Development of Student Attendance Information System at SMK Negeri 9 Medan

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A B S T R A C T

The conventional attendance process takes a long time during attendance and also during recording. Absenteeism recapitulation helps teachers monitor student attendance in class. In addition, attendance recapitulation can be one of the considerations in the assessment. The information system can help the conventional attendance recapitulation process become automatic. Vocational High School (SMK) Negeri 9 is a school located in Medan City, North Sumatra. SMK Negeri 9 Medan has 5 majors with a total of 2077 students. Attendance management still uses conventional methods so it is necessary to conduct research related to the development of student attendance information systems. The methodology used in this research is problem identification, system requirement identification, data collection, system analysis and development. This study aims to facilitate the attendance process and attendance recapitulation. System development uses the Use Case Diagram model and Entity Relationship Diagram. The Use Case Diagram helps answer the functional requirements of the system desired by the school. While the Entity Relationship Diagram describes the database model. The model can be corrected to get the best results in database development.

Keywords: *SMK Negeri 9 Medan, Student Attendance, Web-based, Information Systems*

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1. INTRODUCTION

Absenteeism is a routine activity carried out by students every time they carry out learning activities [1]. Absence as proof of the running of activity [2]. Once the importance of the attendance process is, the process should be carried out easily and efficiently. SMK N 9 Medan is a school located at Jalan Patriot No. 20 A, Lalang. Medan Sunggal District, North Sumatra. At SMK N 9, 2077 students were reported through Dapodik [3]. A large number of students at the school is the background for the importance of implementing a computerized attendance system.

The conventional attendance process using paper media is still widely used in schools. At SMK N 9 Medan, the attendance process still uses the conventional method. Technology is increasingly sophisticated and very useful to assist human activities. An information system is one of the technologies in the field of information. Information systems change manual transactions into electronic transactions. Electronic transactions can solve calculation problems such as recapitulation and so on very easily.

Information system development aims to change manual attendance to computerized [4]. The information system development process can be divided into two parts, namely the application or dialog and the database or storage. In an attendance report, there are other data such as classes, subjects, and so on. System requirements [5] are analyzed using the use case diagram model approach [6]. Meanwhile, database needs are analyzed using an Entity Relationship Diagram or ERD. ERD makes it easier to define the necessary tables and their relationships [7].

The data needed in this study were obtained through interviews and direct observation. Interviews to obtain the primary data needed such as students, classes, schedules, attendance, and so on. While direct observation aims to observe the actual system that is running. Valid data collection will result in a suitable system. An information system is a system with input in the form of data and produces output in the form of information. The process of recording attendance and other functional requirements is input data [8]. While the results of

student attendance recapitulation are the information needed. The student information system is the solution offered in this research to simplify the process of student attendance.

Web-based technology is growing rapidly along with the growth of internet users. Therefore, this system is designed web-based. The programming language used is Hypertext Preprocessor (PHP) [9]. PHP is server-side programming. This means that users don't need to install it on their devices because the code runs on the server. Users only need a web browser [10] to use the student attendance information system later.

2. RESEARCH METHODOLOGY

2.1 Stages of Research

The research methodology is the stages carried out in this research. These stages are as follows.

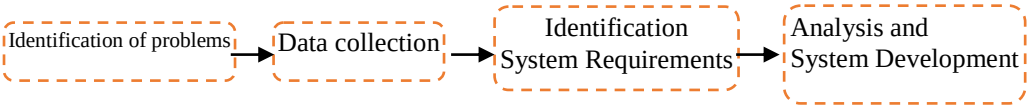

Figure 1. Flow of Research in Student Attendance Information System Development

1. Identification of problems

Problem identification is the initial stage of this research [11]. Identification of the problem, namely conducting a field study and explaining it in the background. In identifying the problem, it was found that the student attendance process was still conventional. So the solution offered is the development of a student attendance information system.

2. Data collection

Data collection was carried out through field observations and interviews. Collecting data through direct observation (observation) aims to obtain valid data [12]. Direct observation also aims to observe the actual system. While the interview process to obtain primary data in the form of existing documents. The necessary data such as attendance, schedule and so forth.

3. Identification System Requirements

Identification of system requirements consists of functional requirements, hardware requirements and proposed system software. Functional requirements are described using a use case diagram model. At this stage identification of information needs is also carried out. The results of the information system are in the form of information reports needed by users.

4. Analysis and System Development

Analysis of system development using use case diagrams and Entity Relationship Diagram models. The use case diagram model describes the task or job requirements of the user [13]. These cases generate multiple user interfaces. While the approach to the database model uses ERD. The model is implemented into the database with the help of Object-Relational Mapping (ORM).

3. RESEARCH RESULT

The results of research on student attendance information system design will be explained in this section. Functional requirements are modeled using use case diagrams. Meanwhile, the database is modeled using an Entity Relationship Diagram. (ERD). Lastly is the design of the user interface design of the student attendance information system.

3.1 Functional Needs

Functional requirements are the processes that must be carried out by the system. The purpose of the system will not be achieved without these processes. The functional requirement is in the form of recording the data needed to carry out student attendance.

Table 1. Functional Needs

No	Name of Need	Description
1	Login	To enter into the system
2	Home	To display brief information
3	Siswa	To manage student data
4	Admin	To manage admin data
5	Kelas	To manage class data
6	Mapel	To manage subject data
7	Jadwal	To manage schedule data
8	Absensi	To manage attendance data
9	Logout	To exit the system

3.2 *Entity Relationship Diagram*

Entity Relationship Diagram or ERD is a diagram that describes the relationship between tables. The tables in the database are designed as efficiently as possible. Relationships between tables are useful for retrieving complete information from several related tables. The following is a picture of the ERD student attendance information system.To enter into the system

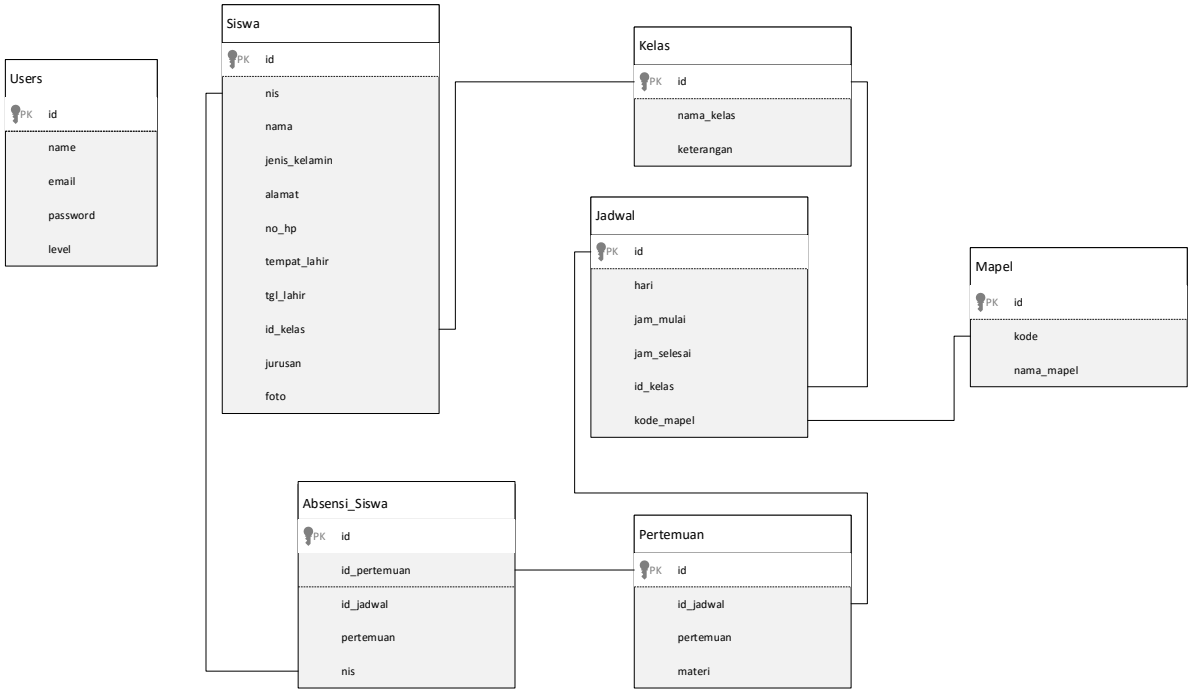

Figure 2. Entity Relationship Diagram

In Figure 2 above you can see the entity relationship diagram of the student attendance information system. ERD describes the relationship between tables in a database.

3.3 *Use Case Diagram Design*

This student attendance information system is designed using use case diagrams. Use case diagram is one example of object-oriented analysis modeling. The following is a display of use case diagrams of student attendance information systems.

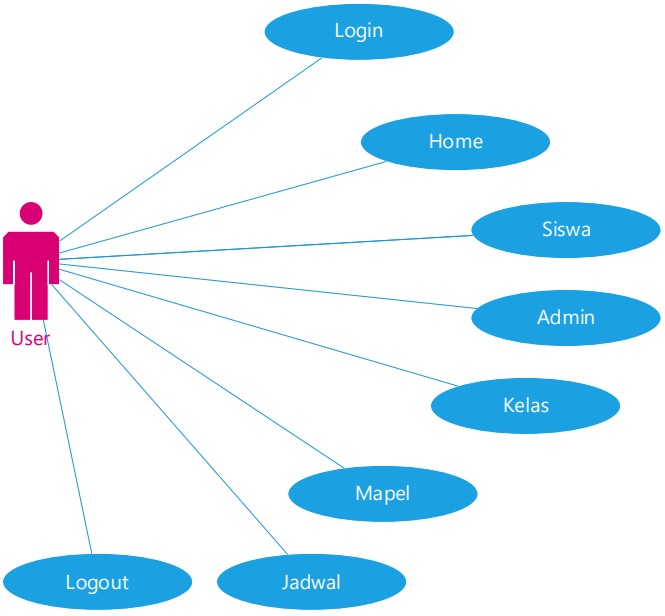

Figure 3. *Use Case Diagram* Design

In Figure 3 above you can see the use case diagram of the student attendance information system. The functional requirements of the system can be seen in the image above. The system requires student, class, and subject data to schedule. Then based on the schedule absenteeism is carried out.

3.4 Desain User Interface Sistem informasi Absensi Siswa

User interface design is the process of developing a student attendance information system. User interface design is a very important part of an information system. User interface design results in a good or bad user experience. The following is a display of the user interface design.

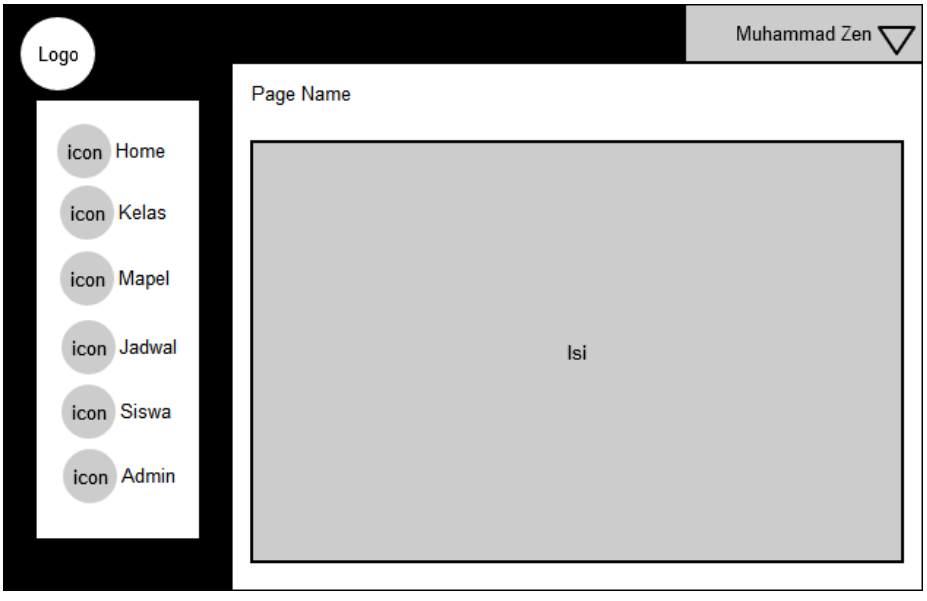

Figure 4. User Interface Design Display Student Attendance information system

Figure 4 it can be seen the user interface design of the student attendance information system. The interface model used is admin. The user interface above consists of several menus, namely home, class, folder, schedule, student, and admin data. Each menu will display different contents according to the menu.

4. CONCLUSION

After designing the student attendance information system, the attendance record process is easier. Other records such as classes, subjects, students, and schedules are also handled by this system. Electronic transactions facilitate the process of calculating attendance recapitulation using a student attendance information system application. The design of student attendance information systems uses use case diagrams and Entity Relationship Diagram (ERD) models. Database design using ERD simplifies the process of creating databases and their relationships. ERD is a guide for creating database relationships using Object-Relational Mapping (ORM). The student attendance process is carried out by the admin through an information system. However, system maintenance also requires a lot of money. The person in charge of the student attendance information system plays a role in the life cycle of this system.

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