Implementation of User-Centered Design in the Online Seminar Application

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ARTICLE INFO	ABSTRACT
	Online seminars have many benefits in various fields of science. Information about workshops online, registration, and other activities so that it can help users get information. During the pandemic, COVID-19 had a strategic role in providing information related to the development of science and insight. The right application will provide optimal data and information to all users. The online seminar application is designed with a User-centered design to obtain user-friendly information and usability. The results of the study showed that the online seminar application that was designed had good usability and was acceptable to users. usability testing concluded that an acceptable application with a value of 82.40% and block box testing received the designed menu. Keywords: acceptable, black-box, system, usability, user-centered-design.

1. Introduction

The trend in 2020 is changing because of the pandemics COVID-19. Society starts new habits in various aspects of life. The protocol in handling pandemics is done to reduce and break the distribution chain. Physical distancing, wearing a mask, and washing your hands are all rules that must be obeyed and implemented. The education world applies a policy that teaching and learning activities (KBM) must be online and not face to face until the specified time [1]. The online learning process will be new to all levels of education, starting from elementary school to college.

Technology and communication are the leading centers in providing solutions in the online teaching and learning process. The presence of mobile technology has brought significant changes in the development of information technology [2]. Almost every day of our daily activities is inseparable from mobile technology. Communication activities become a favorite application on mobile technology, especially the presence of social media, which is one of the "killer applications" in mobile applications [3] [4]. The online seminar application is a system designed to help users find information related to seminars conducted online.

The development of technology following the needs of the community is a top priority in building an application. Making applications, in general, are more inclined to making applications only without considering the user's desire to use [5]. Usability is a factor, and attributes that affect an

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application can be said to be good or not [6] [7]. Building an information system that has a high level of usability and a good level of comfort for users, we need a method that has a concept where a user is at the center of the development of the system [8].

User-centered design (UCD) is a method that prioritizes users as an essential point in designing applications [9] [10]. The designer can be seen from a more specific user point of view. What is needed by the user and to make a good design. The designer cannot use abstract things, must know the real things that happen in life, can be applied and feasible. This study aims to create an online seminar application using the UCD method. To get the results of the system following the wishes of the user. The application designed will assist users in receiving and finding information optimally.

2. Research Method

System design is the stage or step after the problem is defined as well as user needs. There is a clear picture of what will be done. The purpose of the system design is to meet the needs, a clear picture that can be implemented. In designing the system, the User-Centered Design (UCD) method is used to answer questions about the user, the task, and its purpose [11]. Evaluation results are used to determine its design and development with a usability approach (**Figure 1**).
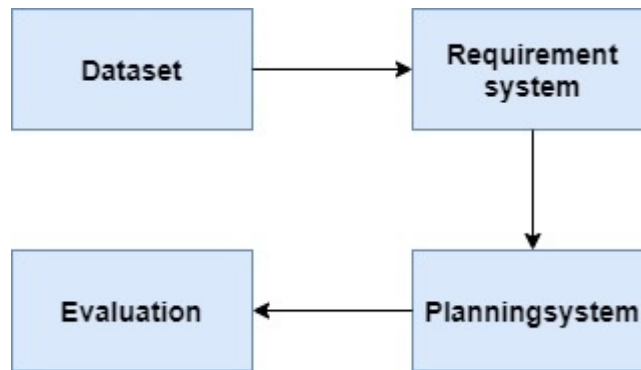

Figure 1 Research Framework

2.1. Dataset

The dataset in making an online seminar application is obtained from interviews with users by asking several questions. In the next stage, make observations about what data requirements in the application. The data obtained in the form of questionnaire results provided before doing the requirements and system design.

2.2. Requirement and Analysis system

Analysis of application requirements is done by analyzing software to determine information, models, and specifications of the system. The process carried out by analyzing the application is dynamic, which aims to facilitate the users in obtaining information precisely and accurately. Based on the included software development technical documents, several functional and non-functional requirements [12] (Table 1).

Table 1 Functional and non-functional requirements

No	Function	Description
1.	Menu module system	Menu for users to choose the system module to be

		used.
2.	Module registration / sign up	Module for users to register for seminars.
3.	Seminar data and information processing	Functions used to manage agenda data, news, participants, and information related to online seminars.

2.3. Planning system

The application will be designed according to the user's wishes based on the user-centered design (UCD) method. The design phase involves several objects in the system design. Users will provide information about what is needed by the system. Users provide input about the system used and find errors on the system to be repaired.

1. Use case diagram

The design of the application in an online seminar was explained in detail using a use case diagram (Figure 2) [13]. Users or actors on the system consists of two, namely the admin on duty or responsible for managing and managing the system properly. The second actor is the user who interacts directly with the system services provided by the participant.
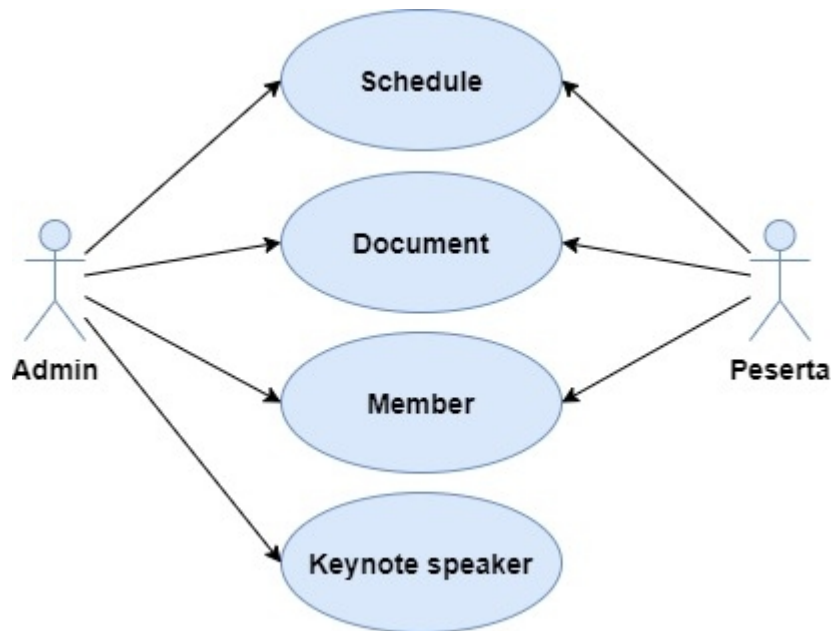

Figure 2 Use case study diagram of online seminars

2. Planning the menu display

Menu Display is the result of a system that can be seen in the form of results in hard media such as paper or results in soft media in the form of displays on the monitor layer. In designing this system using the User-Centered Design (UCD) method, so the system design directly focuses on the user as the user. Design evaluations have user feedback collected at the start of application design. The wide-ranging prototype and feedback are used in the system's floating design process. Designing a user-centered system requires observation of the user. The interview also represented other users who wanted to participate in an online seminar when they could provide information clearly and when interacting with the system. Based on the test results of the interface system designing this online seminar application according to the user's wishes.

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2.4. Evaluation system

System evaluation is the system design stage starting from data searching. Conduct direct interviews with users so that the conceptual design of the system will affect the needs. In every system design and design, the user must be involved continuously until the system is complete and following user needs. Integrated design includes a user interface, help system, technical support. Usability testing is used to evaluate whether a system is designed to be accepted by users or not based on the results of the questionnaire (Figure 3) [7]. The evaluation results have three decisions, not acceptable means the system design will not be accepted by the user, and UCD does not contribute. Marginal is an evaluation result that must be reconsidered whether it can be used with revision or not accepted. Acceptable results state that the system designed can be well received by users with circumstances needing improvement or is appropriate.
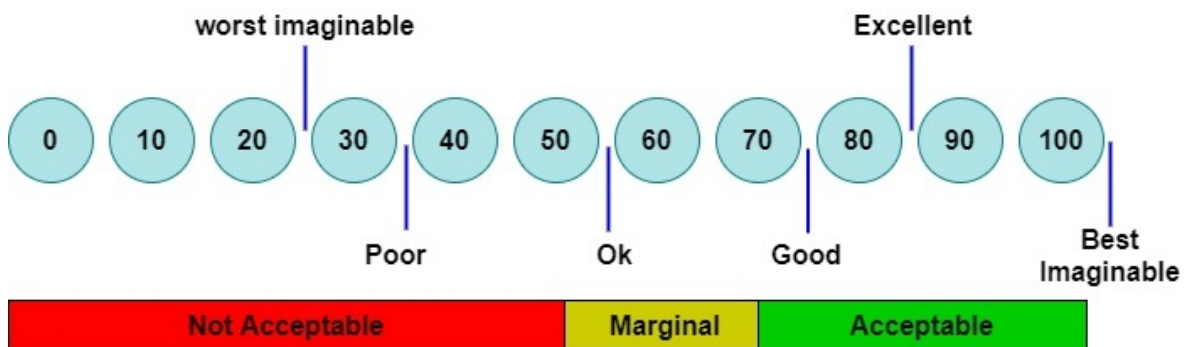

Figure 3 Range usability test UCD

3. Results and Analysis

Usability testing is done to get the result that online seminar applications can be used according to the user's wishes. For usability testing, 10 questions were used, which referred to the system design using UCD (Table 2). The questionnaire was filled out by 15 respondents to prepare and evaluate system requirements.

Table 2 Results of the questionnaire on usability testing

No	Respondents	Age	Gender	Results									
				Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	Respondents 1	20	F	3	3	5	3	4	4	4	4	5	4
2	Respondents 2	23	F	5	4	3	4	3	4	5	4	5	5
3	Respondents 3	27	M	4	3	5	5	3	3	4	5	5	4
4	Respondents 4	23	F	4	3	5	3	5	5	4	4	4	3
5	Respondents 5	30	M	5	3	4	5	4	4	3	3	5	3
6	Respondents 6	21	F	3	4	5	5	5	3	3	5	4	5
7	Respondents 7	29	M	3	3	5	3	4	5	5	5	4	4
8	Respondents 8	30	M	3	5	3	5	3	5	3	3	3	3
9	Respondents 9	30	M	4	5	5	5	5	4	4	5	5	4
10	Respondents 10	28	M	5	3	4	4	4	5	5	5	4	5
11	Respondents 11	24	F	4	5	4	5	5	3	3	3	4	4
12	Respondents 12	22	F	3	4	5	3	5	4	3	3	5	5

13	Respondents 13	25	M	4	3	4	4	3	4	3	5	3	4
14	Respondents 14	21	M	5	4	5	5	3	3	4	4	3	4
15	Respondents 15	28	M	4	4	5	5	4	4	4	4	5	5

3.1. Implementation of online seminar applications

At the implementation stage, the online seminar application is conducted after modeling and designing the UCD. The interface in the system is designed based on input from participants and questionnaire results that have been distributed. On the system login page can be done by entering the username and password that you already have (Figure 4). The login process has a problem, so you can reset the password. Twitter and Facebook social media bottom and the module on sign up can be used to register if online seminar participants do not yet have access rights to the system.
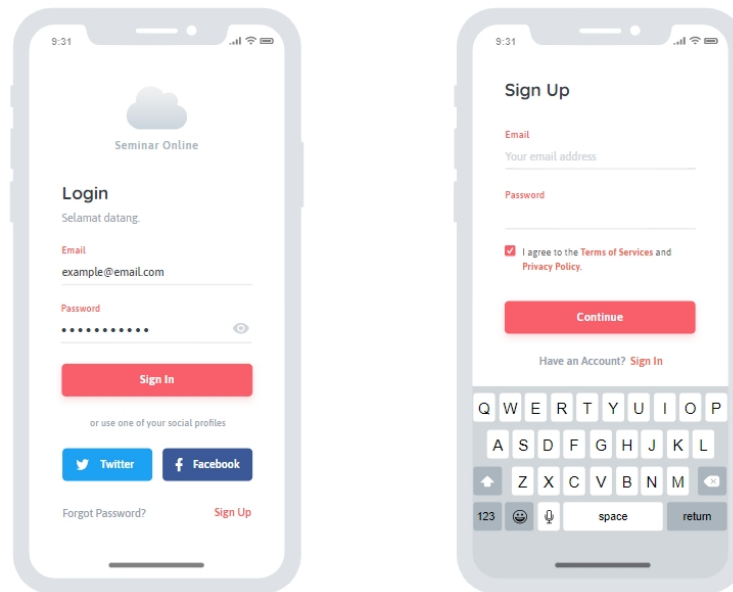

Figure 4 Menu Login online seminars

Figure 5 presents the results of the seminar participant data report for each activity. The first day of the online seminar was attended by only 40% of the participants who registered. 64% and 90% of the number of participants who take part in online seminars on the second and third day.
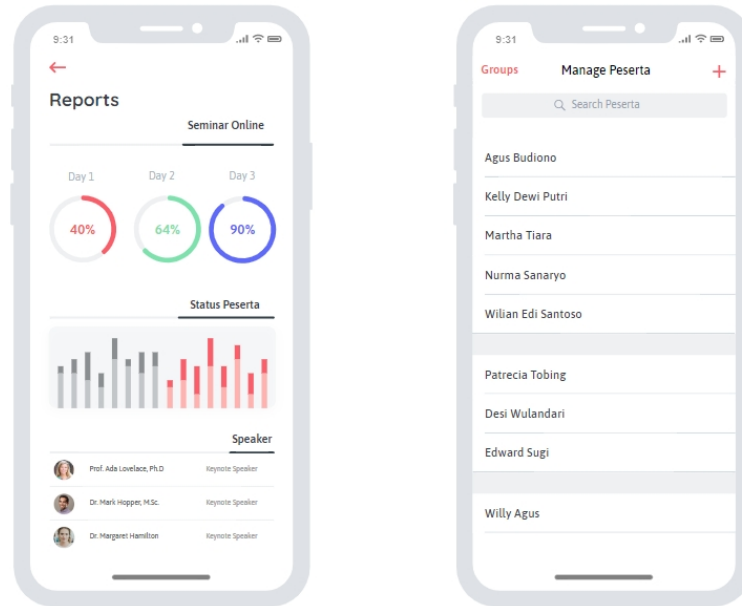
Figure 5 Participant and member seminar online status menu

3.2 Black box testing

Black box testing is done as a functional system test, whether the functions and menus are available and working well [14] [15]. This test is carried out together with data collection for usability testing (Table 3).

Table 3 Result black box testing

Function	Expected results	Results Obtained	Conclusion
Login process	Users can enter the login system page.	The start page for login is displayed successfully.	Received
Logout process	The user exits the system.	Return to the login page.	Received
Register online participants	Users can register on the system.	The registration page displays all the participant's attributes.	Received
Change and display seminar data online	Seminar information can / cannot be successfully changed in the database.	The notification was successfully displayed, and there was no data change.	Received

3.3. Usability

From the results of the average usability test conducted from 10 questions obtained an average value with a range of 3.73 to 4.47 (Table 4). The average value is given a range of 1 - 5 based on the initial review when designing the application. One indicates that the application is not recommended and vice versa. The range produced by respondents as a whole has more than enough value to state that the design of an online seminar application is recommended.

Table 4 Result usability testing in 15 respondents

No	Result									
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	3	3	5	3	4	4	4	4	5	4

2	5	4	3	4	3	4	5	4	5	5
3	4	3	5	5	3	5	4	5	5	4
4	4	3	5	3	5	5	4	4	4	3
5	5	3	4	5	4	4	3	3	5	3
6	3	4	5	5	5	5	3	5	4	5
7	3	3	5	3	4	5	5	5	4	4
8	3	5	3	5	3	5	3	3	3	3
9	4	5	5	5	5	4	4	5	5	4
10	5	3	4	4	5	5	5	5	4	5
11	4	5	4	5	5	5	3	3	4	4
12	3	4	5	3	5	4	3	3	5	5
13	4	3	4	4	3	4	3	5	3	4
14	5	4	5	5	3	3	4	4	3	4
15	4	4	5	5	4	4	4	4	5	5
Average	3.93	3.73	4.47	4.27	4.07	4.40	3.80	4.13	4.27	4.13
Usability	78.67	74.67	89.33	85.33	81.33	88.00	76.00	82.67	85.33	82.67

The implementation of UCD in the online seminar application shows an average value of more than 70 so that it is acceptable (Figure 3).

4. Conclusion

The online seminar application was designed well using UCD) based on black-box testing and usability tests. Black box testing gives the result that the system is acceptable and functions no problems. Usability testing on 10 questions has a value at Q1 78.67%, Q2 74.67%, Q3 89.33%, Q4 85.33%, Q5 81.33%, Q6 88%, Q7 76%, Q8 82.67%, Q9 85.33%, and Q10 82.27%, so it is declared as a user-friendly system with a good level of usability. Online seminar applications to meet user satisfaction and get all information about the seminar flexibly and optimally.

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