

Implementation of Student Activity Attendance System using Photo and Location Detection based on Android

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ABSTRACT

The development of technology in the current era is very rapid. One of them is application development in the Android operating system. Android provides an open platform for developers to create their own applications that are used on various mobile devices. The application was created with the aim of simplifying performance. Every agency definitely needs a system as a tool to organize every process carried out in the agency.

Educational institutions cannot be separated from the use of technology. With the current practical situation, this report will create a student attendance system using the android-based location method. This is because students still use manual signatures, with the presence of attendance with the android-based location method, students cannot manipulate attendance, so attendance fraud can be avoided.

With the application of location features in the lecture attendance system with Android devices, it can speed up the student attendance process besides that it can also record student attendance accurately and quickly. On the results of system trials that have been completed and successfully made, the system will soon be implemented on Android smartphones.

General Terms

Android, PHP, GPS, Java.

Keywords

Application, Attendance, Location Based, Photo.

1. INTRODUCTION

Student attendance is an important factor for students to succeed in a course [1]. In a certain university, student attendance in a course is also used as one of requirements for student to take the exam [2]. The conventional approach to recording student attendance is done by signing an attendance register that passes through all students during the beginning of the lecture. There is often cheating in terms of student attendance because the system is still poor.

With the rapid development of technology at this time, the development of the attendance system has developed from initially using paper forms to computers and even through smartphones. Android technology is currently very accessible to anyone and anywhere. Scientific and technological innovation has become the core content of national development layout, among which technological innovation occupies an important position [3].

In this study, a system will be created that can help the student attendance process. This system uses photo and location features as evidence of the accuracy of the system and minimizes fraud. System is made into web applications and android applications. The database is a part of our daily life in the present which we are not often mindful [4]. The database

used in making this system is MySQL.

2. RESEARCH METHOD

In this research, a system is designed that will help universities or schools improve quality and service by simplifying the student attendance process using location-based android, where later the admin will create employee data and create an attendance schedule on the web, then students take attendance in the android application using photos and locations so that the lecture process becomes more effective. Therefore, identifying such features and suggesting suitable design solutions for them can simplify the development and maintenance of such complex systems [5].

The process of creating a system begins with designing an architecture diagram. In the architecture it is explained how the system performs in managing attendance data.

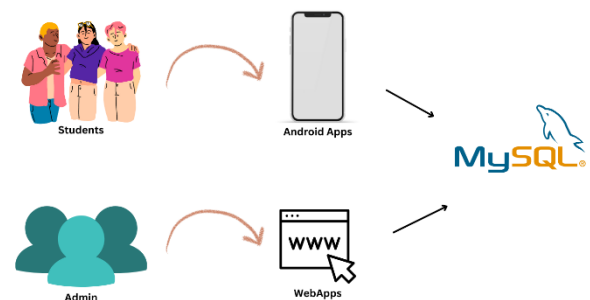


Fig. 1. Architecture Diagram

Students can access application data using Android, while admins can access application data using the web.

2.1 Data Collection Procedure

Collecting references from the internet, books and journals related to android programming theory, GPS theory, and system design theory and system design.

2.1.1 Journal

The author uses journals related to this research as references.

2.1.2 Literature Review

Collecting references from the internet and books and journals related to android programming theory, GPS theory, system design theory and system design theory.

2.2 System Design Logic

2.2.1 Use Case Diagram



Fig. 2 Use Case Diagram

The picture above is an attendance use case design consisting of 2 admin, namely actors and students. Use case admin actors perform the login process and display the menu, there is a semester menu, class menu, student data menu, lecturer data, create course schedules, register students and can edit or delete student data and others. The student actor process can see the student's own absence history, take attendance, make permission or illness, see the lecture absence schedule, and can change the password.

2.2.2 Admin Activity Diagram

In the picture there is an activity diagram for the admin, where first the admin opens the web login via localhost then enters the username and password when it fails, the admin will enter the password again when successful, the system will display the semester menu, classrooms, lecturer data, student data, schedule menu, and student absence history.

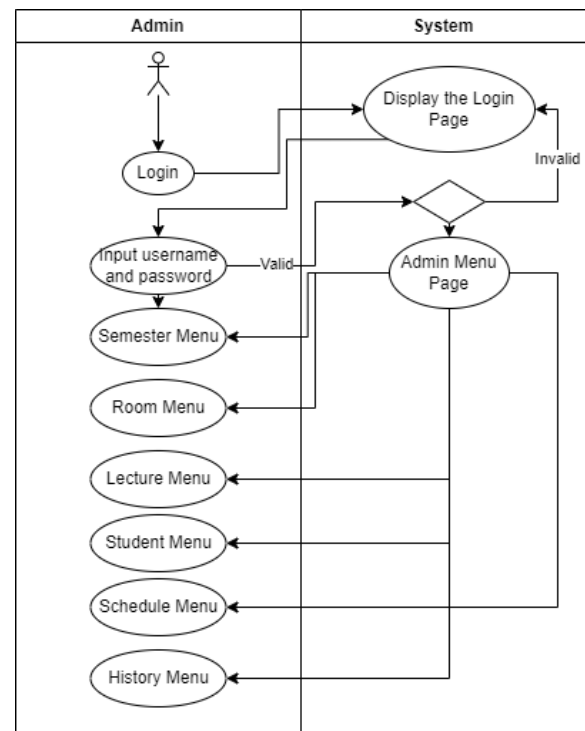


Fig. 3 Admin Activity Diagram

2.2.3 Student Activity Diagram

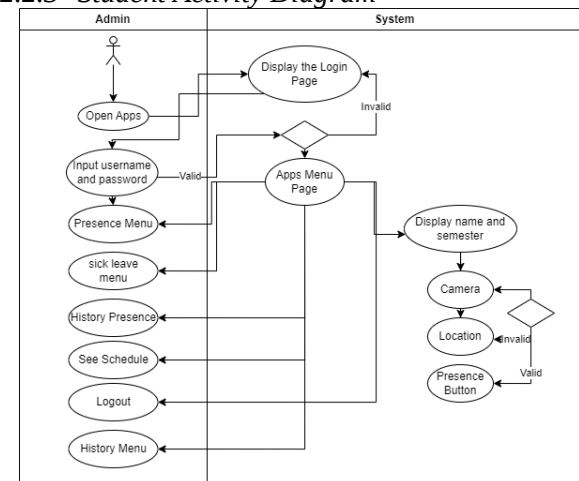


Fig. 4 Students Activity Diagram

In the picture above is the flow of the system from students where first students open the application then the login menu will appear, students who have registered login username and password according to their nim if successful then the system will display the attendance menu, permission or sickness menu, absence history menu, schedule view menu, and exit menu. On the attendance menu, students are asked to enter a photo and press the button with the location logo if it matches the location then students can take attendance if it does not match the location then students cannot take attendance.

2.2.4 Add Students Activity Diagram

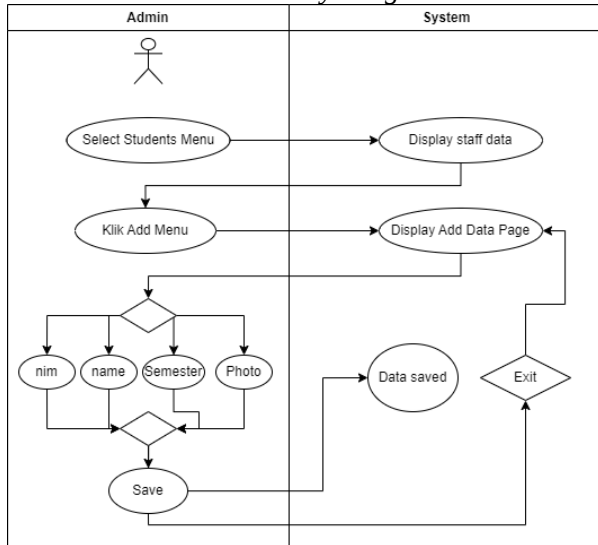


Fig. 5 Add Students Activity Diagram

In the picture is admin access for admins to add student data where the admin after logging in then selects the student menu, then clicks the add button then the system will display a form containing nim, name, semester, and photo. After completing the data, click save then a notification appears that the data has been saved.

2.3 Physical Design

A database is a collection of interrelated data, typically stored according to a data model [6]. Many of the popular RDBMSs such as PostgreSQL and Oracle Database have adopted data structures from other logical data models as well [7].

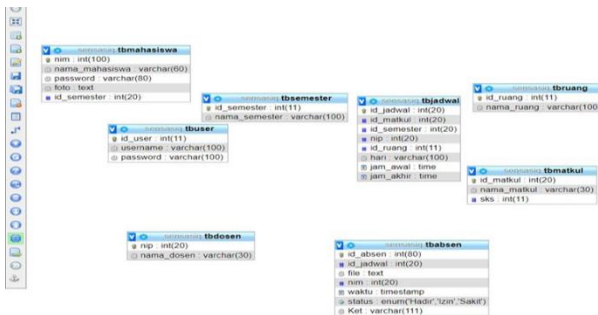


Fig. 6 Table Relation

In the picture above there are student tables, semester tables, room tables, course tables, lecturer tables, user tables, and schedule tables.

2.4 Interface Design

Before the UI is properly designed, existing interfaces that work for users were made as reference to build ideas into the systems as much practically as possible [8]. The views that will be used are designed as well as possible to help user convenience [9]. Application display design in the form of an android application for users and web applications for admins.

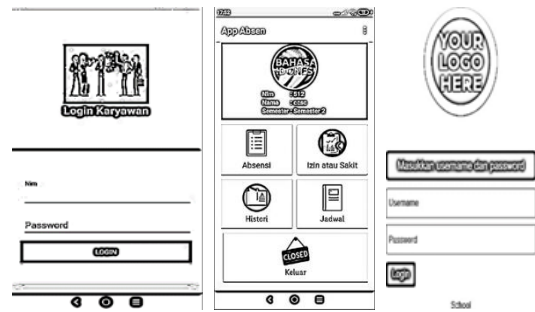


Fig. 7 Android Apps UI



Fig. 8 Web Apps UI

3. RESULT AND DISCUSSION

3.1 Feature

The features in the application can be accessed by admins and users. features that can be accessed as follows

Table 1. Feature

No	Actor	Description
1	Admin	Editing and adding student data Editing and adding course data Editing and adding classrooms Editing and adding class schedules Editing and adding semester data Editing and adding lecturer data View and delete student attendance
2	Students	Log in Taking attendance Making permission or sick View schedule and view absence history

3.2 Run an Experiment

System coding uses Java and PHP programming languages. Java programming language is a general-purpose programming language supporting object-oriented programming paradigm [10]. In Java, as it happens in most programming languages, a variable cannot be used without being previously defined [11].

Although numerous technologies are available for developing web applications, PHP holds the lions' share of web content today. PHP offers several features that enable developers to easily produce dynamically extendible code, forming an entire ecosystem of standard as well as more 'exotic' opportunities that can be exploited [12]. Coding is done to create a good system.

3.3 Implementation

3.3.1 Login Page Admin

The display design of the admin login page displays a page for filling in personal data in the form of a username and password when logging in.

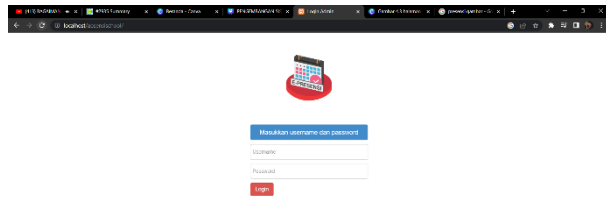


Fig. 9 Login Page Admin

3.3.2 Home Page Admin

Design the display of the admin's main page which has a menu of semesters, rooms, courses, lecturers, students, schedules, and reports.

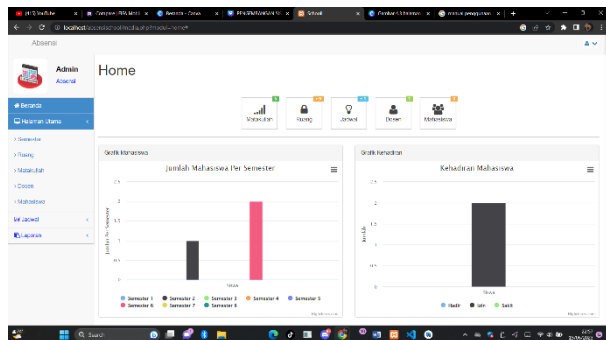


Fig. 10 Home Page Admin

3.3.3 Schedule Menu Page Admin

Displays a list of lecturer schedules accompanied by a CRUD menu (Create, Read, Update, and Delete) to change the data.

Fig. 11 Schedule Menu Page Admin

3.3.4 Add Schedule Page

Display form creates a lecture schedule so that students can take attendance, there are course, semester, lecturer, room, day, and time forms.

Fig. 12 Add Schedule Page

3.3.5 Students Menu Page Admin

admin can display student data that has a schedule. Data can be changed by the admin through the action menu.

Fig. 13 Students Menu Page Admin

3.3.6 Add Students Data Page

The admin can add student data that has a schedule by entering student data.

Fig. 14 Add Students Data Page

3.3.7 List Course Admin

Display the course list with the action menu.

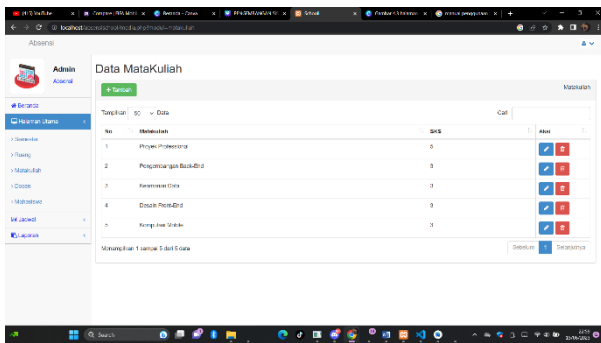


Fig. 15 List Course Admin

3.3.8 Room Data Page

Display room data list with action menu.

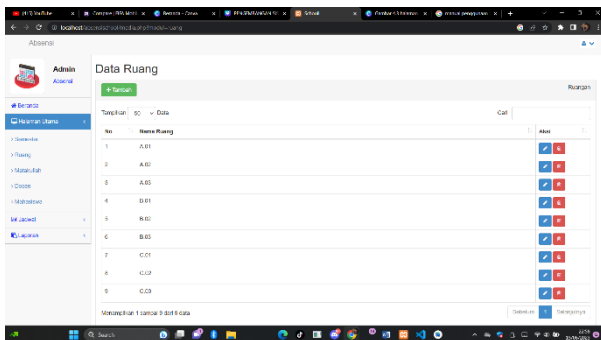


Fig. 16 Room Data Page

3.3.9 Lecture Page

Display a list of lecturer names with the action menu.

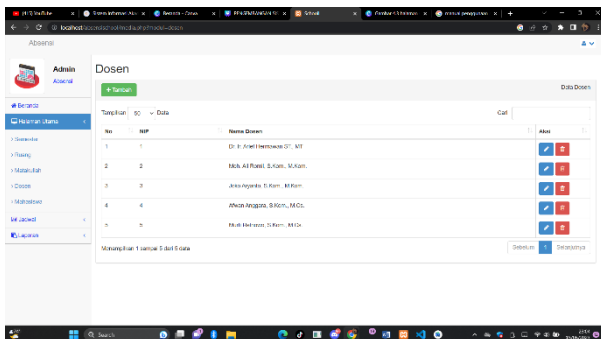


Fig. 17 Lecture Page

3.3.10 Report Menu

Display a report on the schedule.

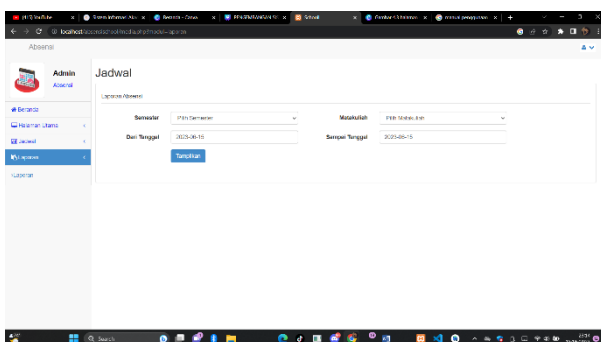


Fig. 18 Report Menu

3.3.11 User Login Menu & User Main Menu

Users can log in by entering the id number and password. after success the user will be directed to the main menu.

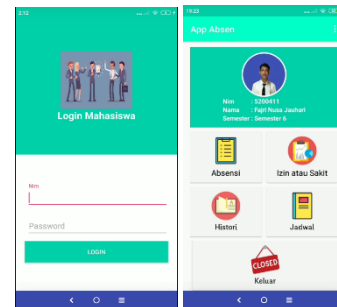


Fig. 19 User Login Menu & User Main Menu

3.3.12 Attendance Menu Display

This page displays the attendance menu when taking attendance by activating the location on the GPS.

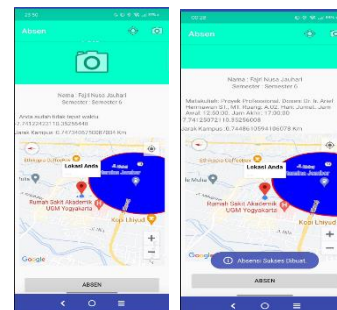


Fig. 20 Attendance Menu Display

3.3.13 Attendance Failed View & Success View

Attendance will fail if the location does not match and will succeed if the location matches.

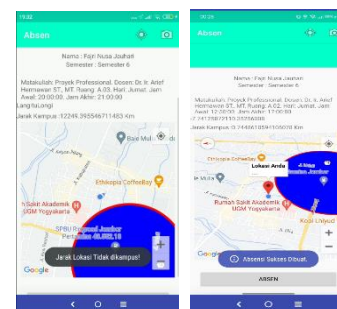


Fig. 21 Attendance Failed View & Success View

3.3.14 Presence Menu Display & Permission Menu Display

Display attendance history and menu when authorized and sick.

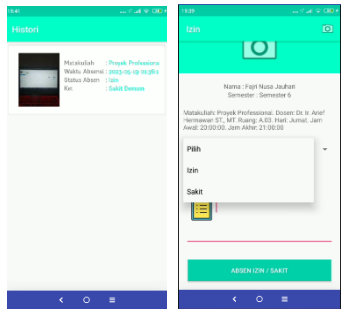


Fig. 22 Presence Menu Display & Permission Menu Display

3.4 Discussion of Result

Software testing is the main technology to ensure the quality of the software [13]. There is a survey that indicates 45% of development cost is spent on software testing [14]. Black box testing is done to find out what features can run well and smoothly.

Table 2. Black Box Testing Android Application

Testing Activities	Expected Realization	Testing Results	Conclusion
Login page admin	Admin can login account	Can login to the main feature	Accepted
Home page admin	Admin can view home page in web apps	Can display home page in web apps	Accepted
Schedule menu page admin	Admin can view schedule in web apps	Can display schedule menu	Accepted
Add schedule page	Admin can add data schedule in web apps	Can display data and add schedule	Accepted
Students menu page admin	Admin can show the students data	Can display students data in web apps	Accepted
Add student data page	Admin can add data about student	Can input data in web apps	Accepted
List course admin	Admin can view list of course	Can display list of course	Accepted
Room data page	Admin can view room data page	Can display room data page	Accepted
Lecture	Admin can view lecture	Can display	Accepted

page	page	lecture page	
Report page	Admin can show a report data	Can display report data in web apps	Accepted

Table 3. Black Box Testing Web Application

Testing Activities	Expected Realization	Testing Results	Conclusion
Presence & Permission Menu	User can get presence and permission easily	User can presence and permission with android apps	Accepted
Login	User can login	Can login to the main feature after successfully entering personal data	Accepted
User Main Menu	User can view main menu	Can display main menu	Accepted
Attendance Menu	User can attendance	Can attendance using the android apps	Accepted
Attendance Failed	User can not attendance cause the location unvalid	Can not attendance	Accepted
Attended Succes	User can attendance	Can attendance	Accepted

4. CONCLUSION

The creation of the system in this study aims to develop technology in the attendance system by applying computer science so that the results are more accurate.

Based on the results of the application of how to solve student attendance problems that still use manual methods, it can be concluded as follows:

1. The attendance system using location and photo features runs quite well in doing attendance.
2. This system makes it easier and faster to process and check student attendance. Because students no longer need to do manual signature attendance.

Students can no longer cheat when doing absences such as leaving absences to friends, because there are location and photo features.

5. REFERENCES

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