Online Student Attendance System Using Android

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Abstract. The purpose of this research is to design a database system implemented on an academic management android application that will be utilized to support the academic management information system for the advancement of institutions and education systems. The method in this study is to perform a design consisting of a proposed design to be implemented in applications such as online study materials, notifications, academic calendars and online reminder checks, online attendance records, performance records, and parent intimacy systems using Android applications. The system helps teachers to attend via smartphone and keep student records for their progressive assessments. The system provides prior intimacy to students as soon as their attendance is below the attendance threshold specified in the form of SMS. The result of this study is an android-based student attendance management application at an Educational institution.

1. Introduction

In this era of globalization, technology and information are developing rapidly so that competition to develop technology in the field of information systems is very useful so that work can be done more efficiently[1][2]. One of the technologies that is developing quite quickly in today's use of computer-based technology.The development of software applications is used to support the utilization of information systems[3][4][5]. The application of information technology and activities in its use to support the operational activities of academic management is a combination of information systems.

In the academic field and its daily operations, information technology is more efficient if supported by internet-based technology, where internet use is very affordable and can be used together[6][7][8]. The capabilities and characteristics of technology using the internet can support the occurrence of distance learning processes that are more effective and efficient. The development of software applications is used to support the utilization of information systems. The application of information technology and activities in its use can support academic management activities and is a combination of information systems[9][10]. The use of technology in the academic field will be more efficient if supported by internet equipment, where the internet is a tool that can facilitate and accelerate work[11][12][13].

Computer network is a technological development that utilizes several computer devices so that information can be shared quickly[14][15][14]. Users who receive and request information are called clients, while users who provide information or send information are called servers. The method used in this research is the survey and interview method where the author conducts a direct interview with

institutions and academics to obtain information that can be used in this research. The information obtained is useful to be known and used so that the design of the application can run well.

1.1 Different Presence Tracking System Surveys

This application in order to provide information in terms of attendance is done by giving a sign of student attendance[16]. Manual attendance system using paper is not efficient because it is done by calling each student and signing on paper and this will use a lot of paper. Using absenteeism manually allows the loss of such manual absenteeism. To overcome all these shortcomings, using the Android application is the Solution offered. Using Android applications has a lot of advantages including this application can be used wherever it is and always ready to use and more structured. The device can monitor students' attendance directly and can also report faster. The use of android applications in addition to the attendance system is also integrated with the central computer or server so that the school or operator can monitor directly.

The use of an information system has shortcomings that must be fixed one of which is that in Indonesia not all regions have a network connection, some locations do not have a signal that can be reached by the internet network. This is a record that needs to be fixed. And also data security issues. The data of students who attend at any time may experience problems. This should be considered by the manager in order to avoid errors or damage to a minimum.

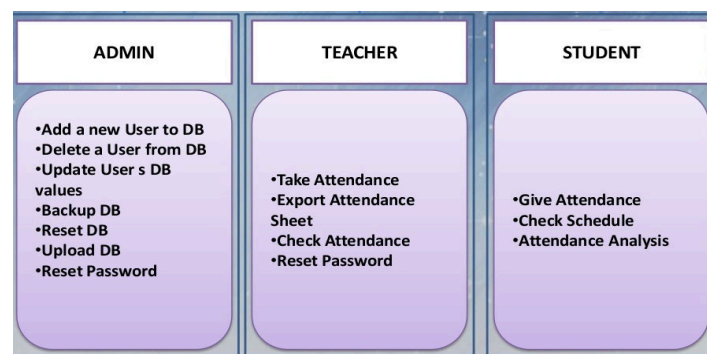### 1.2 Technology Diagrams Used

Figure.1. Technology Diagram

In the use of technology in accordance with the Diagram in figure 1 officer first add the user to be included in the database and also update the data periodically and provide a password to each user. The teacher serves to be able to retrieve student attendance data and also perform the reporting process. Reporting can also be provided to parents in the form of SMS. The percentage of students can be done and analyzed quickly. Students in this case are required to fill out attendance through the application and can also do a check of the schedule that has been given.
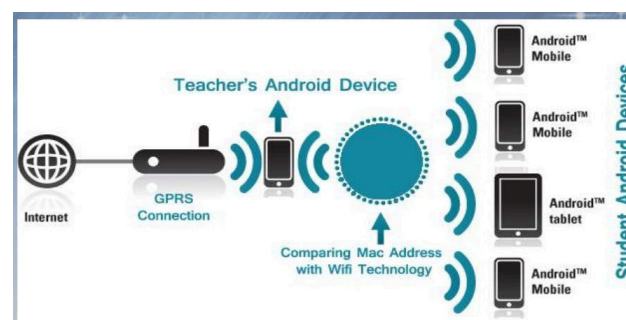
1.3 System Development Design

Figure 2. System Design and Development

System development in android application system this presence in figure 2 can be seen the system will work and start attendance When the internet starts working. Connection is required and the app will get to know the user based on the Mac address contained in a smartphone. Students will connect to a server and the server will recognize the mac address as well as the student account.

2. Methodology
This research is 3 sections that present the sequence of activities carried out in completing the system. The work in the development of this system in accordance with the rules in software development which before implementation will be detailed in advance based on the needs and also practical in its use.

2.1. System Design
This application user security is indispensable, in figure 3 looks authentication model used. Each user's application entry model is requested to enter the user name and password that has been given. The server will record the password if the username and password match the data provided then the server will allow the user to run the system and the application starts running.
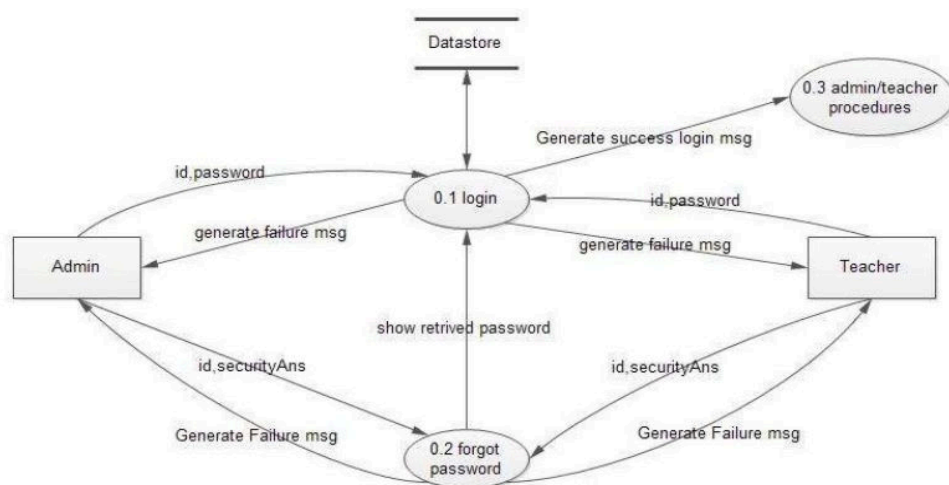

Figure 3. Authentication Module flow diagram

a. Student Attendance Module
In the module above is designed to be used in an institution. After the learning activities are completed a staff can stir the presence in a database server that has been prepared. The percentage of student attendance can be calculated automatically and messages will be sent to parents if the student has a attendance rate of less than 75% in accordance with the applicable rules at an institution. The process can be seen in figure 4 given.

b. Data Base Module
A teacher is required to store the teaching materials in a database that will be shared by the server. Through an internet connection, the teaching materials will be distributed to students who have registered and have an ID provided by the operator

c. Notification via SMS
The SMS notification module will be given to parents and students if the SMS notification option is selected. If the student notification module is bulk selected then the notification will be sent to the Group entered in the class. With this notification module, students' progress will always be monitored and the percentage of student attendance can be continuously monitored. Modules like this are very useful both for students and for parents.
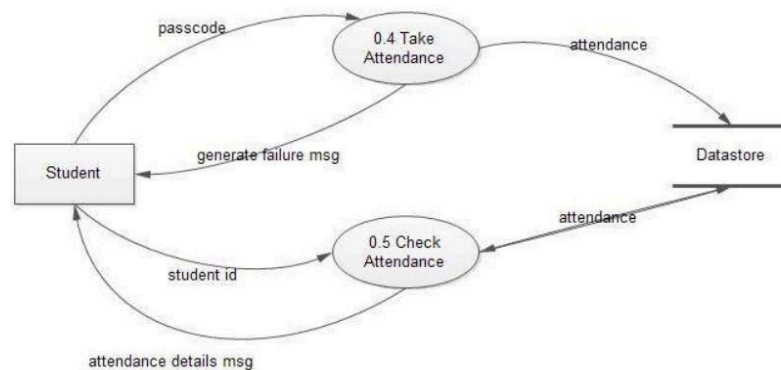
Figure 4. Student attendance module flow diagram

2.2. Technical Steps

Technical steps in this application there are several parts that must be prepared in this phase of the application used using JAVA SDK, JRE and JRE. Android SDK and Eclipse Creation GUI / Main From / Sub Form can support each other's activities. The authentication module tracks user errors such as entering passwords, unstable servers and keeping records of network connections. The call log module tracks all user activities such as login time, network timeout and also upload and download times the report will also authenticate the file size. To do the communication is done web API design. This application requires the hardware that a functioning data storage server uses in order to perform data processing. 1 GB of memory is required as well as a smartphone in order to connect to each other. In the needs of several platforms used software include android applications with pie version, WEB-C and ASP.Net development application system, SQL Server 2012 database management, Android Eclipse-Luna 4.4 application development and Microsoft Visual Studio Express Edition.

3. Results and Discussion

This implementation is done on servers and smartphones. Server implementations are done using .Net and visual studio, while smartphone implementations use Java scripts. This app is tested on Android smartphones Android pie version 5.0.1.
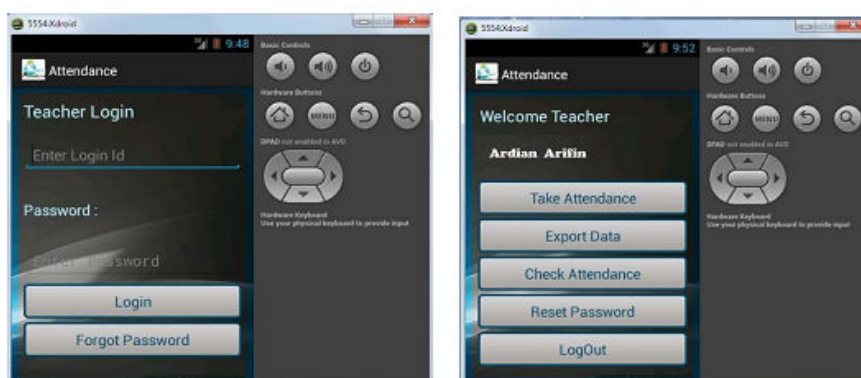

Figure 5. Application Login Menu

In the Login Menu Master can enter the Login in accordance with the Login Id provided by the Administrator. All users, both teachers and students, will be given a login ID that works in order to enter data based on the user id number. When the Login ID has been entered, the server will record the presence of students and teachers. Teachers can also move data into the print version as well as be able to check student attendance data.

4. Conclusion

With this system students can study anywhere at any time at their own convenience. Timely updates students can send to students as well as their parents. Presence tagging and report generation are easy. Fewer possibilities don't work. In the future this system can be implemented to automate most education systems and can be designed for cross-platform.

In recording student attendance, conventional methods are still adopted in some institutions, where instructors call students' names one by one or by taking signatures from each student to determine their attendance. Nowadays, better methods are also used, namely by relying on systems to record student attendance in a semi-automatic way, such as RFID or biometric-based systems. Such a system is really very good as a solution to existing problems, but one obvious drawback is the additional cost of hardware and maintenance. Therefore, it is our target to develop a presence system that will require minimal hardware costs, setup and maintenance. that is, by asking the app to run on the Android mobile device that is in the instructor. In addition, to prevent data loss, the online database will be used primarily to store the attendance of recorded students. The system was successfully developed by following a client-server framework. The complete design of the system is created first, followed by the actual implementation of the system on both the server and the Android device. Development is completed by testing the system on the whole system.

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