



Website-Based E-Learning Management System Case Study at SDN Cijantung 02

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Abstract

The development of information technology is increasingly sophisticated not only as a communication tool, but is used as a medium to support teaching and learning activities, many educational institutions including elementary schools have implemented information technology in the learning process through the web, one of which is known as e-learning. E-learning is education that uses an electronic system that supports the development of teaching and learning activities with internet media or other computer network media. With the existence of e-learning, the teaching and learning process becomes simple where students and teachers do not have to meet face to face. The method used is data collection methods, namely observation, interview and literature study.

In this study, a waterfall model is used, one of the models in the SDLC (System Development Life Cycle). This waterfall model includes several stages in software development, such as: Analysis, Design, Coding, Testing, and Maintenance. This system is built using the PHP programming language with PHPMyadmin as administrator and MySQL for the database.

The results of this study can be used and applied to support teaching and learning activities and can facilitate teachers and students, besides that students can access subject matter doing assignments or exercises via the web anytime anywhere according to their needs.

Keywords: E-Learning, Management System, Website Based

Introduction

Along with the development of the world of technology today is increasingly rapidly in the direction of all-digital. The digital era has made humans enter a new lifestyle that cannot be separated from all-electronic devices. Technology becomes a tool that helps human needs. With any technology can be done more easily. So important is the role of technology that began to bring civilization into the digital era. The information system, which has now developed along with the rapid development of technology, has proven to play an important role in various activities, such as as a medium to support teaching and learning activities. Many institutions use information technology, including educational institutions, namely schools. Schools that have implemented information technology in the process of teaching and learning activities through websites known as e-learning (Electronic Learning). E-learning is a learning strategy brought about by huge data innovation advances towards changes in learning techniques or Teaching and Learning Activities (KBM), and currently the concept of e-learning has been widely used and has been accepted by the community.

As time goes by, the development of Information Technology (IT) is growing so rapidly and increasingly sophisticated, many new technologies have emerged that are created to ease human activities. Information technology is not only used as a communication tool, but is used as a medium to support teaching and learning activities. Many institutions use information technology, including educational institutions, namely schools. Schools that have implemented information technology in the process of teaching and learning activities through websites known as e-learning (Electronic Learning). E-learning is a learning strategy brought about by huge data innovation advances towards changes in learning techniques or Teaching and Learning Activities (KBM), and currently the concept of e-learning has been widely used and has been accepted by the community.



In the currently controlled era of the COVID-19 pandemic, the government still imposes restrictions on community activities (PPKM) in Jakarta itself, the restrictions imposed are teaching and learning activities carried out through face-to-face or distance learning called online. Because of these restrictions, teachers and students are still unsure of the current situation, teaching and learning activities are still uncertain. Teachers and students still use hybrid learning methods, including SDN Cijantung 02 in Pasar Rebo District, East Jakarta.

As long as the government still applies PPKM level 1, all students at SDN Cijantung 02 carry out learning activities from home using social media facilities (whatsapp) and using a learning management system (LMS) in the form of Google Classroom due to the unavailability of an appropriate e-learning system at SDN Cijantung 02 .

After the COVID-19 pandemic and the implementation of PPKM, learning at SDN Cijantung 02 when carrying out teaching and learning activities using Google Classroom, the teacher has difficulty in collecting assignments and student attendance because students often forget to be absent and are still confused when collecting assignments. For this reason, the application of e-learning at SDN Cijantung 02 is needed to help students and teachers in the process of distance learning activities.

In this case the author makes a system design entitled "E-Learning Management System Based Case Study Website at SDN Cijantung 02". With the availability of this system, teachers and students can carry out teaching and learning activities when they are not available or cannot attend school which can facilitate teachers and students according to their needs by utilizing the internet network without having to meet face to face.

Methodology

According to Pressman in the SDLC there are several models including the waterfall model, sometimes referred to as the classical life cycle, showing a systematic, sequential approach to software deployment that begins with the specification of customer demand and progresses through planning, modeling, construction and deployment ending in ongoing support. from the completion of the software

The following is an explanation of the stages of the waterfall method.

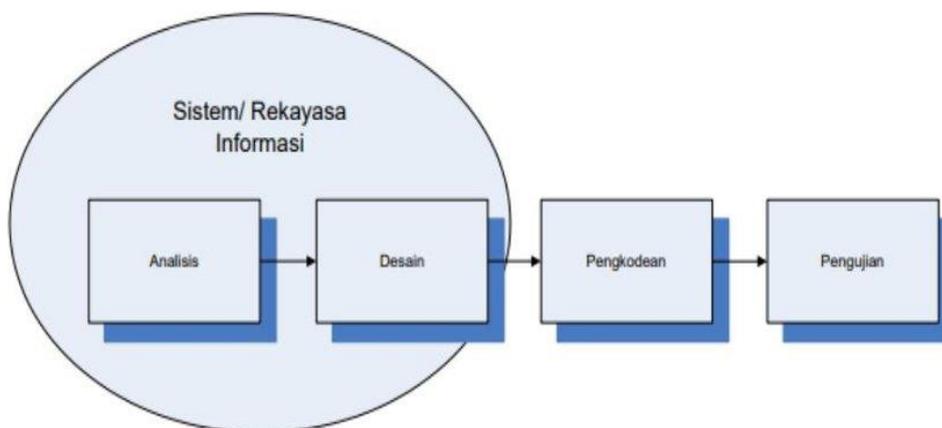


Figure 1 : SDLC waterfall model stage

Needs analysis

At this stage, the requirements collection process is carried out to specify software requirements. All software requirements must be obtained at this stage, in order to find out what kind of software the user wants, including the benefits of the Design system. This process is carried out to provide a complete picture of what must be done and how the system will look so that it can help specify hardware and system requirements.

Design

At this design stage is a process that focuses on the design of software programs including software architecture, coding procedures, data structures, and interface representations that can be done before coding the system. This stage transmits the software requirements from the previous stage to a design representation

so that it can be applied to the next step to give an idea of what should be done and how it should look. The software design obtained at this stage should be documented.

Coding/implementation

In this stage, coding or software programming is carried out according to the design that has been made. So that the result of this stage is the computer program according to the design.

Testing

At this stage, testing is carried out that focuses on the software that has been made in terms of functionality and to ensure that all parts of the software have been tested. This test is carried out to reduce errors and ensure that the output produced is as expected/desired.

Result

Analysis of data needs

The material taken to be used as a sample is class 5. Below the data needed in writing a thesis are as follows:

Table 1 : Class 5 Data Sample

1	Student Data	in the form of student profiles that will be used as samples.
2	Teacher (Teacher) data	in the form of Teacher (Teacher) profiles that will be used as samples
3	Subjects	the number of subjects.
4	Material	which will be used as a sample.
5	Tasks or Exercises	which will be used as samples.

Analysis of the running system

The system analysis that has been carried out at SDN Cijantung 02 is the learning system still uses conventional learning methods (lectures) manually or face-to-face which is carried out in the classroom based on system analysis carried out at SDN Cijantung 02 the teaching and learning process uses social media applications such as Whatsapp and Learning Management System (LMS) to send and receive assignments so that both the learning process is less effective due to the absence of a Learning Management System that adapts to the needs of students and teachers. To find out more about the system procedures that are currently running, it is explained as follows using an activity diagram.

The following is an activity diagram of a system that is currently running, there are 2 actors involved, namely: Teachers (Teachers), provide material and explanations and provide assignments or exercises and assessments. Students, do or answer assignments or exercises given by the teacher to get grades.

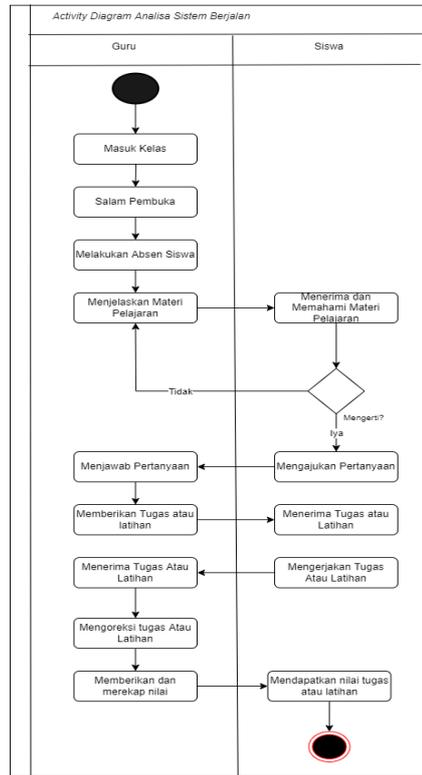


Figure 2 : activity diagram running

The following is an explanation of the current system activity diagram, namely: The teacher enters the classroom, after the learning hours start, the students and the teacher enter the classroom. Then the teacher does absent students and starts learning by providing material and explanation of the material provided. After the teacher explains the material and asks whether there is material that has not been understood to the students? If there are students who do not understand, the teacher re-explains the material that has not been understood by students, if students have understood then the teacher makes assignments or exercises and is given to students. Then the students work on and answer the task questions given by the teacher and collect the answers to the completed assignments or exercises that have been answered to the teacher. Then the teacher checks the assignments that have been done and answered by the students and gives marks to the answers to the assignments and recaps the scores to be used as reports. Then the teacher distributes the value of the results of the assignment to students and students receive the value of the results of the assignments or exercises that have been done. After the teaching and learning activities are finished the teacher leaves the class.

Table 2 : Interview

INTERVIEW FORM			
Date and time	Kamis 18 Agustus 2022		
Source person	Surtarmi(guru)		
Interview Hours	10:00 WIB		
Location	SDN 02 Cijantung		
No	Component	Question	Answer
1	Learning Environment During PSBB	1. What learning methods are used in this	Larynx or online

		pandemic era after the PSBB was implemented?	
		2. Is there any electronic learning media or online-based learning?	There have been and during the pandemic the learning media used were whatsapp and google class rooms. Each subject will be sent via google class room such as materials and assignments.
		3. How can the material be delivered via google class room and whatsapp?	The teacher sends an assignment link on whatsapp that leads to the google class room material with a word file format or assigns students to open the book page, and sends a video link from youtube as an explanation of the material.
		4. How are assignments/quiz given to students?	Assignments or exercises are given via Whatsapp and google class room in the form of questions, voice notes, messages, youtube video links then students answer with answers written in books then students take photos of the answers and send them through groups or private messages to the teacher.
		5. How is the student absence process when in the wa group?	By looking at the name of each student. If the student who sees his name in the group is considered present otherwise it means he is not present.
		6. How do students get grades for assignments/quiz?	Students who work on or collect assignments/quiz given or who answer the teacher's questions directly on that day will get grades.
		7. Are there other media used for online learning?	The media used is only whatsapp and google class room, have used zoom and google meet but the signal is not stable.

		8. What are the obstacles with online or online learning?	Students rarely collect assignments, the student quota is limited, the signal is not good, there are students who do not have their own cellphones, and sometimes students are lazy.
		9. How do students who do not have their own cellphones participate in online learning?	Students borrow cellphones from their parents, siblings or create groups with students who have cellphones
		10. Do you agree that at SDN 02 Cijantung there is a website-based e-learning Management system to support teaching and learning activities?	Strongly agree and support, because to support the learning process even though the pandemic is well controlled, e-learning is needed for unexpected circumstances.
2	Learning Environment	1. How is the learning process face-to-face or in class?	As usual the teacher came in to say hello, did absent students sometimes gave directions to students. After that, giving the material and explanations can be through slides of material and learning videos, the teacher asks if the students have understood the material, otherwise the material that is not understood will be explained again. Giving assignments / quizzes, students do assignments / quizzes and collect answers to assignments / quizzes to the teacher then the teacher checks student answers and assesses them.
		2. Before this pandemic, how was the environmental condition in the classroom when the study hours had started and the teacher	When the teaching teacher is not present, the one who fills the subject is the substitute teacher providing independent material or

		was not in the classroom and could not deliver the material due to an obstacle?	assignments that are entrusted to the substitute teacher. Sometimes students do the assignments that have been given. However, if class hours are empty and no one fills in the material, sometimes students are noisy and do not study.
		3. Will the material still be delivered if the teaching teacher is unable to attend school?	The material is still delivered, through a temporary substitute teacher
3	Required Data	1. Do all students have their own smartphone?	On average, they already have their own smartphone, but some don't have one and still use their parents' smartphones.
		2. How many teachers are there in SMPN 4 Campaka?	There are 27 teachers, principals and 26 subject teachers.
		3. How many classes are there from grades 1-6?	There are 17 classes, consisting of: 1st class there are 3 classes class 2 there are 3 classes 3rd grade there are 2 classes 4th grade there are 2 classes 5th grade there are 4 classes 6th grade there are 3 classes
		4. How many subjects?	There are 8 subjects consisting of: 1. Religion 2. English 3. Ppkn 4. Ipa 5. Ips 6. Plbj(local load) 7. Cultural arts

Device Needs Analysis

In building this expert system there are 2 needs, namely hardware requirements (hardware) and software requirements (software).

Hardware Requirements

The details of the hardware requirements used to run a website-based e-learning management system are as follows:

Table 3 : Hardware Requirements

Hardware	Minimum Requirement	Suggested Requirements
Processor	Intel Core i3 1.5 GHz	Intel (R) Core i7 2.60GHz
Hard Disk/SSD	256GB	256GB or more
Memori RAM	4GB	4GB or more
Graphics Card	Intel(R) HD Graphics 520	Intel(R) HD Graphics 520 or more
Keyboard	Standard	Standard
Mouse	Standard	Standard

Software Requirements

The details of the software requirements used to build this expert system are as follows:

Table 4 : Software

Software	Information
Windows 10	Used as an operating system
Sublime Text 3	Used as a text editor
Google Chrome	Used to access the website
XAMPP	Used as a web server
MySQL	Used to create database
Microsoft Visio dan Adobe XD	Used to design the system
Adobe XD	Used for design

Design (Design)

Design (Design) is the stage where the author does the design of the system to be made.

UML (Unified Modeling Language) Design

Activity diagrams are used to describe or define activities or workflows from a menu process system in the e-learning management system. The following below is the design of the activity diagram model of the e-learning management system, namely:

Use case diagrams that run on a website-based e-learning management system

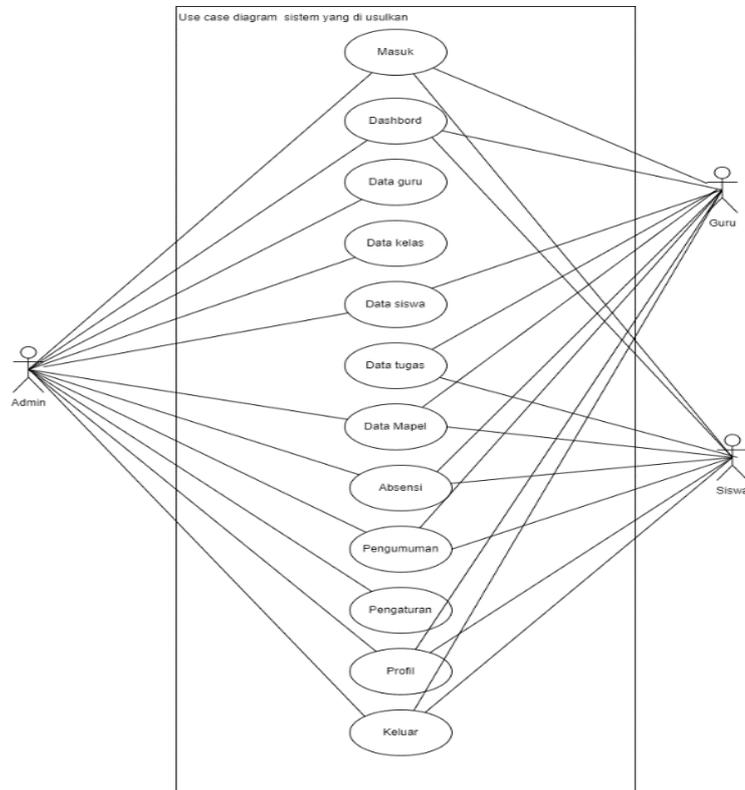


Figure 3 : Use a web-based electronic management system diagram

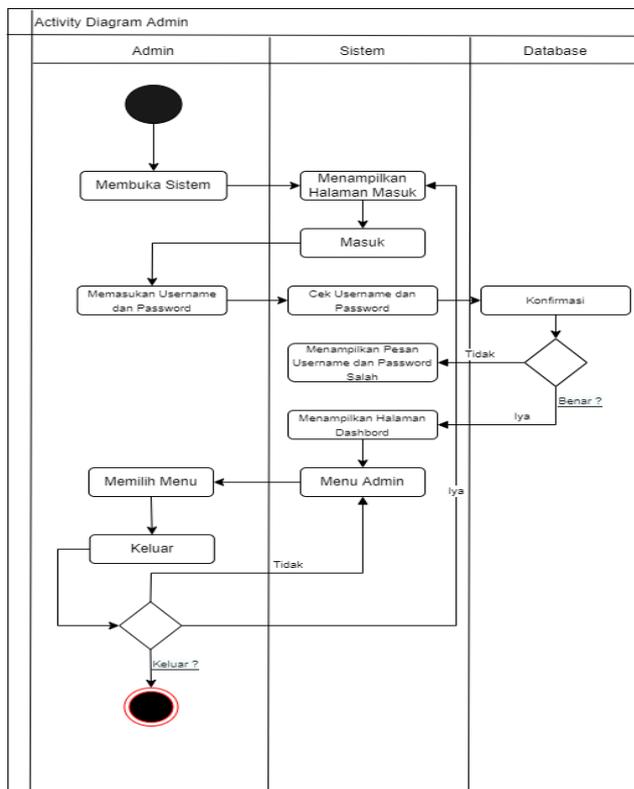


Figure 4 : admin activity diagram

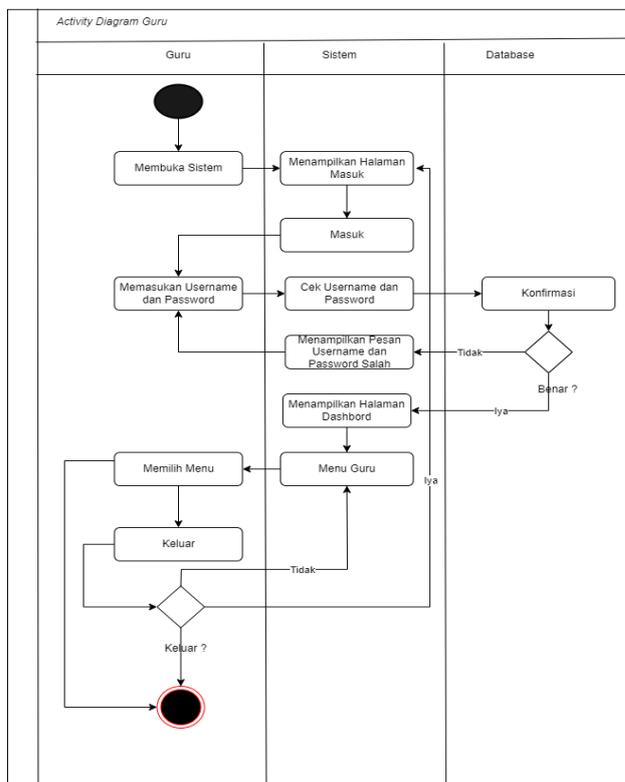


Figure 5 : teacher activity diagram

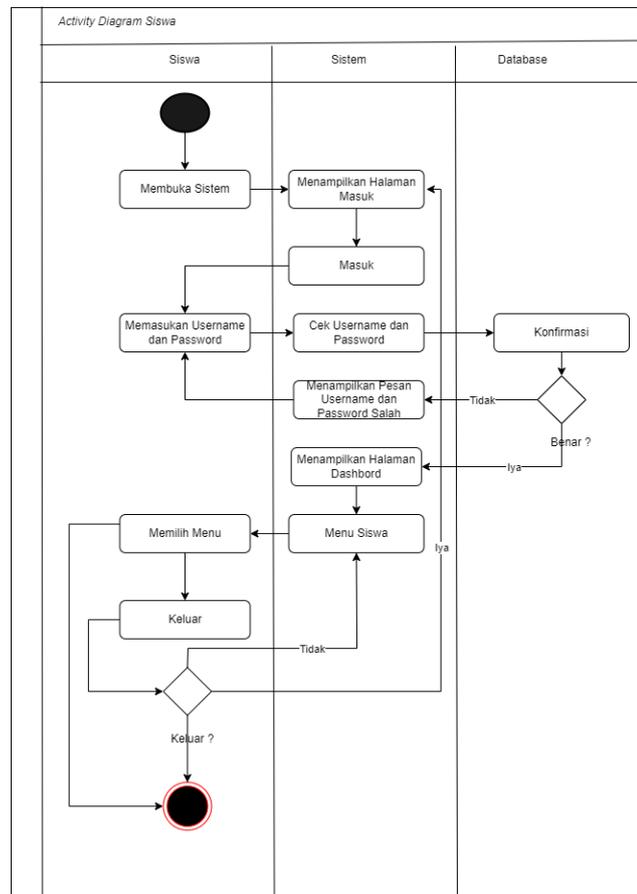


Figure 6 : student activity diagram

Display Design

The dashboard page design can be seen in the following image.

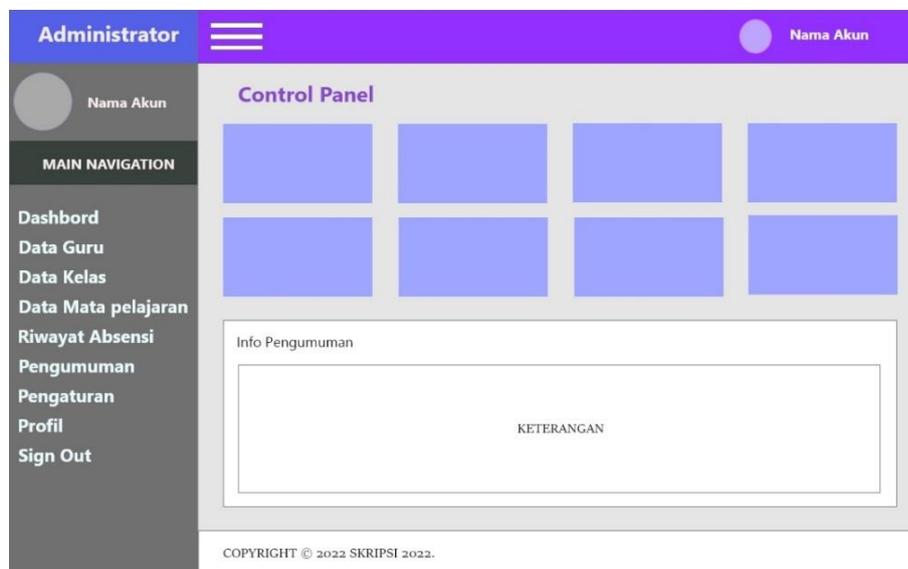


Figure 7 : designing dashboard page view

Test

Testing is the stage of testing the system that has been made whether it is appropriate or not. In testing this website-based electronic management system, the author uses the black box testing method.

Documentation

Documentation is the stage where the author does documentation of the system interface that has been created.

Dashboard Page View

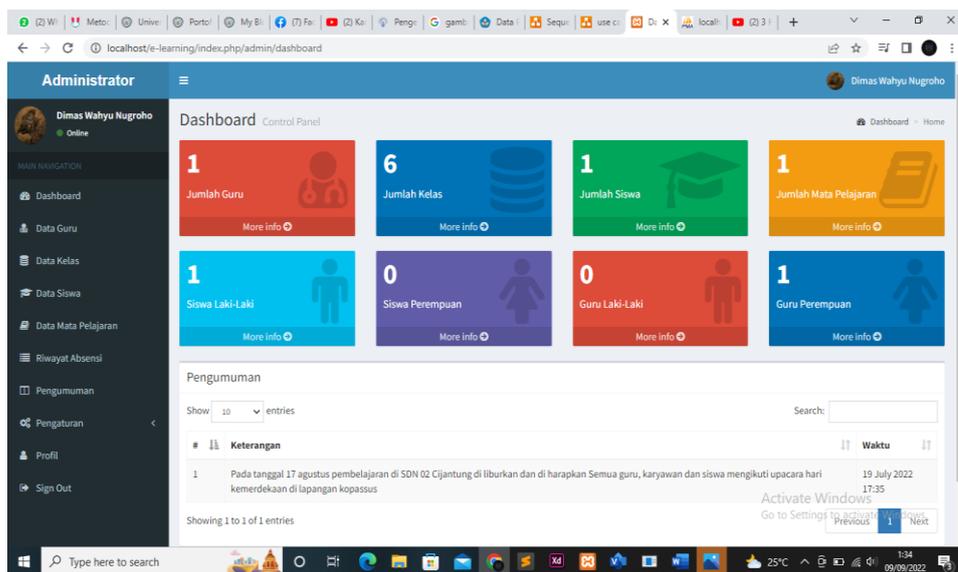


Figure 8 : Dashboard page documentation display

The picture above is a dashboard page display of the website-based e-learning management system that was built. On the dashboard page there are 10 menus that users can choose according to their needs.

Teacher data page view

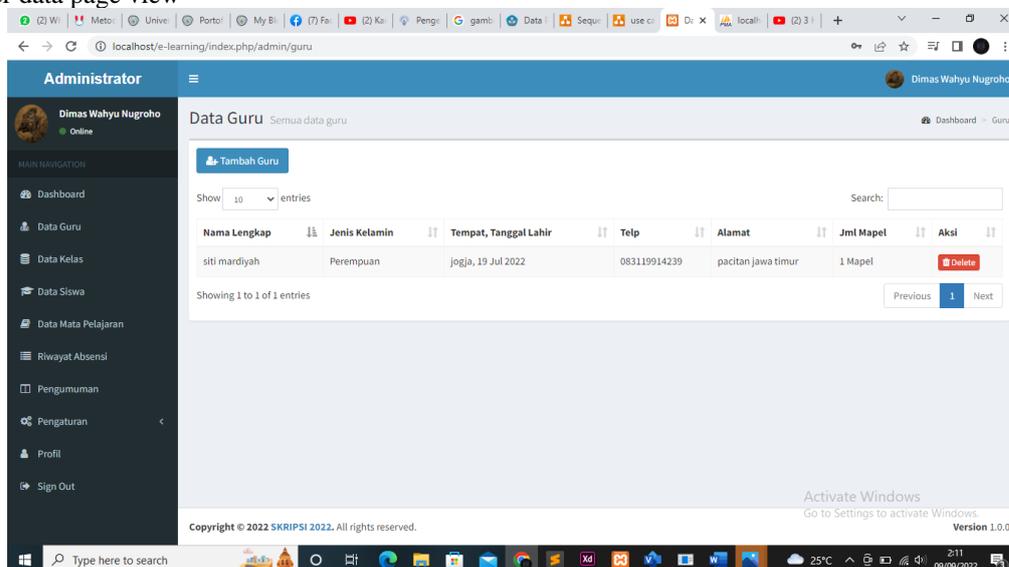


Figure 9 : Teacher's Page View

The picture above is a teacher page view. On this page the user can add and delete teacher data.
Class Data Page View

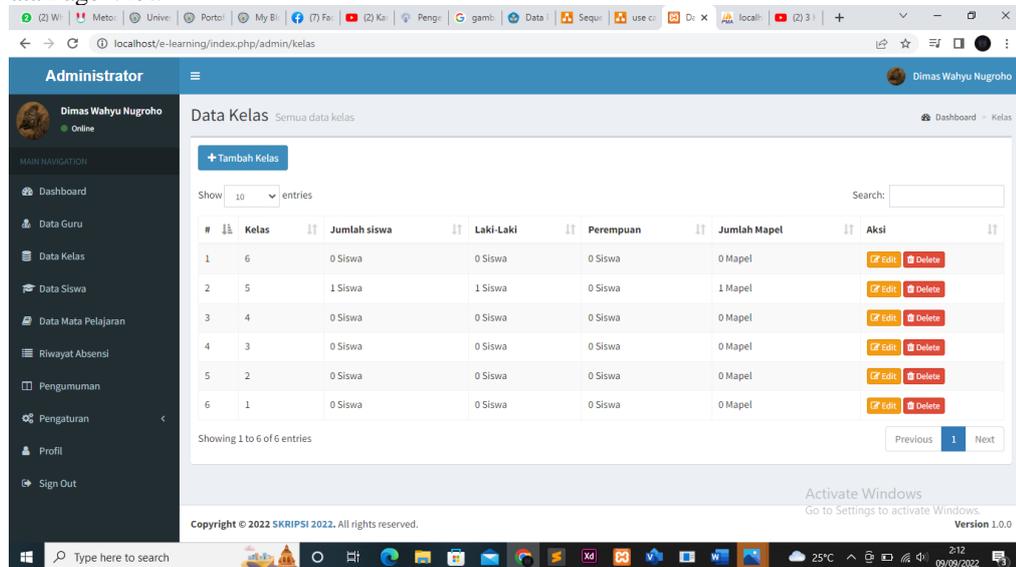


Figure 10 : Class Data Page Display

The image above is a class data page display. On this page the user will be able to add, delete and edit class data.

Student data page view

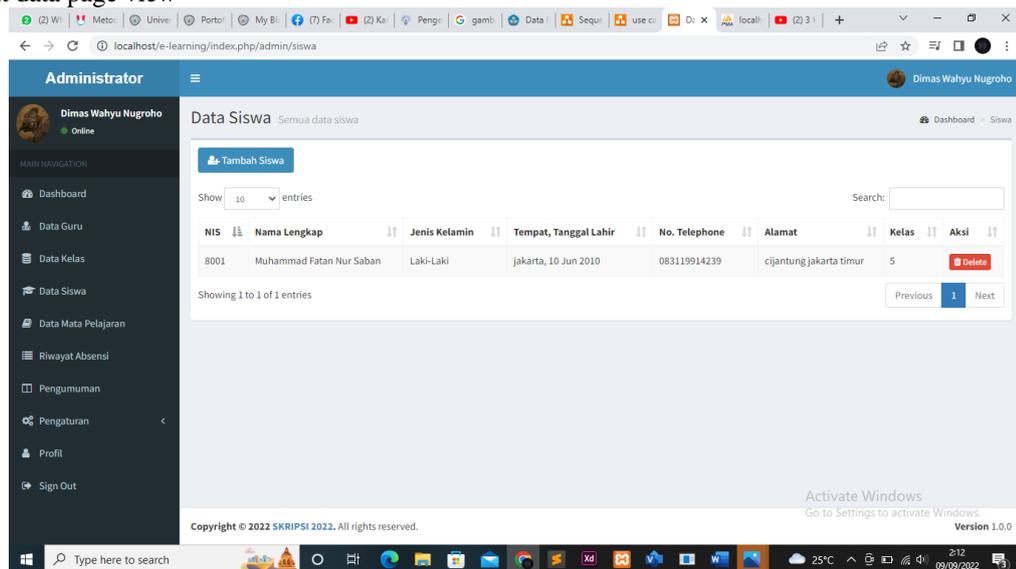


Figure 11 : Student Data Page Display

The picture above is a view of the student data page. On this page the user will be able to add, delete student data.

Maintenance

At this stage maintenance or maintenance of the system is carried out by the user, namely the admin, before that the admin can be taught and told by the programmer how to perform maintenance/maintenance of a system. Maintenance can be done 1 or 2 months, the following maintenance can be done, namely:

Check the system, changes and errors may occur when the system is used. Because at the time of testing there may be errors that are not detected or the hardware used does not support it, it is necessary to check so that it can adapt to the hardware used. In checking the system, the admin can be helped by the programmer. Perform routine virus checks to maintain system security so that data or information is protected. Perform a backup (backup) important data, if at any time something goes wrong and the data disappears, the data can be restored again. Provide a little free space on the partition where the system is located, so that the system works optimally and computer performance is not slow.

Conclusion

Based on the research, discussion in previous chapters and the results of the stages of the waterfall model of designing a website-based e-learning management system at SDN Cijantung 02, it can be concluded, as follows: (1) This system can be designed by following the following steps: waterfall model as expected. This system can be used as a means to support teaching and learning activities and can support teaching and learning activities between teachers and students at SDN Cijantung 02 at the current condition. (2) In this system, teachers can manage materials, absences, assignments, exercises, and exams and students can download materials, do assignments, exercises, and exams and students can see the results of assignments or exercises and exams. In addition, students can also watch YouTube videos with the share link feature of learning videos on their respective maps.

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