Designing Student Attendance Application with WhatsApp Notification Integration to Increase Parent Involvement at SMA N 2 Lengayang

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Abstract. The rapid development of information technology and telecommunications has driven companies and MSMEs to adopt desktop, mobile, and web-based applications to enhance operational performance. PT HPS Painan Padang, previously relying on manual ticket bookings, faced challenges in efficiency and susceptibility to brokering practices. To address this, a web-based travel ticket booking application was developed, enabling customers to book tickets online more practically, quickly, and conveniently, anytime and anywhere. The integration of Natural Language Processing (NLP) technology in the form of a chatbot further enhances service efficiency and responsiveness. This feature provides real-time information on departure schedules, seat selection, and payment transactions while also supporting sentiment analysis and swift responses to customer feedback, ultimately improving service quality. The application, built using PHP, MySQL, and CodeIgniter with a Prototype development approach, adapts to changing market demands. Testing via GTmetrix on the https://desistravel.xyz/backend page demonstrated excellent performance with an 88% Performance score, 95% Structure score, and optimal Web Vitals metrics, indicating a fast, responsive, and stable platform. The final product is a user-friendly web-based ticket booking application supported by an intelligent chatbot, offering a seamless user experience, enhancing customer satisfaction, and streamlining the travel booking process efficiently.

Keywords: Chatbot, Information Technology, NLP, Web Application.

1. INTRODUCTION

Information technology has a very important role in improving the quality of an agency, not only as a tool to automate information access, but also to create accuracy, speed, and completeness of an integrated system. This makes the technology an efficient and effective tool in managing an institution. Utilizing information technology properly can have a positive impact on a system that was originally done manually to become computerized, such as student attendance (Ratu et al., 2024). In the context of education in schools, student attendance is an important component. Attendance is used to record student attendance and absence every day, which is a reference in giving grades and assessing student participation in the teaching and learning process (Prasetyo et al., 2023). However, the challenge faced by schools and parents today is in effectively monitoring student attendance which is still not optimal. SMA Negeri 2 Lengayang, like other educational institutions in Indonesia, also faces similar challenges.

The management of student attendance at SMA Negeri 2 Lengayang currently only relies on manual methods such as attendance books or separate attendance records. This method is prone to errors, manipulation, and difficult to monitor in real-time. On the other

hand, parents have the desire to be actively involved in their children's education, including monitoring their attendance and academic activities at school. Therefore, there is an urgent need to update the attendance system with a more modern and efficient solution.

Monitoring student attendance is an important aspect in maintaining discipline and optimizing the learning process at school. It is not uncommon for attendance activities to be part of student assessment which affects the final results that will be received by students (Yunanto & others, 2023). However, limitations in the attendance system that are still manual often hinder the efficiency of managing student attendance. As an educational institution responsible for the education of students in the region, it is necessary to increase the proactive involvement of parents in monitoring the attendance and quality of student education. One approach that can be taken is to develop a student attendance application equipped with a notification feature via WhatsApp.

Conditions like this should be overcome with the development of technology that is very sophisticated in the modernization era (Jubaedi et al., 2023) It is necessary to develop a system that can monitor student attendance so that parents or teachers can monitor every activity of attendance and development of their students (Farizi & Maesaroh, 2022; Hendrastuty, 2021). The system is equipped with the Whatsapp API feature, the Whatsapp API acts as a link between the system and the user, where the way it works is that every process that has been carried out in the system will automatically notify both teachers and parents of students (Rizki et al., 2022). With an attendance monitoring system, parents can access and get attendance information about their children in real time (Arisandi & Fatmawati, 2023). Schools can provide accurate reports and parents can get information about their children's attendance easily and quickly.

In previous research, by Chaisar Abi Prasetio (2023) with the title "Designing a Mobile-Based Attendance System for Teachers That Can Be Monitored by Parents" stated that the design of android applications can overcome the problems that exist in schools in managing attendance data so that attendance becomes more effective, efficient and accurate(Prasetyo et al., 2023). The research method used uses the Waterfall method where the system development process is carried out sequentially. Further related research by Muhammad Sirojuddin (2022) with the title "Designing a Student Attendance System with Realtime Notification Whatsapp Features Using Scrum Framework (Case Study: MTs Darul Hikam Bantur)" states that a computerized attendance system with whatsapp notification features can produce printed output of student attendance reports so that it can send student attendance information to

student guardians (Sirojuddin et al., 2022). This research uses agile development methods with the chosen modeling scrum.

From the above problems, this research prioritizes how parents / guardians can get information about the attendance of their children who are in school without having to wait for 1 semester. With the online attendance application using the prototype method with WhatsApp notification, it can make it easier for parents or guardians to monitor their child's attendance (Muhajir et al., 2022).

2. METHODS

This model produces a prototype of a software that can be used as an intermediary between developers and users to interact in the development of information systems.
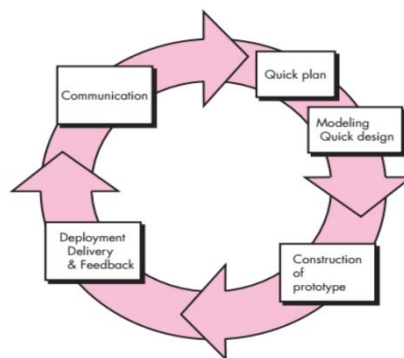
Figure 1. Prototype Method

Communication

At this stage, communication or interviews were conducted with the parties from SMA N 2 Lengayang as users or users of this student attendance application. At this stage there are several facts and data related to the state of the attendance management system that is currently running at the school.

Quick Plan

At this stage, the analysis and planning of the needs that will be used in designing the student attendance application with WhatsApp notification integration is carried out.
Device Requirement Analysis (Software)

Xampp

XAMPP stands for X (This program can be run on many operating systems, such as Windows, Linux, Mac OS, and Solaris), Apache, MySQL, PHP, Perl. XAMPP is a tool that

provides software packages in one package. The package includes Apache (web server), MySQL (database), PHP (server side scripting), Perl, FTP server, phpMyAdmin and various other auxiliary libraries.

Sublime Text

Sublime Text is a fast and simple popular text editor, designed for software development. Supporting many programming languages, Sublime Text has advanced features such as multi-selections, split editing, and customizable key bindings. Plugins through Package Control allow users to extend its functionality. The clean and responsive interface makes it a favorite choice for many developers.

Fonnte

Fonnte is a third-party service that provides an API to send WhatsApp messages automatically. This service belongs to the category of messaging service platforms or WhatsApp API providers.

Whatsapp

WhatsApp is an application designed to facilitate communication in the midst of current technological developments. WhatsApp is an internet-based application that makes it easy for users to communicate with the features available and is the most popular social media used in communication. 83% of 171 million internet users are WhatsApp users.

Hardware Requirements Analysis

The most important hardware requirements needed in designing this application are a set of computers and hard drives that must match the needs of the program and the amount of data in the computer.

Modelling Quick Design

Modeling Quick Design at the prototyping stage is a rapid and iterative process to create a visual representation of the system or product to be developed. It is an early step in software or product development that focuses on creating a prototype that can be tested and evaluated before going into further development stages.

Contruction of prototype

Construction of prototype is the process of creating an early version of a product or system that is used to test and validate the concept, design, and functionality before further development or mass production.

Deployement Delivery & Feddback

Deployment Delivery & Feddback is evaluating the prototype and refining the analysis of user needs. Prototype improvement, which is the creation of the actual type based on the results of the prototype evaluation and then final production, which is producing the device correctly so that it can be used by users.

3. RESULT AND DISCUSSION

Design

This research is a development research to produce an attendance monitoring system. The purpose of this design is to provide an overview of student attendance to reduce the number of violations of the rules at SMA N 2 Lengayang, as well as provide actual reports to parents to find out the presence of their children who are studying and make it easier for teachers to get student attendance reports. The application design process is presented in Figure 2 to 8.
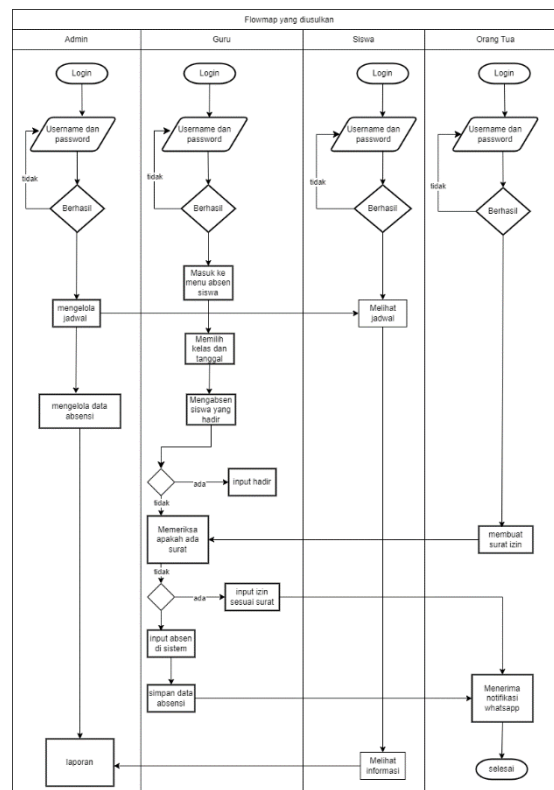
Figure 2. Flowmap
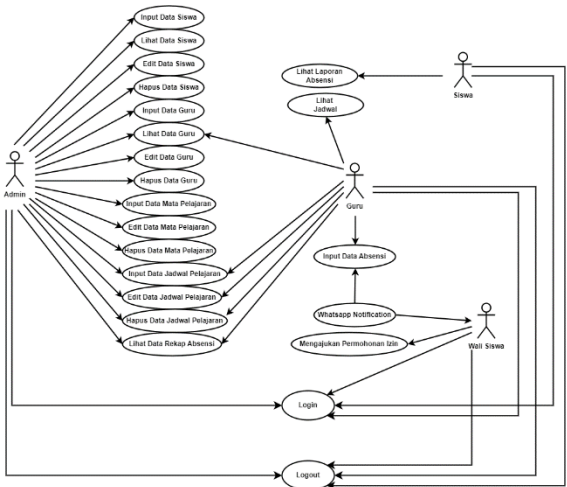
Figure 3. Use Case Diagram
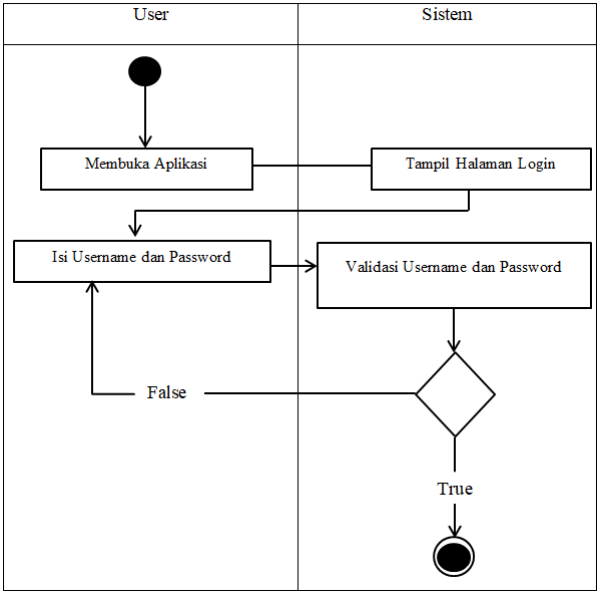
Figure 4. Activity Diagram Login
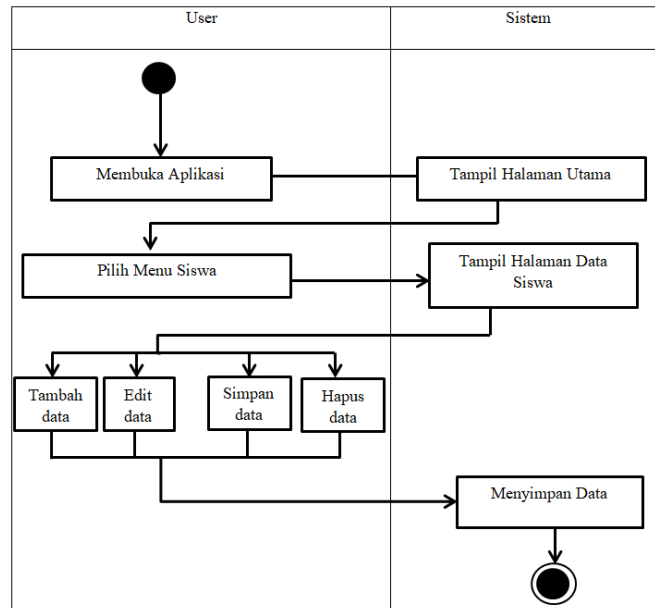
Figure 5. Activity Diagram of Student Data
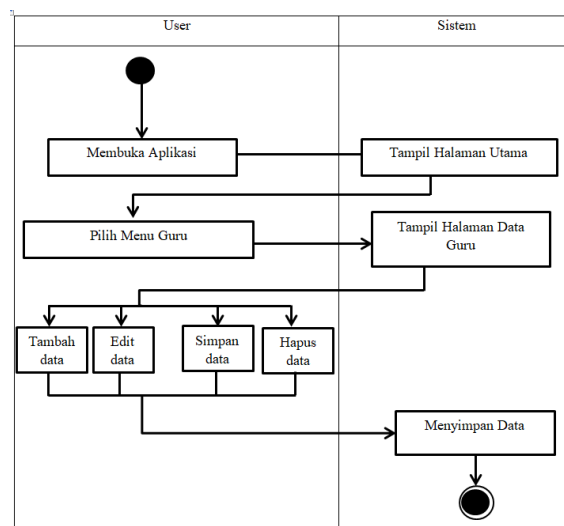
Figure 6. Teacher Data Activity Diagram
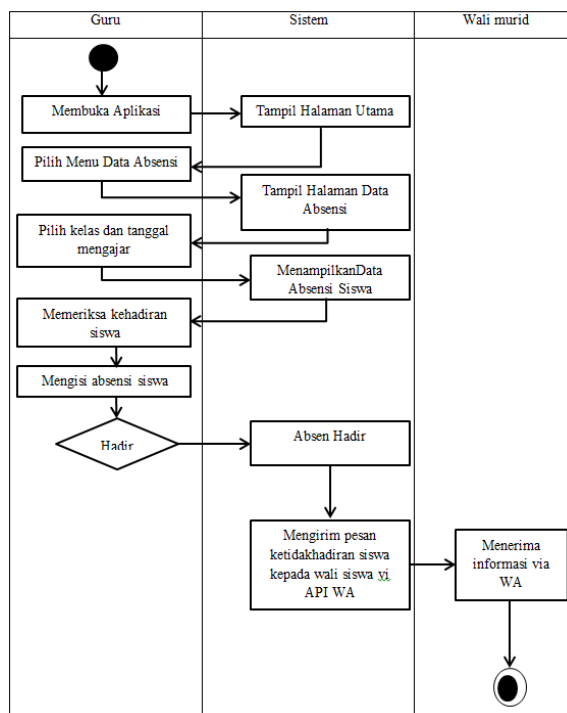
Figure 7. Attendance Activity Diagram
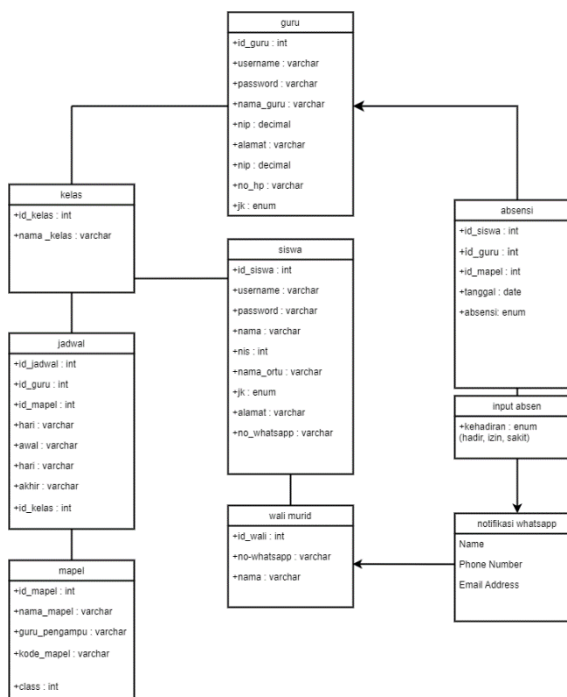

Figure 8. Class Diagram

Implementation

The application form is presented in Figures 9 to 17.
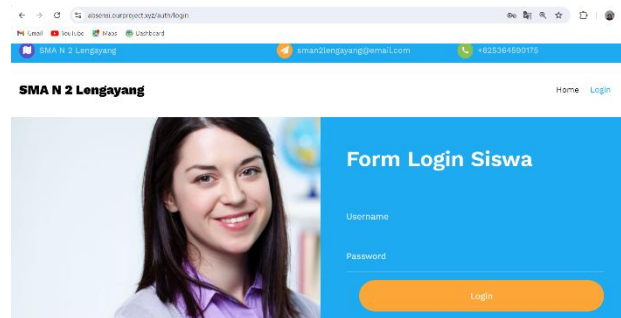
Figure 9. Student Login View

On the student login page, students enter their unique identification (username) and password to access personal attendance data. Meanwhile, the admin login page has its own separate login view for admin, teachers and parents. Use of the login button initiates the authentication process, which, if successful, directs the student to the dashboard or administration panel, while authentication failure displays a corresponding error message. Security is enhanced through password encoding and login attempt restrictions, maintaining the integrity of information on the student attendance website.
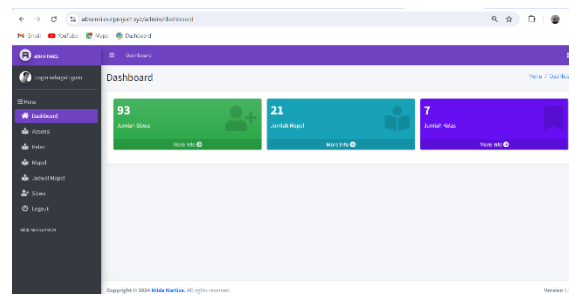
Figure 10. Dashboard view

After logging into the application, users will be directed to the dashboard page according to their role. On the admin and teacher dashboards, important data information such as student data, subject data, and class data is displayed. Meanwhile, on the parent dashboard, information on their child's attendance is displayed, including the status of attendance, permission, or absence.

Figure 11. Student Data Display

The student data page contains information about all student data. Starting from the name, cellphone number, parent's name, and others.

Figure 12. Teacher Data Display

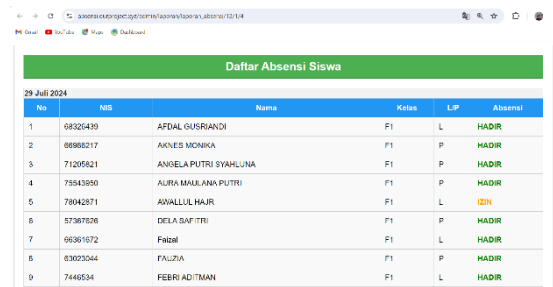The teacher data page contains information about the data of each teacher who teaches in that period.

Figure 13. Parent Data Display

The parent data page contains information about the parent data of each existing student.
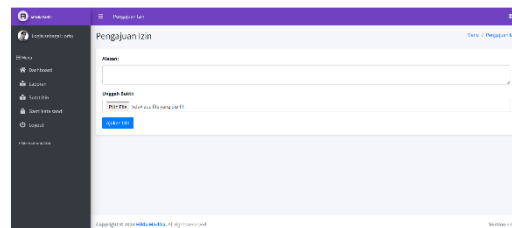

Figure 14. Attendance display

The Student Attendance page is a feature used to record and monitor student attendance on a daily basis. On this page, teachers can input student attendance data based on attendance status, such as present, permission, sick, or absent.

Figure 15. Display of Attendance Report

The Attendance Report page is a feature that allows users to access, view, and manage detailed student attendance reports. This feature is designed to provide a complete overview of student attendance data in various time periods, such as daily, weekly, monthly, or annually. This page makes it easier for teachers, administrators, and parents to monitor and evaluate student attendance, ensure transparency, and assist in making decisions related to attendance.

Figure 16. Permit Submission Display

The Student Permission Submission View from Parents is a feature that allows parents to apply for permission for their child's absence directly through the application regarding the reason for the student's absence, whether due to illness, family needs, or other reasons.
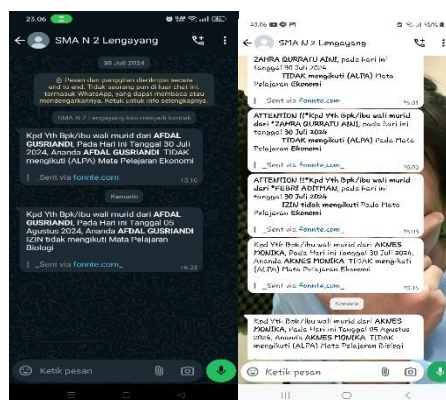
Figure 17. Whatsapp Notification Display

Whenever a student's attendance is taken by a teacher and declared absent or authorized, a WhatsApp notification will be sent to the student's parents/guardians. This step is taken to ensure parents/guardians are kept up-to-date with their child's attendance at school, as well as to support more effective communication between schools and families. Thus, parents/guardians can immediately take the necessary actions if there are any issues regarding their child's attendance.

System Testing

System testing using GTmetrix is a way to analyze and optimize the performance of a website. GTmetrix provides detailed reports on various aspects that affect the speed and efficiency of a website.

Figure 17. System Testing

Based on the results of testing with gtmetrix, it can be concluded that GTmetrix Grade A (87% Performance, 95% Structure): The app received an A grade, which indicates excellent performance. In more detail, the performance of the application is rated at 87%, which means that the response time and page loading efficiency are very good. The page structure (which includes HTML, CSS, and JavaScript) is rated at 95%, which indicates that the code that makes up this page is very well optimized, allowing for fast and efficient rendering in the browser.

4. CONCLUSIONS

After conducting research and based on the analysis and design made for the attendance program at SAM N 2 Lengayang school. Then the author can draw several conclusions including the following Student attendance system with realtime notificatioan Whatsapp feature is a system used to manage student attendance data and convey student attendance to student guardians. With this attendance application, all guardians can monitor their children's attendance directly. With this application, it is easier for teachers to take attendance. With this application, it helps in recapitulating attendance and becomes faster and more accurate because

the recapitulation process is not done by manually calculating the number of attendances anymore. In this application only enter the period or range of months and the application will display data for each date.

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