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WEB-BASED SPP PAYMENT INFORMATION SYSTEM WITH MIDTRANS PAYMENT GATEWAY

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ABSTRACT- The tuition payment system at Taufiq Islamic Middle School is still manually using ledger media in transaction activities and data recap. The system still needs to be revised and is prone to errors in calculating incoming payments and reporting payment data. This research was conducted to facilitate the school in the payment management process so that the recording error rate no longer occurs. The system development method used in this study is the Waterfall model and uses the Midtrans payment gateway in the online payment process. The results of this study are in the form of a tuition payment website that can facilitate all parties, both the school and students. This system makes the payment and recording process better and more efficient.

Keywords: information system, waterfall, payment gateway, Midtrans.

1. INTRODUCTION

Activities that support the success of educational institutions are determined mainly by systems that provide fast and accurate information to help make institutional decisions in improving quality education.[1]. Education Development Contribution (SPP) is a mandatory contribution paid by students to schools regularly to support teaching and learning activities at school[7]. Usually, this SPP is paid monthly through the school administration. Each student will receive an SPP card from the school, which contains the month and the amount to be paid each month.

With the implementation of information technology, the data collected will be stored in a computer, making it easier for every user, in this case, the school, to get the information needed quickly and accurately. One of the schools' uses of information technology is to create a computerized tuition payment system. Computerization makes data collection faster and the presentation of accurate information. To provide payment services that are effective and efficient[2]. However, Attaufiq Islamic Middle School has yet to utilize Information Technology fully.SPP payment Students are still carried out conventionally. School administration records transactions In a big book. This wastes a lot of time and is prone to errors in calculations and data collection[3].

The information required still needs to be presented; the Administration must sort data on students who have paid and those who still have arrears. Not to mention if there is an error in data recapitulation, of course, this will take longer to present the data. This kind of thing will disrupt the smooth Administration of the school, which impacts teaching and learning activities[4]. So the purpose of this research is to create a Web-based SPP payment information system with the Midtrans Payment Gateway, replace the manual SPP payment system to be computerized, and make the SPP payment system effective and efficient. A payment Gateway is a legitimate online payment in a transaction that complies with the provider's policy rules[6]. The payment gateway function sends transaction details from computerized buyers to the bank for approval. Midtrans is a company *fintech (financial technology)*that provides system payment services *and gateways.* Midtrans company has recently released a feature *snap* that provides a simple display that is easily understood by consumers and is equipped with *a pop-up window*. For a developer, Midtrans has provided *libraries* that can be integrated with *the framework* [8].

2. RESEARCH CONTENT

2.1 Research Methods

The system development model in this study uses the waterfall development model. The Waterfall system development model or commonly referred to as SDLC (Software Development Life Cycle), is a system development model that applies a methodology that others have used with a well-proven approach.[13].

The steps carried out are as follows:
a. System Requirements Analysis
   At this stage, an analysis of Software requirements That will be made related to information systems payment SPP The data obtained from the research method became the basis for compiling the system requirements analysis in this study. Some of the requirements needed include the following:
   1. Data Requirements
      The data that this information system will process includes resume data that will be displayed to students related to unpaid and paid tuition fees along with

how to pay them and admin resumes for recapitulation of tuition payments and other student bills.

2. Interface Requirements
    The system to be built must be user-friendly, easy to use, and transparent. In addition, features are made for online and cash payments.

3. Functionality Requirements
    In this system, there will be multilevel user logins to manage the access rights of each user. Access rights between admin and students will differ according to their individual needs.

4. Software Requirements
    The application to be designed is a web-based application so that the application can be accessed flexibly and quickly. The author uses a programming language PHP and databases MySQL.

b. Design
The application to be designed is a web-based application with a client/server architecture. The server side contains the database, and the client side includes the user interface and application logic. The input data will be stored on the server side, which the user will access via a client browser.

c. *Code Generation*
After the design is made, program code is created using the PHP programming language, MySQL database, and XAMPP as a database server link. At this stage, it does not involve the school in depth.

d. Testing
At this stage, the system that has been created will be tested to see how far the system can work as expected in this test using the black box testing method.

e. Support
The last stage is using the product for ready use by the user (user). In its use, it is necessary to pay attention to the maintenance of the system, which allows for improvements to be made as expected. In addition, if needed, add the required features. Finally, hardware that supports system performance must also be considered in its use, so that system performance is not disturbed.

2.2 Needs Analysis
Analysis Stage
The system in this application will use a multilevel user login, including administrators, administrators, and students. Each will get an account with different access rights. The administrator will hold the highest access rights, in this case, the Principal accompanied by IT staff. Administrators have complete control over applications that can manage users and manage other data, as Administrative and student access rights are adjusted to the needs.

The following are the system requirements for the Web-Based SPP payment system:

1. Administrator Page (Superadmin)
    A1. Administrators can manage user data
    A2. Administrators can process student data
    A3. Administrators can process class data
    A4. Administrators can process bank account data
    A5. Administrators can process student billing data
    A6. Administrators can confirm online or cash payment manuals
    A7. The administrator can print proof of bill payment.
    A8. Administrators can manage transaction data

2. Administration Page (Admin)
    B1. Administration can confirm online or cash payments
    B2. Administration can manage student billing data
    B3. Administration can manage payment and transaction data
    B4. Administration can print payment reports

3. Student Page
    C1. Students can view student bills
    C2. Students can make payments online through a payment gateway.

UML
UML is the language used to create models in object-oriented software design. In UML, you will see the concept of business processes, class representations, database design, and other supporting components in software[11]. The UML developed in the creation of the SPP payment information system consists of use case diagrams and activity diagrams.

Use Case Diagrams
The following is a use case diagram illustrating the tuition payment information system at the Attaufiq Islamic Middle School and management at the administrator, administrative, and student levels.
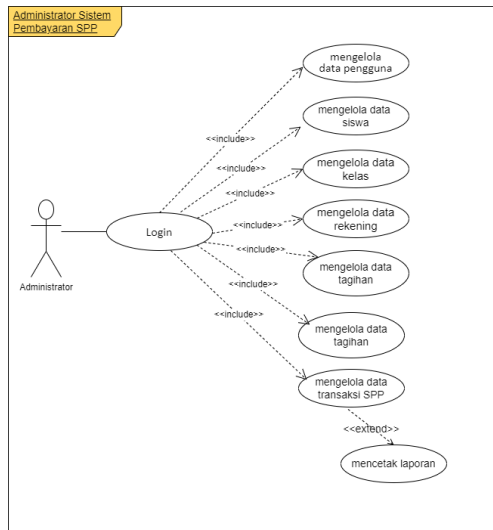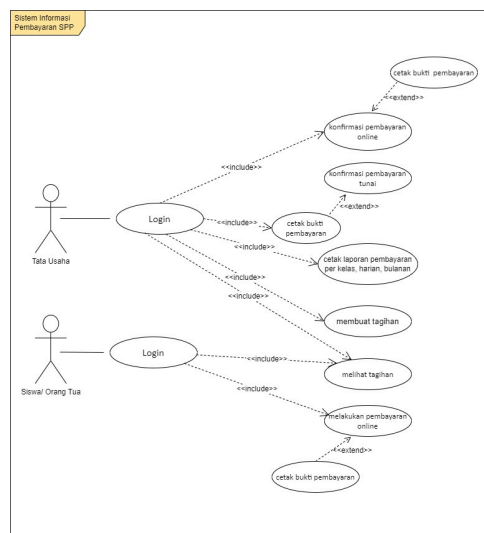
Figure 1 Administrator Use Case Diagram

Figure 2 Use Case Diagram of Treasurer and Student

Activity Diagrams

Furthermore, described system interactions between treasurers and students in paying tuition fees can be seen in the following activity diagram.
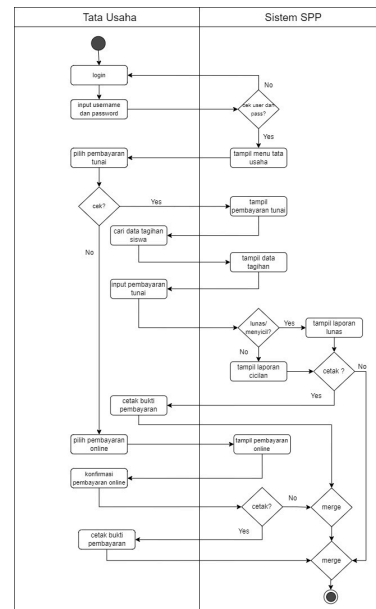

Figure 3 Activity Diagram of SPP Payment by the Treasurer

The activity diagram in Figure 3 shows that after the treasurer has successfully logged in, the treasurer can do two things in handling tuition payments. First, the treasurer can receive student payments in cash, and second, the treasurer can confirm online student payments.
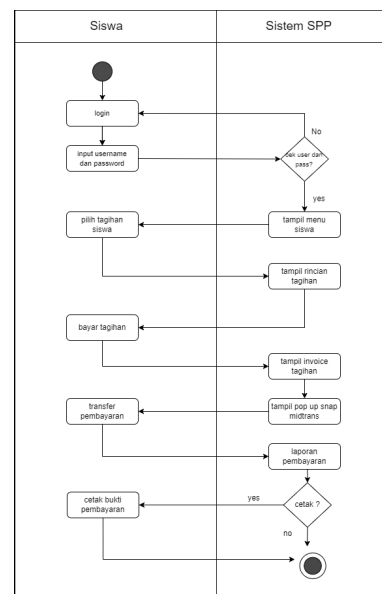

Figure 4 Activity Diagram of Tuition Payments by Students

In the picture above, students can see that after successfully logging in, students can make payments independently through the mid-trans payment gateway. In addition, after creating an online amount, the system will notify students in the form of proof of income that has been made.

Database
The database design used in this research uses ERD (Entity Relational Diagram) and Logical Record Structure (LRS).
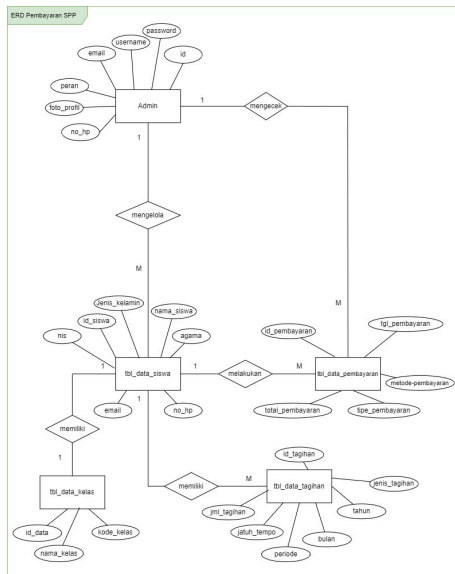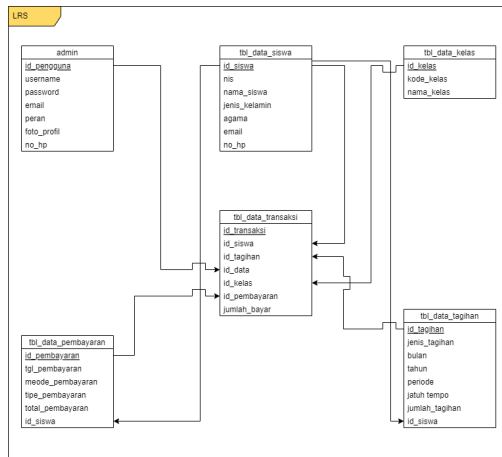

Figure 5 Entity Relational Diagram (ERD)

Figure 6 Logical Record Structure (LRS)
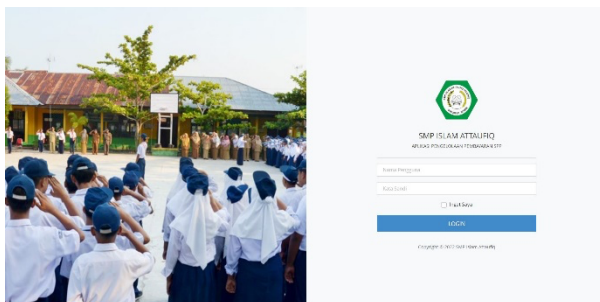
2.3 *UserInterface*

Figure 7 Login Dashboard

Dashboard login this is the main page for administrators, treasurers, or students to log into their

respective accounts. The username and Password that are entered correctly will be directed to the application according to their individual access rights.
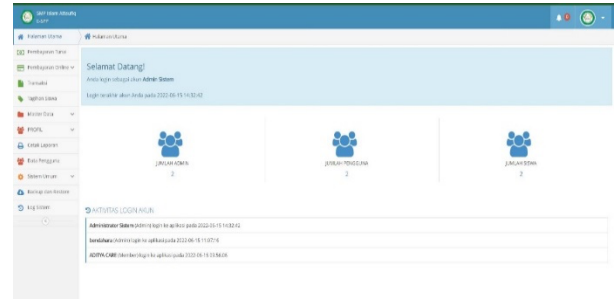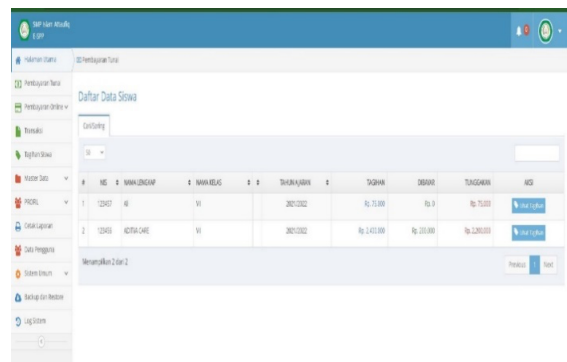

Figure 8 Administrator Dashboard

*Dashboard*The administrator will display all menus from this application, such as student data, classes, bills, manage users, etc. An administrator is the holder of the highest access rights because he can handle all the data in this application.

Figure 9 Cash Payment Dashboard

A treasurer can serve students who pay tuition or other bills in cash on this page. The treasurer can select the selected student's account to choose the payment.
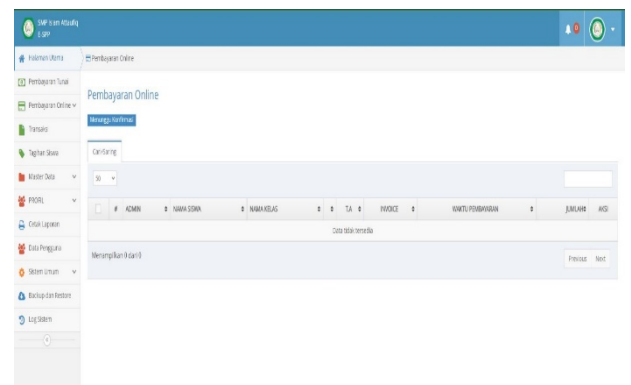

Figure 10 Payment Confirmation Page

On this page, the treasurer can see students who have made payments online.
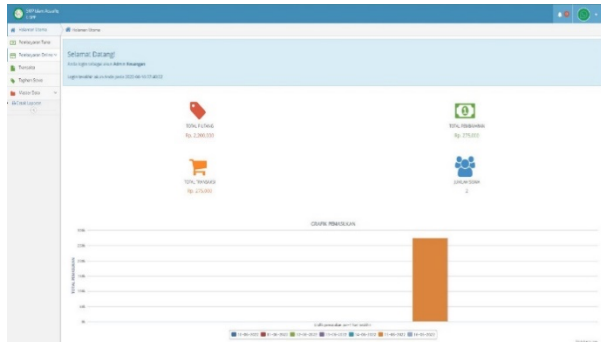
Figure 11 Treasurer Dashboard

*Dashboards*the treasurer will display menus that can only be accessed by the treasurer, including menus for cash payments, online payments, making student bills, and others.
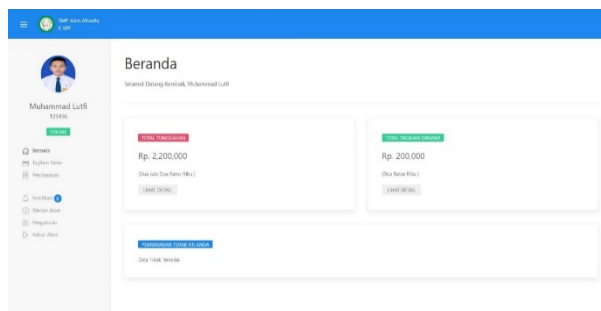

Figure 12 Student Dashboard

*Dashboards*student will display the main student page. In addition, students will be shown arrears data and SPP data, and bills that have been paid on the homepage.
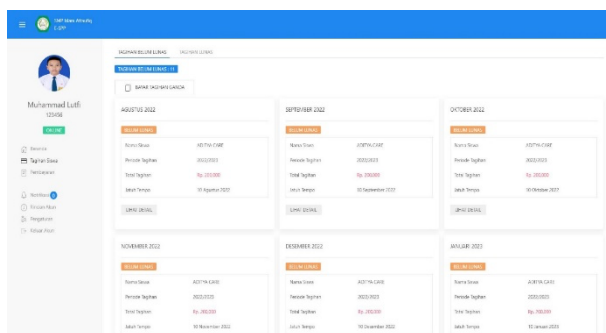

Figure 13 Student Billing Page

On this page, students can see student bills that have not been paid and their details when they select the "view details" menu.
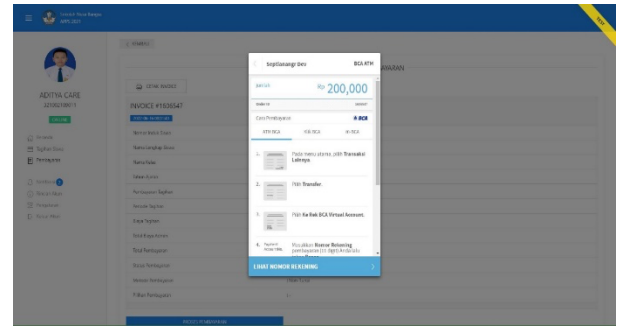

Figure 14 Payment Gateway page

On this page, students can directly make online payments on this application integrated with the Midtrans payment gateway. In addition, real-time payment status updates can be seen in the application.
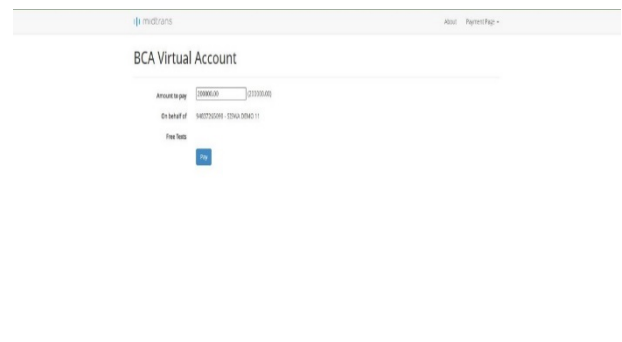

Figure 15 Midtrans page

This page is a black box provided by Midtrans to test whether the application has been integrated with the Midtrans payment gateway before entering the production stage when the application is ready to be published online.

2.4 Application Testing

Tests were carried out in this study using black box testing. The following are some results of testing the SPP payment information system application.

1. *From Login*

Table 1 Testing the Login Form

Test Scenario	Test Cases	Expected results	Test result	Ket
usernames and Password are not inputted, then click the 'Login' button	*username :*(blank) *Password:*(blank)	The system will deny login access and display the message "Please fill out this field."	Accordin g to expectati ons	*Vali d*
Enter the username and wrong Password, then click the 'Login' button	*Users*: (admin) *Password:*(admin)	The system will deny login access and display the message "Incorrect username or password."	Accordin g to expectati ons	*Vali d*

Test Scenario	Test Cases	Expected results	Test result	Ket
*cheat*s password data and empty the username data, then clicks the 'Login' button	*User:*(blank) *Passwords*: (admin1)	The system will deny login access and display the message "Incorrect username or password."	According to expectations	*Valid*
Enter with the condition that one of the data is correct, and one is wrong, then immediately click the 'login' button.	*User:* admin (correct) *Password:*12345 (false)	The system will deny login access and display the message "The username and password you entered are incorrect...!!!!"	According to expectations	*Valid*
Enter the correct login data, then click the 'login' button	*user:*alamsyah14 *Password:*123456	The system receives a login to access and then immediately displays the home page according to their respective access rights.	According to expectations	*Valid*

2. Class Data
Table 2 Class Data Form Testing

Test Scenario	Test Cases	Expected results	Test result	Ket
Class code, class, and school year are not input, and click add data	Class code (blank) Class (empty)school year (blank)	The class code, class, and academic year will not be stored and will display the "red mark in the column and says Please fill out this field."	According to expectations	*Valid*
The class code is inputted, while the class and school year are not inputted.	Class code (VII-2021/2022) Class (empty)school year (blank)	The class code, class, and school year will not be stored and displays the message "red mark in the class and school year column and says Please fill out this field."	According to expectations	*Valid*
Enter the class code, class, and school year	Class code (VII-2021/2022)	The class code, class, and school year will be saved and	According to expectations	*Valid*

	Class (VII)school year (2021/2022)	display the message "data successfully added"		

3. Billing Data
Table 3 Testing of Billing Data Forms

Test Scenario	Test Cases	Expected results	Test result	Ket
If the billing code, billing name, billing category, and billing costs are not inputted, click "Add Data."	Billing code (blank) Billing name (blank) Bill category (blank) Billing fee (blank)	The billing code, billing name, billing category, and billing fee will not be stored and will display the message "red mark in the column and says Please fill out this field."	According to expectations	*Valid*
The billing code is entered while the billing name, category, and costs are not inputted, then click "Add Data."	Billing code (SPP/2021) Billing name (blank) Bill category (blank) Billing fee (blank)	The billing code, billing name, billing category, and billing fee will not be stored and displays the message "red mark in the billing name column, billing category, and billing fee and says, Please fill out this field."	According to expectations	*Valid*
Billing code, billing name, billing category, and billing costs are inputted, then click "Add Data."	Billing code (SPP/2021) Billing name (SPP) Billing category (Education) Billing fee (200,000)	The billing code, billing name, billing category, and billing costs will be saved and display the message "data successfully added"	According to expectations	*Valid*

3. CONCLUSION

Tuition payment applications that are still done manually at Taufiq Islamic Middle School can be computerized using a website-based tuition payment application. The presence of a website-based tuition payment system application helps the school in processing and presenting tuition fee financial data. Data search is speedy and easy to find, and calculations with computer programs make valid calculation results.

4. CLOSING

Whatsapp API or SMS Gateway API to provide information to students' parents regarding tuition

payments can be applied for further research, which can complement the deficiencies that exist in this study. In addition, testing can be carried out not only for applications, but system security can be developed for further research.

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