Design of Web-Based E-Learning Application

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Abstract. This research aims to design a Web-based E-Learning Application at Rumah Belajar LCC-Line. The methods used in designing applications use prototype methods, starting from listening to user needs, building mock-ups of applications, and testing mock-up of applications to users. Systems analysis method uses Object Oriented Analysis and Design (OOAD), and Unified Modelling Language (UML) as a system design tool. The results of this research is a web-based e-learning application design that consists of interaction design between users, data design, and interface design. This E-Learning Application Design can be used to develop and implement E-Learning Applications. With this Web-Based E-Learning Applications can help the process of distance learning so that the learning process becomes more effective and efficient.

1. Introduction

Rumah Belajar LCC-Line is a non-formal educational institution for high school and junior high school students. One of the problems faced by instructors at the Rumah Belajar LCC-Line is the limited time in the learning process, and there is no medium that connects the students with the instructors for the learning process outside the classroom. Therefore, Web-Based E-Learning Applications are required to solve the problem.

The previous research that discussed E-learning theme such as research [1] make an E-learning application in SMK Negeri 1 Painan so that students more easily and develop in getting knowledge in learning. The research [2] makes E-learning application aims to help students learn at SMA Pusri Palembang in preparing for the national exam by providing the function of downloading material, doing exercises, exam and can communicate directly. In research [3] developed mobile-based e-learning applications and in research [4] developed e-learning applications based on Android mobile smartphones. In research [5] development of web-based e-learning application for learning activities at universities. In research [6] explains the application of web-based e-learning to improve learning and teaching in pre-schools However, in this research, the E-Learning Application is designed for non-formal educational institution to process registration student, to process student attendance data, group discussions, provide lessons, giving and take the assignment, and online assessments.

This research aims to design a Web-based E-Learning Application at Rumah Belajar LCC-Line. The results of this research are the interaction design between a user with the application, data design, and interface design. This application will be developed using PHP programming language and MySQL database. This application expected to help the process of distance learning without always be done with face-to-face, so that the learning process becomes more effective and efficient.

2. Methodology

System development methods used by the author is to use the prototype method as a method of development with the existence of several advantages and in accordance with the problem that would authors lift. One of the users can play an active role in system development and system implementation (Figure 1).
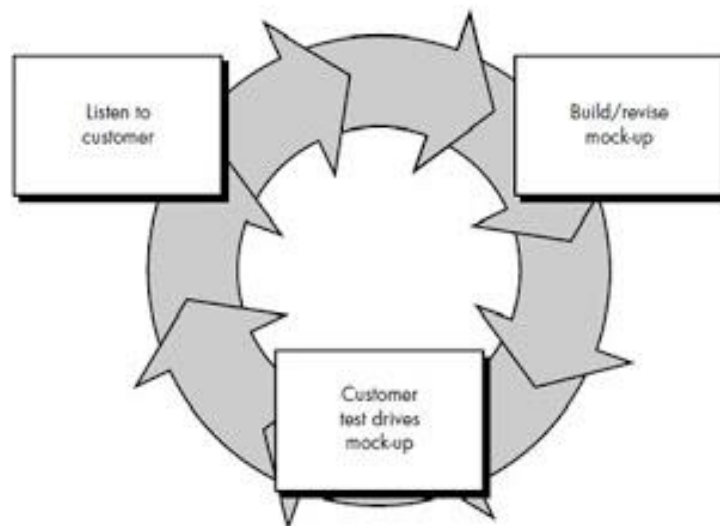

Figure 1. Prototype model.

System development method used is prototype method. Steps of system development start from identifying user needs. User needs are obtained by way of observation and interviews to the user. Next is a system design consisting of data design and interface design resulting in a mock-up system. Next is the system mock-up testing to the user. If the mock-up system does not meet the needs of users, it will be repaired. This process is done continuously until the system mock-up in accordance with the needs of users

3. Result and discussion

Evaluation of the current learning system aims to obtain the best solution to the problem and create a system change. After the author doing observation and analysis research on Rumah Belajar Line-LCC, the author found problems on the learning system that is running, but the ongoing learning system is not a problem that must be removed but here the author will make the addition of computerized or online system at Rumah Belajar Line-LCC, The problem can be seen in (Table 1):

Table 1. Evaluation of current learning system.

A	Problem	Solution
1	There is no medium of information between instructors and students when it is outside the classroom, not to mention situations where the instructors may be unable to attend	Build a web-based online learning application that can help instructors stay in touch with students even if they are outside the classroom or unable to attend, such as providing libraries so that instructors stay on teaching materials, then students just download if necessary on the form that has been provided
2	Not enough time of meeting between instructors and students in because of the implementation of teaching and learning to do in the afternoon so there are still many things that may be asked in the question by students, whether it is about the material and the task of the school	Build a web-based online learning application that can make students and instructors always able to discuss despite being outside the classroom without any time limit. Instructors live to upload the discussion materials in the form of pdf, then instructors and students can discuss online on the form that has been provided
3	Parents of students are quite difficult to find out the presence or learning outcomes of students during the tutorials in Line-LCC.	Build web-based online learning applications that can also help parents in monitoring students is by way of login on student accounts and can check attendance and tryout score on the form that has been provided
4	So far, the learning of Line-LCC has not applied any data of students either written or computerized	Provide database system to store data related to learning activities

Use case diagram is a diagram that shows the functionality of a system or class and how the system can interact with the outside world and explain the system functionally visible user. Use case diagrams also describe the expected functionality of a system. Below is designed use case diagram of E-learning Application (Figure 2):
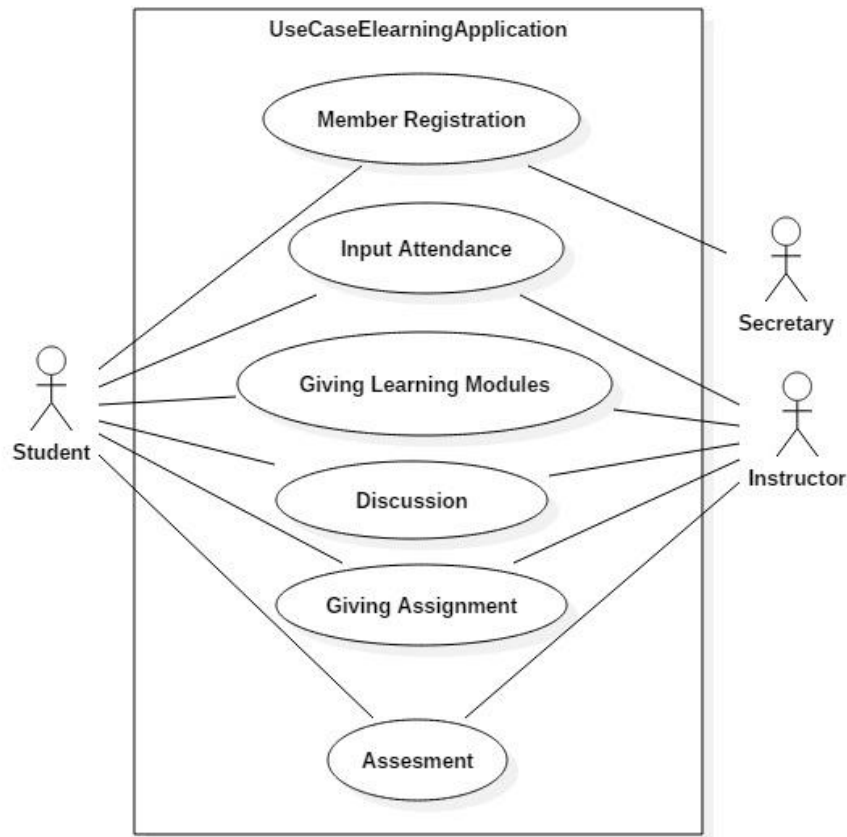
Figure 2. Design of use case diagram.

Application design consists of student registration process, student attendance input, giving learning modules, personal or group discussions, task assignments, and online assessments by instructor. Students can also view attendance reports, access the lesson module, download, and upload tasks, and view assessment online. Interface design is a description of the view that will be used by the user. There are several items contained in the interface design such as the determination of the menu structure in the application, the input-output proposed in each function. (Figure 3) is an interface design for uploading tasks

Figure 3. Design of interface upload task.

4. Conclusion

Based on the results of this research, it can be concluded that the design of web-based e-learning applications can be implemented in Rumah Belajar LCC-Line. This application can enable distance learning. This application can help learning activities that facilitate access to course material, personal and group discussions, task assignments, and online assessments.

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