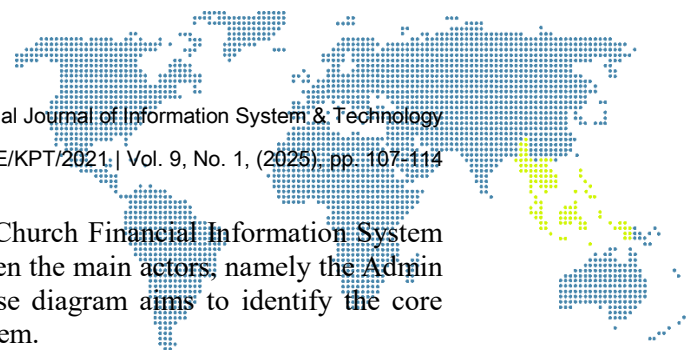


Figure 1 illustrates the use case diagram of the Church Financial Information System Website. This diagram shows the interactions between the main actors, namely the Admin and the Congregants, with the system. The use case diagram aims to identify the core functions that each actor can perform within the system.

Admin Actor has full access to all functions within the system, including:

- (a) Login: *The authentication process to access the system.*
- (b) Logout: *The process of exiting the system after completing tasks.*
- (c) Transaction Management: *A feature for managing the church's income and expenses, such as recording offerings, donations, or operational expenditures.*
- (d) Financial Report: *A module for viewing and generating financial reports on a regular basis, serving as a means of financial accountability and transparency.*

Congregant actor has limited access, meaning they can only view financial reports and do not have the ability to perform transactional or administrative actions within the system access Financial Reports, with the purpose of viewing financial reports provided by the admin. This feature supports transparency in church fund management for all congregants. Overall, this use case diagram shows that the system is designed with a clear separation of access rights between the admin and congregants, ensuring data security and guaranteeing that only authorized personnel can make changes to financial data.

3.2.2. Activity Diagram

Activity Diagram is used to map out the flow of activities within a system in detail. This diagram illustrates the logical steps in system processes, such as financial transaction input and report generation. Through this visualization, business processes can be depicted sequentially, facilitating the implementation and testing phases.

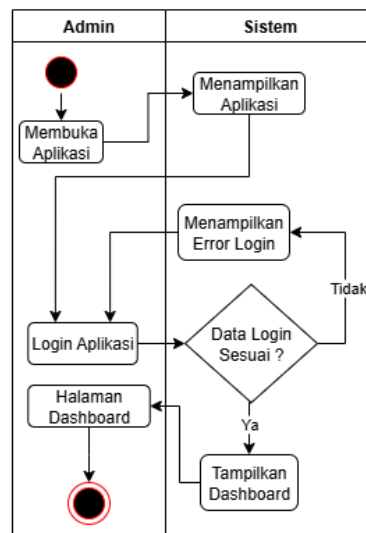


Figure 2 . Diagram Login Admin

Figure 2 shows the activity diagram of the admin login process in the financial information system. The process begins when the admin opens the application, which is then responded to by the system by displaying the initial screen. Next, the Admin enters the login data, which is verified by the system. If the data is incorrect, the system displays a login error message; if correct, the system displays the dashboard page. This diagram illustrates the interaction between the Admin and the system during the authentication process.

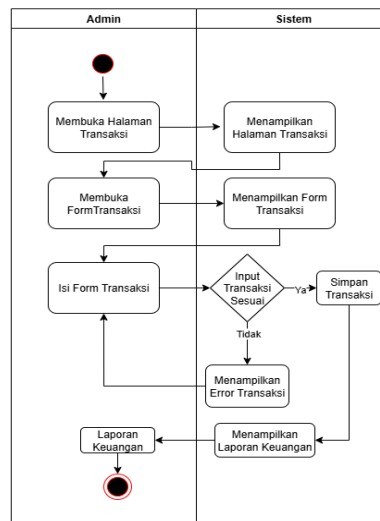
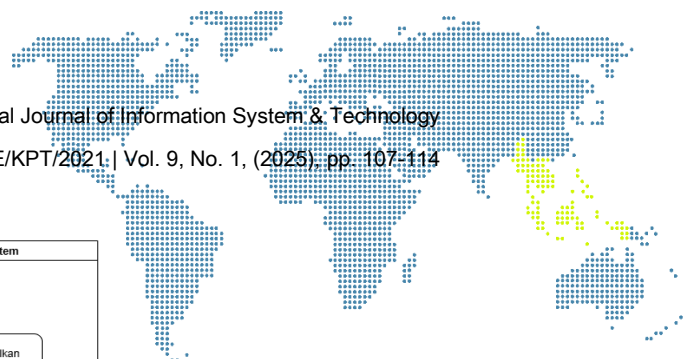


Figure 3. Activity Diagram Admin

Figure 3 illustrates the financial transaction process flow carried out by the admin and the system. The process begins when the admin opens the transaction page, which is then responded to by the system by displaying the page. Next, the admin opens and fills out the transaction form, and the system validates the input. If the data entered is valid, the system saves the transaction; otherwise, if an error occurs, the system displays an error message. After the transaction is successfully saved, the admin can access the financial report generated by the system. This diagram depicts the two-way interaction between the user (admin) and the system, emphasizing the importance of data validation in maintaining the accuracy of financial reporting.

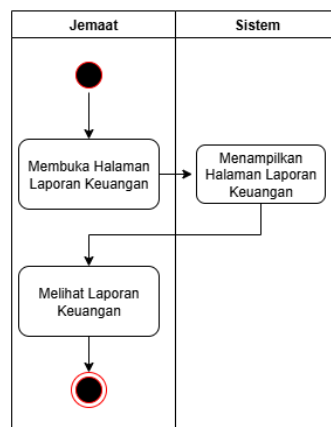
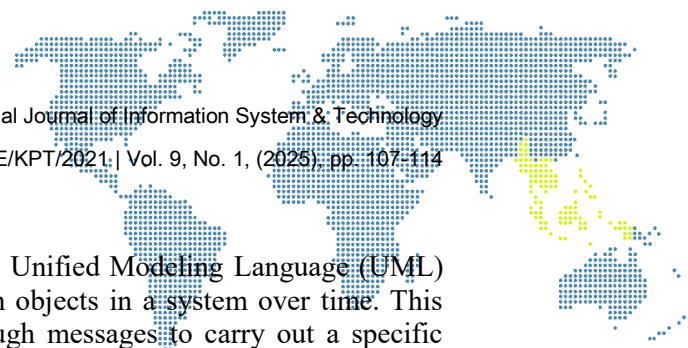


Figure 4. Activity Diagram for Congregant Financial Report

Figure 4 illustrates the interaction flow of a congregant accessing financial information through the system. The process begins when the congregant opens the financial report page, which is then responded to by the system by displaying the page. Once the page is successfully loaded, the congregant can view the contents of the available financial report. This flow demonstrates the ease of access and transparency of financial information provided by the system to congregants in real-time.



3.2.3. Sequence Diagram

A Sequence Diagram is a type of diagram in the Unified Modeling Language (UML) used to depict the sequence of interactions between objects in a system over time. This diagram visualizes how objects communicate through messages to carry out a specific scenario or use case. The main focus of a sequence diagram is the time sequence, represented from top to bottom, showing how a process unfolds from start to finish including message exchanges, responses, and specific conditions such as errors or branches. The following diagrams explain the interactions between users and system components in a structured manner, covering processes such as login, transaction data input, and access to financial reports by Congregants.

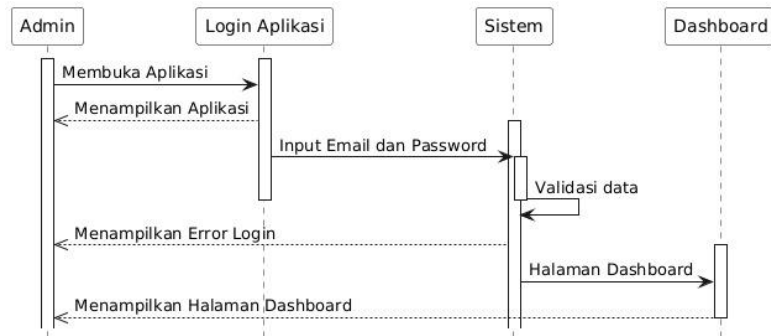


Figure 5. Sequence Diagram Login

Figure 5 illustrates the Admin login process: when the Admin opens the application, the System displays the Login Page . After the Admin enters the email and password, the data is sent to the System for validation. If valid, the System redirects to the Dashboard Page as the main interface; if invalid, an error message is displayed. This process includes credential verification by the System and navigation to the appropriate interface based on the validation result.

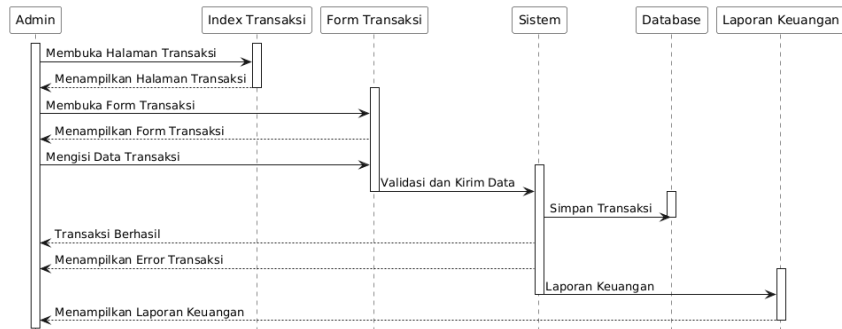


Figure 6. Sequence Diagram Transaction

Figure 6 shows that when the Admin opens the Transaction Index Page , the system displays the main transaction page and directs the user to the Transaction Form to enter data. After the Admin submits the data through the form, the system validates it: if valid, the data is saved to the Database , and the system generates a Financial Report summarizing the successfully processed transactions; if invalid, an error message is displayed to the Admin. This process involves a two-way interaction between the Admin and the System , starting from data entry to database storage and final report generation.

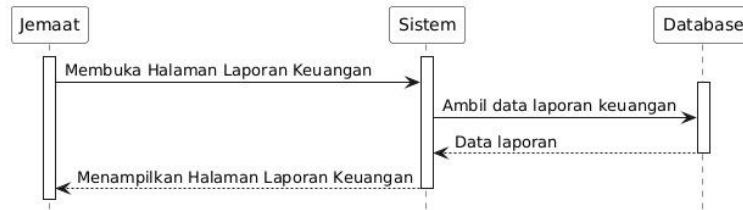
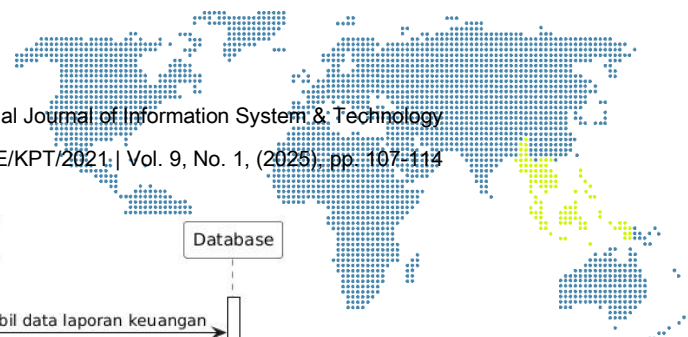


Figure 7. Financial Report Sequence Diagram

Figure 7 illustrates the interaction flow when a Congregant accesses the Financial Report page by sending a request to the System. The system processes this request by retrieving data from the Database, processing it into a structured report, and displaying it through the user interface. This process includes data retrieval, processing, and the accurate presentation of financial information to the Congregant.

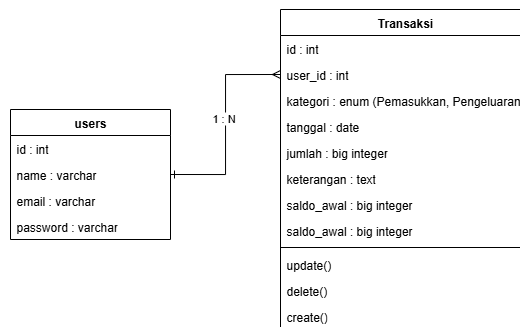


Figure 8. Class Diagram

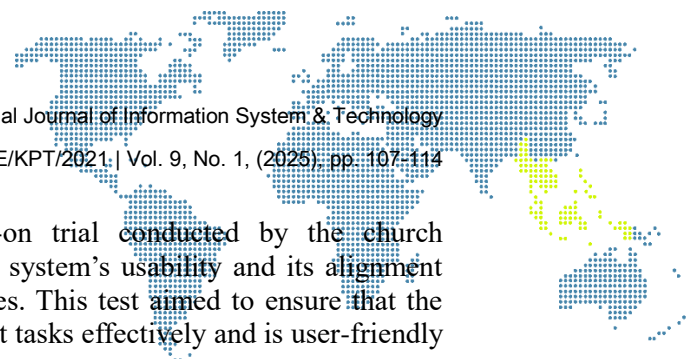
Figure 8 is a simple class diagram consisting of two main classes: Users and Transaction . The Users class represents system users and includes attributes such as id, name, email, and password. Meanwhile, the Transaction class represents financial transaction data performed by users, with attributes such as id, user_id, category (with an enum value of Income or Expense), date, amount, description, initial_balance, and final_balance. There is a one-to-many relationship from Users to Transaction, meaning that one user can have multiple transactions. Additionally, the Transaction class includes three methods: create(), update(), and delete(), which represent basic operations for manipulating transaction data. This diagram provides a logical overview of the data structure to be used in the transaction recording system and shows how entities interact structurally.

3.3. Implementation

This phase explains the implementation process of the previously designed web-based financial information system. The implementation was carried out step by step, starting from technology selection, database creation, user interface development, design of core system functions, to testing in order to ensure the system operates as intended.

After the implementation phase was completed, testing was conducted on all core features of the GKII Muara Asa Church Financial Information System Website. The purpose of this testing was to ensure that each function operates as specified in the planned requirements, as well as to detect any potential bugs or errors before the system is actively used by the church administrators. The testing was conducted using two main approaches:

- (a) Functional Testing: This ensures that all modules, including login, transaction input, data search, report display, and data backup, operate according to the defined business processes and technical specifications.



- (b) User Acceptance Test (UAT): A hands-on trial conducted by the church administrator and treasurer to evaluate the system's usability and its alignment with the previously used manual procedures. This test aimed to ensure that the system supports daily financial management tasks effectively and is user-friendly for non-technical users.

Table 1. Test Result

No	Testing	Test Result	Note
1	Login	As expected	Email and Password Authentication
2	Input Transaksi	As expected	Data is Stored Validly and in the Correct Format
3	Filter	As expected	Filtering by Date and Category Functions Properly
4	Tampilan Laporan	As expected	Displaying Complete Income and Expense Data
5	Logout	As expected.	User Session is Properly Cleared

Based on the test results, all core features functioned without significant errors. The average response time for each action was under 2 seconds, meeting the predefined success criteria. Additionally, feedback from initial users indicated that the system interface is easy to understand and intuitive.

4. Conclusion

The development of this web-based financial information system has successfully transitioned manual recording processes into a digital format. With features such as transaction input, data search, financial reporting, and regular backups, the system provides church administrators with a more accurate, secure, and efficient way to manage finances. Additionally, the system allows limited access to financial information for congregants as a form of transparency. Although still relatively simple, this system has addressed the basic needs of digital migration and is ready to serve as a foundation for more professional and sustainable church financial management.

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