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Student Attendance Information System at SMKN with Web-Based QR Code

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ABSTRACT

SMKN Kakuluk Mesak is a vocational high school located in Dua Laus Village, Kakuluk Mesak District, Belu Regency, East Nusa Tenggara Province, which prepares students to work in specific fields. Students can continue their education at SMK after completing their education at the junior high school level. The study period for SMK students is carried out for three to four years of learning, which is divided into three years of study at school and one year in the related industry department. SMKN Kakuluk Mesak has five majors: APAT, NKPI, WBE, TKPI, and APHPI. One of the problems at SMKN Kakuluk Mesak in terms of technology is the manual attendance and grading of students. Attendance and grades are recorded using books. Therefore, a web-based student attendance information system with QR code is needed to facilitate the student attendance process. This system is built using the waterfall method, which is a systematic and directed approach to developing software in which it is used step by step until it runs in order. This research resulted in a website-based student attendance information system with QR code that helps the school manage attendance data and students can view grades and attendance records anytime and anywhere.

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1. INTRODUCTION

SMKN Kakuluk Mesak is one form of formal education unit that organizes vocational education at the secondary education level, one of which is to prepare students, especially to work in certain fields. Students can continue their vocational education after completing their education at the junior high school level. The study period for students at the SMK level is carried out for three to four years of learning which is divided into three years of study at school and one year in the relevant industry. At SMKN Kakuluk Mesak there are five majors, namely, Freshwater Fisheries Agribusiness (APAT), Fishing Vessel Nautics (NKPI), Marine Tourism and Ecotourism (WBE), Tourism Service Business (ULP), Fishing Vessel Engineering (TKPI) and Fishing Product Processing Agribusiness (APHPI).

The technology used at SMKN Kakuluk Mesak today is a computer as a learning medium. Technology is very important in the need for accurate, precise and fast information in presenting very complete data [1]. For this reason, technology plays an active role in all fields and can facilitate one's work [2][3]. As a result of technological advances, especially in the world of informatics and the increasing number of emerging software created to solve information problems [4]. One of the problems that exist at SMKN Kakuluk Mesak in terms

of technology is attendance and student grades which are still done manually. Attendance is generally divided into two, namely, manual attendance and online attendance. Manual attendance is where teachers still use notebooks to record student attendance [5]. Meanwhile, online attendance already uses a system to input student attendance anytime and anywhere and no longer uses books to record student attendance [6]. Attendance and grades are carried out using books in recording student grades and attendance. This may make it more difficult to find data and reduce productivity. Furthermore, security hazards include the potential for data loss, flammability, and theft vulnerability [7].

The problem formulations taken in this study are How to create a student attendance information system with qr code at SMKN Kakuluk Mesak and how to implement a student attendance information system with qr code at SMKN Kakuluk Mesak. The purpose of this research is to create and implement a student attendance information system with a qr code at the web-based SMKN Kakuluk Mesak to facilitate the school in managing student attendance data [8]. Qr code is a two-dimensional barcode that can be read by a smartphone [9]. It allows to encode more than 4,000 characters in a two-dimensional barcode. The qr code can be used to display text to the user, to open a URL, save a contact to the address book or to write a text message [10]. The website employs an HTTPS domain to increase security and specific authentication is in place for authorized users to preserve data security in the system. The benefit of this research is to make it easier for officers or administrators at schools who play a role in managing attendance data and speeding up data reports and students can see attendance results easily [11][12].

2. METHOD

This system development method uses the *waterfall* model, which is the waterfall method or called the *classic life cycle* in its use is used as a method of approach that is systematic and directed in developing a *software* where its use is carried out [13], step by step until it runs in order and can be seen in Figure 1.

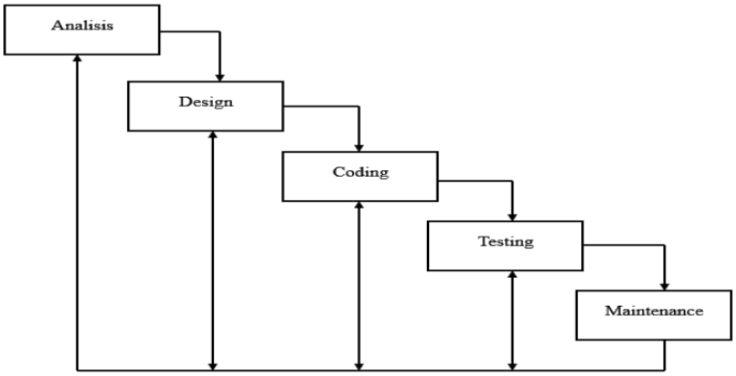

Figure 1. Waterfall method

a. *Analysis*

At this stage the researcher analysis the needs of the system to produce the data needs that will be needed in building a student attendance information system, the needs needed such as student names, classes, subjects, gender and information (absent, sick, permission and present) [12]. At this stage, researchers are looking for information about attendance as much as possible to be further analyzed so that the system built is in accordance with user needs.

b. *System Design*

After analyzing what data systems the system will need, researchers will design the design starting by creating or modeling the system from each class and student identity [9]. As well as designing the database of the attendance information system and the interface of the system being built.

c. *Coding*

At this stage, researchers translate the student attendance design into a programming language, as well as integrate and complicate all modules [10]. The programming language used by researchers in translating designs uses PHP with the Mysql database.

d. *Testing*

At this stage the researcher will carry out the attendance information system testing process or trial, to find out whether this attendance information system is ready to run or not? Researchers use black box testing to test the features of the attendance information system that has been built.

e. *Maintenance*

At this stage, researchers carry out maintenance of the attendance information system which aims to maintain performance until system development. Development of the attendance information system in the form of adding features to the operating system or other devices[14].

3. RESULT AND DISCUSSION

3.1. *System Design*

In designing this student attendance system with qr code, there are several stages that must be done, so that the system made can function as expected.

3.1.1. System Flowchart

The system flowchart is a chart that shows the workflow that is being done in the system as a whole and explains the sequence of procedures in the system. This flowchart is a graphic description of the sequence of procedures that combine and form a system [15]. The flowchart display of the student attendance information system with qr code can be seen in Figure 2 below.

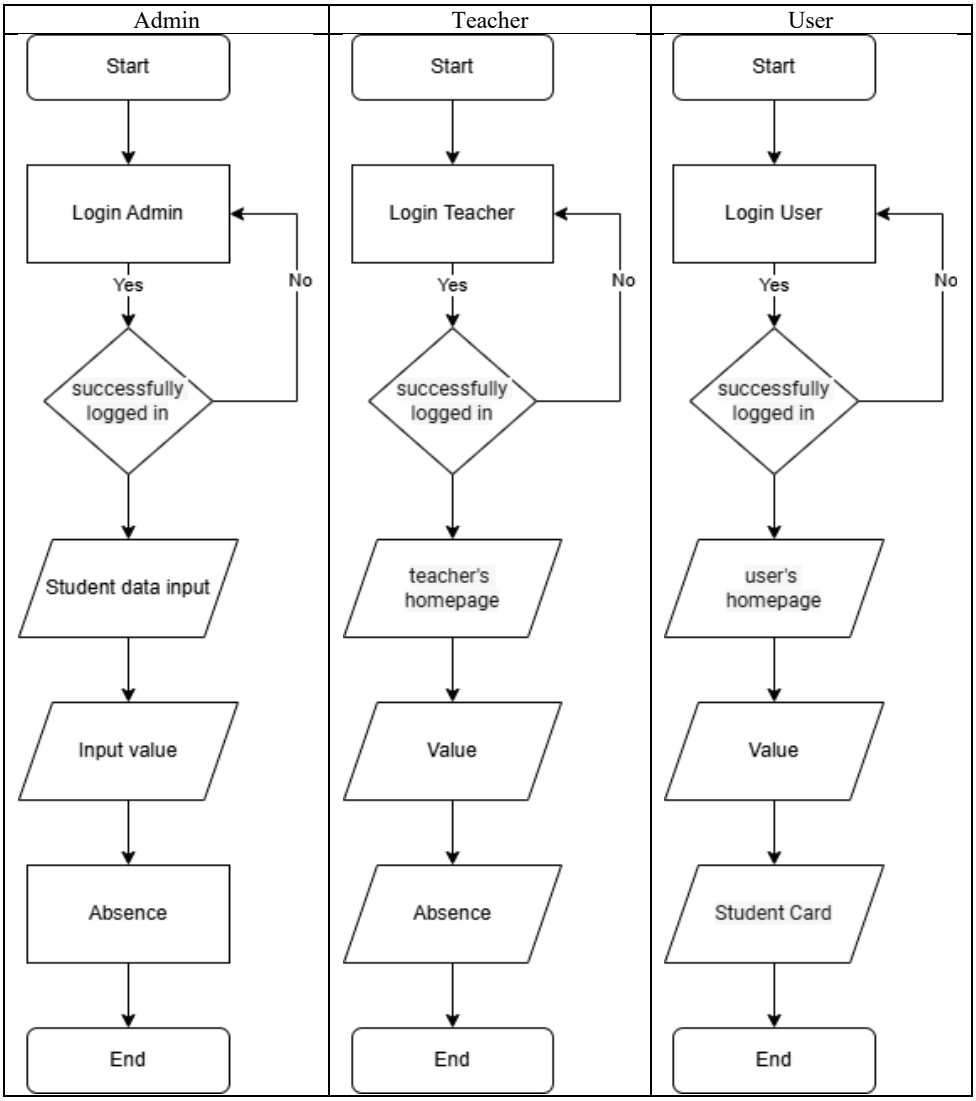

Figure 2. System flowchart

3.1.2. Use Case Diagram

In this system use case there are 3 user entities, namely, admin, teachers and students. The admin is in charge of managing student data and adding student grade data to the system. In addition, the admin also updates changes to student data into the system. Users are students who use attendance and are tasked with carrying student cards (Barcode). The following Use Case Diagram of the student attendance information system with qr code can be seen in Figure.

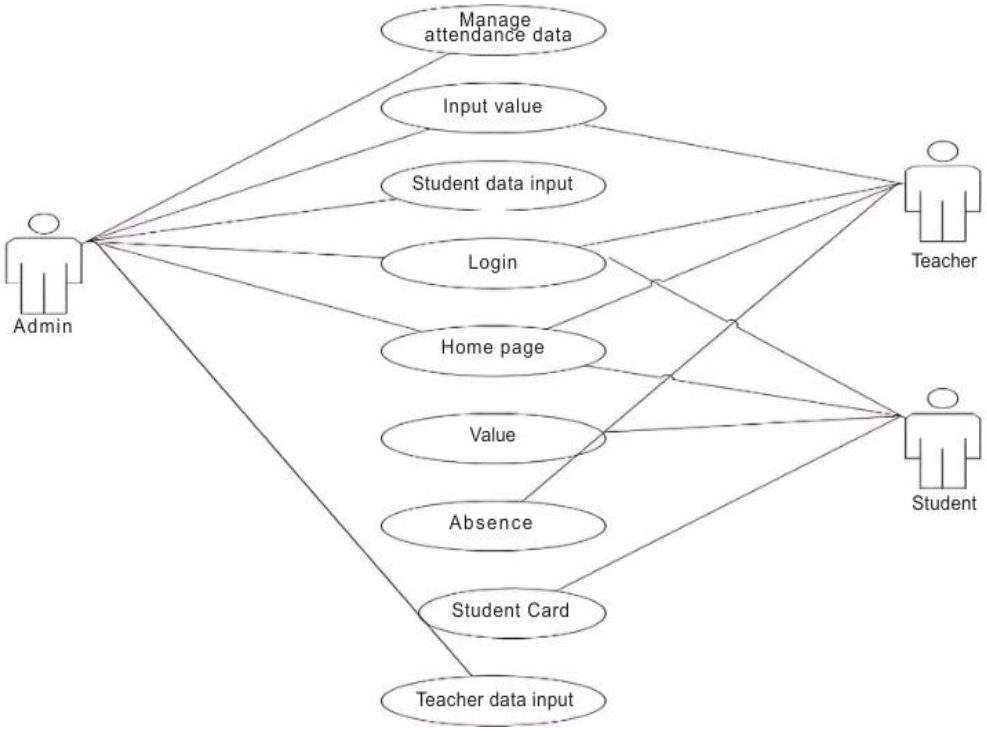

Figure 3. Use case diagram

3.2. *System Interface*

1. *Home Interface Result*

The home interface is the front view of the system before the *user logs in*. In addition, this page will appear menu views such as the *home* menu, grades, attendance, student cards and *logout*. This page will direct the *user* to access the next page.

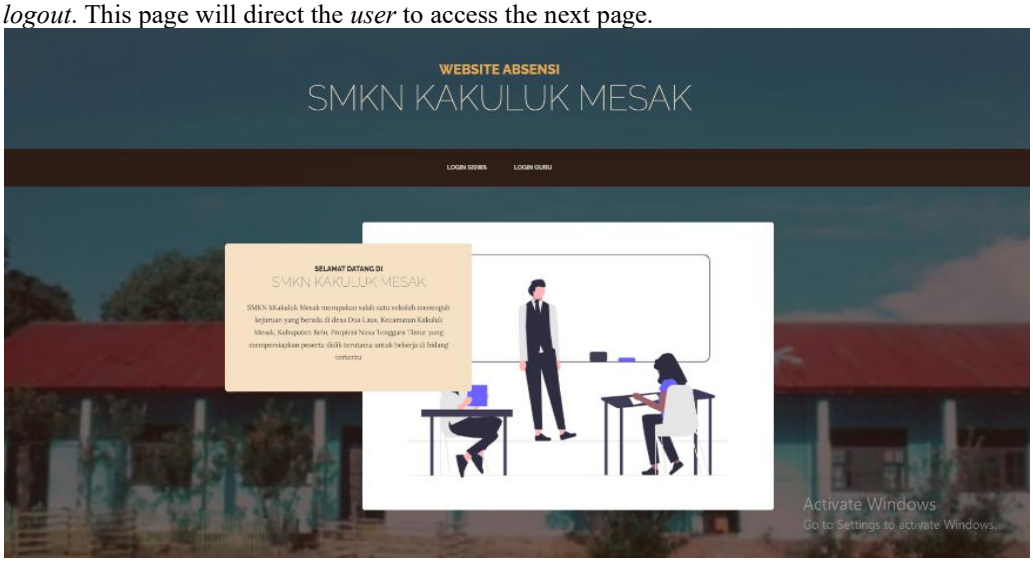

Figure 4. Home interface display

2. *Result of Value Interface*

The result of the value interface is a display page for student grades that will be inputted by the subject teacher. Such as assignment grades, test scores, uts and uas scores. And students can also see the grades that have been uploaded by the teacher. So that this page makes it easy for teachers and students to upload and view grades at any time.

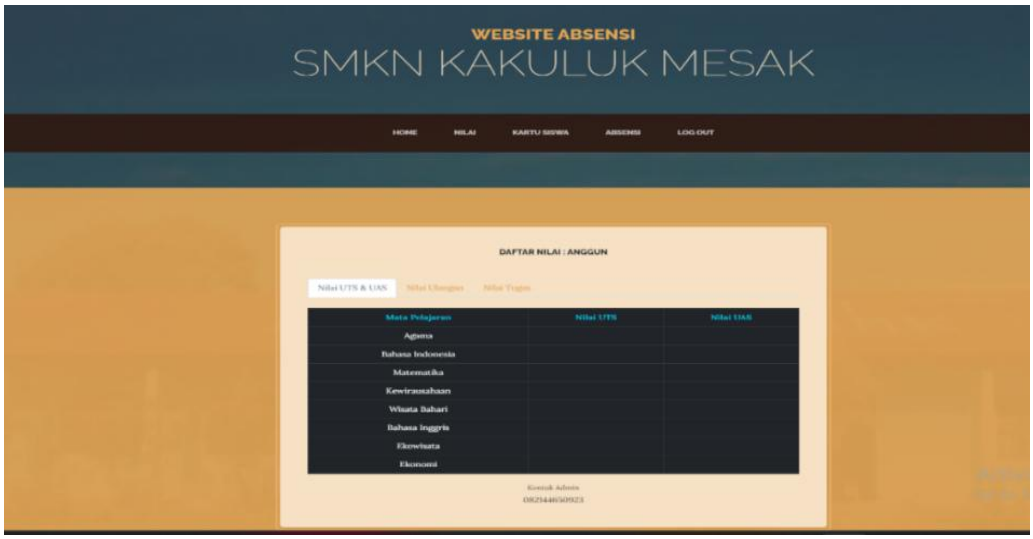

Figure 5. value interface

3. *Student ID Card Display Result*

The result of the student mark card interface is a page that directs students before carrying out the attendance process. The student mark card serves to make it easier for teachers to carry out the attendance process for students without having to take notes. With this card, it can make it easier for students to take care of matters related to academic activities.

Figure 6. KTS interface

4. *Result of Attendance Display*

The result of the attendance interface serves to make it easier for admins to process attendance recap data. Attendance records are a collection of student data during a certain period

or usually per month according to majors and classes. This recap shows the status of student attendance such as attendance, illness, permission and absence.

Figure 7. Attendance interface

4. CONCLUSION

After conducting a series of research, the author draws the following conclusions:

1. This successfully built website-based qr code student attendance information system can help schools in conducting attendance and inputting student data easily.
2. The waterfall method used was successfully applied in the development of a student attendance information system with a website-based qr code in this study.

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