

Evaluation of Heuristic Portal Lecturer at XYZ University Bandung Indonesia

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Abstract: The lecturer portal at XYZ University is used to support lecturer activities at a university. The purpose of this paper is to test the usability of the information system on the XYZ University lecturer portal whether it is in accordance with the acceptability criteria of usability testing. The test method uses Nielsen's heuristic evaluation with Nielsen's ten principles. The high level of popularity and use of the system by users to help them is related to the high level of usability. The test involved 5 evaluators who acted as idea givers, critics and evaluators from 10 aspects of usability as material for analysis. The results of the analysis show that there are independent variables that have a dominant influence on the usability of the application, namely the visibility of the system variable, the recognition rather than recall variable, the error prevention variable, the flexibility and efficiency of use variable and the help and documentation variable. The results showed that the questionnaire index value of the XYZ University lecturer portal information system has a severity rating of 0.67, which means that the problem does not have to be fixed directly, but can be fixed when there is development.

Keywords: Usability, Evaluation, Heuristic

1. Introduction

The lecturer portal is a portal that can be accessed by lecturers via a web browser. When a user accesses a website page, at that time an interaction occurs between the user and the computer or device used to open or access the web browser. This interaction is called human computer interaction. Human Computer Interaction (HCI) can be defined as computer-human interaction, is a multi-disciplinary focus on the design, evaluation and implementation of computer system interactions used by humans and other things around them. [9].

In a website, user satisfaction is a measure of success, meaning that if the website is easily accessed by users, it can be said to be successful, and vice versa [1]. There is an approach that can be used to measure user experience, namely the usability aspect approach that can see the success of a website from its use. We can judge a product can be used by certain users to achieve certain goals and satisfaction in a particular usage context in terms of effectiveness and efficiency [2].

In the usability aspect, there are 3 aspects to measure the success of a website, namely effectiveness, efficiency and user satisfaction and comfort. Effectiveness can be seen to what extent the user's success in running the website, efficiency is related to user efficiency and accuracy in running applications and user satisfaction and comfort with regard to accessing the website [2].

A good website can increase the interaction between users and the system, which makes users return to visit the website, while a bad website will make users bored and uninterested and dissatisfied when visiting the website. However, to meet this need, there must be a method used to find usability problems, the method used is heuristic evaluation. With the heuristic evaluation, it is expected to be able to increase the success of the website in understanding the user experience [3].

This research is a preliminary study that focuses on the use of evaluation methods, especially the ease of use (usability) in relation to human and computer interactions, using the XYZ University lecturer portal as the object of research. This preliminary research is used as a general description before carrying out further research that is more in-depth and thorough using other evaluations so that it can be used as an evaluation medium, and of course the results can be used as input, so that in the future the XYZ University lecturer portal can provide a very meaningful value for lecturers, and related stakeholders.

2. Literature review

Heuristics evaluations are general principles, guidelines, or that can guide design decisions or are used to criticize decisions that have been taken. Heuristic evaluation aims to improve the design effectively. The evaluator can evaluate the performance of a series of tasks to see if it is in accordance with the criteria at each level. If an error is detected, the design can be reviewed before the implementation level. Therefore this approach is more flexible and relatively inexpensive [6].

Heuristic evaluation is the best used to design evaluation technique, because it is easier to find usability problems that arise. This evaluation needs a software that will be researched or a storyboard is needed for the system to be made [3]

3. Heuristic Evaluation Rules

There are ten principles in Heuristic Evaluation [5], that is:

1. Visibility of the system status (feedback). The system must always inform the user what is going on, through good messages and at the appropriate time.
2. Match between the system and the real world, the system must speak in accordance with the language of the user, using words, sentences, and concepts commonly used by users.
3. Use Control and Freedom. Users must be able to freely choose and do work (as needed). Users must be able to make their own decisions (with clear information) regarding the work that is being / will be carried out. The system must have the capability to undo and redo.
4. Consistency and Standards. Users do not need to question any more about differences in understanding of words and sentences, situations and actions. All must have followed the existing standards.
5. Error prevention. Designing a system that prevents errors from occurring is better than designing good error messages.
6. Recognition Rather than Recall. Help users to recognize, diagnose, and solve problems. Users do not need to question the difference in understanding of words and sentences, situations and actions. All must have followed the existing standards.
7. Flexibility and Efficient of Use. How to create a system that accommodates users who are already experts and users who are still beginners. Provide alternatives for users who are "different" from ordinary users (physical, cultural, linguistic, etc.).
8. Aesthetic and Minimalist Design. The system only produces relevant information, irrelevant information reduces the visibility and usability of the system.
9. Help users recognize, dialogue, and recovers from errors. The creation of objects, actions and choices must be clearly visible. Users do not have to memorize information from one page to another. Instructions and information on the system should be easily accessible and clearly visible when needed.
10. Features help and documentation. The system must have relevant documentation and good help features, so that users can learn everything related to the system..

4. Methodology

This study focuses on evaluating the ease of use of the lecturer portal by providing recommendations on the object of research. The methodology used is the Molich and Nielsen version of the heuristic evaluation.

This research has stages starting from literature study, data collection, analysis and reporting. The literature study aims to obtain the data and references needed, data collection and analysis to provide an overview of the assessment and selection of the method used. The website evaluation uses the Nielsen ten heuristic evaluation method by distributing questionnaires, then calculating and recapitulating the average results of the test scores on XYZ University lecturer portal, then analyzed and ended with drawing conclusions.

Based on the analysis of advantages and disadvantages by Nielsen, it is stated that the recommendation for the number of examiners in the heuristic evaluation process is three to five people. Basically, heuristic evaluation is not easy to do, because it is very difficult for individuals to be able to find all usability problems in an interface design. However, heuristic evaluation has been widely used because the process can be carried out in a short timeframe and with limited funds [7, 10].

The method used in this study is divided into two, namely distributing questionnaires to the research object being tested and calculating the results of the heuristic evaluation of the lecturer portal. The questionnaire was distributed to 5 respondents. Fill out the questionnaire developed from the existing heuristic evaluation methods. Development is related to the Usability dimension and question attributes on the questionnaire. The selection of

dimensions and attributes is based on the results of previous literature studies, in order to obtain a questionnaire design that aims to capture problems and assess usability more accurately. Usability aspects and the development of usability sub-aspects can be seen in table 1.

Table 1. *Heuristic Evaluation Aspects*

No	USABILITY ASPECTS	CODE
1	Visibility of system status	H ₁
2	Match between system and the real world	H ₂
3	User control and freedom	H ₃
4	Consistency and standards	H ₄
5	Error prevention	H ₅
6	Recognition rather than recall	H ₆
7	Flexibility and efficiency of use	H ₇
8	Aesthetic and minimalist design	H ₈
9	Help users recognize, diagnose, and recover from errors	H ₉
10	Help and documentation	H ₁₀

The test involved 5 evaluators who acted as idea givers, critics and evaluators from 10 aspects of usability as material for analysis

Data Analysis Method

After distributing the questionnaire, the calculation of the results of the questionnaire was carried out by calculating the average of each attribute for each developed usability principle. The heuristic evaluation value is obtained by performing calculations based on Table 1 [17]. Every aspect of usability is evaluated heuristically. has a usability sub-aspect which is a development point in accordance with the usability aspect [8].

The calculation for the heuristic evaluation uses the equation (1):

$$\sum Hx = (0*x) + (1*x) + (2*x) + (3*x) + (4*x) + \dots (1)$$

With,

$\sum Hx$ = the number of rating scores from the usability sub-aspect in each usability aspect (H1, H2,, H10)

x = usability points, worth 1/0

To produce the severity rating for each usability aspect, the equation used was (2):

$$Sv = \frac{\sum Hx}{n} \dots \dots \dots (2)$$

With,

Sv = the severity rating results in one aspect of usability

n = The number of usability sub-aspects in each usability aspect [8]

Table 2. Severity Rating Scale

Severity Rating	Keterangan
0	There were no problems or deficiencies in usability found
1	For cosmetic problem category, the problem does not need to be fixed unless the project time is still available.
2	The category of minor usability is given a low priority repair

3	Major usability problem category, main usability problem, important improvement is made, therefore it is given high priority
4	Catastrophe usability category, this problem of repair must be done before the product is launched

5. RESULT AND DISCUSSION

The following is the appearance of the lecturer portal

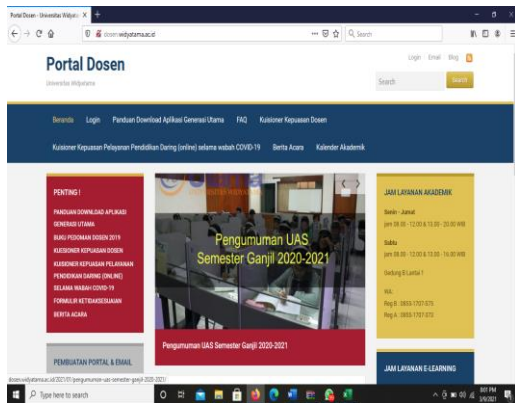


Figure 2: Lecturer Portal Display

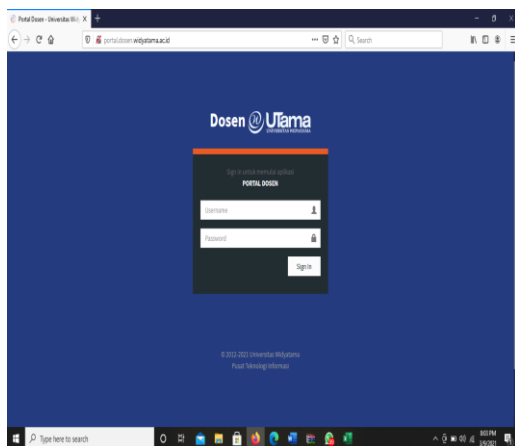


Figure 3 Login Display

Aspects and sub -aspects of usability can be seen in table 3

Tabel 3. Aspects and Sub -Aspects of Usability

No.	Aspects Usability	Sub- Aspects of Usability
1	Visibility of system status	<ol style="list-style-type: none"> Each page has a title describing the content on the web portal. Every symbol or icon as well as the design on every page is always consistent.

		<p>3. Visual different responses when pressing or selecting a button.</p> <p>4. The menu and page titles match the contents</p> <p>5. Each page display or menu can show the difference</p>
2	<i>Match between system and the real world</i>	<p>1. Commonly, symbol, icon or thumbnail on web portal pages are easy to use and understand</p> <p>2. On the Lecture portal there is a choice of language.</p>
3	<i>User control and freedom</i>	<p>1. Help button on the lecture portal</p> <p>2. Search field options on the lecture portal.</p>
4	<i>Consistency and standards</i>	<p>1. All pages already have a title.</p> <p>2. The information section on each web portal page consistent for writing.</p>
5	<i>Error prevention</i>	<p>1. There is a notification or pop up if there is an input error.</p> <p>2. Commands on navigation are not confusing</p>
6	<i>Recognition rather than recall</i>	<p>1. Technical error message when failed to access the page</p> <p>2. Error message if the user fills in the wrong form</p>
7	<i>Flexibility and efficiency of use</i>	<p>1. The navigation menu is in accordance with the classification</p> <p>2. The entire navigation menu is sufficient information for user.</p>
8	<i>Aesthetic and minimalist design</i>	<p>1. The information display or navigation menu is easy to understand for novice users</p> <p>2. The menu layout is familiar and users can easily access it.</p> <p>3. Different colors of the navigation keys.</p>
9	<i>Help users recognize, diagnose, and recover from errors</i>	<p>1. The information displayed on each page already allows users to make decisions.</p> <p>2. The structure of each page is consistent and uniform</p> <p>3. The title of each page is clear and informative</p>
10	<i>Help and documentation</i>	<p>1. Help menu can help users</p> <p>2. Contact the help center so that users can contact if having problems</p>

Based on the results of the questionnaire it is stated that, 10 aspects of the heuristic evaluation method by Nielsen have a severity rating of 1 (one) which means that errors or deficiencies can be tolerated by the user. [19]. In other words, the usability problem in the lecturer portal is not a problem by the user and is considered not to disturb the user when accessing the portal. The highest severity rating is in the Match between system and the real

world aspect with a severity rating of 1.8. For the results of the complete heuristic portal lecturer evaluation questionnaire data processing results can be seen in table 2 below.

Table 4. Recapitulation of Lecture Portal Severity Rating

<i>Usability Aspects</i>	<i>Average value of Severity Rating</i>	<i>Value Rounding Scale 0-4</i>
<i>Visibility of system status</i>	0,6	1
<i>Match between system and the real world</i>	1,6	2
<i>User control and freedom</i>	1,2	1
<i>Consistency and standards</i>	0	0
<i>Error prevention</i>	0,8	1
<i>Recognition rather than recall</i>	0	0
<i>Flexibility and efficiency of use</i>	0,2	0
<i>Aesthetic and minimalist design</i>	0,8	0
<i>Help users recognize, diagnose, and recover from errors</i>	0,13	0
<i>Help and documentation</i>	1,5	2
<i>Average value of Severity Rating</i>	0,67	1

The results listed in table 4 are the average results of the questions that represent the usability sub-aspects made by the questionnaire and given an assessment by the evaluator, then the severity rating is obtained from the results of the data processing. From the table, it can be seen that there are several aspects of usability contained in the questionnaire, which have a high severity rating. These are the two questions that have the highest severity rating.

1. In the sub-aspect of Match between system and the real world, namely the choice of language for users on the lecturer portal page. With a severity rating of 1.6, in this aspect the problem that occurs is that there is no language choice.

2. In the sub-aspect of Help and documentation, namely the help feature is not available on the lecturer portal. With a severity rating of 1.5, in this aspect the problem that occurs, the system must have relevant documentation and a good help feature, so that users can learn everything related to the system. In addition, based on the results of the heuristic evaluation shown in table 4, the lecturer portal has a low usability problem, namely with an average value of 0.67 or scale 1 which is a cosmetic problem category, the problem does not need to be fixed unless the project time is still available. This problem can be fixed in future system development..

6. Conclusion

The conclusions of this study are as follows :

1. The results of the test are that there are several aspects whose values are below what they should be, but currently these aspects are not very important aspects, so that these problems can still be tolerated by users and do not interfere with user comfort when accessing the website portal.

2. From the test value, it produces a severity rating of 0.67, which means that the problem does not have to be fixed directly, but can be fixed when there is development.

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