Mobile-Based Employee Attendance System Design Using the Rapid Application Development Method at the Universitas Muhammadiyah Jakarta

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A R T I C L E I N F O

A B S T R A C T

Employee attendance is an important activity because it is related to employee productivity and is usually used as part of paying employee salaries. Therefore, recording employee attendance must be thorough, fast and accurate. Now, various types of employee attendance systems have developed, one of which uses fingerprints. The employee attendance system currently used by the University of Muhammadiyah Jakarta is attendance using fingerprints placed in every building or faculty. This system has drawbacks, namely the limited availability of fingerprint scanners, placement of presence tools far from the work location, and dependence on presence tools. So with these weaknesses, a mobile apps-based attendance system was built that uses GPS to make it easier for employees to make attendance while in the presence area or where they work. The method used in this research is Rapid Application Development. With this system, the attendance process and attendance data processing is easier and more efficient, helping to maximize the attendance data collection and processing process.

INTRODUCTION

The development of information technology is very fast, the benefits can be felt in all fields. These developments can be utilized in various sectors such as finance, education, administration, and others. Employee attendance is an important activity because it is related to employee productivity and is usually used as part of paying employee salaries. Therefore, recording employee attendance must be thorough, fast and accurate. Now, various types of employee attendance applications have developed, one of which uses Finger Print [1].

Universitas Muhammadiyah Jakarta (UMJ) is one of the Muhammadiyah universities located in Jakarta, bordering South Tangerang. In Muhammadiyah universities, Muhammadiyah University Jakarta is the oldest and the first private university owned by Muhammadiyah which was established on November 18, 1955. In realizing the Vision of the University All activities are carried out with the full support of all employees.

Employee attendance greatly affects university productivity. Therefore, Muhammadiyah University of Jakarta wants to implement an Android-based employee attendance processing system. The factors that influence the process of employee attendance include; employee entry hours, employee exit hours, official permits, personal use permits,

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sick leave, and leave. In processing employee attendance, Universitas Muhammadiyah Jakarta has implemented a finger print system for employee attendance input devices. In the application of the system, there are several obstacles in processing attendance, attendance reports for employees, lost transportation money due to delays, employee permits and some employees have difficulty in doing attendance because the location of the finger print machine is quite far.

Attendance processing system is an important part because employee attendance is related to employee salary, employee performance appraisal and employee discipline level. Of course, this problem needs serious attention and a solution must be found. One of them is by making employee attendance applications that can make it easier for employees to take attendance. With this employee credentials application, it is hoped that employees can be more disciplined in working according to the regulations set by the university so that they can realize the vision and mission of the university.

EXPERIMENTAL METHOD

The Rapid Application Development system method is a relatively fast and short development time. According to Mishra and Dubey in Supriyatna [2]. For the development of a normal information system takes a minimum of 180 days. However, with the RAD method a system can be completed in only 60-90 days.

The RAD method has phases of planning the requirements of the system requirements, involving users to design the system and build the system (this activity is carried out repeatedly until a mutual agreement is reached), and finally the implementation phase presented in Figure 1.

Figure 1. Design RAD

There are four phases in the RAD method and the assessment phase involves the analyzer and the user, namely:

Requirements Planning Phase

This Requirements Planning phase is the first phase in system development. At this stage the meeting between the analyst and the user identifies the purpose of the system to be built then identifies the information requirements that will appear to achieve these goals and analyze all systems that will be needed by the user.

RAD Design Workshop Phase

In the second phase, this is a phase in the form of a workshop between analysts and programmers to work together in designing and building a system which will then show its representation in the form of visual designs and work patterns to system users. Analysts and programmers can make improvements and analyze modules that have been designed based on responses from system users.

Instruction Phase (Construction)

This stage resembles the execution phase of the previous phase. This phase will show the platform, hardware and software that will be used in system development. The designs that have been made in the previous phase will be improved using RAD tools. When a new function is available, the function will be shown to system users for interaction and revision, then the analyst will make changes in each application design based on instructions from the user.

Implementation Phase

In this phase the analyst works closely with system users in an ongoing workshop to design some of the non-technical aspects needed. Once these aspects are approved and systems have been built and screened, the new systems will be piloted and then introduced to the organization.

RESULTS AND DISCUSSION

Entity Relationship Diagram (ERD)

Figure 2 is illustrated of Entity Relationship Diagram describes the relationship between objects in the database through the relational key of each table. ERD formed as follows:
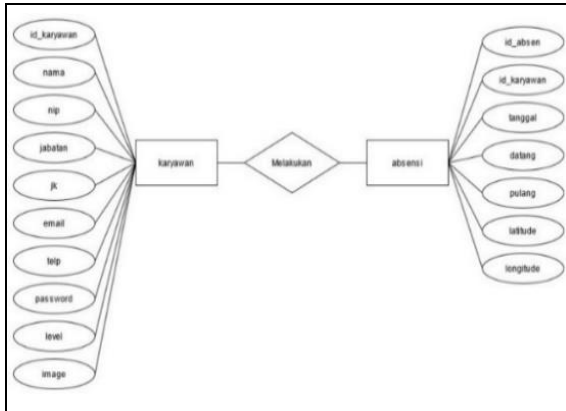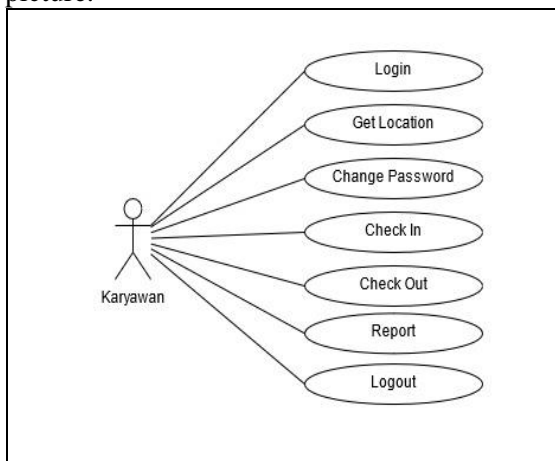
Figure 2. Entity Relationship Diagram (ERD)

Use Case Diagrams

Use case diagram is an activity that describes the sequence of interactions between one or more actors and the system. There are 2 use case diagram designs in this system, including the android application use case and the web application use case shown in the picture.
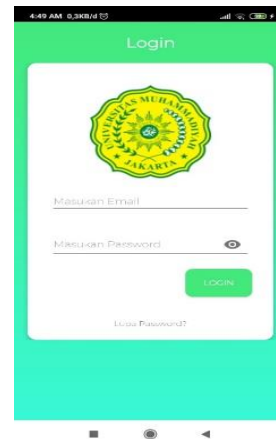

Implementation
a. Splash Screen Page
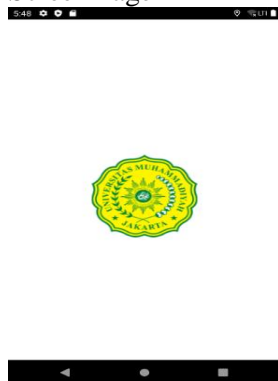
In this interface, the user has entered the initial application screen where this display is
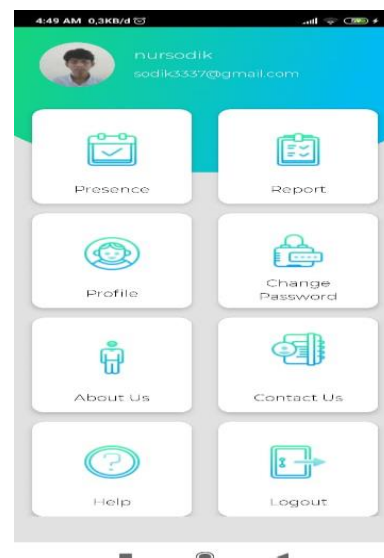
the first display when the program is run. This view is useful as a marker that the user has successfully run the application and then takes it to the login page.

b. Login Page

In this interface, the user must enter data in the form of an email and password in order to enter the next interface page.

c. Menu Page

In this interface, the user enters the main application page. After checking the email and password data, the user can try to explore the menus contained in the application, especially the presence in the presence menu.

d. Maps Page
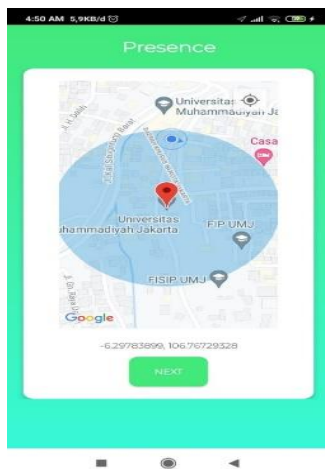
In this interface, the system will check the GPS location of smartphone users by activating the GPS feature. On this page the user must enter the geofence area in order to make attendance.

e. Presence Page
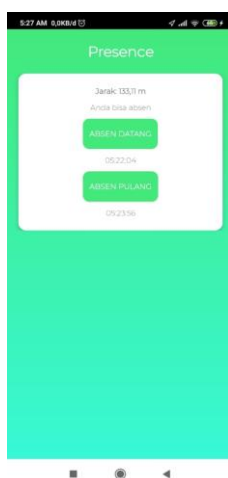
In this interface, the user will perform the presence process. If the system has recorded the location of the smartphone user and entered the geofence area, the application will display the absent come and go home buttons and display the distance between the user and the access point location.
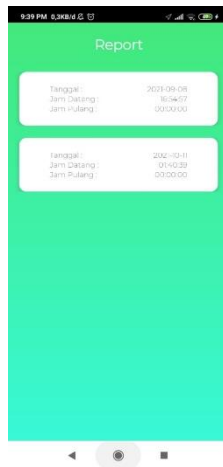
f. Change Password Page
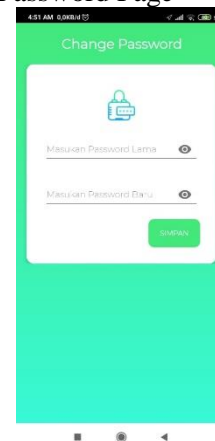
In this interface, the user can change the password by entering the old password first and then entering the desired new password.

g. About Us Oage

In this interface, users can see information about the vision & mission of Universitas Muhammadiyah Jakarta.

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h.   Report Page

In this interface, users can view information about attendance reports.

CONCLUSION

After going through the stages in designing and building a Mobile-Based Employee Presence Application, conclusions can be drawn including the following:

a. This presence application implements a global positioning system with the geofence method to detect the device's position when performing the attendance process and the haversine method as a calculation of the distance between 2 location coordinates. This presence application is an effective global positioning system for employees.

b. Presence data that has been created in this presence application is recorded again in the web admin and can be accounted for. So that employees can monitor attendance reports.

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