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Departement of Information System, Faculty of Sains and Technology,
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DESIGN AND DEVELOPMENT OF A WEB-BASED NEW STUDENT ADMISSIONS INFORMATION SYSTEM (SPMB) WITH TEST INTEGRATION

Rohma Hidayah[1], Rini Agustina[2], Wiji Setiyaningsih[3]
Information Systems Program, PGRI Kanjuruhan University, Malang
Hidayah19.ama@gmail.com[1], riniagustina@unikama.ac.id[2], wiji@unikama.ac.id[3]

Abstract. Student Admissions (SPMB) is a crucial annual cycle for educational institutions, such as SMK Islam Kalipare, to recruit prospective students. Currently, the registration process is conducted in person, requiring students to visit the school to obtain and complete physical forms, as well as submit the necessary documentation to the admissions committee. This mechanism leads to an accumulation of physical records and a dependency on face-to-face interaction, which triggers various issues such as the risk of document damage or loss, data entry errors, and data duplication. Consequently, the admissions committee requires more time to process applicant data, while prospective students face difficulties in obtaining timely updates on their registration status. This research aims to develop a new web-based student admission information system (SPMB) to optimize existing processes. By integrating online examinations and notification features, the system is designed to enhance performance and reduce the time required for the registration process. The Rapid Application Development (RAD) approach is employed to facilitate accelerated software development through structured stages of planning, design, development, and implementation. The system is developed using PHP and MySQL, with modeling represented through Unified Modeling Language (UML). The research resulted in a system capable of facilitating the registration stages, data management, online examination administration, and the delivery of test results via notifications. The evaluation, conducted through Black Box Testing and User Acceptance Testing (UAT), yielded a usability rating of 87.8%, demonstrating high levels of acceptability and ease of use. Consequently, the system facilitates a more effective, accurate, and structured admission process.
Keywords: Information Systems, Student Admission System, Rapid Application Development (RAD)

INTRODUCTION

The changing times are driving ever-faster advances in science and technology. It is only natural that each school should develop its own system for admitting new students (Putra Mahendara et al., 2022). In the age of information technology, the ease of accessing data has become a key factor driven by advances in the internet and networking. The use of information technology in the SPMB process is a concrete step toward supporting good governance (Yudahana et al., 2023). The use of websites in education serves not only as a means of conveying information but has also evolved into an online system to support various school activities, such as the online student admission system (Nur Dina Kamelia & Zaehol Fatah, 2025).

New student enrollment is an event that many schools in Indonesia hold every year. The new student admission process involves converting data into information (Nugraha et al., 2024). New Student Admissions is one of the processes carried out by educational institutions, such as schools, to screen prospective students who will be selected to enroll in a school (Bay Haqi et al., 2025). New student admissions (SPMB) are a routine process that serves as the primary gateway for every educational institution to manage prospective student data each year. At SMK Islam Kalipare, the enrollment process involves direct interaction between prospective students and the administrative office. Prospective students are required to physically visit the school solely to obtain the registration form, fill it out by hand, and submit it along with other supporting documents (Satria, 2023). This conventional workflow creates various technical obstacles for all parties involved. The use of large volumes of paper documents increases the risk of recording

errors, data duplication, and potential physical damage to files during storage. In terms of efficiency, the SPMB committee often experiences delays in compiling results. This directly affects prospective students, who are unable to find out their admission status in a timely manner. As a result, this manual approach is too time-consuming and inefficient for managing student data (Hidayati et al., 2025).

The lack of an integrated system makes it difficult for school administrators to monitor enrollment and make decisions quickly and accurately. To address this issue, a system needs to be developed that can provide a structured process for the entire enrollment cycle. The system is expected to integrate the management of prospective students' data and automatically send notifications of admission results. In addition, centrally stored enrollment data will make it easier for schools to monitor enrollment and make administrative decisions (Fadhli Erlangga Lubis et al., 2024). With this system in place, the risk of data loss or duplication can be minimized, the administrative burden on the committee is reduced, and prospective students can easily access registration services without being constrained by distance or time (Puspita et al., 2021). Ultimately, this will enhance the professionalism of SMK Islam Kalipare's services in managing the annual cycle of new student admissions in a more transparent and accountable manner.

In the academic world, RAD is widely used in the development of campus information systems and educational administration (Nurmiati et al., 2025). The RAD model was chosen for its ability to accelerate the system development process through repeated iterations and active end-user participation (Bachtiar, 2025). RAD development model supports rapid system development and allows for immediate user feedback. Through its iterative approach, the RAD development model facilitates the adaptation of the system to dynamic user needs, ensuring that the developed system is more effective and readily accepted by users (Dwi Fahri Harahap et al., 2024). Various studies have shown the potential of using information systems for student registration, which can improve efficiency and reduce the administrative workload, while also incorporating features such as entrance exams as part of the selection process for new students (Laia, 2025).

RESEARCH METHODS

The web-based new student admission system (SPMB) at SMK Islam Kalipare, as examined in this study, uses the RAD model, which focuses on identifying user needs. The RAD development model is a development model that can save time in designing and implementing information systems, resulting in a system development process that is quick and does not require much time (Aldisa, 2021). RAD also places greater emphasis on rapid prototyping and involves users more intensively, for example, by soliciting feedback on the registration and file-upload processes (Ahmanto & Wijaya, 2026). The stages of the Rapid Application Development method are shown in Figure 1.

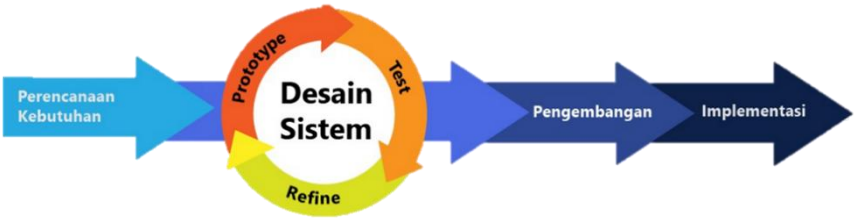


Figure 1. The RAD Model

a. Needs Assessment
   The process carried out in this phase is system requirements analysis through the identification of functional and non-functional requirements. The output of this phase consists of detailed system requirements, which serve as the blueprint for the design of the New Student Admission Information System.
b. System Design

In this phase, system planning is carried out to understand user requirements related to a structured design. System planning uses the Unified Modeling Language (UML), which includes Use Case Diagrams, Activity Diagrams, Sequence Diagrams, and Class Diagrams. Based on the RAD Model Diagram, the iterative process of prototyping, testing, and refining is carried out during the development phase. This phase is iterative, in which the system is developed in stages with the direct involvement of users.

c. Development Process
The development and feedback collection phase incorporates input in the form of a system design. The processes carried out during this phase include the implementation of the system design into a web-based application and initial testing of the developed system modules.

d. Implementation
The implementation or completion phase is the final phase in the RAD model, with the developed system which has been refined serving as the input. The process carried out in this phase involves comprehensive system testing using Black Box Testing and User Acceptance Testing (UAT).

RESULTS AND DISCUSSION

1. Needs Assessment

Conducted observations and interviews at SMK Islam Kalipare. Determined that the new student admission process is still carried out using conventional methods and identified the needs of the system's users. The identified users are listed in Table 1 below:

Table 1. Identification of System Users

Number	Actor	Access Rights
1.	Prospective Students	Register and log in, fill out the registration form, upload the required documents, take the online test, and check your registration status.
2.	SPMB Staff	Manage prospective student registration data, verify application documents, manage test questions and schedules, and monitor selection results.
3.	Principal	View the SPMB dashboard, monitor applicant data, and review reports to inform decision-making.
4.	Administrator	Manage user data and access rights, and configure and maintain the system..

The functional requirements of the system are listed in Table 2 below:

Table 2. Functional Requirements

Number	Activities	Description	User	Input	Output
1	Login	User authentication process for logging in	Administrators, Staff, Prospective Students, Principals	Username and password	Access to the home page
2	Registration	The process of creating an account for prospective students before they register.	Prospective Students	Account identification information	Prospective student accounts are registered
3	Master Degree in [Major]	The process of managing department data available at the school.	Administrators	Department Data	Major data is stored in the system

Number	Activities	Description	User	Input	Output
4	Mastering Teacher	The process of managing data on teachers involved in the system	Administrators	Teacher Data	Teacher data is stored in the system
5	Mastering Questions	The process of managing the question bank used in selection tests	Administrators	Question Data	Question data is stored
6	Entry of Registration Form Data	The process of filling out the registration form and uploading required documents by prospective students	Prospective Students	Personal information, parental information, major, documents	Registration data is saved
7	Take the Practice Test	The process of prospective students taking the selection test online	Prospective Students	Answers to the test questions	Test scores
8	Document Verification	The process of reviewing and validating prospective students application documents	Staff	Registration Form Data	Document Verification Status
9	Test Results	The process of displaying the results of the prospective student selection test	Administrators, Staff, Prospective Students	Test score data	Test Results Information
10	Prospective Student Report	The process of presenting prospective student data reports as a basis for evaluation and decision-making	Administrators, Principals	Registration data and test results	Prospective Student Report
11	Logout	The process of logging out of the system to end a user session	Administrators, Staff, Prospective Students, Principals	Logout command	User session has ended

2. System Design

The main use case diagram for the SPMB website is shown in Figure 2 below:

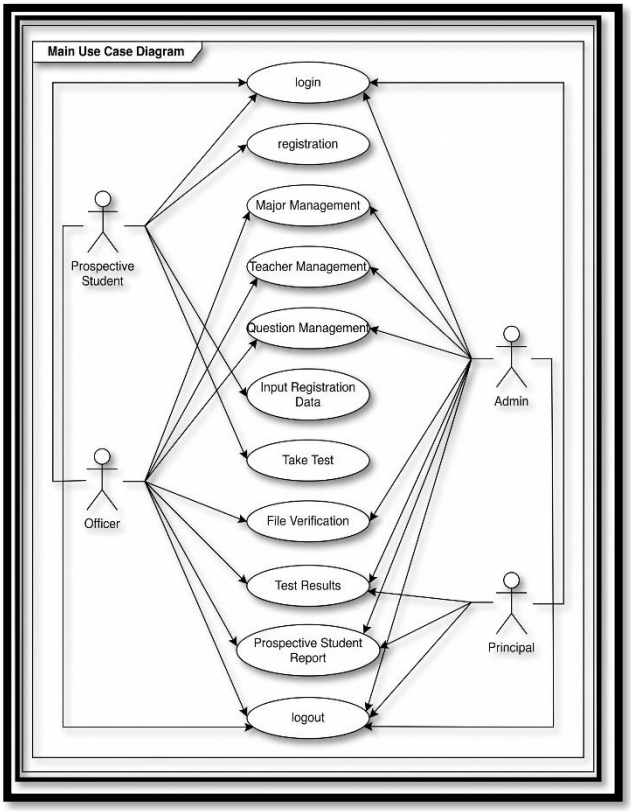


Figure 2. Main Use Case Diagram

This diagram illustrates the relationship between actors and the main functions available in the system. The diagram shows four main actors: Prospective Students can access the login menu, the registration menu, upload documents, take a practice test, and log out. Administrators can access the login page, document verification, test results, prospective student reports, and the logout option. Staff can access the login page, the department master list, the teacher master list, the test question master list, document verification, test results, prospective student reports, and the logout option. The principal can access the login page, test results, prospective student reports, and the logout option. Each user has different roles and access rights based on their responsibilities in the new student admission process.

a. **Activity Diagram Registration Form Data Entry**

This illustrates the process by which prospective students upload their application documents, whereby valid documents are saved to the database, while incomplete or invalid documents must first be corrected by the prospective students. The Activity Diagram for the Registration Form Data Entry can be seen in Figure 3 below:

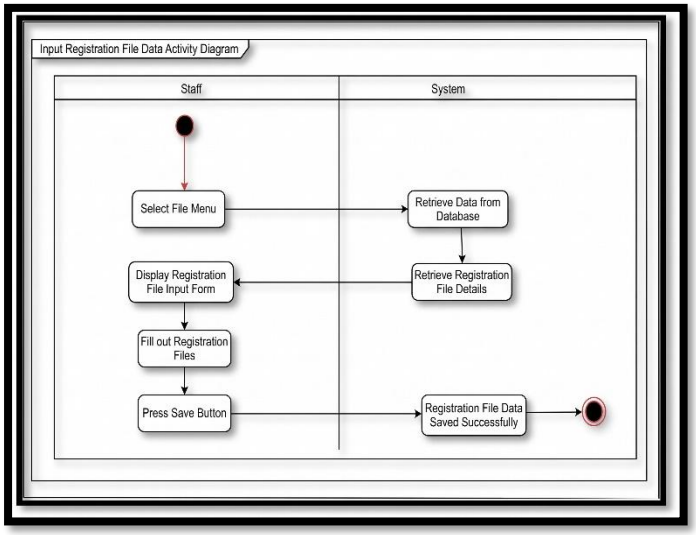


Figure 3. Activity Diagram Registration Form Data Entry

b. **Sequence Diagram Setup of Input Data for Registration Files**

The process involves staff reviewing file data, adding to and verifying registration files, and deleting data as needed, with all data stored and managed through the system. The sequence diagram showing the setup of input data for registration files is shown in Figure 4 below:

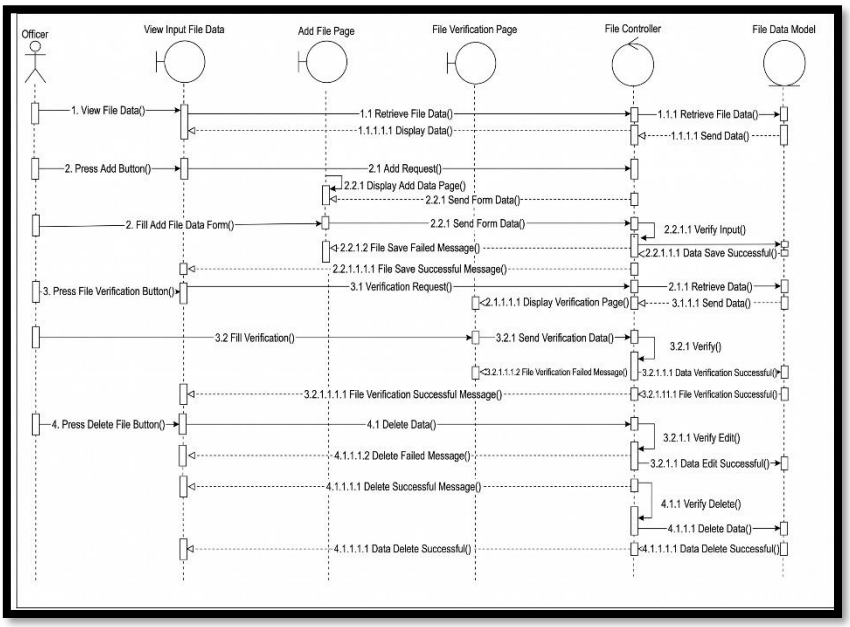


Figure 4. Sequence Diagram: Setup of Registration File Input Data

c. **Activity Diagram for Verifying Student Data Files**

This illustrates the process by which staff review registration documents, whereby complete and valid documents are marked as verified by the system. The Activity Diagram for Verifying Student Data Files is shown in Figure 5 below:

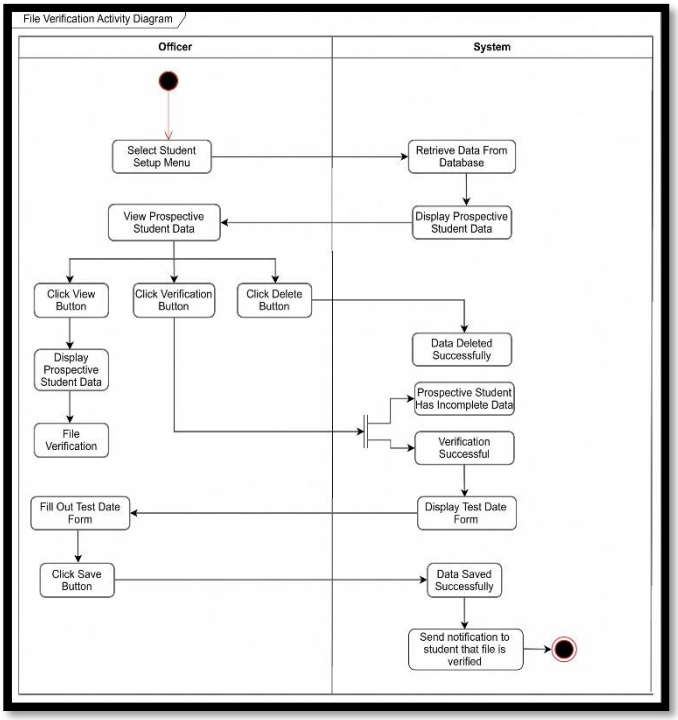


Figure 5. Activity Diagram for Verifying Student Data Files

d. Sequence Diagram for Verifying Student Data Files

The document verification process involves selecting a prospective student's data, reviewing the documents, and, if they are valid, the system marks the status as verified and displays a success notification. The sequence diagram for verifying student data files is shown in Figure 6 below:

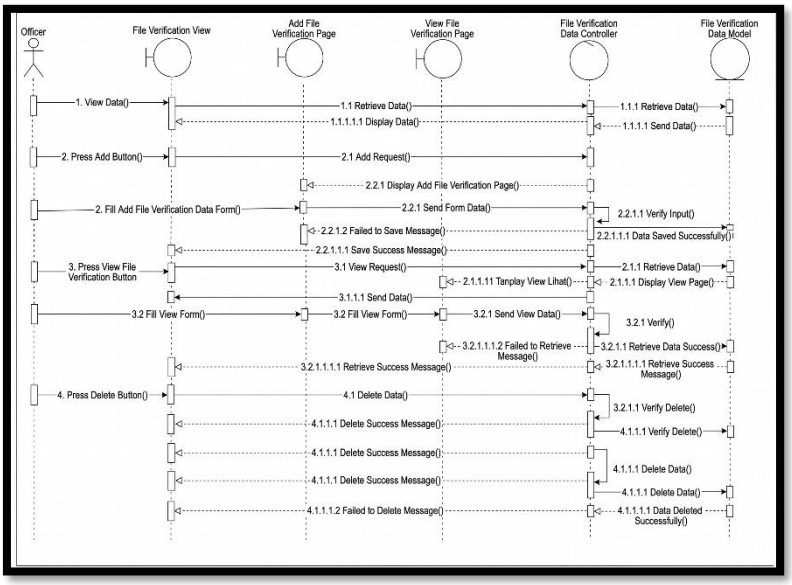


Figure 6. Sequence Diagram for Verifying Student Data Files

e. Activity Diagram for Prospective Student Reports

This process includes displaying prospective students' data, filtering by major, and verifying admission status until the report is fully verified. The activity diagram is shown in Figure 7 below:

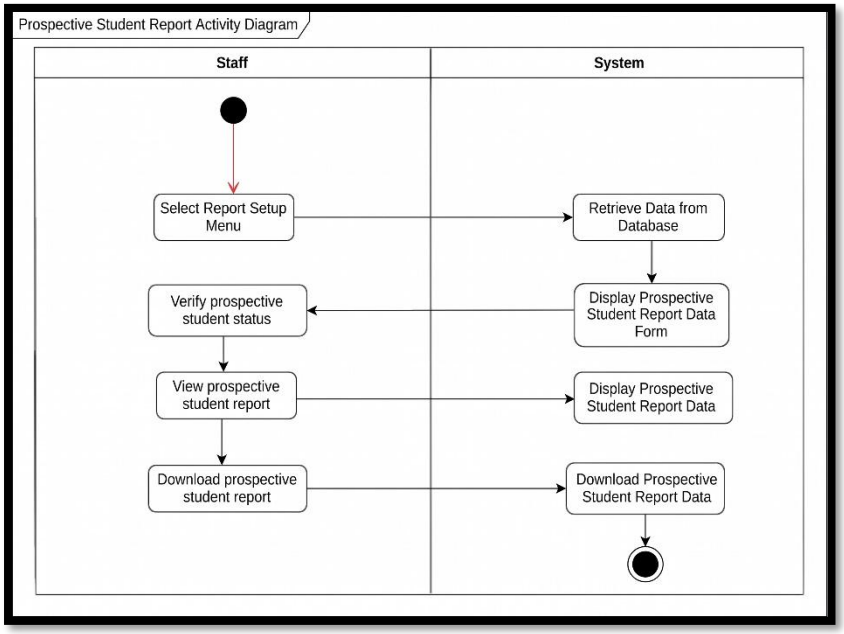


Figure 7. Activity Diagram for the Prospective Student Report

f. Sequence Diagram for Prospective Student Reports

This sequence diagram illustrates the relationship between staff members and the system in accessing and managing prospective student results reports, including the validation process that results in a pass or fail status. The sequence diagram is shown in Figure 8 below:

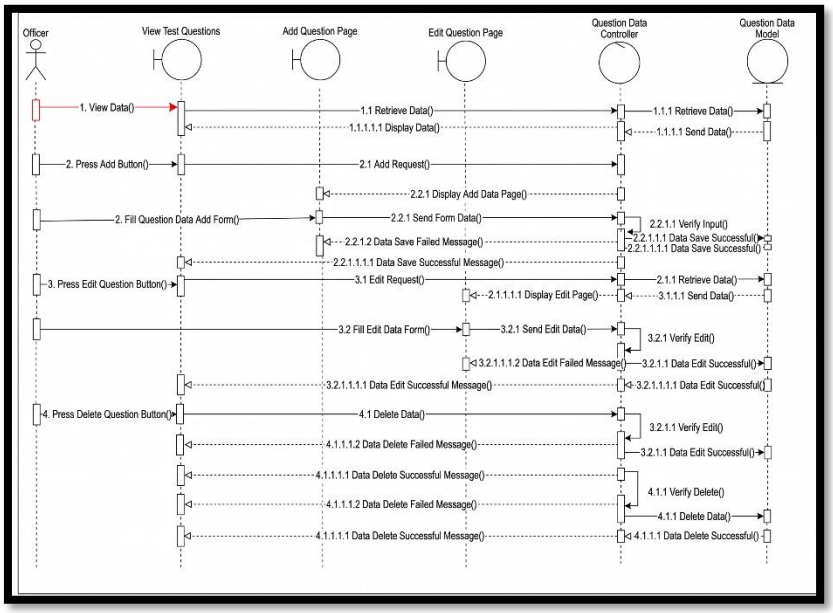


Figure 8. Sequence Diagram for the Prospective Student Report

The class diagram is shown in Figure 9 below:

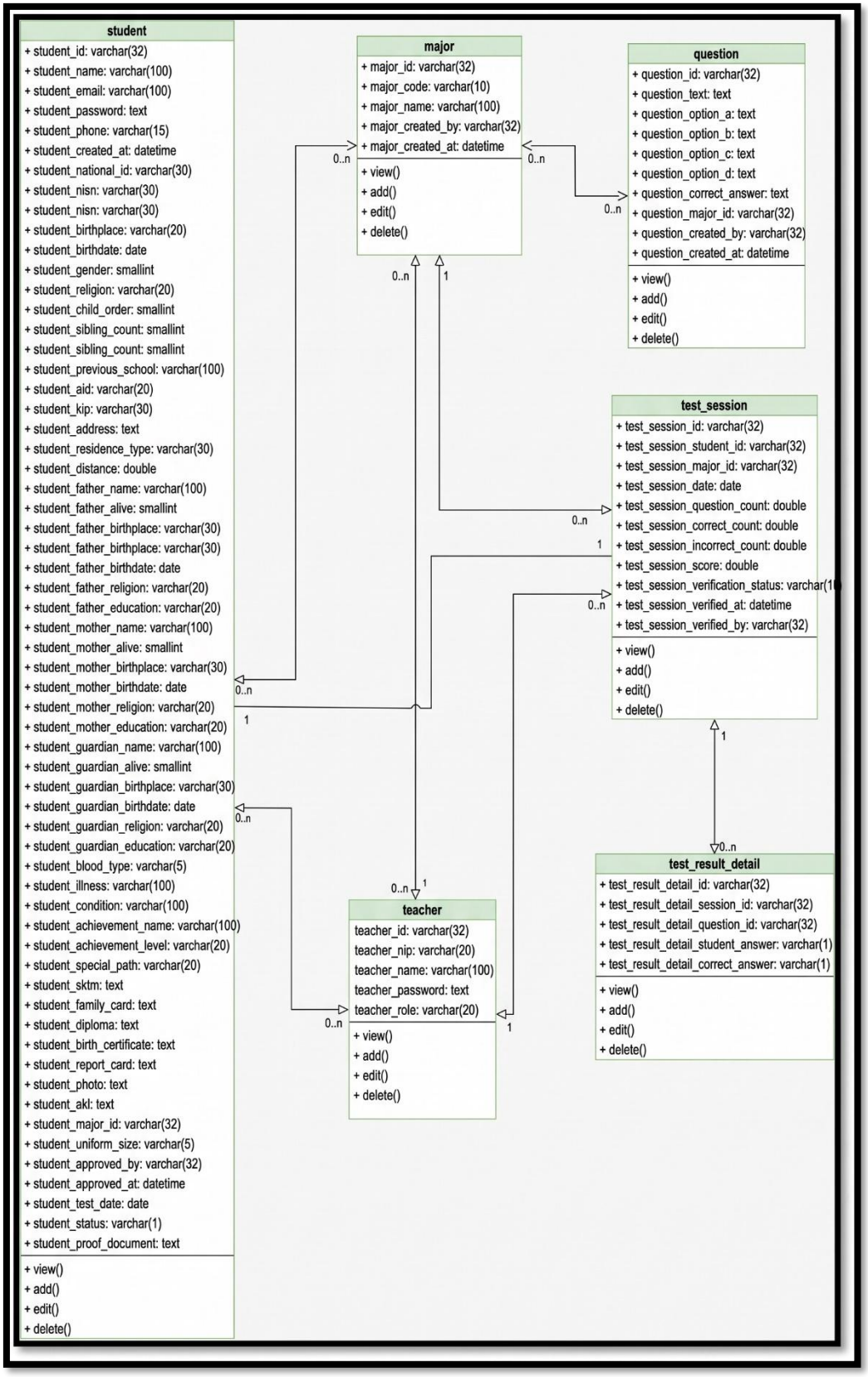


Figure 9. Class Diagram

Class diagrams in this system are used to represent relationships, thereby facilitating the system design and implementation process. With class diagrams, developers can clearly and systematically understand the data management flow and interrelationships within the system.

3. Development Process

The system implementation phases are carried out based on the system design that has been created to facilitate interaction between users and the system, ensuring that data management processes can be carried out effectively and efficiently. The student page interface can be seen in Figure 10 below:

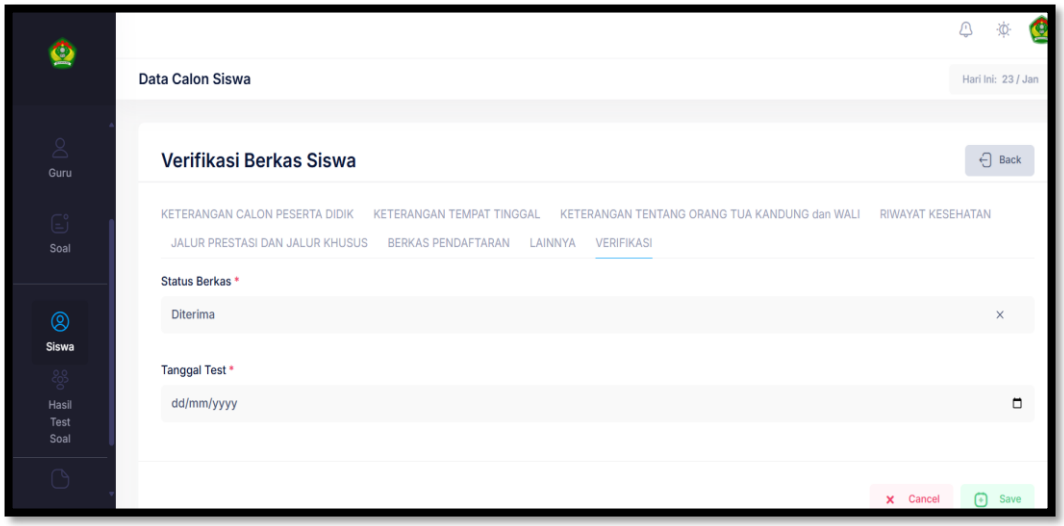


Figure 10. Student Document Verification Screen

The file verification notification screen is shown in Figure 11 below:

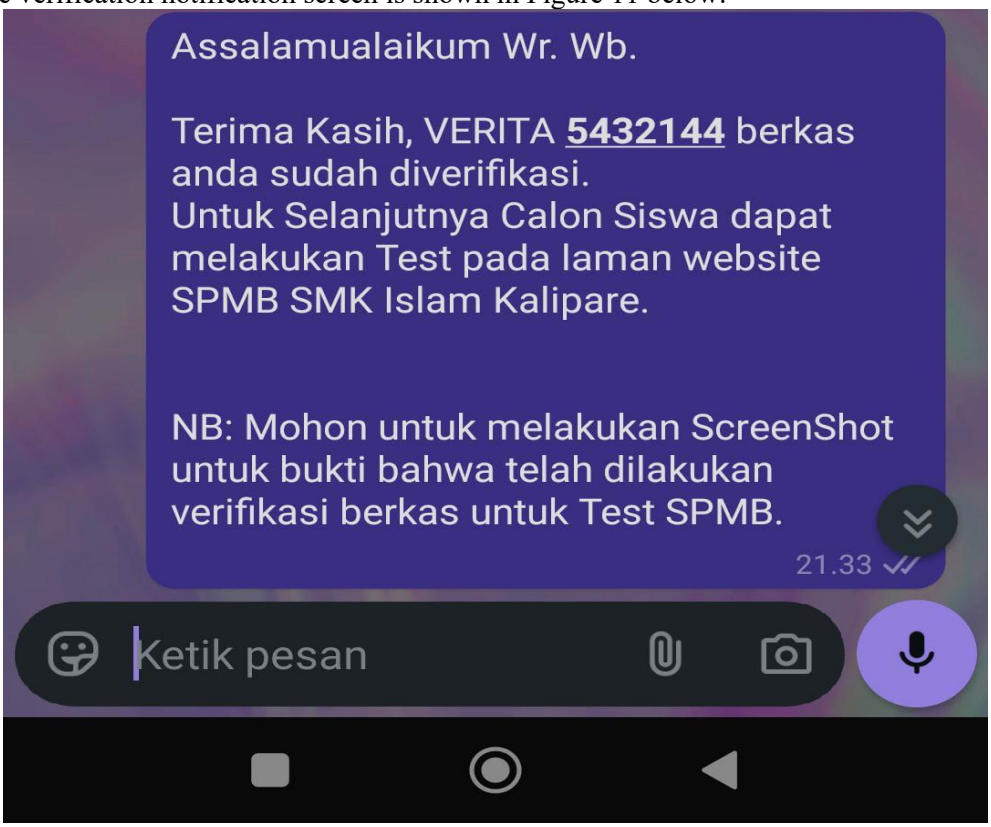


Figure 11. File Verification Notification Screen

This system page allows administrators to monitor who has taken the test and view the details by clicking the Actions button. The system page displaying student test results is shown in Figure 12 below:



Figure 12. Display of Student Test Results

The notification screen displays a dialog box confirming that the student has completed the SPMB test. The notification screen is shown in Figure 13 below:

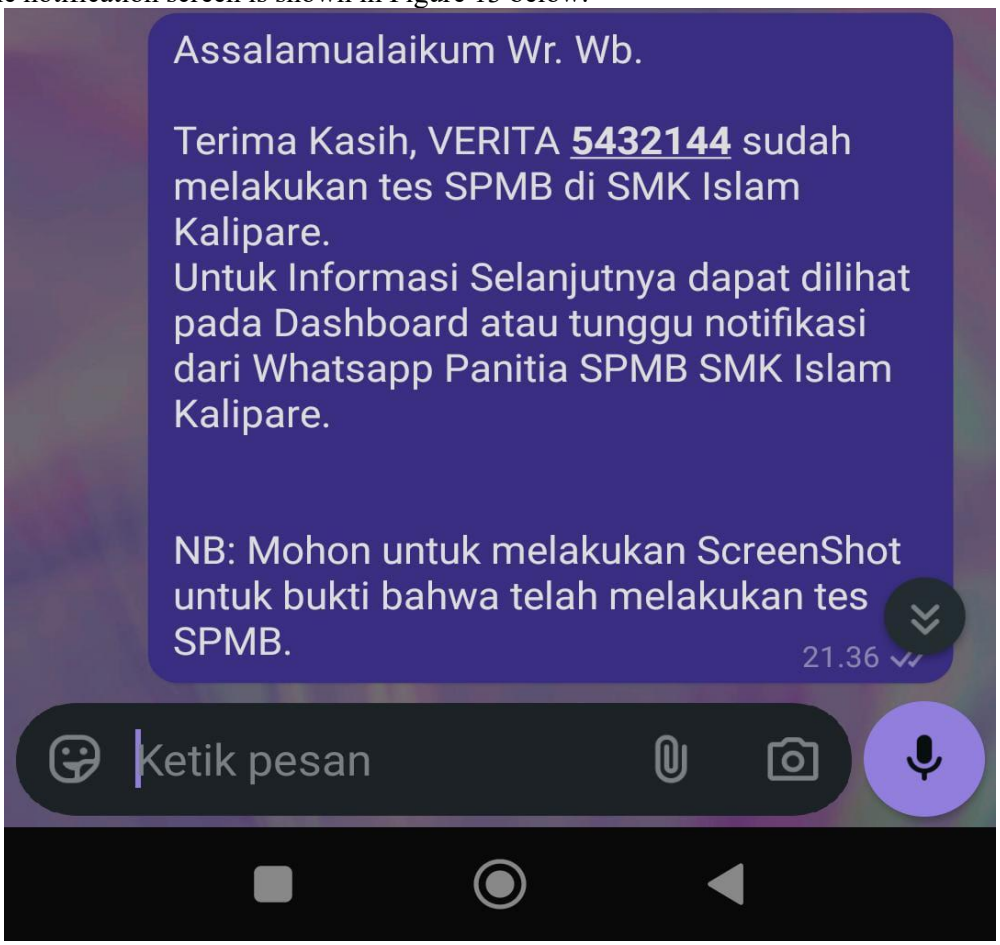


Figure 13. SPMB Test Completed Notification Screen

The interface allows users to filter reports by major and question verification status, and includes buttons to view or download the reports. The prospective student report page is shown in Figure 14 below:

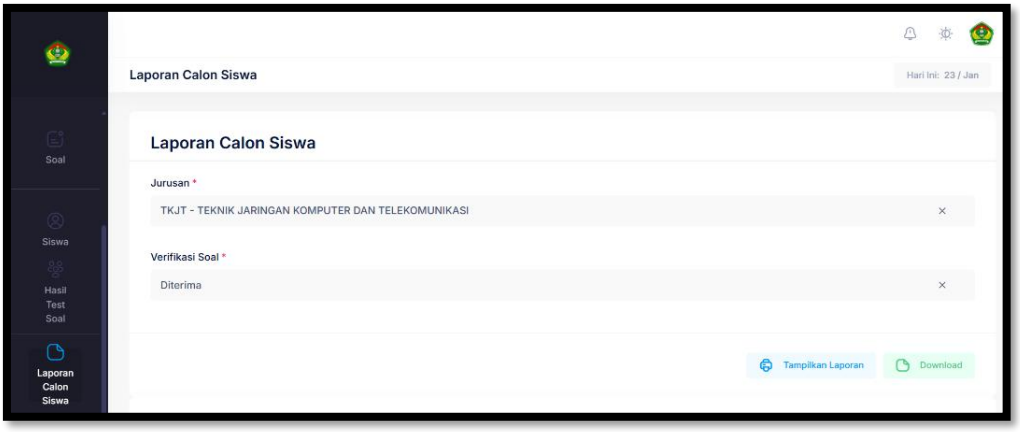


Figure 14. Prospective Student Report Page

4. Implementation

The black-box testing results are shown in Table 4 below:

Table 4. Black-Box Testing Table

Number	Features Tested	Scenario	Expected Results	Test Results	Description
1	Test question results setup (view data)	Tap the View Data menu	The system displays test result data	The system successfully displayed the test results data	Appropriate
2	Test Results Setup (Data Verification)	Tap the data verification menu	The system verifies the test results of prospective students	The system successfully verified the test results of prospective students	Appropriate
3	Verification data (view data)	Press the View Data button	The system displays a student data form	The system successfully displayed the student data	Appropriate
4	Prospective Student Report Setup (download)	Click the download button	Display download notifications	The system successfully downloaded the prospective student reports	Appropriate

The UAT test results are shown in Table 5 below:

Table 5. UAT Test Results

Number	Question	Code	Score	Frequency	S	AVG
USABILITY ASPECTS						
1	Is the process of uploading the required documents easy?	A	4	12	48	
		B	3	9	27	
		C	2	3	6	
		D	1	0	0	
		Total		24	81	
		Calculation		$\frac{81}{96}$x100%=84,3		
2		A	4	13	52	

Number	Question	Code	Score	Frequency	S	AVG
	Does the SPMB system provide clear information after the documents have been successfully uploaded?	B	3	11	33	
		C	2	0	0	
		D	1	0	0	
		Total		24	85	
		Calculation		$\frac{85}{96}$x100%=85,5		
3	Does the data entry page make it easy for users to enter their information?	A	4	12	48	
		B	3	11	33	
		C	2	1	2	
		D	1	0	0	
		Total	1	24	83	
		Calculation		$\frac{83}{96}$x100%=86,4		
4	Is the layout of the test questions page easy for users to understand?	A	4	15	60	
		B	3	9	27	
		C	2	0	0	
		D	1	0	0	
		Total		24	87	
		Calculation		$\frac{87}{96}$x100%=90,6		
5	Is the process of submitting test answers straightforward?	A	4	15	60	
		B	3	9	27	
		C	2	0	0	
		D	1	0	0	
		Total		24	87	
		Calculation		$\frac{87}{96}$x100%=90,6		
6	Is the file verification page easy to understand?	A	4	12	48	
		B	3	9	27	
		C	2	3	6	
		D	1	0	0	
		Total		24	81	
		Calcualtion		$\frac{81}{96}$x100%=84,3		
7	Is the document verification process easy for users to complete?	A	4	13	52	
		B	3	11	33	
		C	2	0	0	
		D	1	0	0	
		Total		24	85	
		Calculation		$\frac{85}{96}$x100%=85,5		
8	Does the SPMB system simplify the process of	A	4	12	48	
		B	3	11	33	

Number	Question	Code	Score	Frequency	S	AVG
	admitting new students?	C	2	1	2	
		D	1	0	0	
		Total	1	24	83	
		Calculation		$\frac{83}{96}$x100%=86,4		
9	Is the web-based SPMB system easy to learn?	A	4	15	60	
		B	3	9	27	
		C	2	0	0	
		D	1	0	0	
		Total		24	87	
		Calculation		$\frac{87}{96}$x100%=90,6		
10	Are the menu and system navigation easy to understand overall?	A	4	15	60	
		B	3	9	27	
		C	2	0	0	
		D	1	0	0	
		Total		24	87	
		Calculation		$\frac{87}{96}$x100%=90,6		

Conclusion

A web-based new student admission system (SPMB) has been successfully developed and has improved the effectiveness and efficiency of the registration process. This system speeds up data processing, reduces data entry errors, and simplifies the presentation of information. The use of the Rapid Application Development (RAD) methodology proved to be appropriate because it supports rapid and iterative improvements through user involvement. User Acceptance Testing (UAT) yielded a usability score of 87.8%, indicating that the system was well-received and easy to use. This system can support the SPMB process more effectively, accurately, and in a structured manner. Recommendations for further development include the ongoing implementation of the system and routine maintenance to ensure its performance. In addition, the system needs to be developed into a mobile platform to improve accessibility, and its security needs to be strengthened through data encryption to ensure the confidentiality of prospective students' information.

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