



Evaluation and Redesign of Telkom University's Open Library Website Interface Using the Goal Directed Design (GDD) Method

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Abstract—As a university with World Class University quality, Telkom University provides information services with a website as the main source of libraries for its students. The website is called Open Library which provides information on all library collections owned by Telkom University which are open and can be loaned. One of the missions of this website is "To play an active role in increasing interest in reading and writing in the community". Because, a good digital library website is a library website that can increase the reading interest of users. Interface design is one of the most important elements to support the quality of digital libraries. Therefore, this study aims to evaluate the design and provide design solutions for the interface of the Open Library website. . The final evaluation used in this study used the System Usability Scale method. The System Usability Scale (SUS) is a measure of the usability of a product using a 10-question questionnaire developed by John Brooke. Of the 20 respondents who had filled out the questionnaire in the final evaluation, the result was 74.45. Where 74.45 is a score that has passed the average standard value of SUS.

Keywords: Interface; Library; Website; Design; Goal Directed Design; SUS

1. INTRODUCTION

A college uses a website to make it easier for students to access all the needs and any task that is needed related to collage. From registration, class selection, exams, to graduation registration. Everything will be easier with the help of a website that can meet the needs of students. With that, the use of computers is not only for playing games. However, there are many useful things that can be done, one of which is activities from colleges. As a university based on ICT (Information and Communication Technology), Telkom University should implement a media website to increase the use of technology in various activities. One of the websites created and used by Telkom University provides a web library site called "Open Library". digital library owned by the best private university version of the 2022 WUR (World University Ranking) should have a high appeal in order to increase one's interest in reading. is a digital library that can be accessed by the public. Telkom University Open Library Website is a digital library website that can be accessed by the public which was built to meet the needs of its users digitally. At the link <https://openlibrary.telkomuniversity.ac.id> this website provides various features including borrowing books, reading journals, room reservations in the library, and others. In general, the users of this website are students and lecturers. The Open Library website is a website that makes it easy for students to access all activities regarding the Telkom university library. This convenience can be obtained by paying attention to the usability element on the website. A good usability element can be done by having a good user interface design and according to the needs and objectives of the user. "However, users still experience difficulties in operating the website. Based on a survey conducted using the System Usability Scale (SUS) method and distributed questionnaires to Telkom University students.

Based on a survey conducted using the System Usability Scale (SUS) method and distributed to Telkom University students, an average score of 52.3 from 54 respondents means that the website has usability problems. The average score of SUS is 68, so if the resulting score is below 68, it is considered below average and has usability problems. Some of the causes that are a problem for respondents include the monotonous color selection that causes users to be disinterested and bored, the layout is not well organized which makes it difficult to find the flow of a service, having difficulty in searching, to sentences that are not well oriented. which causes respondents to not be able to focus in finding what is needed. This is important considering that the Open Library is the main source of Telkom's student library and also a digital library that is open and accessible to the public. Therefore, the researchers designed the interface prototype design on this website using the Goal Directed Design method and using the Figma application. This method is used to produce a user interface design that suits the user's goals. The development of a user interface that focuses on the goals (goals) of the user is expected to be able to fulfill the purpose of building the Open Library website [14]. So that users can use the website properly and according to the purpose. Then an evaluation was carried out using the System Usability Scale method in the hope of getting a score above the average.

There are previous studies that are similar to this research, such as "User Interface Recommendation using Goal Directed Design Method on PPDU Telkom University Website" by Ave Prasojo, Mira Kania, and Dawam Dwi Jatmiko Suwawi who explained how they used the Goal Directed Design method in building user interface on a website owned by Telkom University. The author conducted interviews with students and got the results that the PPDU website still did not help students in finding information [14]. They use the GDD method in the hope of being able to find out the goals of the users so that the results will be able to provide and facilitate users in achieving their goals and also expect to be able to provide design recommendations that are suitable for usability elements [14]. From the results of their research, it is suggested to build a system that can pay attention to the security level of the PPDU website and build a system that can interact between users and PPDU staff.

2. RESEARCH METHODOLOGIES

At this stage, a series of research methodologies will be explained. The following Figure 1 is an illustration of the flow of the methodology made.

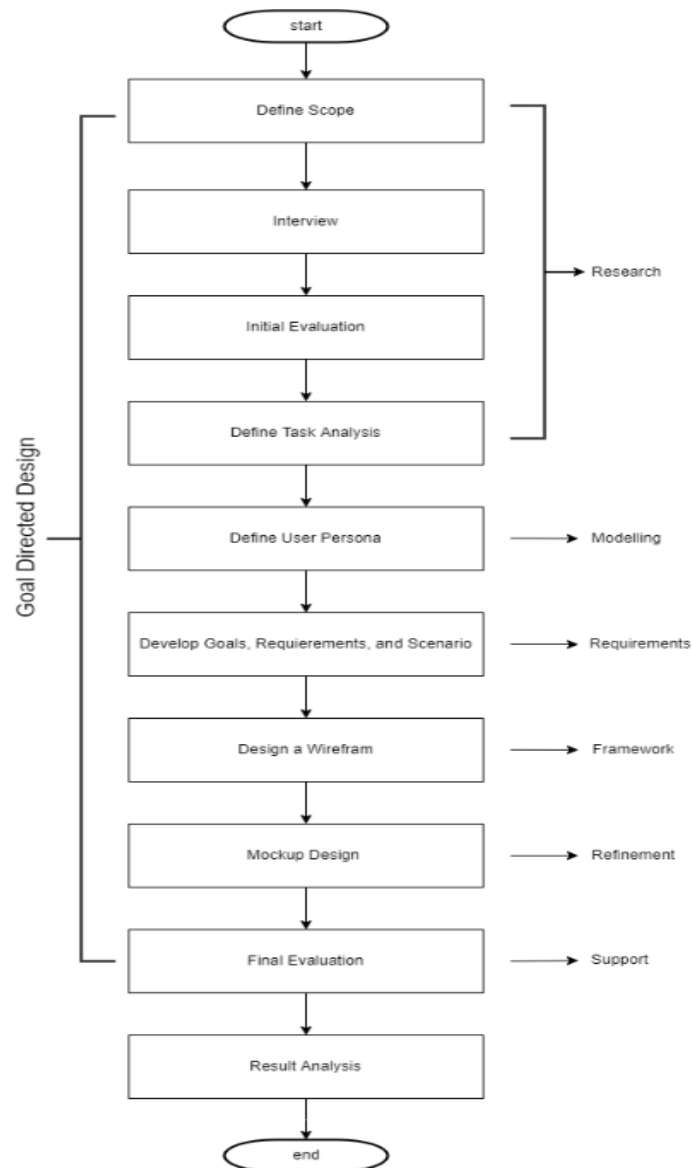


Figure 1 Research Methodologies

2.1 Research

Research stage is the stage that contains the need to be a complement to this research. Consists of 4 working steps, there are:

- a. Define Scope
Determining the scope is useful to make it easier for researchers to know the limitations they have in researching. So that the researcher understands what needs to be researched and done and does not cross the line.
- b. Interview
Interview is a question and answer dialogue between 2 humans which aims to find out what problems are experienced. With this, the researcher obtains original information from the interviewee and can provide solutions to the complaints they are experiencing.
- c. Initial Evaluation
Initial evaluation is an initial assessment step on the system under study and looks for problems from what is experienced by users of the system.
- d. Define Task Analysis
Task analysis can help researchers because with the analysis task, researchers can identify activities carried out by system users. Thus, researchers can use the analysis task as a guide to build designs according to user behavior.



2.2 Modelling

After getting the results from the research stage, the modeling stage was carried out. Modeling is the process of modeling the results that have been carried out at the research stage into a user persona. This user persona has several variables from users and stakeholder who have been interviewed. These include demographics, goals, needs, concerns, motivations, and behaviors.

2.3 Requirements

In this section, the user persona that has been created will be developed and identified the specific goals and needs of the user. So that researchers know in detail the goals of users and give birth to a better interface design solution.

2.4 Framework

The framework stage is processing the results of research, modelling, and requirements which are then defined into a user interface design sketch [15]. The result of this stage is a low-fidelity wireframe that contains layout information, and the work features of a system.

2.5 Refinement

After making the wireframe at the framework stage, the user interface design was refined from the wireframe that had been made into a high-fidelity mockup. The design is made in detail with a high degree of similarity with the system created. Improvements were made in the form of giving colors, adding information, and having interactions.

2.6 Support

This stage is the user interface development stage that has been designed by evaluating the user interface design that has been made [15]. Evaluation of the prototype carried out to users using the System Usability Scale method. The System Usability Scale (SUS) is a measure of the usability of a product using a 10-question questionnaire developed by John Brooke. The answers to this questionnaire use a scale from 1 to 5 and have the highest total score of 100. The bigger the score, the better the usability of a product. The scale used to answer the questions on the System Usability Scale is as follows:

- a. 1 for the answer Strongly Disagree,
- b. 2 for the answer Disagree
- c. 3 for the answer Neutral,
- d. 4 for the answer Agree,
- e. 5 for the answer Strongly Disagree.

SUS has its own way of calculating to get the results of testing its usability level. For procedures for evaluating results from SUS, there are:

- a. On questions with odd numbers, the score will be deducted by 1
- b. In questions with even numbers, 5 minus the score obtained
- c. The results of the odd and even number values are added up and multiplied by 2.5
- d. All results from the calculation process for each respondent are summed and divided by the number of respondents who fill out the SUS to get the average score.

2.7 Result Analysis

Analysis of the results of the System Usability Scale test is done by looking at the final results of the averaged values. From these final results, it can be known by researchers and can be classified based on the assessment indicators owned by SUS. The SUS assessment indicators have minimum standards. If later the final result of the test has passed the minimum value of the specified standard, then the research can be said to be complete.

3. RESULT AND DISCUSSION

3.1 Research

At the research stage, data is collected that contains the needs and goals of users using the Open Library website.

3.1.1 Define Scope

The scope of this research is limited to designing an interface design solution from the Telkom University Open Library website in the form of a prototype.

3.1.2 Interview

At this stage, interviews were conducted to obtain the required data regarding the experience, needs, and goals of using the Open Library website. This interview was conducted to 6 respondents consisting of 1 stakeholder, 1 lecturer and 4 students. These interviews were conducted via Google Meet and met face-to-face with users. Here are some of the questions the writer asked:



Table 1. Question

Question Category	Question
1 Personal data	What is your name? How old are you? What is your profession? What is your hobby?
2 User opinion about the Open Library website	Are you aware of the Open Library website? What is your goal in opening the Open Library website? How often do you visit the Open Library website? What problems do you experience when accessing the Open Library website?
3 How do users get the information they are looking for?	What do you usually do to get the information you are looking for? What are the steps? (what platform use, what website, etc)
4 User interest in design	Do you pay attention to the design of an application? What kind of design criteria or aspects do you need in an application? In your opinion, does the Open Library website design meet the criteria you mentioned earlier? If the Open Library website design were to be redesigned, what changes would have to be made?

3.1.1 Initial Evaluation

The initial evaluation on the Open Library website was carried out by collecting quantitative data using a System Usability Scale questionnaire. The purpose of using the System Usability Scale (SUS) is so that researchers get usability values from users regarding the Open Library website. Contains 10 questions with 5 answer scales. Researchers get answers from 54 respondents. The score results can be seen in the appendix.

Based on the results of the calculation of the SUS questionnaire, an average of 52.3 was obtained. According to the System Usability Scale calculation based on the assessment of Acceptability Ranges, Grade Scale, and Adjective Ratings, the results of the assessment can be seen in the table below.

3.1.2 Define Task Analysis

The task analysis carried out can help identify what activities lecturers or students do when accessing the Open Library website. Making task analysis using the HTA (Hierarchical Task Analysis) model. The following are activities that can be done on the Open Library website.

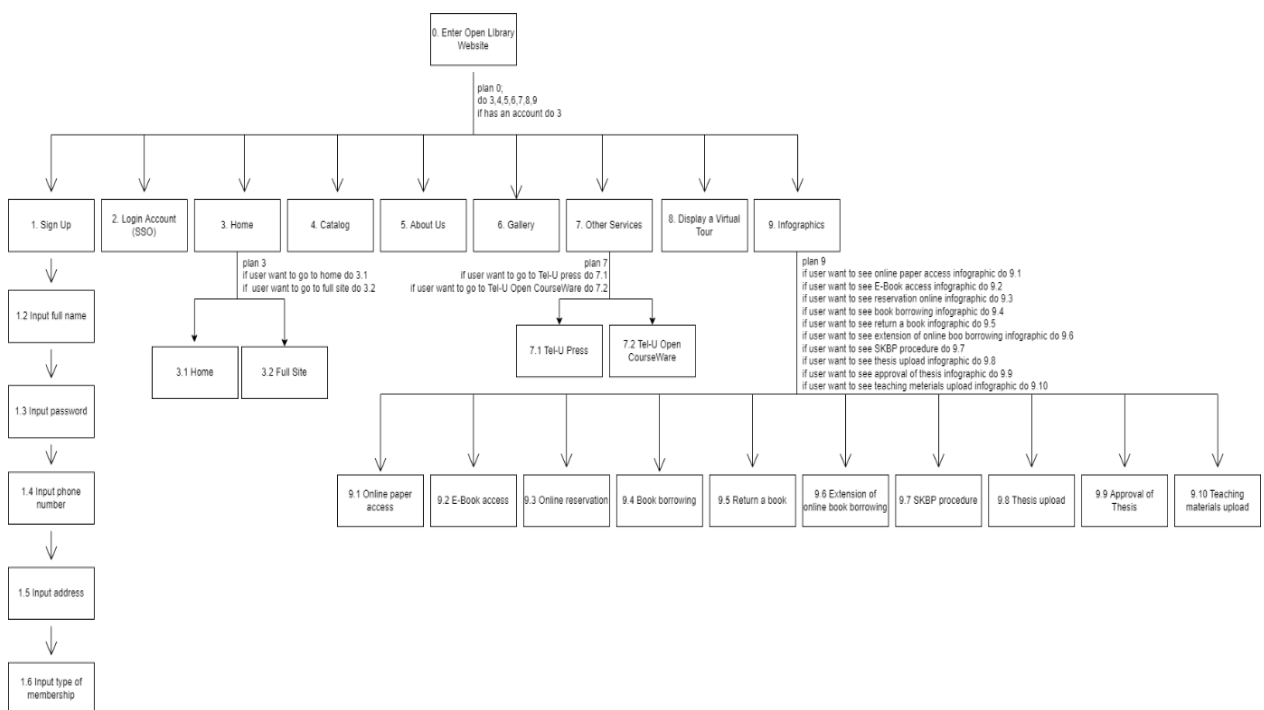


Figure 2. Hierarchical Task Analysis

3.2 Modelling

3.2.1 Define User Persona



At this stage, the researcher analyzes the results of the data obtained from the user during the interview and forms it into a user persona. Personas communicate how the process think of the user, what the user wants to achieve, and why [15].

Table 2. User Persona 1

PERSONA 1	
<p>Demographics Age : 40 Years Status/Job : Head of Open Library and database development affairs Place of Residence: Bandung Activity : Working Hobbies: Reading, walking</p> <p>Needs Ease of users in using the services and information provided on the website.</p> <p>Worries The lack of student interest in using this website is due to the unaesthetic appearance of the design. Also It's annoying because the eyes are easily distracted with a non-minimalist appearance</p> <p>Behavior As usual, every morning I open my laptop to open the Open Library website to access the various features provided</p>	<p>Destination Using the service and searching for information provided by the Open Library website</p> <p>Motivation Can increase user interest in opening the Open Library website</p>

Table 3. User Persona 2

PERSONA 2	
<p>Demographics Age : 30 Years Status/Job : Lecturer, Researcher Place of Residence: Bandung Activity : Teaching, Abdimas Hobbies: Cycling, reading</p> <p>Needs Information on how to upload thesis documents on the start page is easy to find</p> <p>Worries Difficult and take a long time to find information to find out the flow of Theis uploads, so the student always asks the lecturer</p> <p>Behavior The user opens the smartphone to notify the tutored student that the flow of how to upload a TA document is in the infographic section which can be clicked below from the top navigation bar.</p>	<p>Destination Find out information on how to upload a Thesis</p> <p>Motivation Easily get information on how to upload a TA without having to ask a lot of questions</p>

Table 4. User Persona 3

PERSONA 3	
<p>Demographics Age : 19 Years Status/Job : Student Place of residence: Cikampek, Karawang Activity: Lecture, helping mother Hobbies: Reading, cooking</p> <p>Needs Frequently questioned general information about Open Libraries. Such as operating hours, location, duration of borrowing books, how to use e-books, etc.</p> <p>Worries Because they are new students and there is a lack of information about the Open Library, it is feared that when borrowing books from the Open Library, it is not according to the proper procedure.</p> <p>Main Behavior Look for the FAQ section on the Open Library website.</p>	<p>Destination Easily find general information about Open Libraries</p> <p>Motivation Get definite and original information from the Open Library according to your needs</p>

Table 5. User Persona 4

PERSONA 4	
<p>Demographics Age : 21 Years Status/Job : Student</p>	<p>Destination Find out how to reserve a room at the Open Library easily</p>



Place of Residence: Bandung
 Activity : Lecture, Organization
 Hobbies: Watching

Needs

Description of how to reserve a room that is easy to find

Worries

The infographic on how to reserve a room below is not visible, causing the user not to know that this information exists

Motivation

Book a room at the Open Library for discussion needs

Behavior

Accessing the Open Library using a laptop to find information on how to book a room at Telkom University Open Library

Table 6. User Persona 5

PERSONA 5	
Demographics	Destination
Age : 22 Years	Survey and see the contents of the Telkom Open Library
Status/Job : Student	
Place of Residence: Bandung	
Activity: Lecture	
Hobbies: Playing games, learning new things	
Needs	
Information to find out information and facilities available in the Open Library	
Virtual Tour feature with special page/menu	
Worries	Motivation
Not found and realized that there is a virtual tour feature that has been made because it is at the bottom of the page and there is no navigation menu provided so that it can be useless	Can find out information about the contents of the Telkom Open Library through virtual tours remotely
Behavior	
Before leaving for Oplib, turn on the PC to open the Open Library site via firefox and directly click on the virtual tour section in the navigation bar	

Table 7. User Persona 6

PERSONA 6	
Demographics	Destination
Age : 22 Years	Looking for written works in the form of theses, journals, etc. for research needs, using the features provided on the website
Status/Job : Student	
Place of Residence: Bandung	
Activity: Writing Thesis	
Hobbies: Playing	
Needs	
The search feature on the home page and the main features of the Open Library website	
Worries	Motivation
It's annoying because the eyes are easily distracted with a non-minimalist appearance (such as books on the home page) coupled with features other than the main features	One of the virtues of a library website is to search for collections of books, papers, etc.
Behavior	
Opening the Open Library website via a macbook and doing a direct search in the search section that has been provided	

3.3 Requirements

3.3.1 Develop Goals, Requirements, and Scenario

At this stage the researcher determines the user's goals based on the created persona. Then develop the context of the scenario and user needs.

Table 8. Goals & Requirements

No	Goals	Requirements
1	Ease of accessing the infographic section	Relocation of the infographic section
2	Ease of getting general information that is often asked about Open Library	Designing a new page for FAQs

4	Minimalist and aesthetic look	Resize the search bar, relocating some parts, apply a brighter color
5	More effective use of virtual tour features	Designing a virtual tour page

3.4 Framework

3.4.1 Design a Wireframe

At this stage the design of the interface solution from the Open Library website in the form of a black and white low-fidelity wireframe is carried out through Figma. This will display a rough overview of the Open Library website design containing the layout, information, and content that the website has.

3.5 Refinement

This stage is a development of the previous stage, by designing a more detailed and colorful interface design. In this stage, the color selection adjusts the identity of the website [14]. In designing the Open Library website design, we use inter-font with various sizes such as 32 and 20 for titles and subtitles, while for content it uses 14 and 11.

3.5.1 Mockup Design

In this section, the researcher presents a mockup design of the redesigned pages to reach the goals of the respondents.

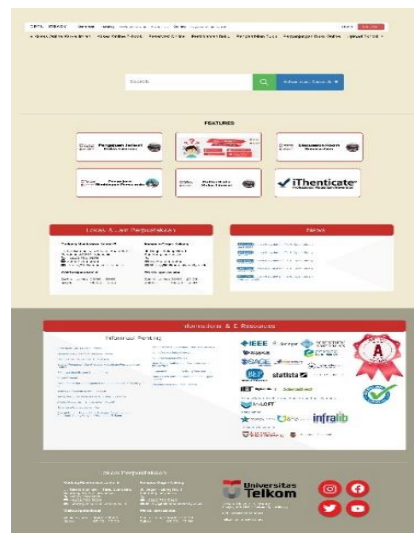


Figure 3. Open Library Homepage

This page is the page that will appear when the website is first opened. This page contains all the contents of the Open Library website. Such as catalogs, news, galleries, and others. The main feature on this page is the search section to find books or papers owned by the Open Library. This page also provides information on the location and hours of library operation.

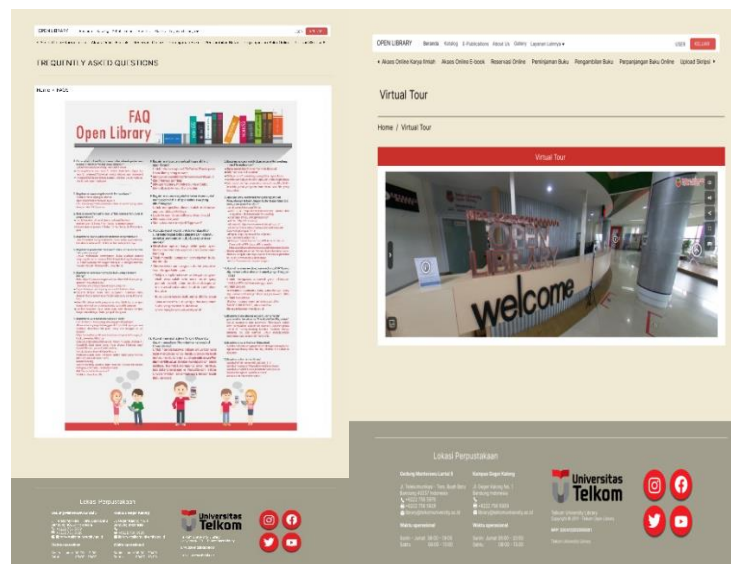


Figure 4. FAQs & Virtual tour page



This page is a FAQs or Frequently Asked Questions page. The contents of this page are questions and answers that are often asked by website users or visitors. The right side, virtual tour page is a newly created page specifically just for virtual tours itself. This page provides a virtual tour of the Open Library library at Telkom University which is useful for being able to visit the library virtually and find out the facilities in the library.

3.6 Support

3.6.1 Final Evaluation

Researcher did the evaluation on a mockups that have been made at the refinement stage. The researcher evaluates by distributing the System Usability Scale questionnaire which has been filled out by 20 respondents. Then usability testing was also carried out with 5 of the 20 respondents. The following is the result value of the System Usability Scale.

Table 4. SUS Result

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Score
R1	5	1	5	4	4	2	5	2	4	2	80.0
R2	3	2	4	1	4	3	5	1	4	4	72.5
R3	2	1	5	4	5	1	4	2	5	3	75.0
R4	4	2	4	2	5	1	4	3	4	1	80.0
R5	3	2	4	4	4	2	5	2	5	3	70.0
.....
R20	5	1	2	5	4	3	5	2	4	2	77.5
Average Score (Final Result)											74.75

3.7 Result Analysis

Researchers conducted an analysis by comparing the initial evaluation and final evaluation using the System Usability Scale method. Compared to the initial evaluation scores that the researcher did at the research stage, the current results have improved. In the initial evaluation, the score was 52.3 while the final evaluation was 74.75. This result is a very good result because it has increased and it can be proven that the design of the new solution that the researcher did was quite successful because 74.75 had passed the average value of the SUS standard. However, even though the score has passed the average, this result cannot be said to be perfect because it has not yet reached grade "A" or "Excellent". This can be interpreted that users are still not completely satisfied with the design solutions provided and still have shortcomings.

4. CONCLUSION

Based on the results that have been obtained from the research conducted, it can be concluded that users of the Open Library website do not like looking at a crowded display. In addition, most of the users also have the same goal, namely looking for a book or paper and want to be practical when they want to access or use a feature on the website. Therefore, the website owned by Telkom University needs improvement. Some of the improvements include: brighter coloring, simpler homepage, larger search section, relocation of infographics, and custom FAQs and Virtual tour page design. These things can fulfill the goals of the user because the user does not need to scroll down or click on the infographic section to view the section. With practical users can see it below from the navigation bar. In addition, with the virtual tour page, users don't need to be confused about where to find the virtual tour because it already has its own page and sub menu. From what has been explained, the use of the Goal Directed Design method is the right method as a benchmark for redesigning the site. Because, this method is used to produce a user interface design that suits the user's goals. The results of the final evaluation using the System Usability Scale method yielded a value of 74.75 which means it has exceeded the average. From this, it can be concluded that the use of the GDD method in this study can be said to be successful.

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