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Attendance System Implementation Existing Android Platform Using React Native Framework

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ABSTRACT (10 PT)

In a school that has hundreds of students, the attendance system or attendance recording is a problem in terms of practicality and data capture. Especially during a pandemic like this, learning is carried out online or in a network, commonly called distance learning (PJJ). Currently, various applications of technological advances have been created and begun to replace conventional systems. One of them is an Android-based attendance application system. The purpose of this study is to analyze and design an application that can help manage attendance data more easily and accurately. System modeling uses Unified Modelling Language (UML) to describe visually, then implemented with PHP and JavaScript programming languages, React Native Framework, and MySQL database as a database. With the mobile-based attendance system, it can make it easier for teachers to conduct attendance effectively and efficiently.

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1. INTRODUCTION

The development of information technology in the current era is growing rapidly [1], along with the increasing human need for technology and information [2]–[5]. Currently, the field of Education uses information technology, and the need for accurate, precise, and fast information in presenting complete data is one of the important goals [6]–[8]. From this progress, there will be changes. Changes will occur if the information is made, and with information will be developed again a new discovery. Currently, the world is experiencing a revolution in the application of computer technology called digitalization [9]–[11].

Since the implementation of the Covid-19 emergency period on March 16, 2020, almost all schools in Indonesia, especially in the city of Bandung, have adopted a policy for online learning called distance learning (PJJ) [12], [13]. Attendance is an important part of every educational institution[14], [15]. Where attendance is one of the main supports that can support and motivate every activity carried out in it. Likewise, in teaching and learning activities in the current distance learning process, of course, the absence of students is the main thing to know about the participation of students in the distance learning process[16]. Such is the case at SMP Pasundan 3 Bandung, where at this time, teachers use the use of technology provided by Google, such as google forms and google classroom, and there are still teachers who use conventional systems. Therefore, researchers will create an attendance system using Android-based photos. The application will then be integrated using web service technology that allows a system to communicate with other systems. In its development, it also uses the React Native framework. React Native is a JavaScript framework [17]–[19]. This framework is widely used by developers because it is easy to learn, has a simple code structure, and has a live reload feature without building processes.

2. METHOD

The study uses a qualitative descriptive approach that is more focused on data according to facts or events at the research location. Data collection in the study was taken from observations and interviews at the research location, namely SMP Pasundan 3 Bandung City.

At this stage, preliminary research planning will be carried out in accordance with the method used, namely Rapid Application Development (RAD). The final stage of this method is implementation, which is processing data that has been obtained into computerized data through the stages of making Android-based applications.

2.1. Data Sources

The source of research data is an important factor to be considered in determining data collection methods. The source of data referred to in the study is where the data or information is obtained. The data sources in this study are divided as follows:

1. Informants, that is, people who master the problem, have information, and are willing to provide information. This means that if the data obtained from existing samples are in accordance with the focus of the research, then the existing samples are declared quite good. The informants in this study include:
   a) Principal of SMP Pasundan 3 Bandung
   b) Vice Principal for Curriculum
   c) Subject Teacher
2. Events, namely various events, situations, or events that are directly related to the implementation of student attendance using Android-based / Online applications to increase efficiency in collecting student attendance data at SMP Pasundan 3 Bandung City.
3. Documents, namely data sources derived from written materials, documents, and archives available and have relevance to the research focus. The documents used in this study include:
   a) Student Attendance List of SMP Pasundan 3.
   b) List of Subject Teachers.
   c) Lesson Schedule.

2.2. Data Collection Techniques

Data collection techniques are ways used by researchers to collect data. Data collection techniques in this study are:

1. Observation
   Observation is a data collection technique carried out on objects at the place where the event occurred or took place so that researchers are with the object investigated at SMP Pasundan 3 Bandung City. The observation model that will be used by researchers is frank observation.
2. Interview
   An interview or interview, according to Esterberg, is a meeting of two people to exchange information and ideas through questions and answers so that meaning can be constructed on a particular topic [20].

2.3. Analysis System Design

2.3.1. System Analysis

The current system at SMP Pasundan 3 Bandung City, in this case, is still carrying out attendance processes that have not followed technological developments because teachers at the school still use manual attendance, where each teacher or teaching staff absents students on attendance sheets. During the implementation of distance learning during the current pandemic, some teachers use the form provided by the Google platform, namely Google Form, to collect student absenteeism.

The school session process is carried out in several stages, as can be seen in Figure 1 below:

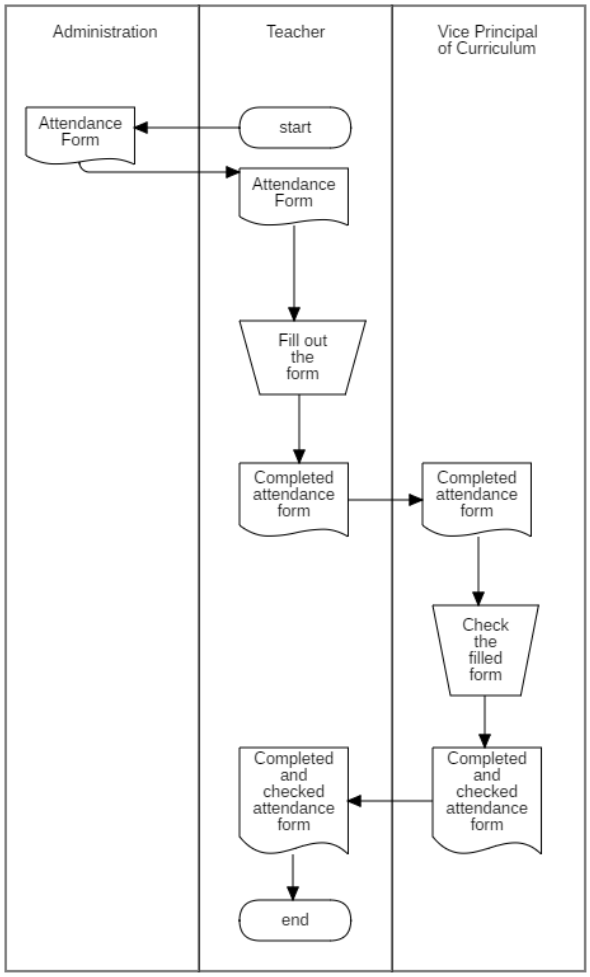

Figure 1. Student Attendance Flow map

2.3.2. Proposed System Analysis

System analysis is the breakdown of a complete system into its component parts to identify and evaluate problems [21], [22]. The analysis part consists of problem analysis and needs analysis. In building an application, stages are needed in its development. System design is described with use case diagrams, database design, and application interface design to be built.

2.3.2.1. Problem Analysis

This student attendance application is an application that will make it easier for teachers to process data and make it easier for teachers to make attendance during distance learning. In addition, this application can control student attendance and punctuality.

2.3.2.2. System Requirements Analysis

a) Interface Requirements

Interface design is an analysis process to get an overview of the layout of the application to be built [8], [23]–[25]. The interface design in making this attendance application will be explained by the author from the admin side and from the Android side as an application user.

b) Data Requirements

The data processed by this application is as follows:

- Data on the names of students along with school parent numbers.
- Teacher Data Teachers
- Subject Data

c) Functional Requirements

Functional Requirements are explanations of function processes in the form of detailed explanations of each function used to solve problems.
The functions possessed by this application are as follows:

- Make it easier for students to fill in absences during Distance Learning (PJJ),
- Make the attendance process faster and more practical,
- Teachers Can Know Absentee Authentication through Photos Sent,
- Make it easier for teaching teachers to collect or capture student attendance data.

The flow maps presented in Figure 2 and Figure 3 present the proposed business process.

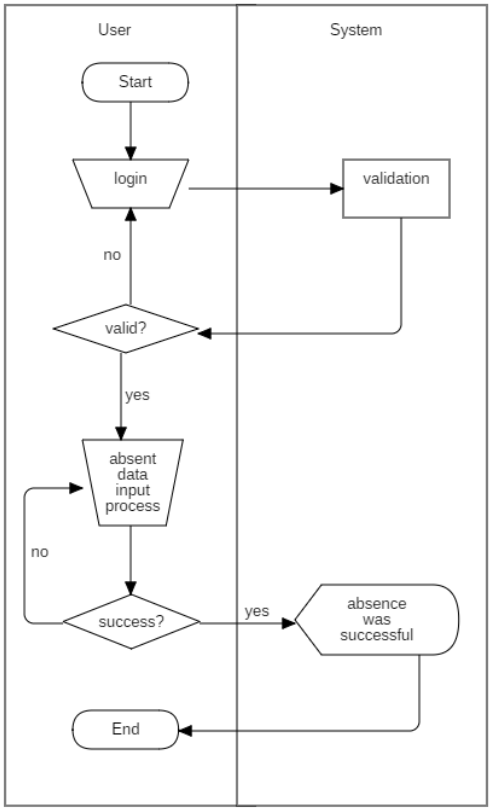

Figure 2. Proposed System Flow map (User/Learners)

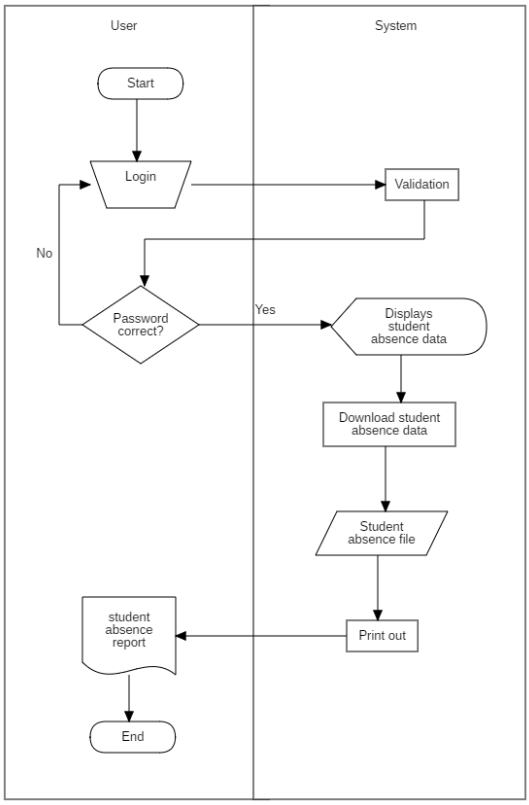

Figure 3. Proposed System Flow map (Teacher)

3. RESULTS AND DISCUSSION

3.1. System Design

3.1.1. Use Case Diagram

Use case diagrams are images of scenarios and interactions between system users. Use case diagrams are very helpful in starting to design an application because, with them, the results of making applications are understood. In a functional context, the interaction between actors and systems is described by the use case diagram presented in Figure 4.

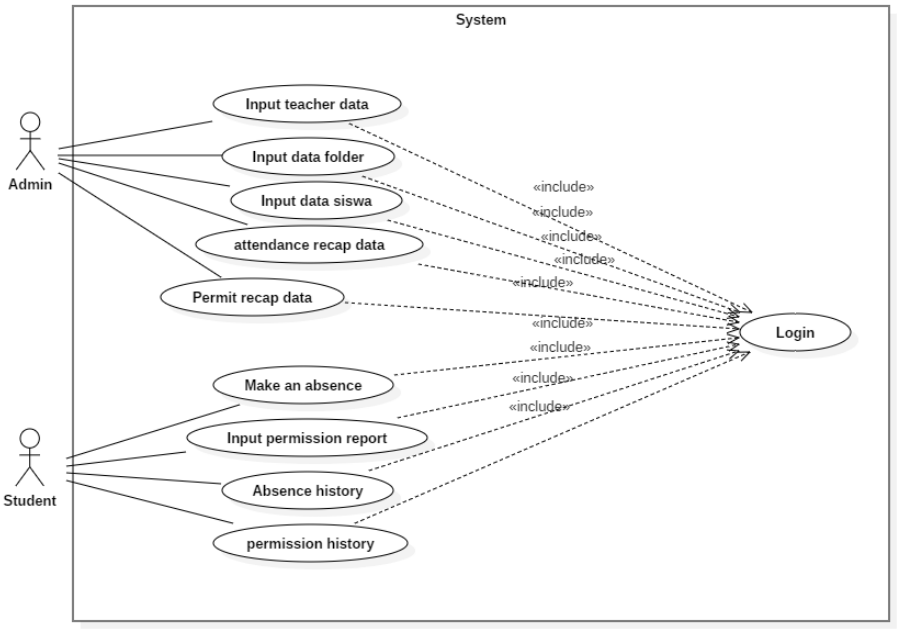

Figure 4. Use Case Diagram

3.1.2. Class Diagram

A class diagram illustrates the relationship between classes in the attendance application. The class diagram used as a parameter for working on the application can be seen in Figure 5 below.

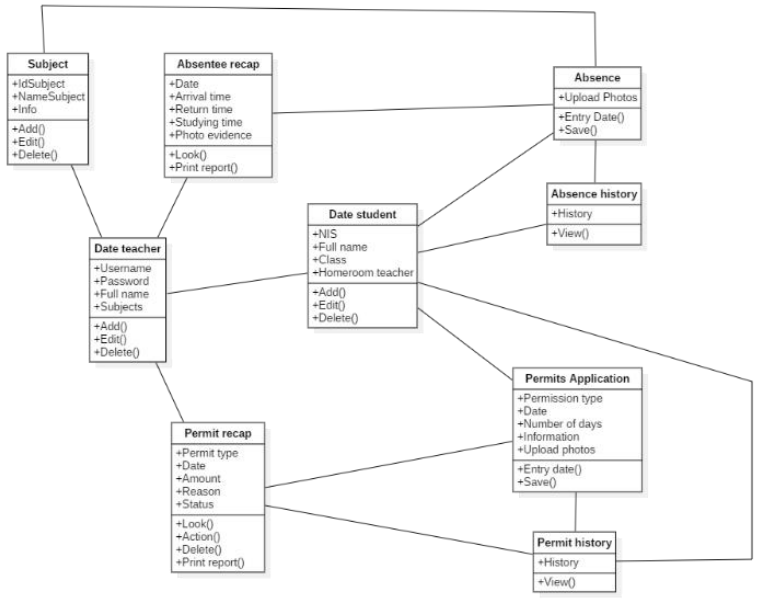

Figure 5. Class Diagram

4. CONCLUSION

From the results of the research that has been done, the following conclusions can be drawn:

a) An android-based Student Attendance application has been successfully built at SMP Pasundan 3 Bandung.
b) This application will make it easier for teachers to carry out the attendance process in distance learning activities.
c) This application will be installed on smartphones for attendance processes and for admin/teacher reports using the webserver.

4.1. Suggestion

Based on the design of the results of the application implementation carried out, suggestions that need to be considered include:

a) From this attendance application, the author realizes that there are still many shortcomings and various things that must be improved so that in the future, users will be easier to use this attendance application and the addition of other features that will add benefits, one of which is the addition of a clock setting feature which is the limit for the beginning and end of learning,
b) In terms of using this attendance application, it requires an internet network connection, so schools need to facilitate an adequate internet network,
c) It is necessary to socialize the use of this application to students and teachers so that it can be used optimally.

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