Design of a Web-Based Student Attendance Information System using the Rapid Application Development Method (Case Study: SMA ST Petrus Medan)

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Abstract

The development of information technology has brought convenience to various fields, including education. One of the challenges faced by St. Petrus High School, Medan, is the manual student attendance process, which often leads to errors, is time-consuming, and complicates data collection. Furthermore, the delivery of attendance information to parents is also less than optimal.To address these issues, this study designed a web-based student attendance information system using the Rapid Application Development (RAD) method. The RAD method was chosen because of its advantages in rapid development and allows for direct user involvement through iterative prototyping. The designed system provides features such as a dashboard, daily attendance, student attendance history, student and teacher data management, attendance reports, and automatic email notifications to parents if a student is absent without explanation. This design is expected to simplify the process of recording student attendance, expedite data recapitulation, and increase the transparency of attendance information between the school and parents.

Keywords: *Student Attendance, Web, Rapid Application Development*

1. Introduction

The rapid advancement of technology, including computer systems connected to the internet, has significantly simplified human work in various fields, including education, where the use of information technology is essential to make processes more efficient and effective, as well as saving time, energy, and costs [1]. Attendance reporting is a routine duty for teachers in face-to-face learning activities [2], serving to monitor students' presence and control the learning process [3]. At SMA St. Petrus Medan, a Catholic educational institution located at Jl. Luku I No. 1, Kwala Bekala, attendance recording and management are still performed manually using books or paper lists, which is inefficient, requires manual recaps, and is prone to marking errors that, when corrected, can make the records untidy or even damage the paper; another issue is the school's limited ability to effectively communicate attendance information to parents [3], which sometimes allows students to mislead their parents about being in class when they are actually absent, leaving parents unaware of their child's actual school progress [1]. To overcome these problems, it is necessary to design a web-based Student Attendance Information System for SMA St. Petrus Medan so that attendance can be recorded directly in the system without using manual books, thus reducing costs, saving time, and keeping student and attendance data well-organized to produce fast and accurate information [4], while also enabling the school to more effectively inform parents. This study adopts the Rapid Application Development (RAD) method, a system development model that emphasizes speed through intensive user involvement and rapid, iterative prototyping until the system evolves into its final form [5], offering advantages such as short development cycles, internal scope focus [6], and quick requirement planning since the development can adapt to user needs that may change at any time [7]. User participation throughout the design process ensures the system meets their needs, and the iterative approach with active stakeholder involvement helps produce a targeted and expected outcome; therefore, the research is entitled **"Design of a Web-Based Student Attendance Information System Using the Rapid Application Development Method (Case Study: SMA St. Petrus Medan)."**

2. Research methods

2.1. Problem Analysis

This Attendance recording and management are still carried out manually, causing difficulties and requiring manual recap activities. Mistakes often occur when ticking, and repairs using a type make the attendance sheet less neat and can even damage the paper. Information on student attendance to parents/guardians has not been conveyed quickly and efficiently, because it is still done manually.

2.2. System Needs Analysis

The expected stages of system creation are: Helping to record student attendance more quickly and accurately, it can be done through the website accessed by the St. Petrus Medan High School school easily. It is hoped that this website can help reduce the potential for errors in filling in attendance that often occur in manual methods. It is hoped that it will make it easier to convey student attendance information to parents/guardians faster and more efficiently.

2.3. Analysis Of The Proposed Method

The St. Petrus Medan High School Student Attendance Website was developed using the Rapid Application Development (RAD) method, through four main stages: Requirements planning defines seven core features for organized attendance. User design creates a responsive UI/UX refined from feedback. Construction uses HTML, CSS, JavaScript, PHP (Laravel & CodeIgniter), and MySQL. Cutover tests all features via black-box to ensure functionality and ease of use.

2.4. Proposal System Analysis

At this stage, the proposed student attendance system is described using a Use Case Diagram and an Activity Diagram. The Use Case Diagram describes the relationship between users (admins, teachers, students) and the features in the system, while the Activity Diagram describes the process flow of each activity in the system in more detail and in detail. The goal is to make the system design easier to understand before the development stage.
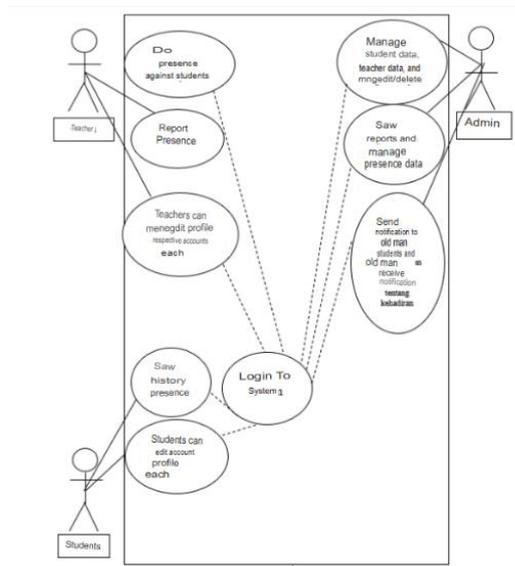

Fig. 1: Use Case Diagram Student Attendance Information System

2.5. Database Design

The following is the structure of the table using the Entity Relationship Diagram (ERD).

Fig. 2: ERD Entity Relationship Diagram (ERD) Information Systems

3. Result and discussion

3.1. Website display result

On the web-based student attendance website created for SMA St. Petrus Medan, users will be presented with a simple and clear interface, starting from the login page to the main pages according to their respective access rights. Menus and features are organized separately so that admins, teachers, and students can more easily understand and use them.

a. When running the Login section of the student attendance Information System website, using Rappid Application Development. For student attendance.

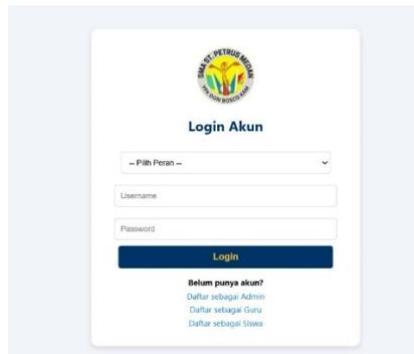**Fig. 3:** Results of the login page display

b. Dashboard page display

Fig. 4: Results of the dashboard page display
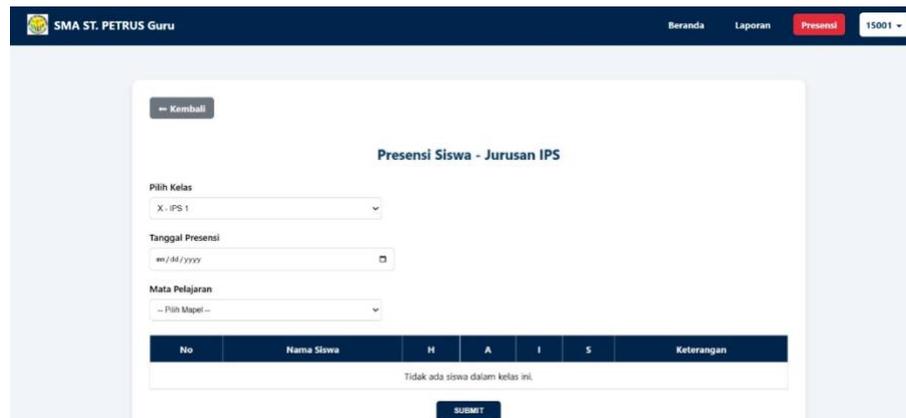
c. Student Attendance Forum Page View

Fig. 5: Student Attendance Forum Page View

d. Attendance History Page View

Fig. 6: Attendance History Page View

e. Manage Students View

Fig. 7: Results of the Manage Students Page Display

f. Manage Teacher View

Fig. 8: Results of the Manage Teacher Viewn Page Display

g. Daily Attendance Report Page View

Fig. 9: Daily Attendance Report Page View.

4. Conclusion

After completing the process of analyzing and designing the student attendance website, several conclusions can be drawn as follows:

1. The web-based attendance system that was built successfully overcame the manual recording constraints that were previously carried out at St. Petrus High School in Medan. With this system, the attendance process becomes faster, more structured, and reduces the potential for recording errors that often occur when using manual methods.

2. This system is also designed to make it easier to process student attendance data neatly, so that admins and teachers can more easily search, recap, and monitor attendance data. In addition, students can log in to the system to view their own attendance history and update their profile data, so that the information recorded is always accurate and up-to-date.

3. The application of the Rapid Application Development (RAD) method has been proven to speed up the development process because it actively involves users from the early stages. As a result, the system is built according to user needs and equipped with an email notification feature that helps the school notify parents quickly if students are absent without information.

5. Suggestions

Another study takes the same title Different schools or about the presence of students at St. Peter's High School Medan can continue the system that has been designed to the stage of further development and the author also suggests for further research, so that the shortcomings of the system can continue to be adjusted to the development and needs of the school.

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