ANALYSIS AND DESIGN OF TEACHER PRESENCE SYSTEM APPLICATIONS WITH THE WEB-BASED QR SCAN METHOD

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ABSTRACT

The digital system has become a habit in carrying out the daily activities of the community at this time. In organization or agency, the digital system has become one of the supporters in improving the performance and services provided, olso in the world of education. Along with the Covid-19 pandemic, of course teaching and learning activities must be carried out remotely and this will also be a necessity for teachers to carry out online presence. Presence of attendance or absence is an initial activity of students and teachers before starting class learning begins, which becomes evidence that teaching and learning activities are carried out in educational units. The purpose of this research is to facilitate teacher presence and recapitulate teacher attendance data, it is necessary to design and create a mobile-based digitalized teacher presence application. Scan QR is a tool that can be used in designing attendance applications. OR is a code with a fast response in how it works that can be read through a scanner (code reader). The development method used in making this application is the waterfall method. The system design analysis method uses the UML model which is explained by making Use Case Diagrams, Swimlane Diagrams, Class Diagrams, Sequence Diagrams and deployment diagrams. The results of the design in this study are implemented into a mobile-based application for carrying out attendance to teachers before class learning begins, using a QR scan feature to make it easier for teachers and staff to record teacher attendance at school.

Keywords: Digital, Teacher Presence, Scan QR.

INTRODUCTION

The development of technology and information for the world of education is very helpful for learning activities. One of the first activities in learning begins with the presence of teachers and students.

The attendance process is the most important, not only students but teachers are also required to take attendance to determine the quality of their work as teachers in schools. Attendance is a form of recording the presence of a person or employee which is part of reporting from an institution which contains data - data on the status of attendance neatly arranged and used at any time required by interested parties. There are still many processes for teacher attendance activities in schools that are still carried out manually, namely by signing on the attendance book. The problem is the manual attendance system cannot monitor teacher attendance, thare is cheating in filling in the attendance by the teacher, the teacher who is not

present can have a signature on the attendance sheet on the schedule that day. With the development of information technology, we can use an application help process attendance and record attendance.

One type of application that has begun to be used as a result of the development of information technology is one with a QR scan. Web-based applications are applications that run independently or independently in a computer web system and can carry out a series of activities that are regulated by the user.

Based on the problems that occur, we need an application that can facilitate users in making attendance quickly. Therefore, through this research a web-based application will be designed. In terms of access this application is easier to apply and the interface is simple. The purpose of this research is to facilitate teacher presence and recapitulate teacher attendance data, it is necessary to design and create a mobile-based digitalized teacher presence application. Scan QR is a tool that can be used in designing attendance applications.

METHODS

The method used in design application is waterfall model. This method describes a systematic and sequential approach to software development, starting with the specification of user requirements and then continuing through the stages of planning, modeling, construction, and delivery of the system to users (deployment), which ends with support on the resulting full software (Pressman, 2012).

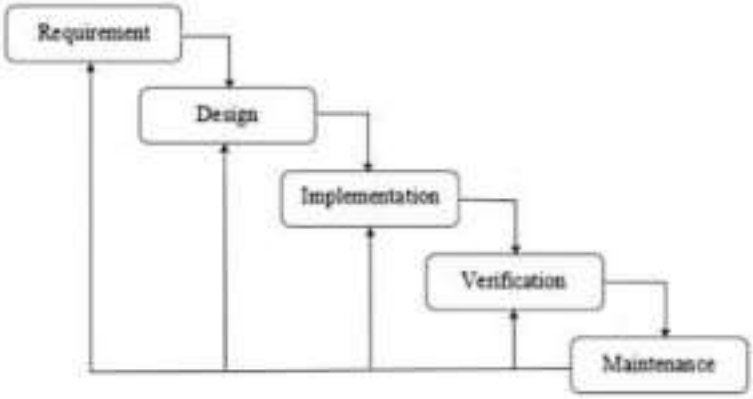

Figure 1. Model Waterfall

The following is an explanation of the stages carried out in the Waterfall Model : a. Requirement

At this stage is the communication stage which aims so that the writer can plan an attendance application that is made according to user needs by conducting interviews and discussions with the attendance staff section.

b. Design

At the design stage, it begins with modeling analysis in accordance with the results of the previous stage, using UML which describes use case diagrams, activity diagrams, class diagrams. The system design will display the menu structure and interface table. c. Implementation

The implementation stage is the stage of starting to make applications using the PHP programming language, Java merging with Scan QR.

d. Verification
Verification stage, at this stage system testing is carried out involving system users.
e. Maintenance
This stage is carried out by the developer and application owner to ensure that the system can support

RESULTS

Field studies are the first step which aims to obtain the data directly needed in the process and analysis stages. In this case the author conducted a field study at SMPN 1 Kadupandak Cianjur to obtain the information and data needed regarding the implementation of the research. The result of the first stage is an analysis of functional requirements.

Table 1. Functional Requirements

No	list	Information
1	Login	Process to access to web by entering email and password to get access rights
2	Dashboard	Presents information about the main indicators of the activity at a glance in a single screen.
3	QR Generator	make QR code
4	Rekapitulation	Summarize data so that it becomes useful.
5	Manage Teachers	To manage Teachers
6	Activity	To make schedule.
7	Profile	Changing admin data
8	History	View of admin presence

The design stage produces a system model using UML. The explanation is illustrated with use case diagrams, class diagram, and deployment diagram.

1. Use case diagram

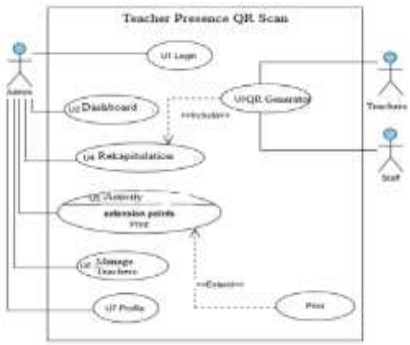

Figure 2. Use case Diagram Teacher Presence QR Scan

Based on the use case diagram, the teacher attendance application has seven use cases. The admin will first login and be directed to the dashboard to view the attendance schedule, verify absent activities, recap daily absences, manage teacher data, and profiles, while teachers and staff must first install the qr absence application to take absences, after that teachers and staff can immediately scan the barcode that has been provided to fill in the attendance.

2. Class Diagram

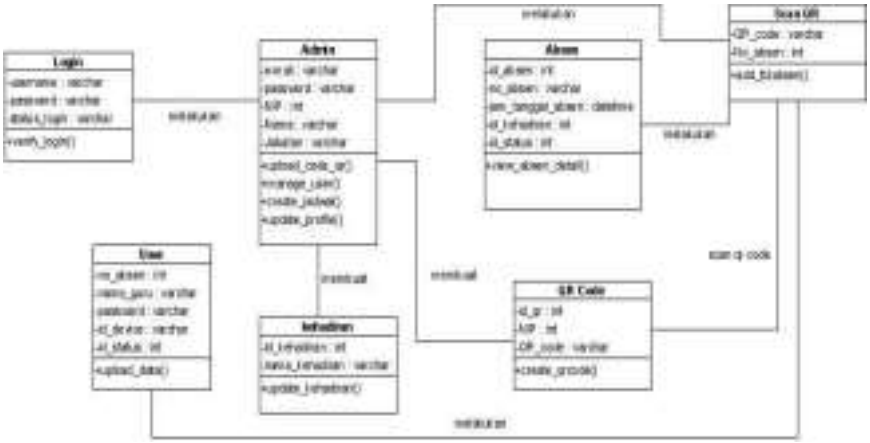

Figure 3. Class diagram Teacher Presence QR Scan

3. Deployment diagram

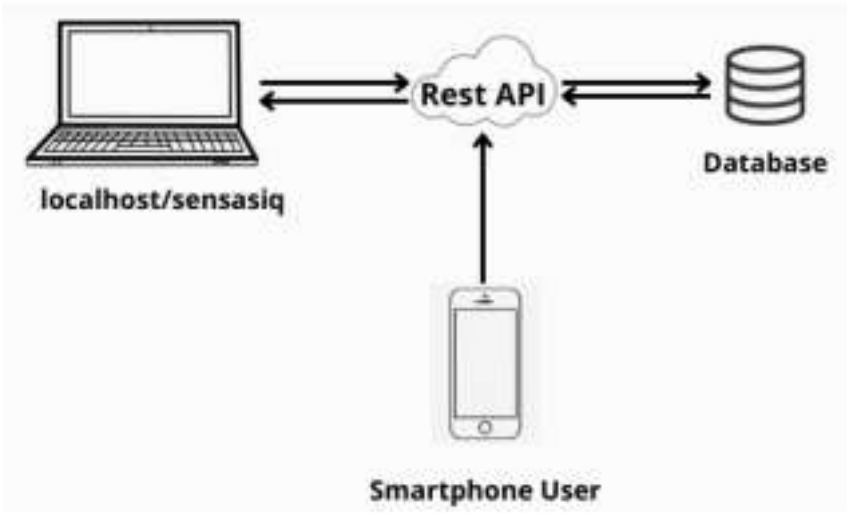

Figure 4.
Deployment diagram

The deployment carried out in this attendance application is as shown in the diagram, where localhost functions as a data storage area for the application, then users who use the qr scan application will send data which later when collecting data uses the API, namely the Rest API, then the database functions as the server. or you could say the backend of this application to perform queries or requests from the client will then provide a response back to the user.

At this verification stage, the author conducts trials at practical workplaces to conduct application trials.

The following is an Entity Relationship Diagram from this teacher attendance application:

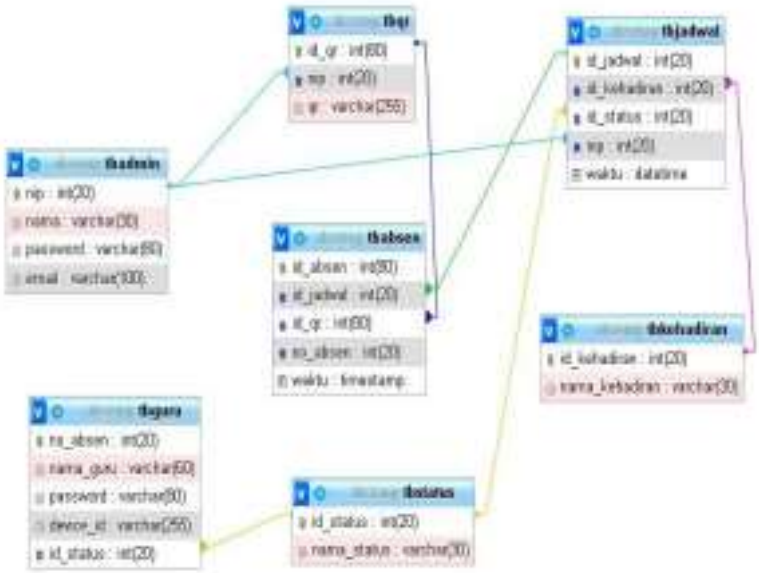

Figure 5. Entity Relationship Diagram

Table 2. Application Testing

No	Test Scenario	Test Case	Expected results	Test Results	conclusion
1	Fill in the wrong email and correct password then press the Login button		Displays the message "email not found"		Valid
2	Fill in the correct email and correct password then press the Login button		Displays the message "email and password correct"		Valid

3	Do not fill in email and password then press the Login button		Displays the message "email and password please fill in"		Valid
4	Fill in email and password then press the Login button		Login to dashboard admin		Valid
5	Pressing the QR Generator menu button		Display QR generator		Valid
6	Pressing the Generator on the QR generator page		Display barcode		Valid

DISCUSSION

From the results of the design that is made, it produces a teacher presence application, where the teacher can use a smartphone android and get a QR Code that has registered by the staff, then the teacher can directly point the QR Code on the webcam which is already connected to the server computer. The server computer is managed by the section school staff and can immediately make reports based on presence of the teacher stored on the server computer.
Then the report is submitted to the school principal to sign the recapitulation of teacher attendance.

QR code is one of the technologies that is very practical and widely used in today's all-digital era, for that QR code is important. The objectives to be obtained from this teacher attendance information system include saving time in processing attendance data, obtaining more accurate

information compared to processing attendance data manually.

According to Sembiling Roy Hartanto, 2020. The results of the Implementation of the Attendance System using the Android-Based barcodes Scanner and GPS can make it easier to monitor students who attend lectures and can minimize fraud, so the level of data accuracy is very good.

With the attendance information systems can provide solutions to facilitate employees in filling the absent, so as to improve the quality of employee performance and can accurately count recapitulation of attendance (Rhomadhona Herfia, 2018). The sharpness of the scan screen can affect the QR code scan, so it is possible that when scanning there will be problems.

CONCLUSION

Based on the results of the analysis and design of the teacher presence application using the QR Scan method, it can provide convenience to teachers in the process of implementing attendance every day when they enter school and the possibility of miscalculation of the percentage of teacher absences is very minimal because it is directly carried out by the system.

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