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## DESIGNING A WEB-BASED ELEMENTARY SCHOOL ATTENDANCE SYSTEM USING THE LARAVEL FRAMEWORK

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### **Abstract**

*The era of globalization has produced transformational innovations and has the potential to drive innovation, productivity, and digital transformation. Digital transformation is an important issue and is a habit that must be applied in all industrial sectors. The implementation of digital transformation will provide competencies and skills that can adapt to various changes, especially those related to digital transformation. One sector that must immediately carry out digital transformation is the education sector. For this reason, the education sector absolutely requires human resource development as a way to improve abilities and skills. Based on literature studies, it has been obtained that the steps of the Waterfall method. The results obtained from the research are software development using the Waterfall method and the Laravel framework according to predetermined stages. At this stage, several components that are needed in making the system and restrictions in making the system will be explained, including the following: Software Requirements, Activity Diagram, and System Results. This attendance website is useful for teachers to be able to take attendance of their students online, this attendance website can recap attendance data automatically in PDF form which of course can facilitate the work of teachers, and with this attendance website, students and parents can monitor attendance data managed by teachers.*

*Keywords: digital transformation, attendance system, and laravel framework*

### **1. Introduction**

The era of globalization has produced transformational innovations and has the potential to drive innovation, productivity, and digital transformation. Digital transformation is an important issue and is a habit that must be applied in all industrial sectors [1]. The implementation of digital transformation will provide competencies and skills that can adapt to various changes, especially those related to digital transformation. One sector that must immediately carry out digital transformation is the education sector [2]. The education sector has many business processes and many entities, so accurate, fast, and precise information is needed.

In addition to the application of digital transformation, building Human Resources (HR) in the education sector, especially in Elementary Schools (SD) is needed to support the character of quality human resources capable of competing in the era of globalization. For this reason, the education sector absolutely requires human resource development as a way to improve abilities and skills [3].

The advancement of digital transformation and quality human resources in the era of globalization will provide

rapid benefits in improving the quality of the education sector [4][5]. In addition to these two factors, another factor is the utilization of information technology media in the use of the internet is expected to be a solution to the problems that occur in the education sector, one of which is the Surabaya City Education Office.

The Surabaya City Education Office is an institution that is a supporting element of the Surabaya City Regional Government in the field of education. Digital transformation in the education sector is significant, with this transformation, information will be effective and efficient.

Every institution, such as elementary schools, needs a computerized system that is an accurate, efficient, and effective computerized system, such as implementing an attendance system in elementary schools [6] [7].

Attendance is a routine that is carried out to record whether or not someone is present at the institution [8]. The application of attendance system is very important to be applied to educational institutions such as elementary schools with the aim that teachers and parents can find out whether students are present or absent on that day.

Various types of research related to the application of attendance systems such as the application of the rapid application development model in the teacher's web-based attendance system for students [9]. Other research is the attendance system and monitoring of student attendance using the location-based services method [10], and the attendance information system, assessment, and student class champion grade at elementary schools [11].

In addition, related research is the design of a web-based leave teacher absence information system in state basement schools [6] and the development of a web-based teacher and student attendance information system in state high schools [12].

Based on this background, the researcher proposes the design of an elementary school attendance system by applying the Laravel framework which is expected to be useful for teachers to be able to take attendance of their students online, can make a recap of attendance data automatically in PDF form, and students and parents can monitor attendance data managed by teachers.

## 2. Research Methods

Based on literature studies, it has been obtained that the steps of the Waterfall method consist of [13]:

Communication, Planning, Modeling, Construction, and Deployment.

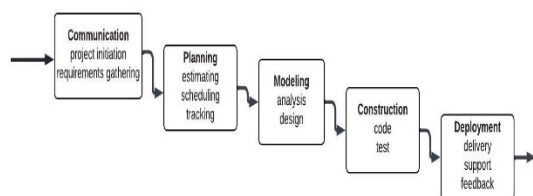


Figure 1. The Waterfall Method [13]

### 2.1. Communication

At this stage, communication with the customer is carried out in order to understand and achieve the goals to be achieved.

The results of communication will be used as project initialization by analyzing problems and collecting data related to the system to be developed. Additional data collection can also be taken from journals and the internet.

### 2.2. Planning

At this stage, planning is carried out by explaining the estimation of the tasks performed, scheduling the work to be carried out, and tracking the process of working on the system.

### 2.3. Modeling

At this stage, the system architecture design and modeling stage focuses on designing data structures, software architecture, interfaces, and program algorithms. software, interface, and program algorithms.

### 2.4. Construction

At this stage, it is the process of translating from design to the coding stage (code). After the coding stage is complete, testing of the system is carried out with the aim of finding errors to be corrected later.

### 2.5. Deployment

At this stage, the deployment stage is the stage of implementing the system to the customer, periodic software maintenance, software repair, and software evaluation.

### 2.6. Framework Laravel

Laravel Framework is an open-source programming framework that is used by many developers from around the world [14]. According to Mulyadi, the ease of use and complete documentation is one of the factors why Laravel has become excellent in recent years.

Laravel follows the Model-View-Controller (MVC) architecture pattern. MVC separates the application based on components such as data manipulation, controller, and user interface. The advantage of developing this application is more manageable maintenance and scalability [15].

## 3. Results and Discussions

The results obtained from the research are software development using the Waterfall method and the Laravel framework according to predetermined stages. At this stage, several components that are needed in making the system and restrictions in making the system will be explained, including the following:

### 3.1. Software Requirements

At this stage, it explains the needs that system users can do for the attendance system. In the following table, it can be seen that there are four system users, namely: Admin, Teachers, Students, and Parents.

Table 1. Software and Supporting Hardware

| Users   | System Requirement Specification   |
|---------|--|
| Admin   | Admins can create, update, view, and delete attendance data, classes, students, and teachers. Admins can also recap attendance data. |
| Teacher | Teachers can create and view student attendance. Teachers can also recap attendance data.  |

|          |   |
|----------|---|
| Students | Students can view their attendance data inputted by the teacher. Students can update their personal data.                 |
| Parents  | Parents can only see their child's attendance data that has been inputted by the teacher and their child's personal data. |

The results of the research are based on a logical sequence to form a story. The contents show facts/data. Can use Tables and Numbers but do not repeat the same data in pictures, tables, and text. To further clarify the description, can use subtitles.

Discussion is the basic explanation, relationship, and generalization shown by the results. The description answers a research question. If there are any dubious results then show them objectively.

### 3.2. Hardware Requirements

Hardware requirements are used to support user access to the attendance system so that the system can be accessed properly, hardware requirements are needed. Here are the hardware requirements:

- 1.Processor: Intel Core i3
- 2.Memory: 2 GB
- 3.Hard Drive: 500 GB
- 4.Operation System: Windows/Linux/Mac Os
- 5.Browser: Google Chrome/Mozilla Firefox/Microsoft Edge

### 3.3. Activity Diagram

At this stage, it explains the activity diagram of all users of the attendance system created. This stage explains the activity diagrams of all users of the attendance system created. The activity diagrams made are login diagram activity, register diagram activity, attendance diagram activity, and data recap diagram activity.

#### 3.3.1. Activity Diagram Login

When the user opens the login page, the user must enter the username and password registered on the website. If the username and password are valid then the user will enter the home page automatically. But if the user enters the wrong username or password then the user will remain on the login page.

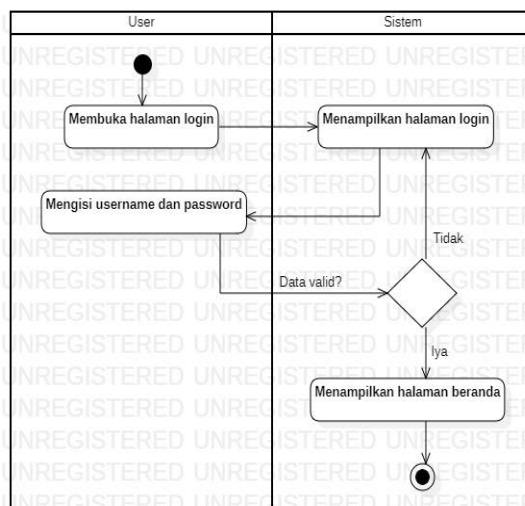


Figure 2. Activity Diagram Login

#### 3.3.2. Activity Diagram Register

To register an account, you must first log in as an admin so that the account is created by the admin. When the admin is on the home page, the admin must click the data management menu and a dropdown menu will automatically appear and the admin must select the account menu. Then the system will display the account list page. Then the admin selects the "+" icon at the bottom right of the page. Then the system will display the register page. Then the admin fills in the username, access, and password input of the new account. After it is correct, click register.

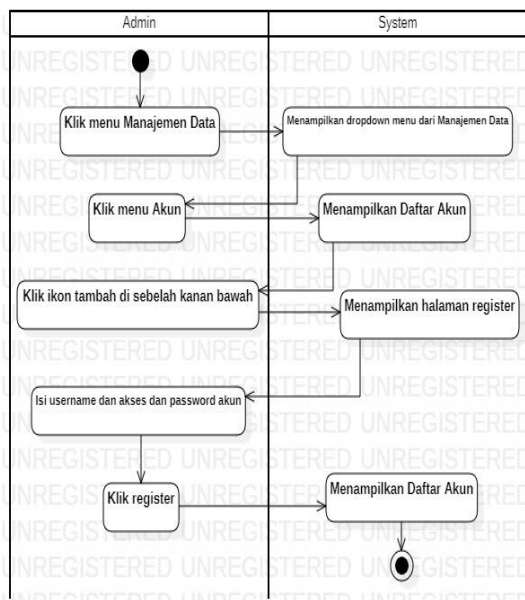


Figure 3. Activity Diagram Register

#### 3.3.3. Activity Diagram Attendance

To take attendance, you only need to click the attendance menu. Then the system will display the class list page. Then the user selects a class for attendance. Then the system will display a list of students in that

class. Then the user fills in the student's attendance data. If so, the user clicks submit.

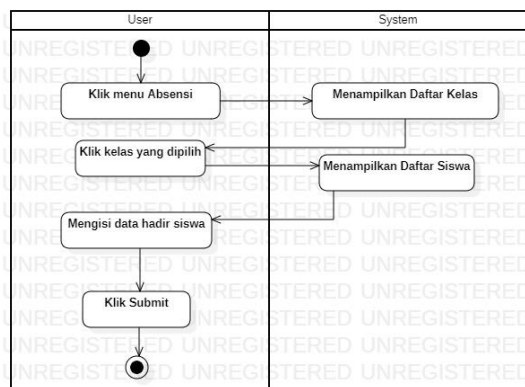


Figure 4. Activity Diagram Attendance

### 3.3.4. Activity Diagram Data Recap

First, the user clicks on the data recap menu. Then the system will display the class list page. Then the user selects the class for which the attendance data will be recapitulated. If so, the attendance recap page will automatically appear. Users can select the time range of attendance that they want to recap by clicking the calendar icon above. Then if you have chosen, the user just needs to click the PDF button to download the data recap file.

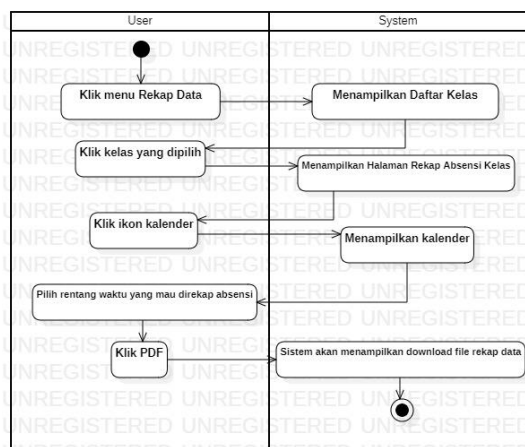


Figure 5. Activity Diagram Data Recap

### 3.4. System Results

The results of the attendance system implementation using the Laravel framework are shown in the following figure. In Figure 5, is the "login" image that appears when the user uses the attendance system. Figure 5 system login that is used when the user wants to login or enter the system. Users just need to input their username and password to be able to log in to the system.

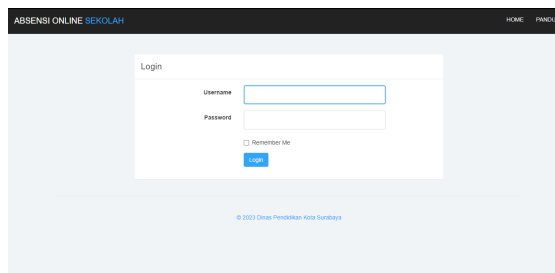


Figure 5. System Login

Furthermore, after logging in, the most important part of the user is to take attendance according to the class that the user / teacher teaches. As in Figure 6, the following display shows the classes taught by the teacher. Furthermore, the teacher just has to choose which class the teacher will do attendance.

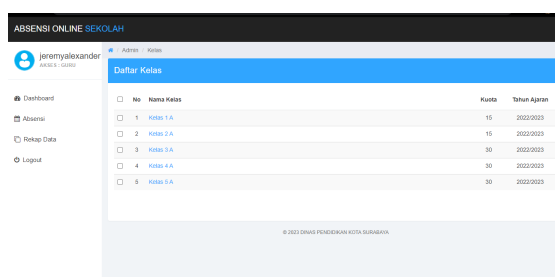


Figure 6. Attendance Display

## 4. Conclusion

Through the design of an online attendance system for web-based elementary school students using the Laravel framework, conclusions can be drawn:

This attendance website is useful for teachers to be able to take attendance of their students online, this attendance website can recap attendance data automatically in PDF form which of course can facilitate the work of teachers, and with this attendance website, students and parents can monitor attendance data managed by teachers.

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