

IMPLEMENTATION OF A SCHOOL INFORMATION SYSTEM AT SD AL ISTIQOMAH IN BANJAR CITY

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Abstract—Information technology facilitates human activities in the modern era. The need for information technology has influenced various institutions, including the education sector. SD Islam Al-Istiqomah is a formal elementary education institution located in Banjar District, Banjar City, West Java. The New Student Admission System (PPDB) still uses Google Forms, which can cause delays in validating applicant data. The school fee payment process, which must be made directly, also creates difficulties for parents due to the separate locations of the administrative office and the school, often resulting in late payments. Therefore, this research aims to assist both parents and the school in carrying out their tasks more easily, securely, and efficiently. The system designed is an integrated information system for New Student Admission (PPDB) and school fee payments within a single system. The integration of these two systems simplifies centralized student data management without the need to export and import data between systems. The method used in this research is Rapid Application Development (RAD), which was selected because it can accelerate application development. The results of testing using Black Box Testing indicate that the system operates as expected without any errors.

Keywords: PPDB, payment system, RAD, SD Islam Al-Istiqomah.

Abstrak—Teknologi informasi mempermudah aktivitas manusia di era modern seperti saat ini. Kebutuhan teknologi informasi sudah mempengaruhi berbagai instansi salah satunya pada sektor pendidikan. SD Islam Al-Istiqomah adalah lembaga pendidikan dasar formal yang berlokasi di Kecamatan Banjar, Kota Banjar, Jawa Barat. Sistem Penerimaan Peserta Didik Baru (PPDB) masih menggunakan Google Form, yang bisa menyebabkan proses validasi data pendaftar menjadi lambat.

Proses pembayaran biaya sekolah yang harus dibayar secara langsung juga menyulitkan orang tua karena lokasi yang terpisah antara kantor tata usaha dan sekolah, sehingga sering menyebabkan keterlambatan pembayaran. Untuk itu penelitian ini bertujuan untuk memudahkan orang tua dan juga pihak sekolah agar dapat menjalankan tugas dengan lebih mudah, aman dan efisien. Sistem yang dirancang adalah sistem informasi Penerimaan Peserta Didik Baru (PPDB) dan Pembayaran biaya sekolah yang saling terintegrasi dalam satu sistem. Dengan adanya integrasi kedua sistem ini dapat mempermudah pengelolaan data siswa yang terpusat tanpa harus ekspor dan impor data dari satu sistem ke sistem lainnya. Metode yang digunakan dalam penelitian ini adalah Rapid Application Development (RAD). Metode RAD dipilih karena mampu mempercepat pengembangan aplikasi. Hasil dari pengujian menggunakan Blackbox Testing menunjukkan sistem bisa berjalan sesuai dengan harapan tanpa ada kesalahan

Kata Kunci: PPDB, sistem pembayaran, RAD, SD Islam Al Istiqomah.

INTRODUCTION

Education is the process of developing a child's knowledge and potential in a structured and planned manner thru institutions called educational institutions. The main goal of education is to strengthen good and beneficial knowledge, morals, spirituality, and character for oneself, society, nation, and country (Maharani et al., 2024). Education provides many benefits, especially for the country, enabling it to produce superior Human Resources (HR) with the emergence of intelligent and characterful generations (Junaedi et al., 2022).

With the advent of technology, various tasks that were initially complex and difficult can now be performed more easily and with minimal human

error, thus improving service quality. Just like the new student admission and school fee payment applications, which make the process and data management of students and payments faster and easier (Alfisyakhrin et al., 2023).

According to Atmaja, The New Student Admission Information System (PPDB) is needed by parents of prospective students to register their children for their desired schools more easily without having to visit the schools in person, especially for parents who are constrained by time. With the implementation of a computerized system, schools, as formal educational institutions, gain convenience in managing new student data without fear of losing or damaging prospective student data (Atmaja et al., 2024). The research conducted by Andrian, states that the New Student Admission System (PPDB) is a solution for schools, as the system can be accessed online, making data collection easier and improving the smoothness of the new student admission process, speeding up data processing and report generation, and providing more accurate information (Andrian et al., 2022).

A school payment information system is also needed to simplify the administrative process, which initially required direct visits to the school administration office, but can now easily allow online payment and checking of school billing status. Similarly, schools as formal educational institutions can more easily manage bills and payments (Putra et al., 2023). The school administration and treasurer can more easily compile reports summarizing payment data or incoming funds from parents (Faridi et al., 2022).

SD Islam Al-Istiqomah is a formal primary education institution located in Banjar District, Banjar City, West Java. As an educational service provider, SD Islam Al-Istiqomah is committed to improving both academic and non-academic services, such as administrative services for parents of students.

The New Student Admission Process (PPDB) at SD Islam Al-Istiqomah currently still uses Google Forms, which has limitations in terms of automation, especially for subsequent management such as managing the status of prospective students and class grouping. Data stored in Google Forms can only be downloaded in spreadsheet format as raw data, which slows down the process of validating and selecting prospective students. Publishing the registration status of new students also requires other tools and cannot be done directly, so schools must publish it separately.

School fee payments at SD Islam Al-Istiqomah are also still not computerized. Parents of students need to come to the administrative office, which is located at a different location from the

school where the students' teaching and learning activities take place, so parents cannot pay directly when dropping off their children at school. The administrative section is still having difficulty quickly and accurately checking the status of school fee payments, so manual checks are needed by opening payment files that are potentially lost or not yet recorded.

From the problems mentioned above, it is clear that there is a need for the digitalization of school information system administration, especially in the New Student Admission (PPDB) process and school fee payments, to make it easier for parents to enroll their children in the PPDB process and also to pay school fees easily. The existence of a school information system also provides convenience for the school, especially in the administrative and treasurer's departments, in managing new prospective students and managing school fee payment data. The school administration information system will be adapted to the needs of SD Islam Al-Istiqomah.

Previous research has typically focused on developing a single, non-integrated system, such as the New Student Admission System (PPDB) or the school fee payment system. In this study, the author integrates two closely related systems: the New Student Admission System (PPDB), which is integrated with the school fee payment system after new students are accepted. This integration simplifies centralized student data management without the need to export and import data from one system to another.

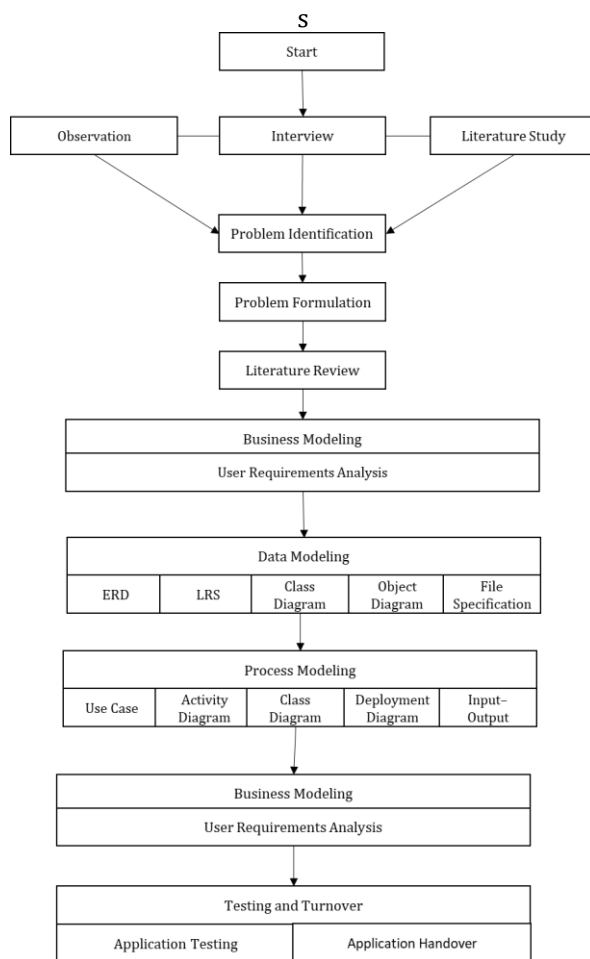
MATERIALS AND METHODS

The system, derived from the Latin word *systema* and the Greek word *sustema*, can be understood as a unity composed of various interconnected components or elements that work together to support the smooth flow of information, materials, and energy. This term is often used to describe an entity that has relationships and interactions between its parts. Simply put, a system is a series of interconnected elements that work together. A system has certain characteristics or properties, namely, it has system boundary components (Saputra et al., 2023).

The word "information" comes from the Latin term "informationem," which means inspiration, outline, or hint. Information is processed data and facts that are specifically processed into a meaningful or purposeful collection, making it easy to understand and beneficial for the recipient. Information can be presented in various forms, such as notes, images, graphs, audio, film, and so on (Widarti et al., 2024).

An information system is a unified set of components that work together, are processed, and analyzed to produce the information needed to support management decision-making processes. This system is a combination of information technology and human activities that utilize it to support operational activities and managerial functions within an organization (Soufitri, 2022).

The research stages are the initial steps in conducting research, providing a comprehensive overview of the research object. The stages carried out in this study can be seen in Figure 1, which illustrates the sequence of activities starting from the initial identification of problems to the final implementation stage.



Source: (Research Result, 2025)

Figure 1. Research Stages

The method used by the author in this study is the RAD (Rapid Application Development) model. This method focuses on development cycles that are short and fast, where time constraints are a very determining factor. RAD employs an iterative method in system development, creating a working model from the early stages as a means of identifying user needs. The stages in the RAD model

include business modeling, data modeling, process modeling, application generation, and testing and turnover (Hartono, 2021).

Here is an explanation of the stages of the RAD model:

1. **Business Modeling:** This stage involves the flow of information regarding the business functions and models being analyzed. This includes information that controls business processes, the information generated, who processes the information, and where the information is used.
2. **Data Modeling:** At this stage, the information derived from the business model is redefined into data structures that support business operations. This process includes determining the attributes for each data object based on the relationships between objects.
3. **Process Modeling:** At this stage, the information is transformed to obtain the information flow required for the implementation of business functions. This process includes adding, changing, deleting, or retrieving specific data objects.
4. **Application Development:** In addition to using third-generation programming languages, RAD also utilizes pre-existing software components or develops new reusable components. Various tools are used to facilitate the software development process.
5. **Testing and Turnover,** this stage is to reduce overall testing time by utilizing existing components, and for newly created components or programs, they must still be tested. After the entire program has passed all tests, it is then delivered and implemented for the customer.

RESULTS AND DISCUSSION

The results of the PPDB and Payment information system research at SD Al Istiqomah, created using the RAD method, will be explained in more detail. Below is a detailed explanation of the research findings:

Business Modeling

The initial step in ensuring that the developed system meets the school's requirements is identifying and defining all system requirements. These requirements are categorized into functional requirements based on user roles and system requirements.

1. **New Student Use Case Scenario**
 1. Access the PPDB page
 2. Fill out the registration form
 3. Make the registration payment
 4. View the announcement of new student selection results

5. Access school information
2. Active Student Use Case Scenario
 1. Log in to the student account
 2. Manage student profile and account
 3. Change account password
 4. Pay bills directly and/or in installments
 5. Download proof of payment
 6. Access school information
 7. Log out
 3. Admin Use Case Scenario
 1. Log in to the admin account
 2. Manage admin account access data
 3. Manage academic year data
 4. Manage PPDB data
 5. Manage PPDB participant selection
 6. Manage payment method data
 7. Manage school fee data
 8. Manage payment and billing data
 9. Manage student data
 10. Manage class data
 11. Manage school information
 12. Log out
 4. System Requirements
 1. The system stores user account and password data securely.
 2. The system displays the PPDB form and accepts online registrations.
 3. The system encrypts uploaded documents such as birth certificates and family cards.
 4. The system displays billing information and accepts proof of payment uploads.
 5. The system allows input, update, and deletion of admin, academic year, PPDB, class, student, payment method, school fee, and payment data.
 6. The system hashes admin and student account passwords.
 7. The system displays school information posted by the admin.

Data Modeling

The database uses 14 entities, namely "academic_year" to group academic years, "admissions" to store PPDB data, "classes" to store study group data, "students" to store active and prospective student data, "accounts" to store student and admin account credentials, "admins" to store admin access data, "guardians" to store student guardian data, "documents" to store PPDB requirement document data, "fees" to group school fee data, "payment_methods" to store payment method data provided by the school, "bills" to store active student bills, "installments" to store payment

data in installments, "news_categories" to group school information categories, and "news" to store school information publications. The database structure of the integrated New Student Admission (PPDB) and School Fee Payment System is illustrated in Figure 2. The figure presents the Entity Relationship Diagram (ERD) that describes the entities, attributes, and relationships within the system.

As shown in Figure 2, the students entity becomes the central entity in the system. It is connected to several related entities such as admissions, bills, guardians, accounts, documents, and classes. This design indicates that all administrative processes—starting from student registration, payment management, to academic grouping—are centered on student data.

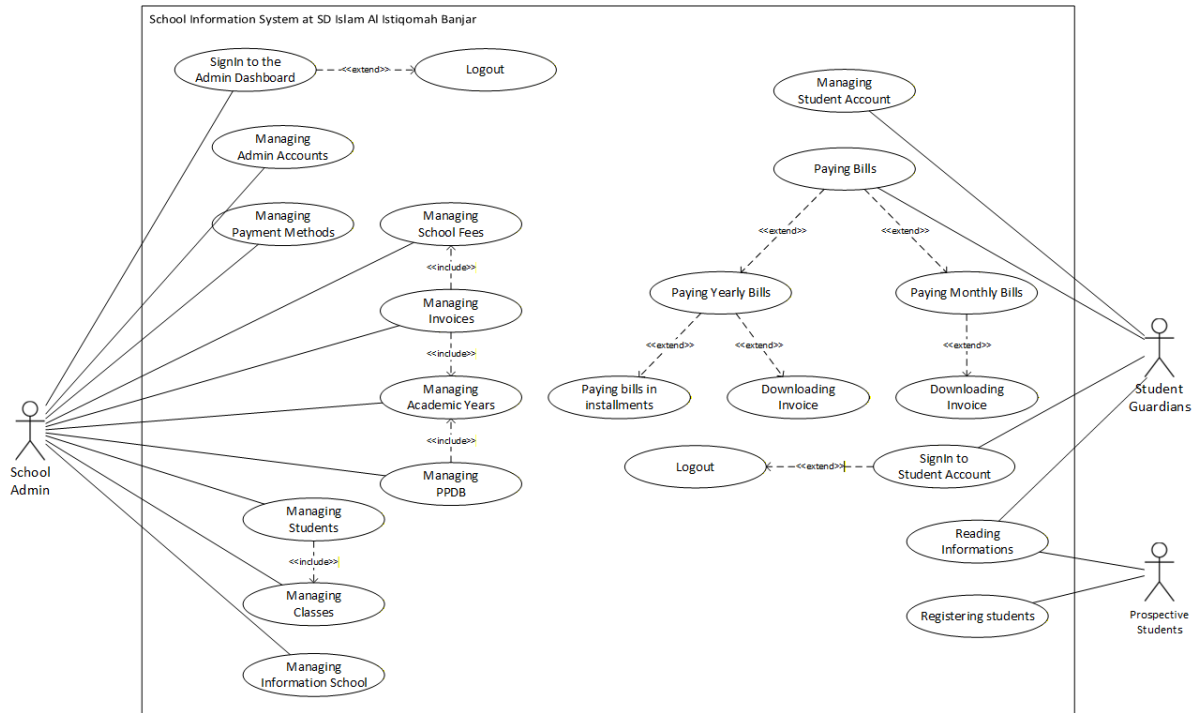
The admissions entity is related to academic_years, which indicates that each admission process is conducted within a specific academic year. Students who register through the PPDB process are recorded in the admissions table and later integrated into the students table after acceptance.

In terms of financial management, the bills entity is associated with students and connected to installments, fees, and payment_methods. This relationship shows that each student can have multiple bills, and each bill can be paid either in full or in installments using various payment methods. The system also records payment status, due dates, proof of payment, and verification data to ensure transparency and accountability.

The ERD also includes user access management through the accounts and admins entities. Admins manage academic years, admissions, classes, fees, bills, and school information. Meanwhile, students have individual accounts for login, profile management, and payment activities. Password hashing and document storage are represented structurally in the relationship between accounts and documents.

Additionally, the system supports information dissemination through the news and news_categories entities. This allows administrators to publish categorized school information that can be accessed by students and prospective students.

Overall, Figure 2 shows that the system is designed as an integrated database model where the PPDB module and the school payment module are interconnected. This integration eliminates the need for data export-import between separate systems and ensures centralized, consistent, and secure data management.



Source: (Research Result, 2025)

Figure 3. Use Case Diagram of the School Information System

2. Activity Diagram

Activity diagrams illustrate the various activity flows within the system being developed, including the starting point of each flow, potential decisions that may arise, and the final endpoint. Additionally, this diagram is capable of illustrating parallel processes that can occur during multiple executions (Hasanah & Untari, 2020).

Figure 4 shows the activity diagram for guardians of prospective students when registering new students through the PPDB feature.

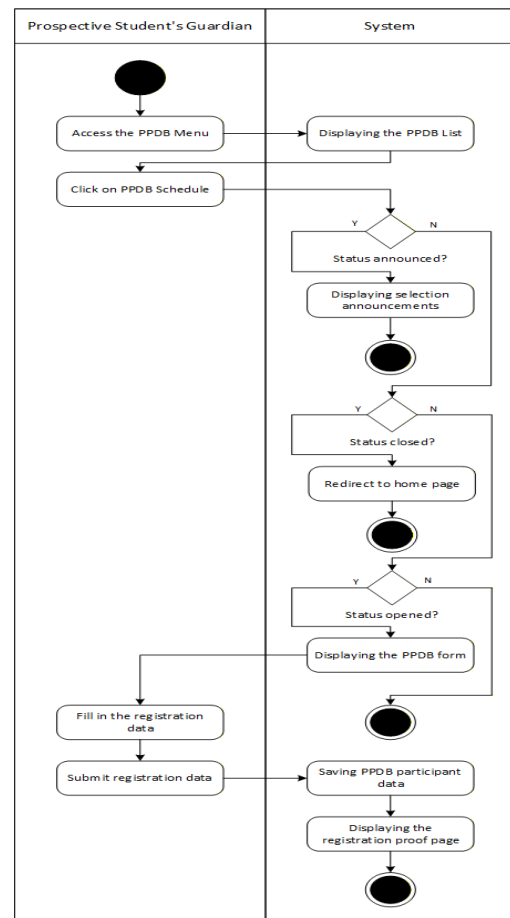
Figure 5 illustrates the activity diagram for active guardians making monthly school fee payments without installments.

Figure 6 shows the activity diagram for school administrators when verifying monthly school fee payments without installments.

Figure 7 depicts the activity diagram for active guardians making annual school fee payments in installments.

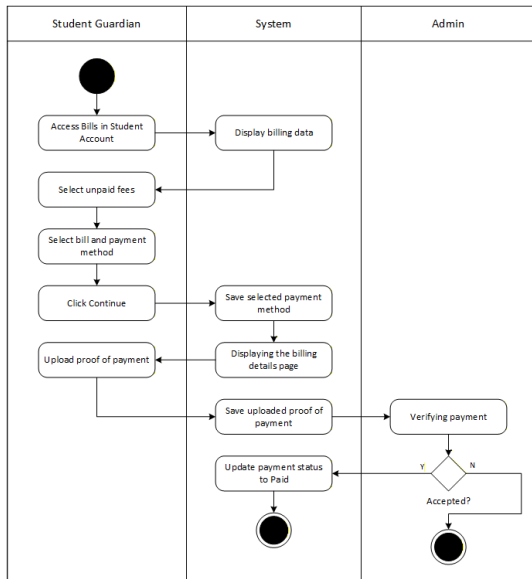
Figure 8 presents the activity diagram for school administrators when selecting new students.

Figure 9 illustrates the activity diagram for school administrators when verifying annual school fee payments in installments

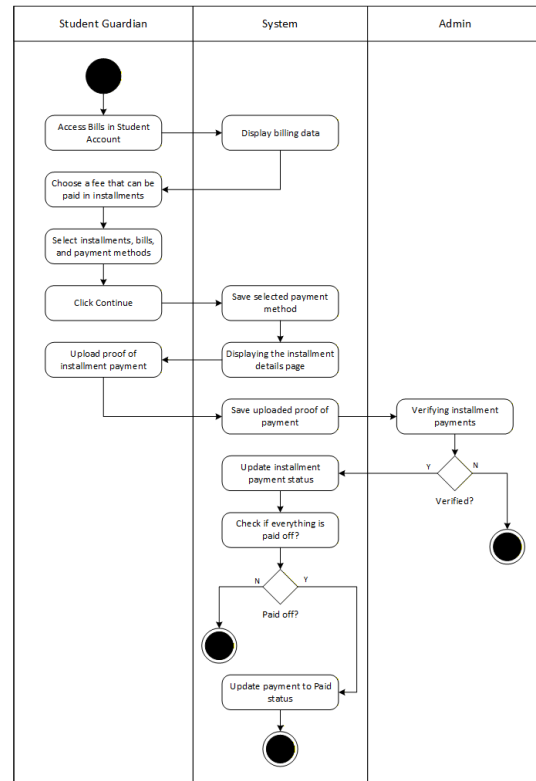


Source: (Research Result, 2025)

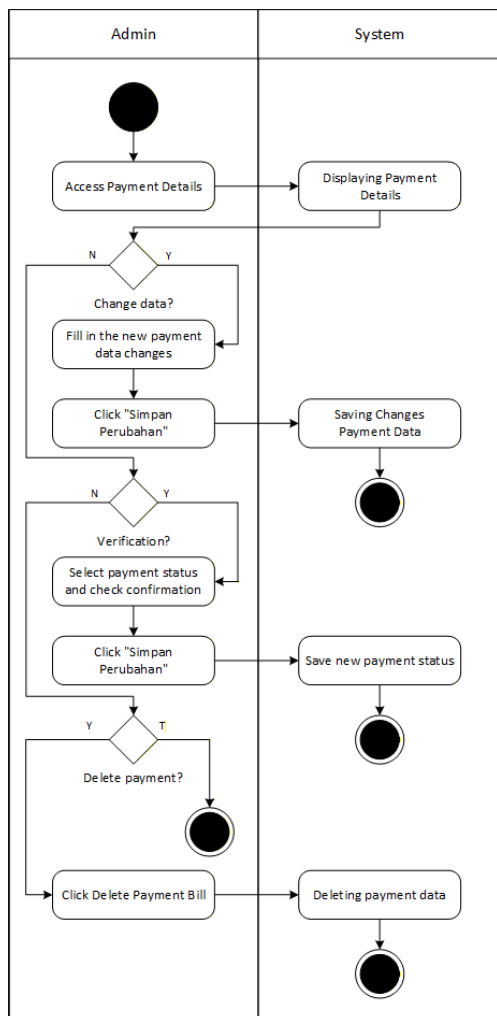
Figure 4. PPDB Registration Activity Diagram



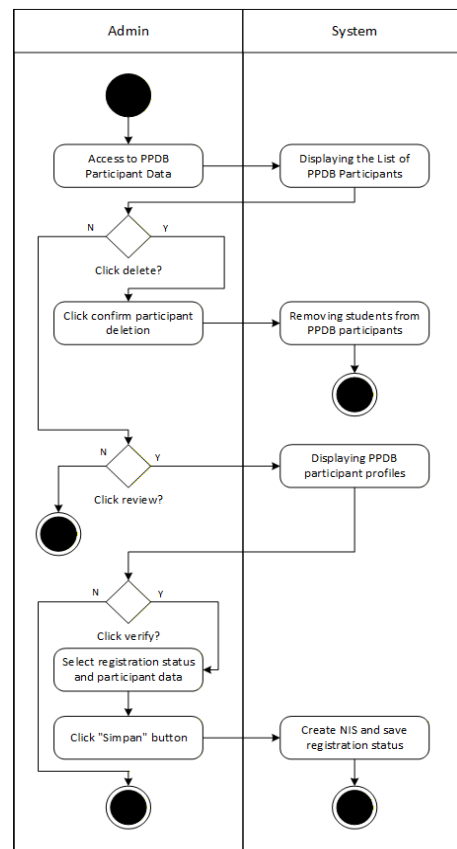
Source: (Research Result, 2025)
 Figure 5. Bill Payment Activity Diagram



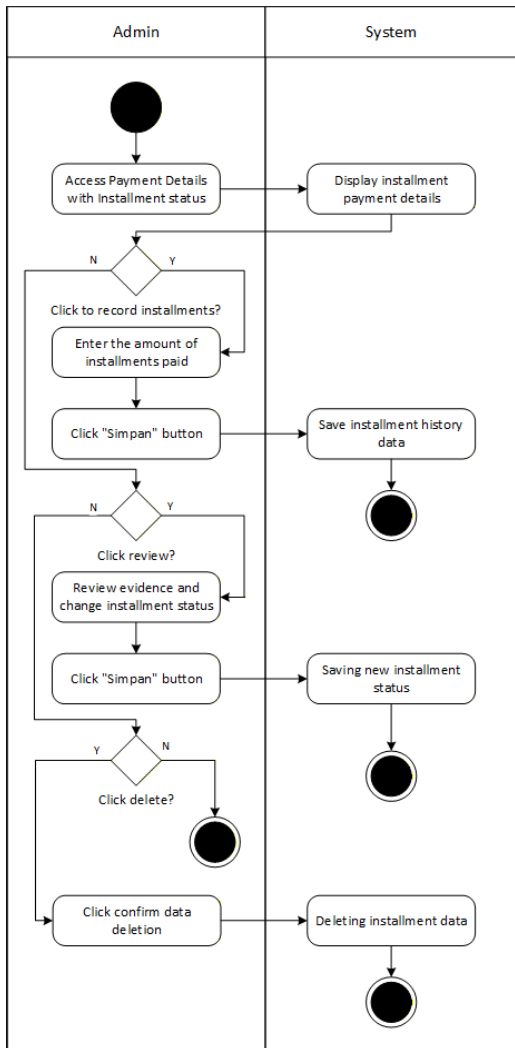
Source: (Research Result, 2025)
 Figure 7. Installment Payment Activity Diagram



Source: (Research Result, 2025)
 Figure 6. Bill Payment Verification Activity Diagram



Source: (Research Result, 2025)
 Figure 8. Verification of PPDB Selection Activity Diagram



Source: (Research Result, 2025)
 Figure 9. Installment Payment Verification Activity Diagram

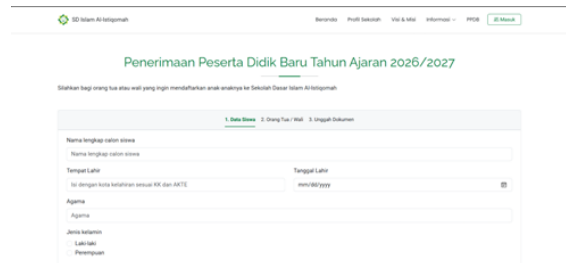
Application Development

Figure 10 shows the main interface of the School Information System at SD Islam Al-Istiqomah, displaying general school information, the school's advantages, and the system's main features.



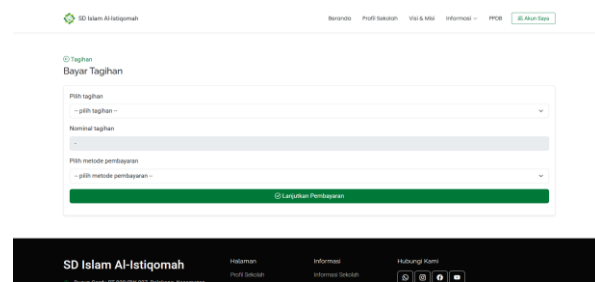
Source: (Research Result, 2025)
 Figure 10. Homepage

Figure 11 presents the PPDB form for guardians of prospective students. On this page, parents can register their children to attend SD Islam Al-Istiqomah by following the PPDB flow.



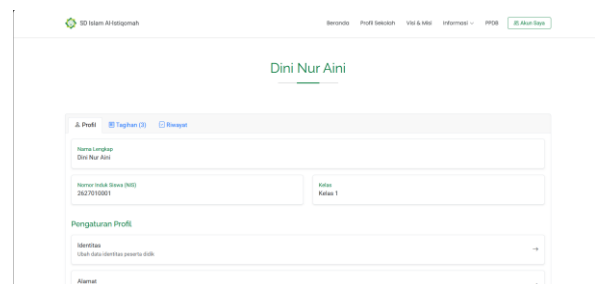
Source: (Research Result, 2025)
 Figure 11. PPDB Page

Figure 12 illustrates the school fee payment page for parents of active students, allowing payment either monthly or in installments depending on the selected payment type.



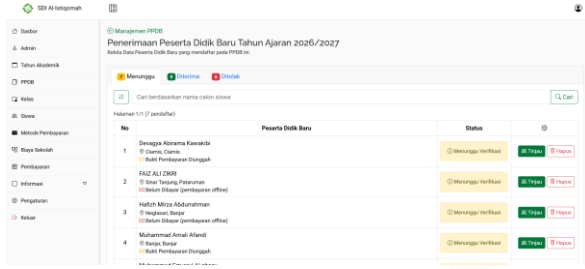
Source: (Research Result, 2025)
 Figure 12. Bill Payment Page

Figure 13 displays the student profile page, where parents can access system information features and update their student's profile.



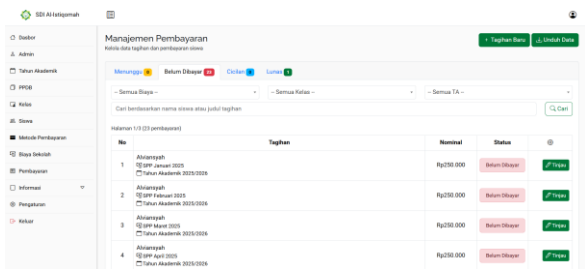
Source: (Research Result, 2025)
 Figure 13. Student Profile Page

Figure 14 displays the new student selection page for the admin. On this page, the admin can determine whether students are accepted or rejected for admission to SD Islam Al-Istiqomah.



Source: (Research Result, 2025)
 Figure 14. PPDB Verification Page

Figure 15 displays direct bill payment and installment verification page. On this page, the administrator can review the payment receipt uploaded by the student's guardian and determine the student's bill payment status.



Source: (Research Result, 2025)
 Figure 15. Payment Verification Page

Testing dan Trunover

Black box testing is a software quality testing method that focuses on the functionality of the software. This testing method aims to find functions that are not working correctly, interface errors, errors in data structures, suboptimal performance, and errors in initialization and termination. Black box testing plays an important role in ensuring that the software functions as the user intends (Wijaya & Astuti, 2021). This testing process was carried out by 5 people, including 3 teachers from SD Islam Al-Istiqomah and 2 other people who were authors as information system developers.

The results of the PPDB feature testing using the black box method are presented in Table 1. The testing shows that all scenarios, including correct data input, incomplete form submission, incorrect data entry, and document upload validation, functioned according to the expected results.

Table 1. PPDB Test Results

No	Test Case	Expected Results	Test Results
1	Participant fills out all form fields correctly	Participant is successfully registered	As Expected
2	Participant fills out some of the form	Displays a message indicating missing fields	As Expected

No	Test Case	Expected Results	Test Results
3	Participant fills out data fields incorrectly	Form cannot be filled out.	As Expected
4	Participant uploads family card and birth certificate documents in a format other than images	File cannot be selected and displays a warning.	As Expected

Source: (Research Result, 2025)

Furthermore, the bill payment feature testing results are summarized in Table 2. The testing indicates that the system is able to properly record monthly and annual payments, as well as validate uploaded proof of payment.

Table 2. Bill Payment Test Results

No	Test Case	Expected Results	Test Results
1	Students pay their monthly bills and upload proof of payment.	Payment successfully recorded	As Expected
2	Students pay the annual bill and upload proof of payment.	Payment successfully recorded	As Expected
3	Students choose the payment that has already been paid in full.	Displaying the paid payment page	As Expected
4	Students upload proof of payment other than images.	Displaying the image validation message is not supported.	As Expected

Source: (Research Result, 2025)

The testing results for the installment payment feature are shown in Table 3. The system successfully manages installment selections, records installment payments, and validates the uploaded payment proof according to the specified requirements.

Table 3. Installment Payment Test Results

No	Test Case	Expected Results	Test Results
1	Students choose the monthly bill.	Doesn't show installment options	As Expected
2	Students pay the annual bill, choose an installment option, and upload proof of payment.	Installment payment successfully recorded.	As Expected
3	Students choose installments that have been paid off.	Displaying the paid payment page	As Expected
4	Students upload proof of payment other than images.	Displaying the image validation message is not supported.	As Expected

Source: (Research Result, 2025)

In addition, the PPDB selection process testing conducted by the administrator is presented in Table 4. The results demonstrate that the system can process participant acceptance, rejection, payment verification, and data deletion appropriately.

Table 4. PPDB Selection Test Results

No	Test Case	Expected Results	Test Results
1	The admin accepts the PPDB participants.	Participants successfully entered the active class data and were automatically assigned an NIS.	As Expected
2	The administrator rejected the PPDB participant.	The participant's status was successfully changed to "rejected."	As Expected
3	The admin checks the payment and then verifies the PPDB payment status.	PPDB payment status successfully verified.	As Expected
4	Admin deleted the PPDB participants.	Participant successfully removed	As Expected

Source: (Research Result, 2025)

The results of the payment confirmation testing by the administrator are shown in Table 5, indicating that the system is capable of updating payment status accurately, including handling cases where payment has not yet been received.

Table 5. Payment Confirmation Test Results

No	Test Case	Expected Results	Test Results
1	The admin has confirmed that the payment has been cleared.	Payment status successfully updated	As Expected
2	The admin confirmed that the payment hasn't been received yet.	Payment status remains unchanged, and students can re-upload proof.	As Expected
3	The admin updates the payment status for students who pay in cash.	Payment status successfully updated	As Expected

Source: (Research Result, 2025)

Finally, the installment confirmation testing results are summarized in Table 6. The system successfully manages installment cycle confirmations, additions, updates, and deletions, ensuring that the billing status and payment records are properly maintained.

Table 6. Confirmation Test Results for Installments

No	Test Case	Expected Results	Test Results
1	The admin confirmed that the installment cycle has been paid.	Loan cycle status successfully updated	As Expected
2	The admin added the installment cycle for cash payments.	The installment cycle was successfully added.	As Expected
3	The admin confirms the final installment cycle.	The installment cycle status has been updated and the bill has been paid.	As Expected
4	The admin deleted the unauthorized installment cycle.	The installment cycle has been removed and students can re-upload proof of payment.	As Expected
5	The admin deleted the last unauthorized installment cycle.	The installment cycle is canceled, the billing status reverts to unpaid, and students can re-upload proof of payment.	As Expected

Source: (Research Result, 2025)

CONCLUSION

This study developed a school information system that includes New Student Registration (PPDB), fee payment and recording (SPP and annual fees), and school information publication using the Rapid Application Development (RAD) method. This system is designed to provide convenience for parents or guardians of students to register their children for school, pay school fees (including SPP and annual fees), and obtain the latest information thru a website that can be accessed anywhere and anytime. This system also provides convenience for the school in managing New Student Registration (PPDB) directly integrated with the Student Management and Fee Payment systems in one place without having to export-import data from one manual system to another, and also simplifies fee recording and recapitulation.

The development of the web-based PPDB feature makes it easier for parents or guardians of prospective students to register their children through the website without having to visit the school directly. This feature provides online access so that registration can be carried out from anywhere, while the data is stored centrally, enabling the school to manage the new student selection process more efficiently in one system. In addition, the system supports document security by storing important files such as birth certificates and family cards in an encrypted format.

The development of the bill payment feature through the website also facilitates parents or guardians of students in making payments and receiving official digital receipts issued by the school without having to visit the administrative office.

Furthermore, the school can more easily recap payment billing data, check student bills, and review payment status quickly and accurately through the admin interface on the website. Previously, billing data was recorded manually in a notebook managed by the school treasurer. With the implementation of this information system, billing data can now be reviewed and managed through a centralized system.

Finally, the integration of the PPDB and school fee payment systems simplifies the management of student data, class allocation, and billing processes within a single platform. This integration shortens the previously long manual process, which started from the PPDB registration, selection, class allocation, to payment billing records, thereby improving the productivity and efficiency of school staff.

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