Integrated Education Payment System UX Design

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Abstract. Educational institutions/schools in Indonesia have education payment activities carried out by students every month. The financial officer makes a monthly education payment report to be reported to the Principal. Routine activities carried out every month are still mostly done conventionally, namely recording using books and reports calculated manually. This conventional activity has problems if the number of students in the school is more than 100 people. For educational institutions/schools that have not utilized information technology, there is a risk if the bill to students does not match with the data in the financial officer's book. This risk can be prevented by using information technology. This paper aims to design an education payment system based on user experience. User experience is conducted so that the system is designed according to user needs. The user experience uses the Five Planes method, namely the strategy plane, the scope plane, the structure plane, the skeleton plane, and the surface plane. The result of this research is the design of an education payment system interface that is integrated with the Whatsapp gateway.

Keywords: education payment, user experience, five planes method

1 Introduction

The development of appropriate technology and information systems will support educational activities in educational institutions. An educational institution requires service management to meet the educational needs of the community. The teacher's teaching activities to students are the main thing, besides the teaching and learning process, there are other activities, namely the process of managing school finances. The process in question is a financial management action that involves recording financial data on education payments that students pay each month. Proper financial management is important to the general development of the school [1].

For Educational Institutions/Schools that have not utilized information technology, the process of recording payments is carried out using books and proof of payment cards. If the Educational Institution/School has more than 100 students, then recording using this book will be a problem. Because, with books, every month the financial officer must write the names of the students again, of course, it will take time and there is a risk that there are students' names that are not

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written. In addition, proof of payment cards is easy to lose. This will be risky if the bill on the payment card does not match the data in the financial clerk's book. To fulfill good and efficient service to its member [2].

Use of cell phones and internet can also help educational institutions/schools to keep the service process running during the pandemic. An educational institution/school requires maximum management for services in meeting the educational needs of the community. Teaching carried out by teachers to students is the main part of the school, in addition to the teaching and learning process, there are other activities, namely the school financial administration process. The process in question is the act of financial management which consists of recording financial data that students pay each month.

Whatsapp gateway is a gateway for information dissemination using Whatsapp which can send messages to hundreds of numbers automatically and quickly which is connected directly to the WhatsApp account number database without retyping on a smartphone. One implementation of the WhatsApp gateway is a notification system where this system can send notifications to someone. This system can be applied to notifications of reminders of the SPP payment process that has been carried out by parents/guardians. This notification can replace the SPP payment proof card.

For financial management to be well managed, an education payment system is needed that can meet all user needs. Therefore, the design of education payments is carried out with User Experience. User Experience design has become a critical part of application development as it has a huge impact on the success or failure of a product [3]. The user experience refers to the parts of the product or service that the user can experience, including the man-machine interface. The scope of user experience covers the user's knowledge of products, search, classification, purchase, installation, service, expansion, upgrade, and various aspects of life [4].

This study aims to ensure the success of the system by designing based on user experience in educational institutions [5]. According to ISO standards, user experience includes all user reactions to interactions with a service, system, or product [6]. The User Experience method is applied to make it easier to find problems and get solutions in the website design process that is following the wishes of users because this method emphasizes human and computer interaction, so that it can analyze the website to be designed, besides the User Experience method can also provide convenience and convenience for website visitors [7].

This article provides a design based on good practices and guidelines so that you can meet your needs. The system is developed according to the five planes method. The five planes method is a framework for describing how you can design your user's experience [8].

2 Methods

2.1 Data Collection

In this study, data collection is primary data obtained directly from the school, through the Principal and SPP Officer. Data was collected through interviews regarding the current payment process. Interviews are also to obtain information, and functionality requirements desired by users.

2.2 Design Method

The method in this study uses the five planes method to get an idea of how to design user experience for the information system that will be built in this study. This approach facilitates describing the user experience of an information system in terms of both the problem to be solved and its solution in terms of conceptual models [9]. The five planes method consists of five fields: Surface, Skeleton, Structure, Scope, and Strategy. Each field depends on the fields below it, so the application should start with the lowest field. Lower levels are more abstract, and higher levels are more specific [10]. Figure 1 shows the flow of the five planes method.

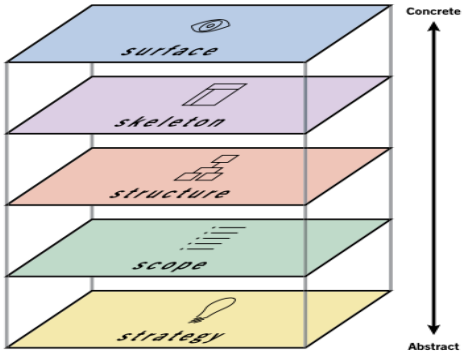

Fig. 1. Five Planes Method Flow

We can model this whole set of confusing terms. By breaking down each layer into its constituent parts, we can take a closer look at how it all fits together when designing an overall user experience.

a. The Strategy Plan: The same strategic considerations come into play for both feature-oriented products and information-oriented resources. User requirements are the goals of her website from outside the organization, especially those who use the website. We need to understand what our audience wants from us and how that fits in with our other goals.
b. The Scope Plan: On the functional side, the strategy is translated into scope through the creation of a functional specification (a detailed description of the product's "feature set"). On information pages, scope takes the form of content requirements. Here's a description of the different content you'll need.
c. The Structure Plan: Functionally, scope is configured by interaction design and defines how the system behaves in response to the user. In information resources, the structure is the information architecture. That is, the arrangement of content elements to facilitate human comprehension.
d. The Skeleton Plan: The skeleton plan are decomposed into three components. Both sides have to deal with information design, that is, presenting information in a comprehensible way. For function-oriented products, the skeleton also includes the interface design or arrangement of interface elements that allow users to interact with the functionality of the system. An information resource's interface is its navigation design. That is, a set of screen elements that allow users to navigate through the information architecture.

e. The Surface Plan: Finally, there is the surface. Our interests are the same, whether it's a feature-oriented product or a source of information. It is the sensory experience that the finished product creates.

3 Results and Discussion

This section describes the results of implementing the design of an education payment system with the Five Planes method. The flow of research was carried out using the five planes method to get an idea of how to design user experience for the information system that will be built in this study. With this method, the user experience of the information system is more easily explained in the form of a conceptual model, both in terms of the problem being solved and how to solve it.

3.1 The Strategy Plan

In the area of strategy, its purpose is to formulate product goals and identify user needs. This is done by interviewing and monitoring stakeholders such as principals, financial officers, and students' parents. The results of interviews and observations obtained several main strategies, including:

1. The system makes it easier for users to store data for all students and does not need to add student data every month, because by using conventional methods, financial officers need to re-record the names of students at the turn of the learning year.
2. The system can present financial reports on tuition payments and arrears in real-time.
3. The system can send payment notifications to parents/guardians, as proof of payment to prevent children from making tuition payments.

3.2 The Scope Plane

At the strategy level, we use strategies laid out, and at the scope level, we use Use Case diagram to describe the main features and capabilities of the system. There are two types of users: administrators and principals. An administrator's main task is to manage master data and payment data. Meanwhile, principals can view reports and tuition delinquency in real-time. Both types of users have the right to register and view reports. The results of the scope plane are designed to be a Use Case diagram. Because the Use Case diagram serves to show the relationship between the system and the user [11].

The relationship between users, namely admin and SPP Officer with functionality on the system. Admin can perform several functions such as the first login to the system, view data first, change class data, view payment type, change a payment data type, view student arrears data, add student arrears data, view user data, view user data, change student data, send payment reports via WhatsApp messages, change WhatsApp delivery reports, view sent payment reports, report payment reports, view payment reports, and can create user system profiles.

Meanwhile, the SPP Officer can only perform several functions, first logging in to the system, viewing the payment reports that have been sent, reporting the payment reports that have been sent, the payment reports that have been sent, and being able to view the system user profile seen in figure 2.

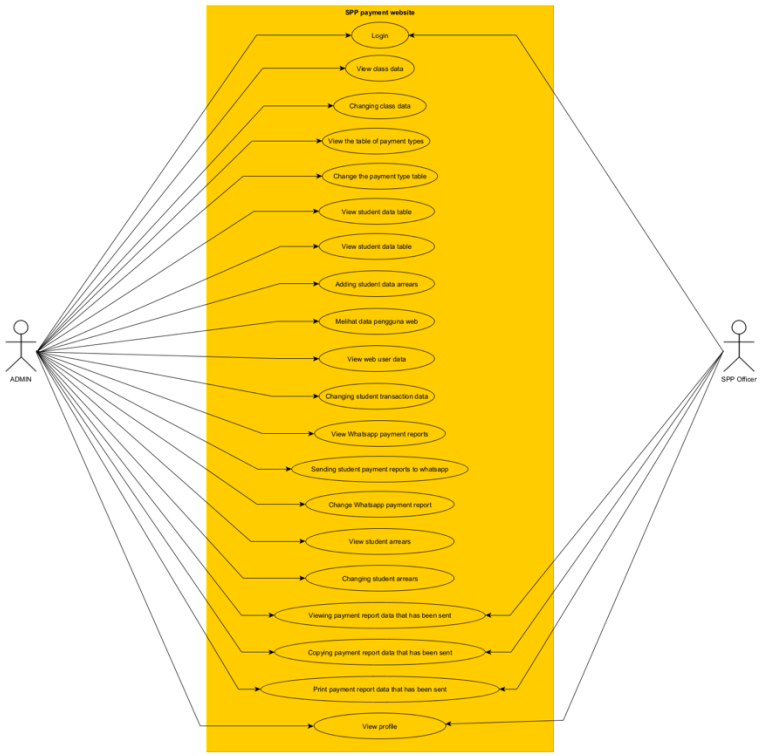

Fig. 2. Use Case Diagrams

3.3 The Structure Plane

Areas of structure in the form of activity diagram. Untuk memudahkan programmer membuat system yang sesuai dengan kebutuhan pengguna, selanjutnya digambarkan beberapa activity diagram yang diturunkan dari use case diagram. Activity diagram akan memperlihatkan urutan aktifitas proses pada system, ini berguna agar programmer dapat lebih memahami proses secara keselurahan dari setiap fungsionalitas yang telah ditentukan pada scope plane.

Activity diagram are categorized based on their function: master data, reporting, and payments. The Master Data Flowchart is a flow system consisting of four phases: Enrollment, Class Data Entry, Student Data Entry, and User Data Entry. This diagram is to facilitate the flow of school data registration in the process of paying tuition fees.

The payment functionality process starts with the admin inputting student data and making payments. The system searches for student data, and if student data is found, the system shows the data that students need to pay. Next, the admin changes the payment data and saves the data. This process can be seen in the activity diagram in Figure 3.

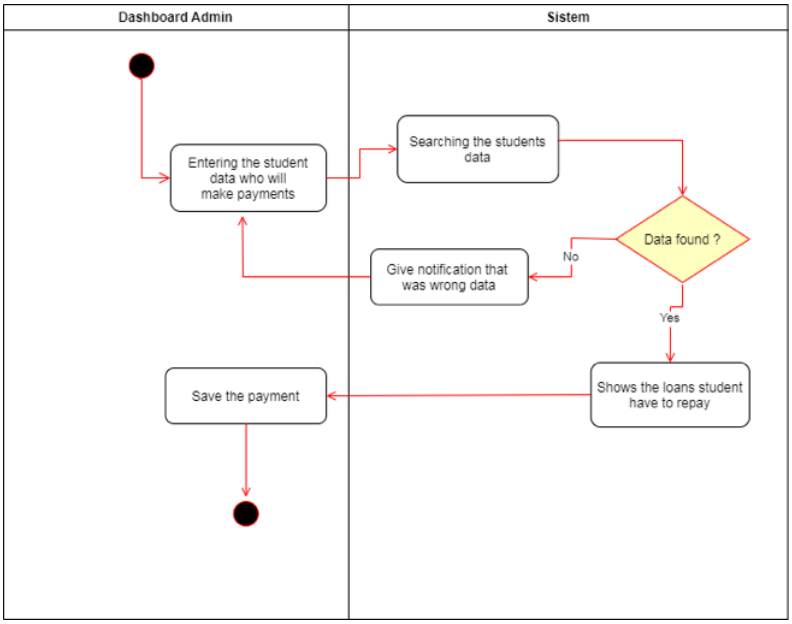

Fig. 3. Activity Diagram Payment

The process of sending functionality to WhatsApp starts with the admin selecting the send button on the student data to which the payment report will be sent. Then the system will send a report in the form of a message to the student's WhatsApp number that has been stored in the system. Admin can also delete payment reports, so the system will delete student payment reports. This process can be seen in the activity diagram in Figure 4.

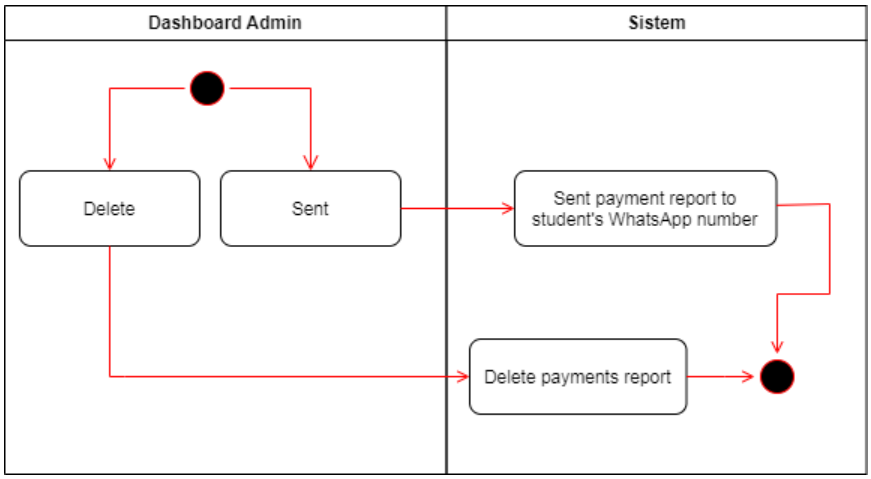

Fig. 4. Activity Diagram Report To Whatsapp

3.4 The Skeleton Plane

At this stage, an educational payment system interface design is carried out that allows it to be applied to website design. The main target of this stage is the layout design which is the embodiment of the interaction design at the structure plane stage. The layout design adapts to the wishes of the stakeholders obtained from the results of the interviews as shown in the image below.

The layout design is made based on the activity diagram that had been designed in the previous stage. This is done so that the User Experience desired by the user can be achieved in the system. The function of the website is divided into three menus, namely the master data menu, payment menu, and reports.

The master data menu is divided into several functions, namely users can CRUD (create, update, delete) class data, CRUD payment types, CRUD student data, and CRUD user data. Furthermore, the payment menu functions for new payment transactions made by students. Finally, the report menu functions to send reports to Whatsapp, print monthly payment reports, and to check reports that have been sent via Whatsapp. In the monthly payment report, users can print the report in CSV, PDF or Excel format. The layout design can be seen in figure 5.

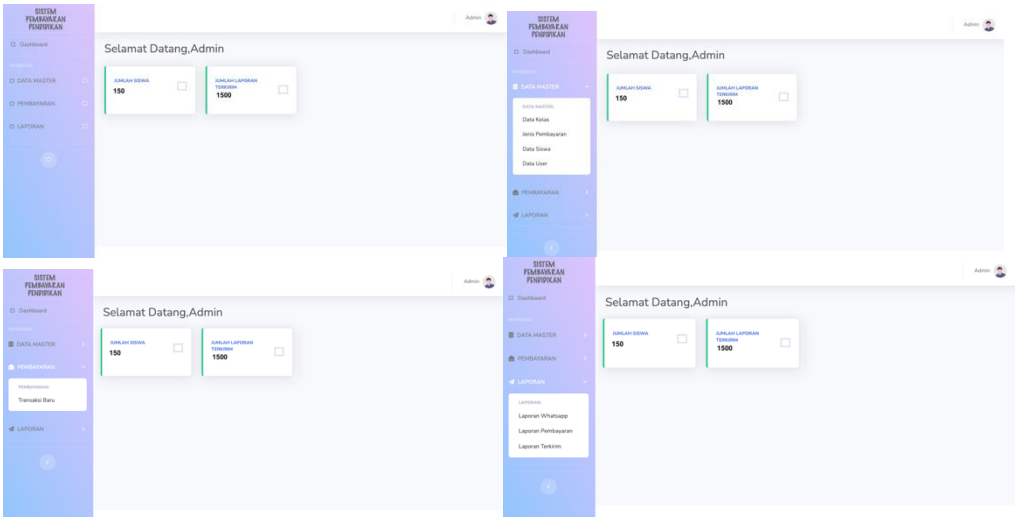

Fig. 5. Layout Design

3.5 The Surface Plane

The final phase runs an interface layer that translates the layout into PHP, HTML, and CSS code. The color selection will be adjusted to the color of the stakeholder's choice. Figure 6 displays the education payment form. This form inputs student data, type of payment, and month of education payment.

This stage is carried out by a programmer, by mapping from the results of the stages that have been made previously. The website is built based on the wishes of the user so that the user experience expected by the user can be realized and the user is easily using the system that has

been built by the programmer. In the new transaction menu in figure 6, the user adds new payment transaction data. Users simply search for student data by inputting their name, NIS, and payment type on the website form.

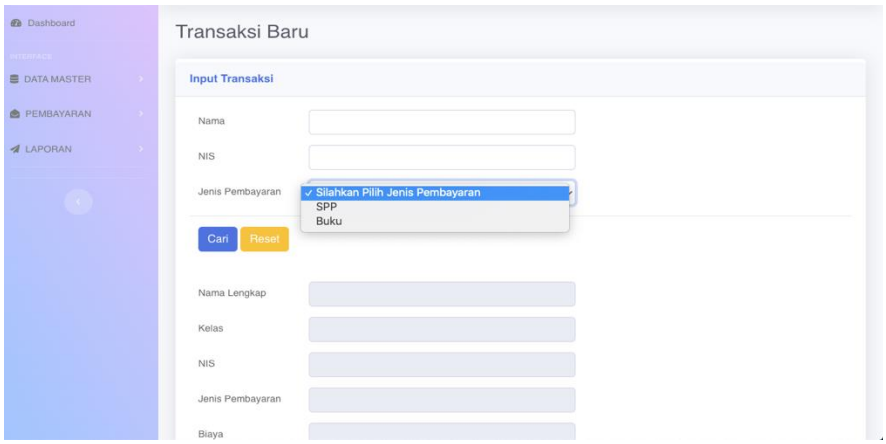

Fig. 6. Education Payment Form Page

After entering student payment data, the user provides a payment report to be sent to the student's parents' WhatsApp via the education payment system. The page for sending payment reports to WhatsApp is shown in figure. 7.

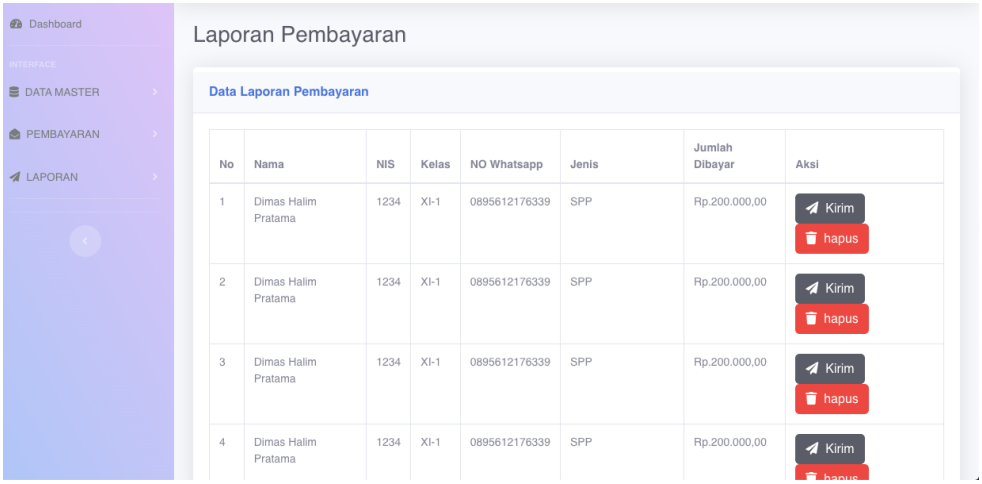

Fig. 7. Report Sending Page To Whatsapp

The Education Payment System can also provide payment reports in the form of CSV, Excel, and PDF files. Reports can be selected based on the month and year of education payments. The report page is shown in Figure 8.

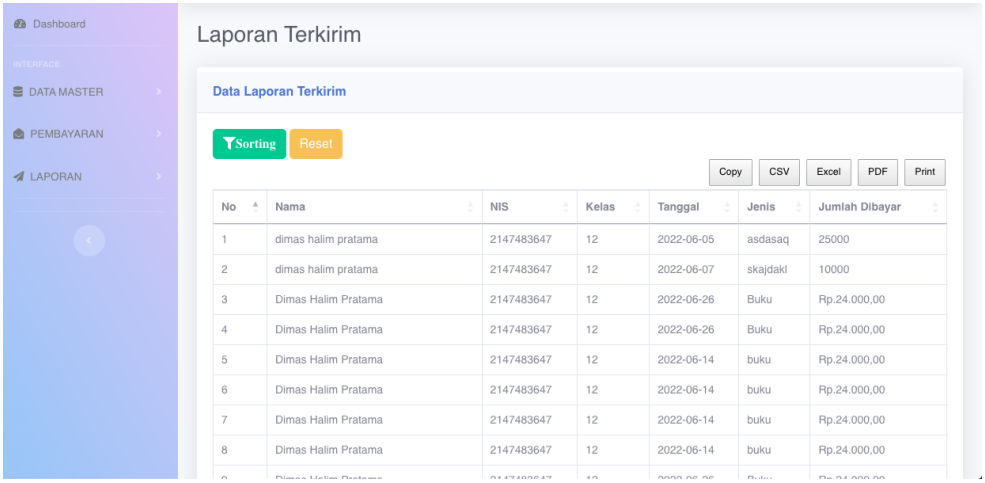

Fig. 8. Education Payment Report Page

4 Conclusion

In this paper, the design of the education payment system is based on the five planes method. Based on the results that have been obtained, the main goal of designing an education payment system interface that is integrated with the WhatsApp gateway has been successfully carried out by making the features appear clearer. and more relevant to user needs. Each area of the five planes method has an important element in designing the interface of an education payment system. This can be seen from the bottom plane showing an abstract concept, the more to the top plane showing the concept is visible as a system design. It can be concluded that using user experience methods or frameworks in the process is very important to the design process so that the final design meets the user's needs.

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