


Digital Transformation of School Administration through Financial Management Information System (SIMKU)

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Abstract

Managing private school administrative data, especially data on Education Development Contribution (SPP) payments, is still a challenge for many institutions that have not implemented information systems optimally. Data collection that is still done manually using spreadsheet applications such as Microsoft Excel has various shortcomings, including limitations in data search, potential input errors, and difficulties in the recapitulation and reporting process. This has an impact on the efficiency of the work of administrative officers and delays in providing information to related parties such as teachers, students, and guardians. Based on this, this study aims to design a web-based SPP payment information system that can help the process of data collection and management of student SPP payments more effectively and efficiently. This system is designed and built using the PHP programming language with the Laravel Framework which is Open Source and supports the development of web applications. MySQL is a database management system that stores all student payment information in a structured manner. The performance results of the designed system have main features such as payment data input, data search based on student name or payment month, automatic recapitulation, and printable payment reports. The system is expected to be able to manage private school financial administration in a more organized, accurate, and fast manner. The final result of the study presents an application of a tuition payment information system that can be utilized by private school administration officers to improve work efficiency and the quality of financial information services to all school residents. In addition, this system can also be further developed for integration with other features such as payment notifications or student achievement system integration.

Keywords: System, Information, Administration, Private Schools, MySQL

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1. Introduction

The development of information technology affects business processes in an organization [1]. The speed and accuracy of information are important factors in supporting various sectors, including the education sector [2]. Schools as educational institutions require a system that can manage information efficiently, including in the administrative process of paying Educational Development Contributions (SPP) [3]. An adequate information system can accelerate and facilitate the provision of accurate and timely data, thus supporting the smooth running of school business processes, both in terms of financial management and administration [4].

Previous research confirms that the application of information technology can help the operational management process of an organization [5]. Other research also states the same thing that the importance of information technology makes management more effective and efficient [6]. The same statement was also conveyed by Asy'ary, APMH, & Asraf, A, that the need

for information technology to help the management process in an organization [7].

The application of technology is also needed for management in an institution such as Yayasan Generasi Rabbani. This institution houses several units engaged in education, social and da'wah foundations. Problems that arise in this institution such as SPP data management are still carried out so that they are prone to errors, data loss, and difficulty in finding information. This non-computerized system hinders the smooth running of school business processes, such as monitoring student SPP payments, making financial reports, and managing arrears. This also results in a time-consuming recapitulation process, as well as inaccuracy in presenting financial reports required by the school [8].

Development of an information technology-based system that can facilitate the management and processing of student tuition fee data in a more structured, efficient, and accurate manner [9]. Designing a web-based tuition fee payment system that

aims to facilitate administrators in managing student tuition fee payment transaction data and support the smooth running of school administration business processes. This system can also assist schools in the process of monitoring student tuition fee payments in a more organized and transparent manner [10].

2. Research methodology

Research in designing information systems uses the Research and Development (R&D) approach [11]. The R&D method aims to develop and test the effectiveness of a particular product [12]. The design of the information system is presented in the form of a web-based Financial Management Information System (SIMKU) to improve the efficiency of financial administration in schools. The R&D method involves a systematic process starting from problem identification,

product development, trials, to revisions based on evaluation results [13]. The RAD method is very relevant to be applied in the development of information systems used in the context of education, especially to support more effective and efficient school administration processes [14], [15].

The design of the SIMKU system in this study also adopts the System Development Life Cycle (SDLC) system development model [16]. SDLC is a series of system development stages that include processes ranging from needs analysis to system implementation and maintenance [17]. The purpose of this approach is to ensure that the system is developed based on the real needs of users and can be applied optimally through the waterfall method, which is a systematic and sequential SDLC model [18]. The description of the research framework is presented in Figure 1.

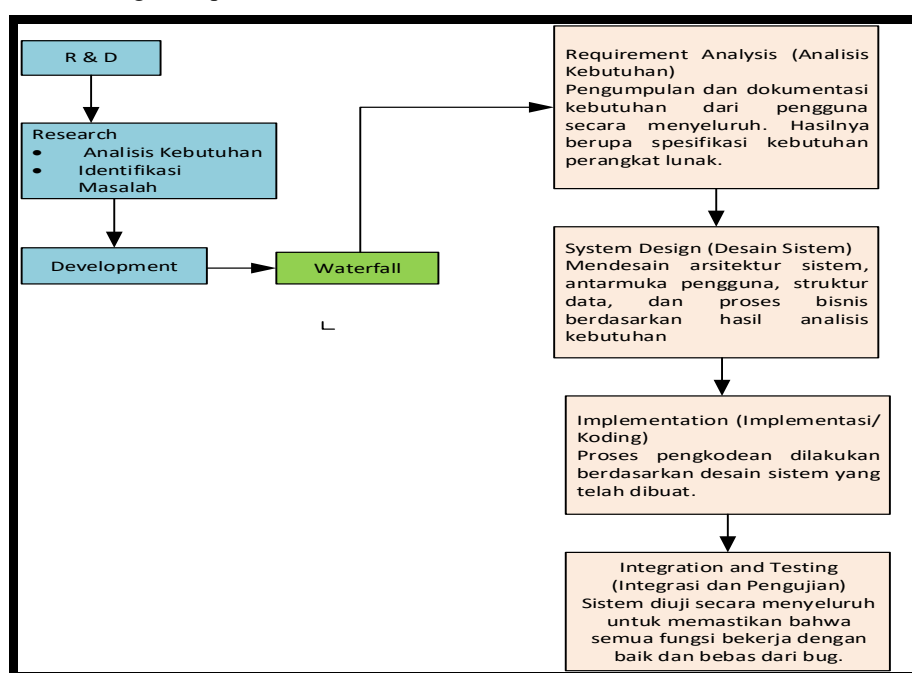


Figure 1. Research Framework

Figure 1 illustrates the flow of stages in the SIMKU information system design process. The development process is carried out step by step, like a waterfall, where each stage must be completed before proceeding to the next stage. The stages in the waterfall method include:

- a. User Needs Analysis, identifying system needs based on the current condition of school financial administration. This process is carried out through direct observation of the school's financial activities, interviews with financial staff, treasurers, and principals, and collection of supporting documents such as financial reports, receipts, and student payment schedules.
- b. System Design Designing the system architecture, user interface, and workflow of the tuition payment system. The system design stage is a follow-up step after the needs analysis is completed. At this stage, a comprehensive design is carried out on the system architecture, user interface, and tuition payment system workflow so that the system built is functional, efficient, and easy to use by end users such as school treasurers and parents [19], [20]
- c. Implementation, building a web-based system according to the design that has been designed. The technology used in system development includes Programming Languages: PHP, HTML/CSS and Laravel framework and Database: MySQL for data management [21-23].
- d. Integration and Testing, testing the system to ensure the functionality works well and meets user needs. The main purpose of this stage is to find errors, ensure system stability, and evaluate the level of

success of the system in meeting user needs. Testing is done with several Black Box Testing approaches. Focus on testing system functions without looking at the internal structure of the code. Testing is done by providing input and observing the output produced. Functional Testing is an activity to test each main function such as login, student data input, transaction recording, report printing, and logout. Make sure all buttons, menus, and forms work properly [24], [25].

- e. Maintenance, handling bug fixes and continued development post-implementation [26]

3. Results and Discussion

This research produces a website-based Financial Management Information System (SIMKU) designed to improve the efficiency of tuition payment administration. The development process is carried out based on the Research and Development (R&D) approach with the system development stages following the Waterfall model. The system results obtained are expected to be able to overcome problems in managing tuition payments at SMPIT Generasi Rabbani, Bengkulu City.

3.1 Needs Analysis Stage

The needs analysis is based on the results of interviews and observations showing that the payment administration process is carried out manually. The process that has occurred so far is carried out through recording in a ledger or Excel. This causes several problems such as delays in financial reporting, duplication of payment data, and difficulties in tracking student arrears. Based on the needs analysis that has been carried out, it was found that schools need a system that can record payment transactions digitally, produce automatic financial reports, and have a search and recapitulation feature for data per student.

3.2 System Design Stage

Based on the needs of the previous analysis, the design of a web-based system is carried out using the Laravel framework. The system has the main features of student tuition payment entries, automatic arrears monitoring, real-time financial report generation. Several actors will be involved in the login process

such as admin, treasurer, and principal, and parents of students. The system can be modeled using *the Unified Modeling Language* (UML) by involving several diagrams such as

1. Use Case Diagram

Designing Financial Management Information System (SIMKU), there are several main actors who interact directly with the system. The actors in question are users who perform actions or receive services from the system. Each actor has a different role and responsibility, according to its function in the school's financial administration process. The use case diagram can be presented in Figure 2.

Figure 2 explains the description of the SIMKU information system design. The performance of the system can be seen from the actors involved in the SPP payment management process. Some of these actors have roles and responsibilities, including:

a. System Admin

Admin is responsible as the initial manager of the system. His role is to ensure that the basic data and system structure are available and can be used by other users. Admin can: add and manage user accounts (treasurer, parents, etc.), organize master data such as school year, class, and payment category, and student data, backup and restore data if necessary.

b. School Treasurer

The treasurer is the actor who interacts most frequently with SIMKU. His main role is to record and monitor all student financial transactions, especially tuition payments. The treasurer can input student payment data, print proof of payment, view and print daily, monthly, and per-student financial reports, track student payment arrears data

c. Parents / Guardians of Students

The system designed in the SPP management process is also equipped with a guardian login feature, so parents will also be actors. Their role is more passive, but important as recipients of information. Parents can: see the status of their child's SPP payment, download proof of payment, receive notifications if there are arrears, and upload proof of payment if made via transfer.

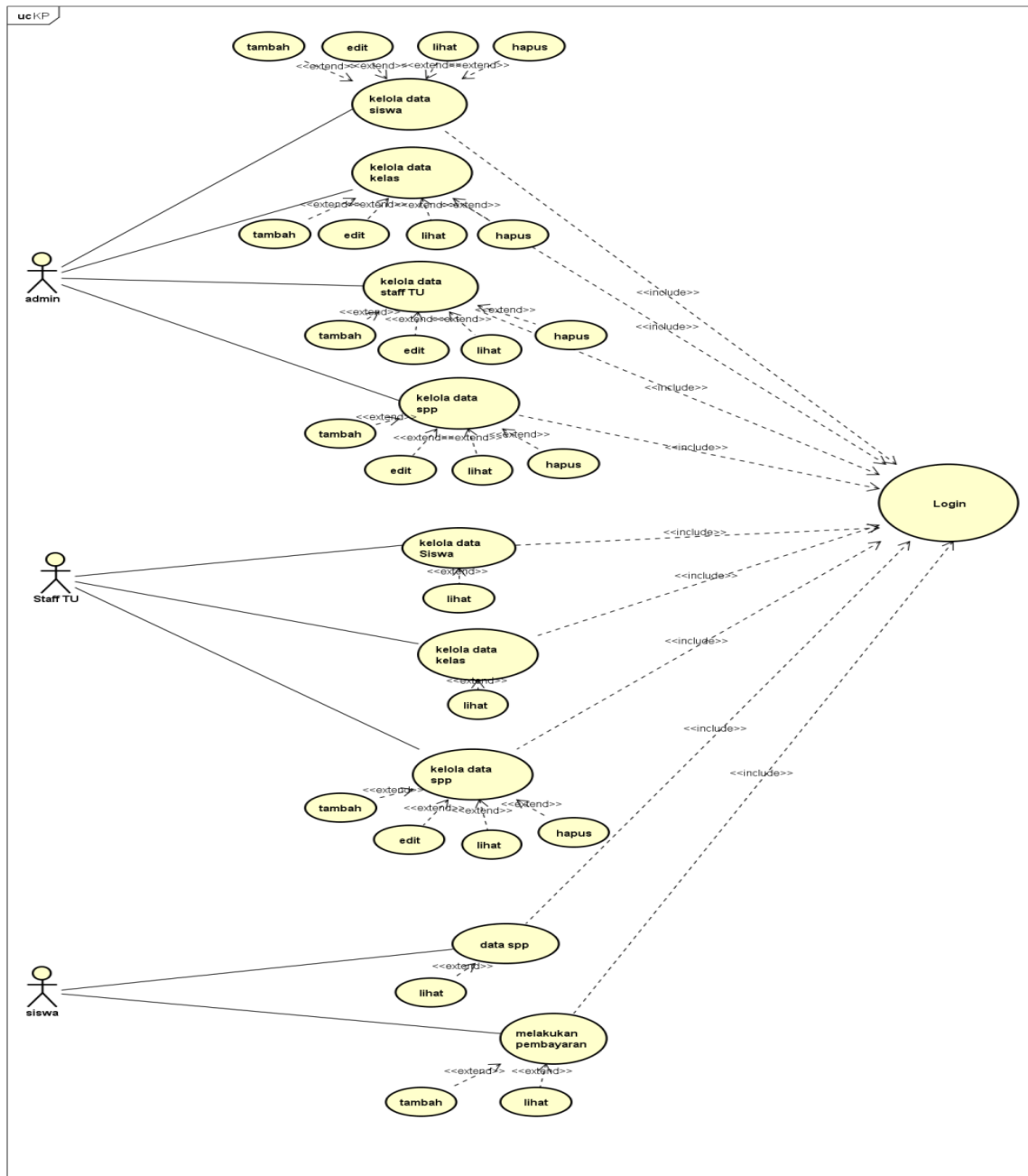


Figure 2. SIMKU Usecase Diagram

2. Class Diagram

Class diagrams describe the static structure of the system in the form of main classes that make up the system along with the attributes (data) and methods

(functions) they have, as well as the relationships between classes. In developing SIMKU, class diagrams are used to model entities and relationships that reflect the process of recording and reporting school finances. The class diagram can be presented in Figure 3.

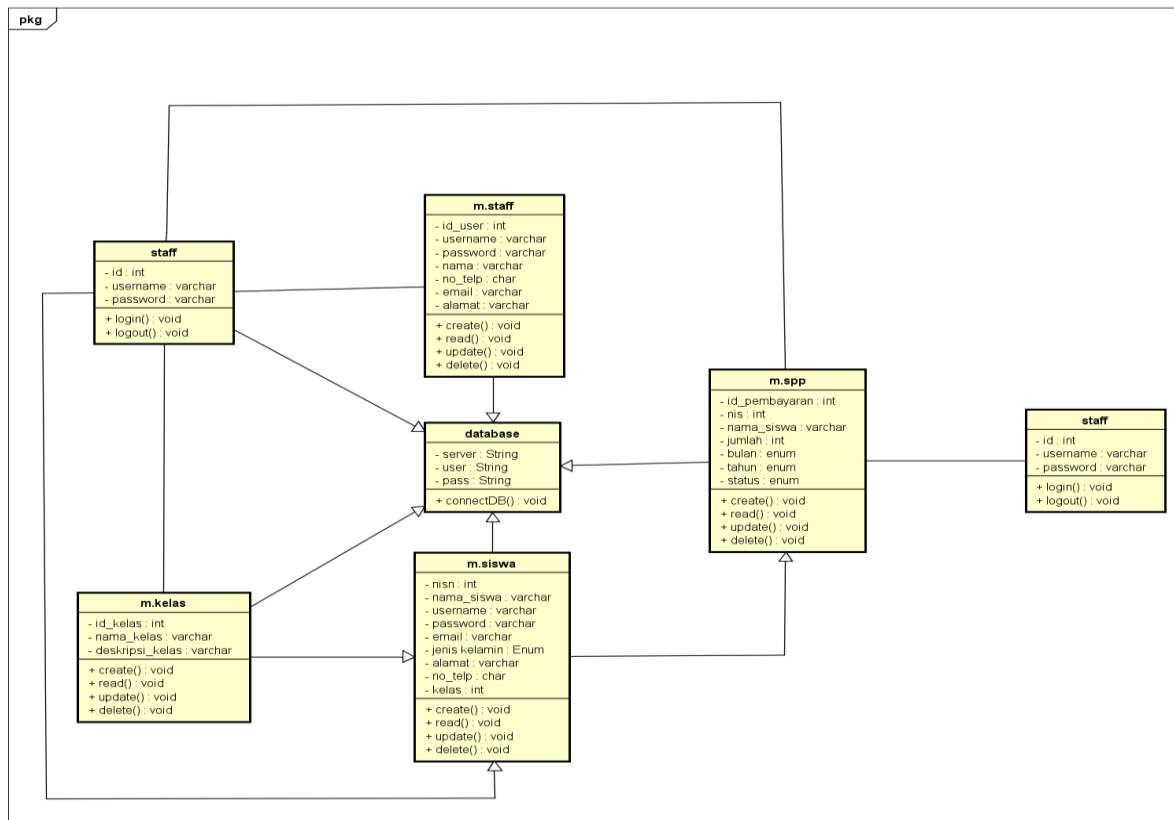


Figure 3. SIMKU Class Diagram

Figure 3 is a depiction of the class diagram in the SIMKU system. The class diagram includes several core classes that represent the main actors and data entities in the system:

- User Class, the User class represents all system users, including admin, treasurer, and parents.
- Student Class, the Student class stores information related to students who make payments.
- Payment Class
- Payment Class is the core of the system, used to record every student tuition payment transaction.
- Report Class, the report class produces a summary of payment data in a certain period.

3.3 System Implementation and Testing

The implementation and testing process of the SIMKU system design results aims to ensure that the SPP payment management process can be more effective and efficient. This is the focus of the system testing process that has been produced. Some of the testing processes include the Interface display. The interface or user

interface is an important part of the information system because it is a direct link between the user and the system. The Rabbani Generation SPP payment information system is designed with the principles of simplicity, ease of navigation, and high accessibility, so that it is easy to use by various user roles such as treasurers, admins, and parents. An overview of the SIMKU system interface can be seen in Figure 4.

Figure 4 is the initial page display on the system, there is a detailed display of the home page website, about the website, faq, contact and button to login. On the login page, the user enters data containing the Username and Password. To access the system, the user must log in to the system to be able to process payment data. In addition to the SIMKU system interface, testing continues on the SIMKU system Dashboard page. The appearance of the dashboard page can be seen in Figure 5.

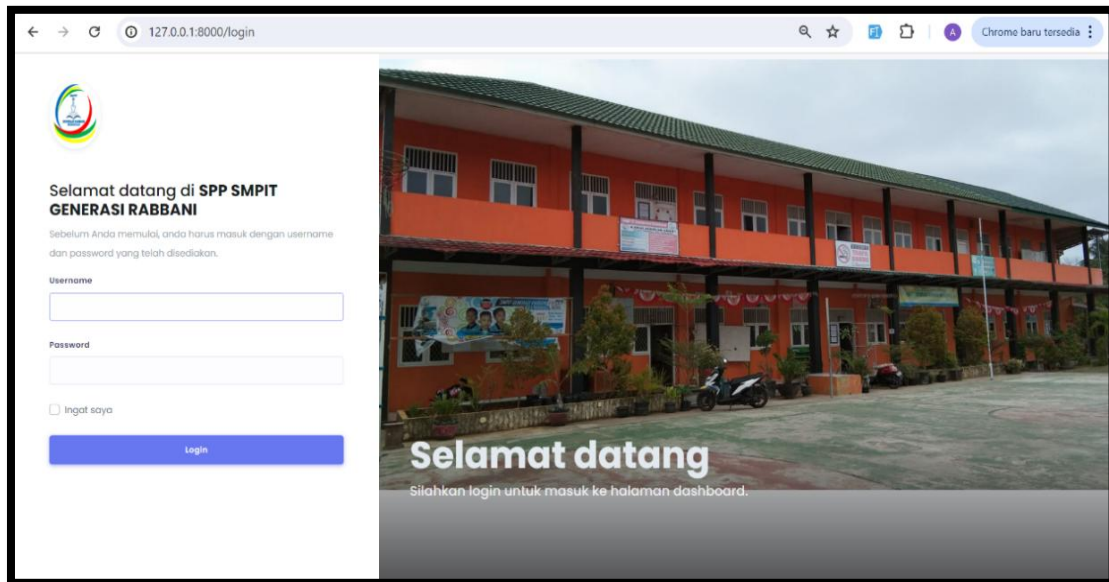


Figure 4. Home SIMKU System

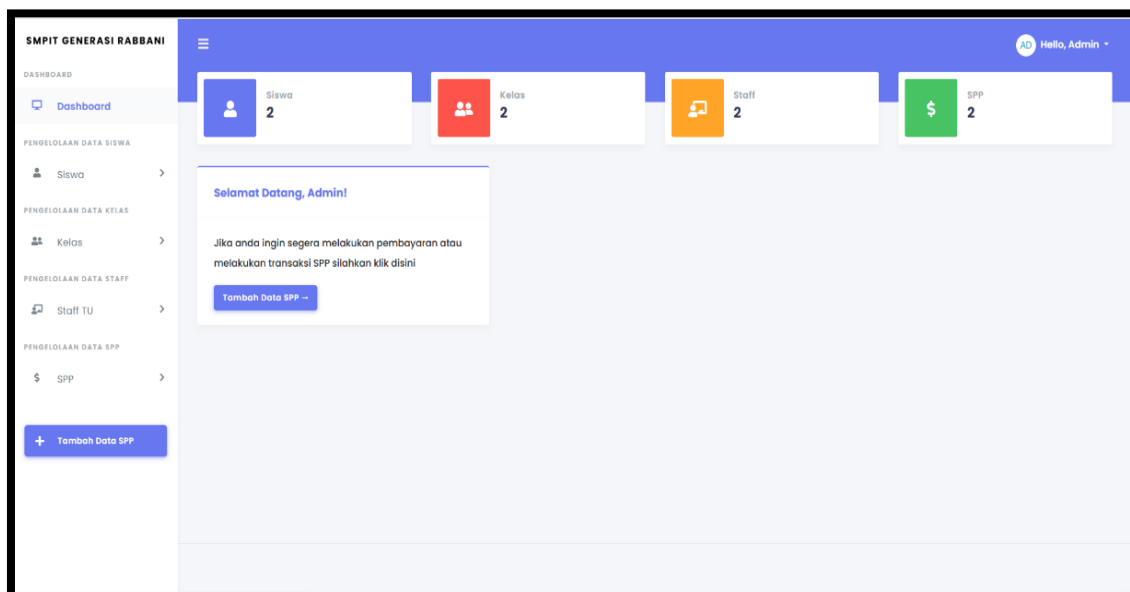


Figure 5. Dashboard page

Figure 5 is a display of the dashboard page. The dashboard page contains a student menu. to enter student data, edit, and delete student data. The TU staff menu is a page for managing staff data that enters

payment transaction data, and the SPP menu. Based on several testing processes that have been carried out, the details of the test results can be described in Table 1.

Table 1. Details of test results

No	Case/Tested	Test Data	Expected results	Test Results
1.	Login	Do not enter <i>Username</i> and <i>Password</i> .	The system will display a notification “Whoops! Something seems wrong. Your username is not registered in our database”.	Succeed
		Entering the wrong <i>username</i> and correct <i>password</i> .	The system will display an error “Whoops! Something went wrong. Your username is not registered in our database”.	Succeed
		Entering the correct <i>username</i> and incorrect <i>password</i> .	The system will display an error “Whoops! Something went wrong. Your username is not registered in our database”.	Succeed
3.		Enter the correct <i>username</i> and correct <i>password</i>	The system will direct you to the <i>Dashboard Admin</i> or <i>Student Dashboard</i> .	Succeed
		View student data	The system will display detailed student data.	Succeed

No	Case/Tested	Test Data	Expected results	Test Results
4.	Student data management and student accounts	Editing student data	The system will display the student data page that you want to edit.	Succeed
		Deleting student data	The system will immediately delete student data from the table.	Succeed
		Adding student data	The system will display the data directly into the student data table when successful.	Succeed
		Adding class data	The system will display the data directly into the class data table when successful.	Succeed
4.	Management Class	Editing class data	The system will display the class data page you want to edit.	Succeed
		Deleting class data	The system will immediately delete the class data from the table.	Succeed
5.	TU staff data management and TU staff accounts	Adding TU staff accounts and personal data	The system will successfully display the TU staff account data in the table.	Succeed
		Editing TU staff account	The system will go directly to the data edit page	Succeed
		Deleting TU staff account	The system will immediately delete the TU staff account	Succeed
6.	Data Management of SPP and Bills	Adding SPP data and transactions	The system will successfully add SPP data and transactions	Succeed
		Edit transaction data	The system will display paid and unpaid forms .	Succeed
		Delete transaction data	The system will successfully delete the transaction data.	Succeed
7	Billing Page On User	Add proof of payment	The system will display a form to input images.	Succeed

Table 1 describes all tested scenarios, most of the system functions run well. Some minor technical constraints were found, such as suboptimal input validation on student data, but have been fixed and retested. The system has passed the test with the final results indicating that SIMKU is suitable for use as a school financial information system.

4. Conclusion

The Financial Management Information System (SIMKU) built using the Laravel framework with a MySQL database was successfully designed and developed to meet the needs of tuition payment administration at SMPIT Generasi Rabbani, Bengkulu City. This system provides key features such as student data management, payment recording, financial report generation, and user management with different access levels. All of these features have been tested using the black-box testing method and show results that are in accordance with user needs. The application of the Research and Development (R&D) development method with the System Development Life Cycle (SDLC) waterfall model approach has proven effective in building a system systematically, starting from needs analysis to the testing and implementation stages. With this system, the school's financial administration process becomes more efficient, structured, and digitally documented, and minimizes the risk of manual recording errors.

Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	W
Niska Ramadani	✓	✓			✓	✓		✓	✓
Ariq Abdurrahman		✓				✓			✓

Fadlul Amdhi Yul	✓	✓	✓	✓	✓			
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Conflict of Interest Statement

Authors state no conflict of interest.

Informed Consent

We have obtained informed consent from all individuals included in this study.

Data Availability

The data that support the findings of this study are available from the corresponding author, [M], upon reasonable request.

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