

Mobile Apps Design to Find Internship Place Using Design Thinking Method

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Abstrak— Magang menjadi kegiatan wajib sebagai mahasiswa di Institut Teknologi Telkom Purwokerto. Namun dengan banyaknya media pencari tempat kerja untuk magang dalam penerapannya, mahasiswa masih kesulitan mencari tempat magang yang cocok. Penelitian ini bertujuan untuk menerapkan Design Thinking dan System Usability Scale untuk merancang tampilan antarmuka aplikasi untuk mencari tempat magang. Tinjauan pustaka digunakan untuk menemukan dasar penelitian yang digunakan sebagai teori, konsep dasar, dan metode. Design Thinking dilakukan untuk menemukan suatu permasalahan yang dihadapi mahasiswa. Validasi masalah dilakukan dengan melakukan survei. Dan memprioritaskan masalah menggunakan matriks tantangan. Prototipe dilakukan dengan membuat desain yang dapat dicoba oleh pengguna untuk mencapai tujuan dari desain yang dibuat dan menguji tingkat keberhasilan menggunakan skala system usability scale. Hasil dari penelitian ini adalah rancangan antarmuka aplikasi mobile yang diuji menggunakan skala system usability scale dengan 8 data uji dan memiliki tingkat keberhasilan dengan nilai 93,75%. Perancangan antarmuka yang dibuat dapat membantu mahasiswa menemukan tempat magang yang paling sesuai dengan kemampuan dan keinginannya.

Kata Kunci: Design Thiking, Magang, Tampilan antarmuka, System Usability Scale, Mahasiswa

Abstract— Internship became a must activity as a student in Institut Teknologi Telkom Purwokerto, but in its application, with many media looking for a place to work, students still have difficulty finding a suitable internship place. This study aims to apply Design Thinking and System Usability Scale for designing mobile apps interface to find internship place. Literature review used to find the basis for this research which was used for theories, basic concepts, and methods. Design Thinking is carried out to find a problem that students face. Validating issues was done by doing a survey. And prioritize the problem using challenge matrix. The prototype was done by creating a try-able design that users can try to reach the goal of design made, and test the successful rate using system usability scale. The result of this study is mobile apps design interface and tested using system usability scale with 8 test data had a success rate with value 93.75%. Interface design created can help students find the most suitable place for an internship that matches their skills and wishes.

Keywords: Design Thinking, Internship, Interface, System Usability Scale, Student

1. INTRODUCTION

1.1. Background

Along with the development of the digitalization era, almost all lines of society inevitably have to follow the flow of these developments. This includes searching for an internship or a place to work. This can be used to help students find internships and gain work experience during college [1]. An internship is a compulsory subject in 7th grade, in institute guidebook [2]. The search for experience during college is very helpful for facing the future in solving problems, socializing with colleagues or teams, and increasing student confidence [3]. The internship is direct job training in order to learn specific skills or skills so that they are qualified in order to produce goods or services under the supervision of people who have higher positions or who are more experienced in their positions organized by training institutions with work partners [4][5].

Based on the research conducted, many students are still having trouble finding an internship that suits their wishes. Research result could be seen in Figure 1.

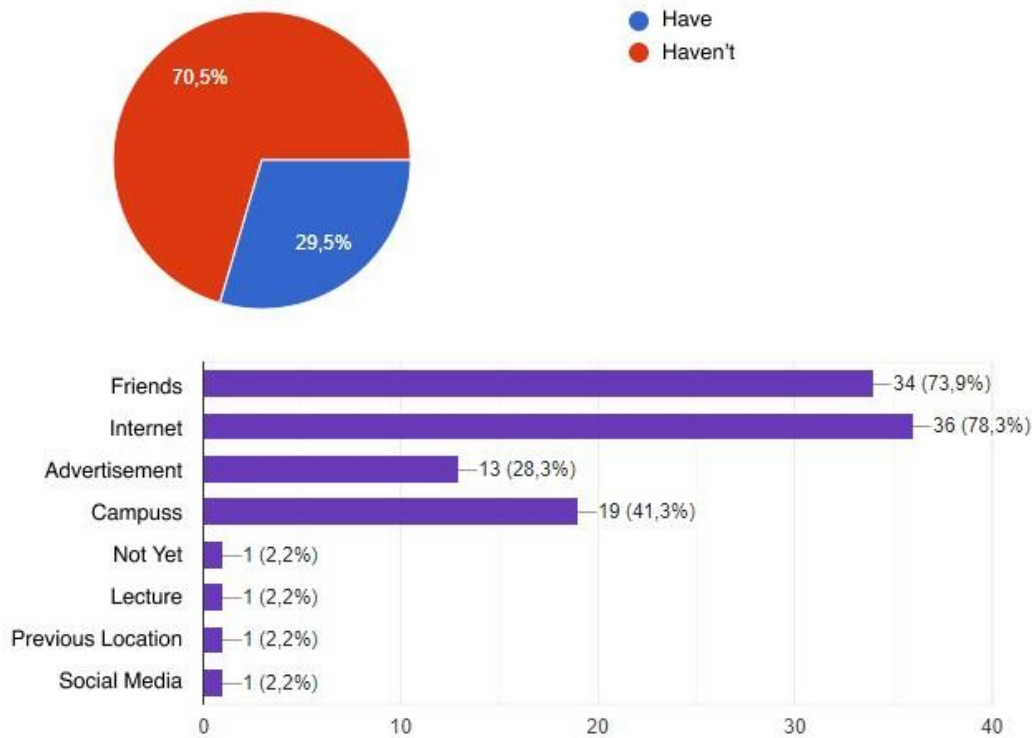


Figure 1. Survey Result

The reason students have not found an internship place is dominated by obstacles in finding information about places that provide internships and finding internships that match the skills or expertise of students. In Fig. 1, the media used in searching for information about the current internship is dominated by the internet as a medium for finding information, followed by friends or referrals as a source of information in searching for an internship.

Based on the results of the research, it shows that the existing media providing information about internships is not optimal in providing information about internships. There needs to be a system that helps students find information related to internships and helps students determine internships that match their skills or abilities.

Based on the description of the problem above, the author will design an application design for an internship finder to find out user experience in finding information about an internship using the design thinking method and system usability scale to measure the success rate of the designed interface

1.2. Previous Research

- a. Aria Ar Razi, Intan Rizky Mutiaz, and Pindi Setiawan, "Penerapan Metode Design thinking pada Model Perancangan Ui/Ux Aplikasi Penanganan laporan Kehilangan Dan Temuan Barang Tercecer", Visual Communication Design, Design and Advertising Management, Institute Bandung technology. This study aims to design a model UIUX in the form of a mobile application to overcome the problem of cases of lost and found items scattered in public places. This research is motivated by the lack of accessibility of information on the handling of cases of loss and findings of scattered goods which is contrary to advances in technology and information that should be able to facilitate the accessibility of information [6].
The results of this research are in the form of an application design called "kembaliin" which is a technology-based media design model designed specifically according to the target user to solve problems cases of lost and found items scattered in public places.
- b. Gusti Karnawan, Septi Andryana, and Ratih Titi Komalasari, "Implementasi User Experience Menggunakan Metode Design Thinking pada Prototype Aplikasi Cleanstic". Faculty of Technology Communications and Informatics, Informatics Study Program, University National. This study aims to educate the community regarding plastic waste and plastic waste management. This research is

motivated by the many problems caused by plastic waste, and the lack of knowledge community about the processing of plastic waste that is piling up [7].

The method used in this research is design thinking, starting from the data collection stage, which is carried out by means of study literature, field observations, and surveys. Then proceed with defining the problem, determining the idea or solutions, making designs from solutions that have been found, and the last test and the results of the designs that have been made at this stage design of the solutions that have been found. The results of the research carried out are in the form of wireframes and designs the appearance of the application named "Cleanstic" with good test results carried out using the SUS (System Usability Testing) method as much as two times showed good results and entered into the good category. Which testing with the User Experience Questionnaire method gets good results and falls into the excellent category.

1.3. Literature Review

a. Internship

The internship is direct job training to learn specific skills or skills so that they are qualified to produce goods or services under the supervision of people who have higher positions or who are more experienced in their positions organized by training institutions with work partners [4][5]. The internship also benefits students from experiences that improve their work-related skills, get more networks, and boost their personal branding to prospective employers [8].

Furthermore, an internship is important for their career path, to learn with experiential learning and provide students with a job environment beside inside the room [9][10]. Students who have internship experience in university have a more significant probability of being invited to a job interview than students who haven't this experience because they have more loyalty skills [11][12].

b. Design Thinking
Design Thinking is an approach method for solving a problem analytically and through a creative process that encourages users to experiment, create and create solutions to a problem and get feedback most effectively and efficiently [13]. Design thinking was developed at Stanford University [14]. Design thinking can be used to develop ideas even in early concepts with systematical development. Design thinking has individual stages, and each stage has the outcome. The stages are empathize, define, ideate, prototype, and testing [15][16][17].

c. System Usability Scale

The System Usability Scale is a questionnaire originally created to test electronic office systems created by John Brooke in 1986 [18]. SUS is considered one of the most reliable and substantial surveys to the degree user's seen convenience. The questionnaire comprises a fair ten questions/explanations, which are evaluated by respondents on a 5-point scale ranging from strongly oppose this idea to strongly concur. The ultimate score ranges from 100 [19].

The System Usability Scale contains ten questions that will be asked of the respondents and provides a scale rating from 1-5 based on how much respondents agree on each question, where 1 means disagree and goes to 5, which means strongly agree. SUS question can be seen below.

Table 1. SUS Question

1.	I think that I would like to use this feature frequently
2.	I found the feature unnecessarily complex
3.	I thought the feature was easy to use
4.	I think that I would need the support of a technical person to be able to use this feature
5.	I found the various functions in this feature were well integrated
6.	I thought there was too much inconsistency in this feature
7.	I would imagine that most people would learn to use this feature very quickly
8.	I found the feature very cumbersome to use
9.	I felt very confident using the feature
10.	I needed to learn a lot of things before I could get going with this feature

Each question has its own value. Where questions with odd numbers, how to calculate the value is the value of the respondent minus 1. As for questions with even numbers, then how to calculate the value is 5 minus the value obtained on the even number. Then add up and multiply by 2.5 to get the total value of SUS. Here is the formula for calculating the SUS value .

$$((P1-1) + (5-P2) + (P3-1) + (5-P4) + (P5-1) + (5-P6) + (P7-1) + (5-P8) + (P9-1) + (5-P10)) * 2.5 \quad (1)$$

The overall SUS score is obtained through the average results of the individual SUS scores. SUS has an acceptability score which can be seen in the image below.

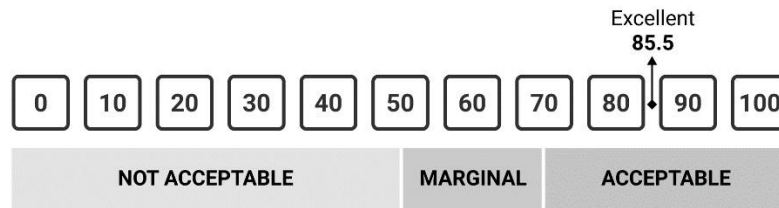


Figure 2. SUS Acceptability Score

2. RESEARCH METHODS

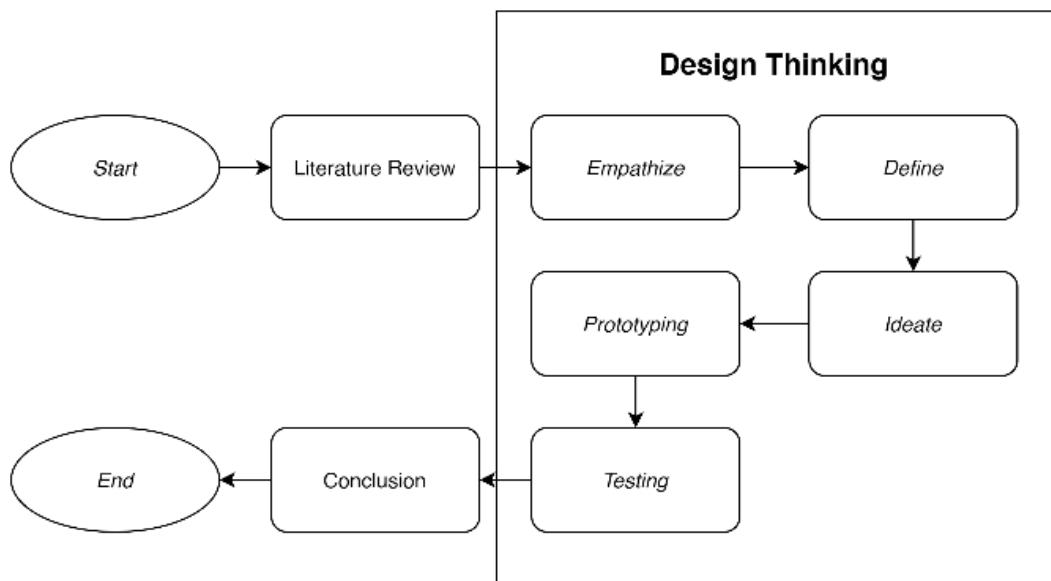


Figure 3. Design Thinking

2.1. Literature Review

The literature search is a process used to search for writings or literature that can be used as a basis for this research. The literature review results can be used as the basis for the theory, basic concepts, or methods that will be applied in this research.

2.2. Empathize

Empathize is doing data collection using an online survey method with purposive sampling technique, which is carried out in two stages to find problems faced by users from the user's point of view. These stages are hypothesis and problem validation. Hypotheses are used as statements to represent problems that users may face, and problem validation is the stage to ascertain whether users experienced the previous statements. This stage produces several problems faced by users.

2.3. Define

The Define stage is carried out after the Empathize process. At this stage, the author performs several stages, namely problem finding to map the problems that have been found at the empathize stage, create a user persona as a picture of the ideal user who will use the design to be built, examine more deeply the problems found in the form of statements that can be followed up with the approach method. How might we, and then the stage of prioritizing challenges is carried out to sort which problems are faced the most by users and the impact felt by users so that it can be determined which problems will be prioritized by using a challenge matrix.

2.4. Ideate

The Ideate stage is carried out after finding and determining the problem to be solved. The steps taken in the ideate stage is processing what the user needs, which aims to determine solutions that can meet user needs are. Next, a user flow is created to map the user flow to achieve the design goals to be built.

2.5. Prototype

The prototype stage is carried out after determining which ideas will be applied in the design. At this stage, the author performs several stages of making a prototype, user flow, producing a low fidelity design, and a high fidelity design. At the stage of making high fidelity designs, the designs made can simulate the design flow that the author wants to build.

2.6. Testing

At this stage, the author conducted a trial using usability testing with the task scenario and questionnaire method to obtain the parameters of effectiveness, efficiency, and satisfaction parameters with the System Usability Scale (SUS).

2.7. Conclusion

The final stage in the flow chart is the stage of concluding the research results that have been done. This stage is carried out after all stages have been completed, starting with data collection, product design, product implementation, and the results of design testing have been carried out. The results of testing and analysis of the designs that have been made become the basis for drawing conclusions.

3. RESULTS AND DISCUSSIONS

3.1. Literature Review

The result of the literature review is design thinking flow to become a basic concept or method in this study, and SUS (System Usability Scale) to measure the success rate of created design used by the target user. A literature review was also used to find a previous similar study to support the concept of this study **3.2. Empathize**

In the empathize stage, the author do some data collection with survey method, with purposive sampling method, based by certain considerations sample, conducting research, the results of which can be seen in Figure 1 and Figure 2, which are problems or obstacles faced by users in finding information related to internships, which can be concluded as follows:

- a. Students have difficulty finding information on internships
- b. Students are afraid or worried that they will not get an internship according to their abilities
- c. Information submitted about the internship place is not detailed (registration flow, job desk, etc.)
- d. Looking for an internship that is located according to your wishes

3.3. Define

- a. Problem Findings
 1. Students have difficulty getting internships according to their skills
 2. Location is an important point in determining the internship place
 3. Information from the internship place is not clear
 4. Non-detailed registration flow and registration procedure
 5. Internship time that does not match the time provided by the campus
- b. User Persona

Persona is a representation of a user that experiences the flow of problems. Persona has two main points. First, goals are what points that persona wants to achieve, and frustration is the anxiety or problems that persona faces in achieving these goals.
- c. How Might We Approach

That author was turning existing problems into challenges to solve.

 1. How Might We help students in finding internships according to the skills they are interested in
 2. How Might We help students find internships in their desired location
 3. How Might We assist students in obtaining information related to the internship place to be applied for (job desk, requirements, documents to be prepared, etc.)
 4. How Might We help companies detail application procedures so that students can understand the flow of applying for internships as well as progress regarding student applications

5. How Might We help students find internships based on the time that fits or matches the time given by the campus
- d. Challenge Matrix

After determining the challenges, here the author will prioritize the obstacles using the Challenge Matrix to find out which problems have the most impact on users and how many users experience these problems with indicators in the form of impact (impact on users) and effort (the amount of effort needed to solve the problem)

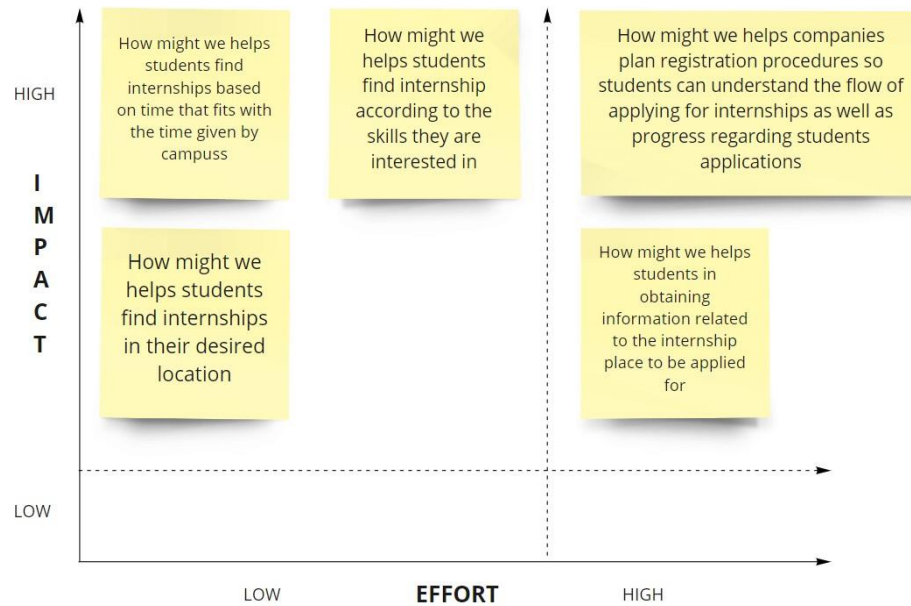


Figure 4. Challenge Matrix

3.4. Ideate

In the ideation phase, the author concludes user needs into a certain point to follow up as a feature that the author is going to develop. As for user needs in question is as follows :

- a. Create a system that can inform all internship places that open vacancies
- b. Provide special filters for users to find internships according to their interests
- c. Detailing information related to the need for internships at the place (detailing job desk, requirements, registration flow, documents to be prepared, etc.)
- d. Allows users to search for internships by location
- e. Provide updates or information related to applications that have been submitted by users
- f. Displays the internship period on the internship information

3.5. Prototype

- a. User Flow

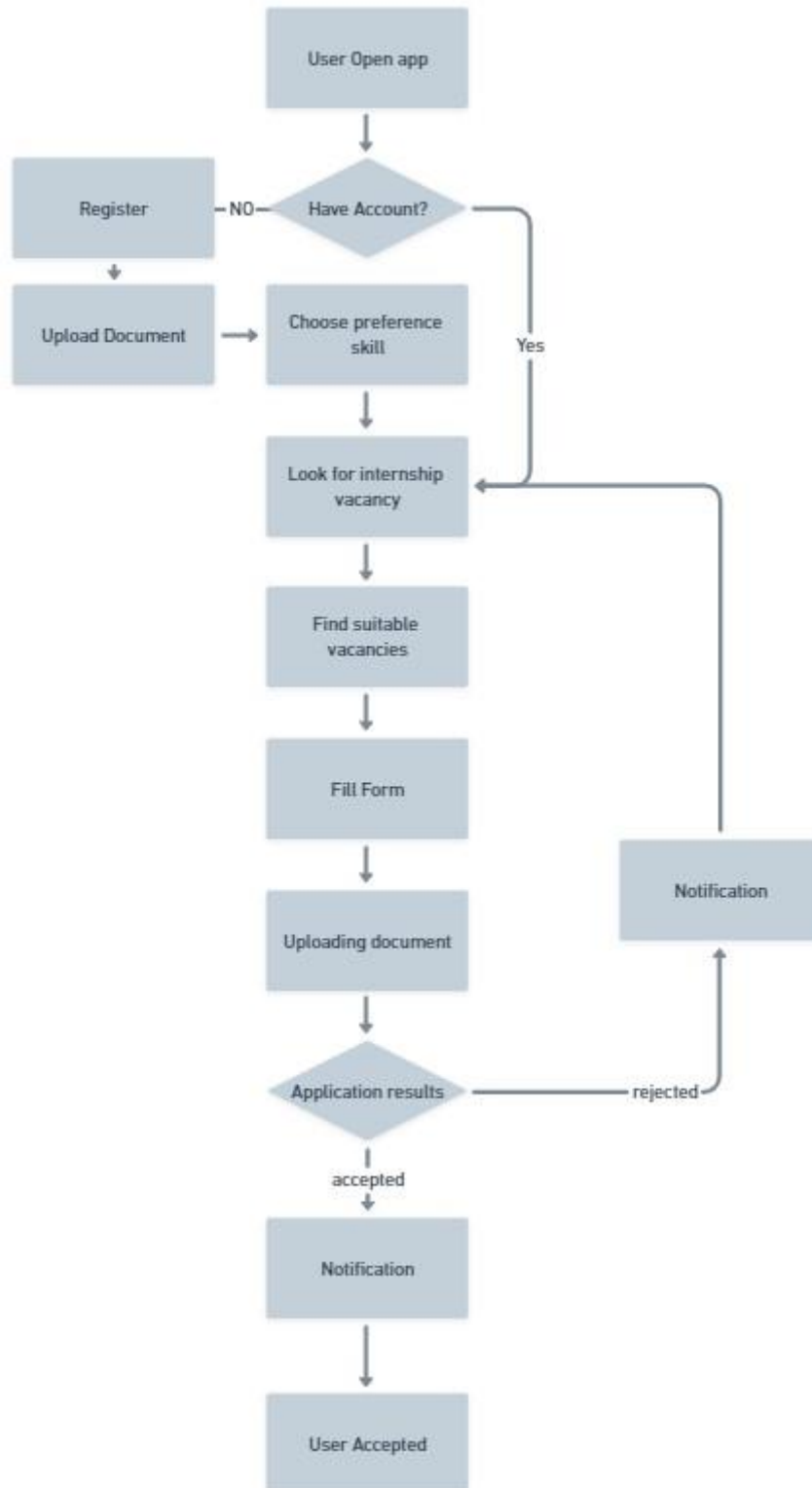


Figure 5. User Flow

b. Low Fidelity Design

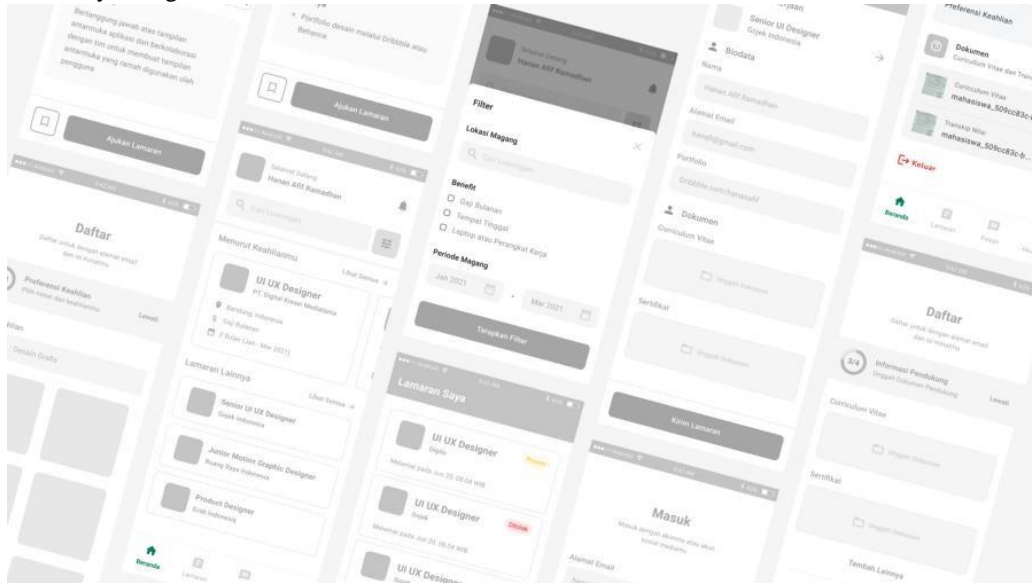


Figure 6. Low Fidelity Design

Low fidelity design is made to describe roughly how the design will look, so there is no need to waste resources to fill in or create detailed content, just the big picture like the wireframe. c. High Fidelity Design

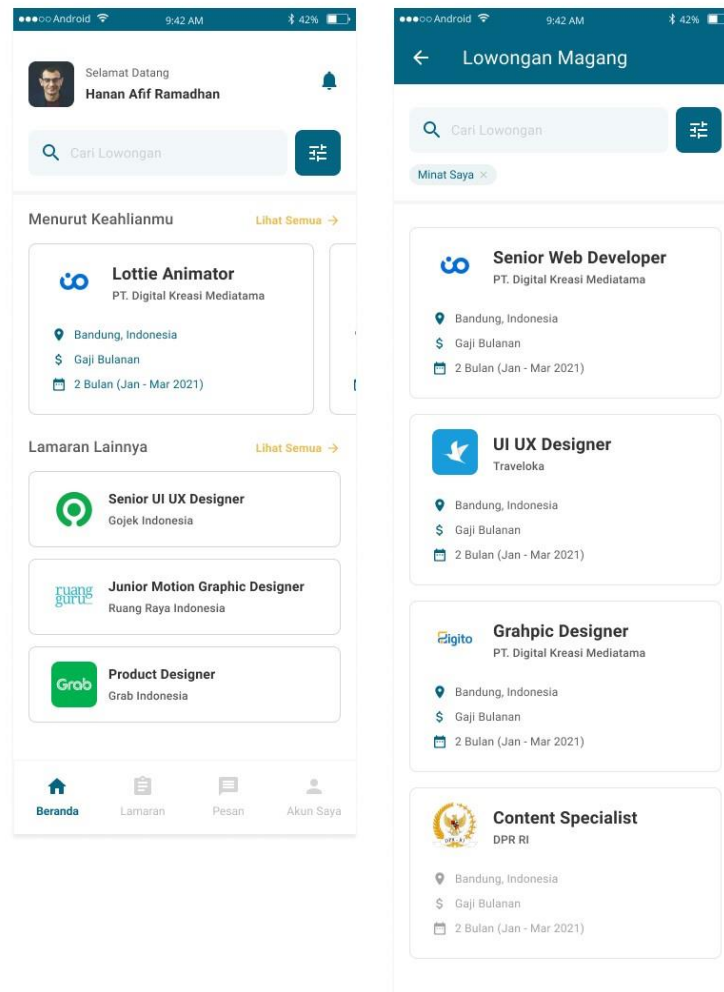


Figure 7. Home and apprenticeship vacancies page design

On the home page, there is a special section that displays the vacancies most relevant to your interests or the skill chosen by the student or user at the time register account. There is a search button and a filter button to search for vacancies related to the desired internship.

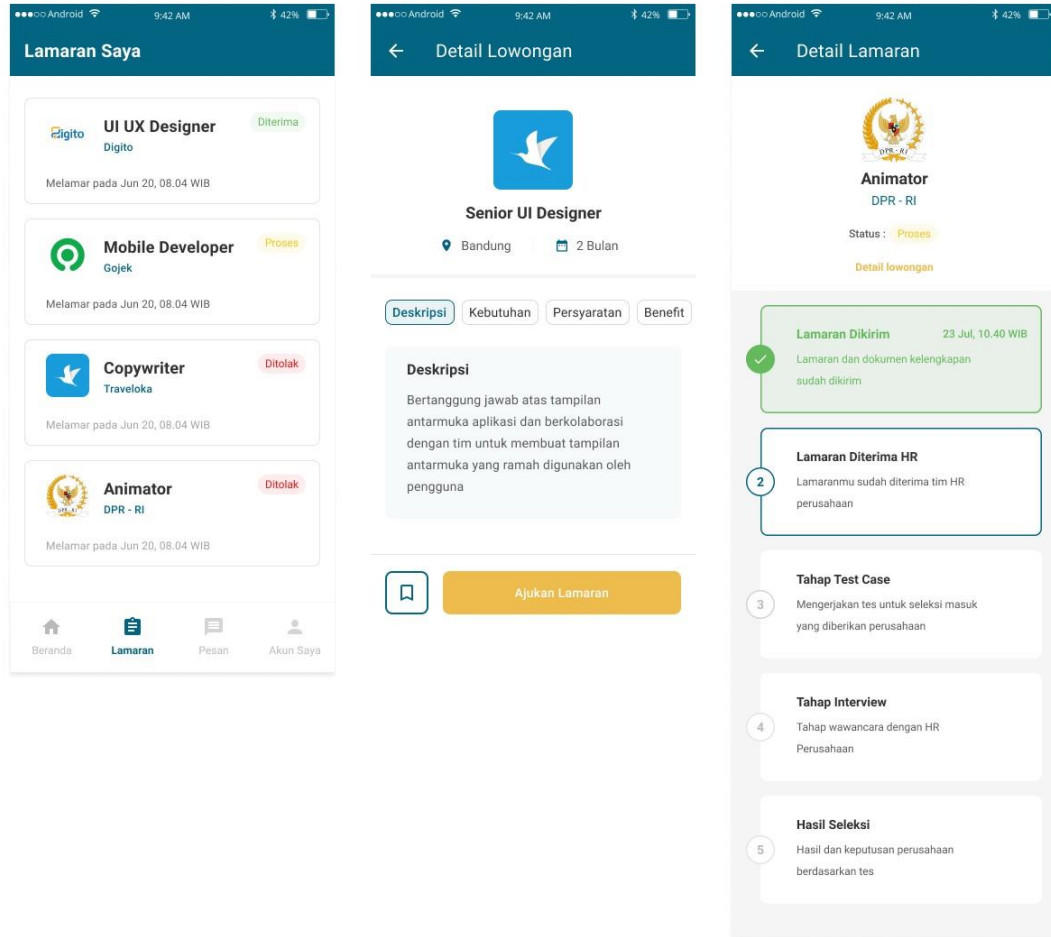


Figure 8. My application, apprenticeship detail and application progress page design

This page contains details of vacancies from places attached internship, contains complete information based on the findings made at which stage of the Emphatize become student anxiety in looking for an internship, which includes information on the needs of candidates students as interns, then the benefits students get, administrative equipment that must be prepared.

3.6. Testing

The test was carried out by 8 participants who are students of the Telkom Purwokerto Institute of Technology who are currently 6th semester students, wherein 7th semester they will do an internship.

Tests were carried out on 4 Major Flows which are solutions offered in applications made in the form of scenarios that must be completed by users, which are as follows.

- a. Open the App, log in or register an account
- b. Searching for applications as desired (filtering vacancies based on needs or desires)
- c. Sending Application
- d. Check application status

The results of the questionnaire found are then processed with a predetermined formula to obtain the SUS value. The results of the SUS score assessment in each scenario can be seen in the following table.

Table 2. SUS Table Scenario 1

											R/P 1	2	3
											4 5	6	7
											8 9	10	
1	4	2	4	1	5	2	4	3	5	4	Σ	$\Sigma * 2,5$	
2	2	3	5	2	5	1	5	1	5	3			
3	5	1	4	1	5	2	5	1	4	4	30	75	
4	3	1	5	1	5	2	5	1	5	1	32	80	
5	5	1	5	1	4	1	5	1	5	1	34	85	
6	4	1	5	1	5	1	5	1	5	1	37	92,5	
7	4	1	5	1	5	1	5	1	5	1	39	97,5	
8	4	1	5	1	5	2	5	1	5	2	39	97,5	
											39	97,5	
											37	92,5	
											Average	89,6875	

In table 2, we can see the results of the testing carried out by 8 participants who tried the prototype with the flow of registering and entering the application producing an average value of 89,6875.

Table 3. SUS Table Scenario 2

R/P	1	2	3	4	5	6	7	8	9	10	Σ	$\Sigma * 2,5$
1	2	5	2	2	4	3	2	3	4	5	16	40
2	4	1	5	1	5	1	5	1	5	2	38	95
3	5	1	5	1	5	1	5	1	5	1	40	100
4	4	1	5	1	5	1	4	1	5	1	38	95
5	5	1	5	1	5	1	5	1	5	1	40	100
6	5	1	5	1	5	1	5	1	5	1	40	100
7	5	1	4	1	5	1	5	1	5	1	39	97,5
8	4	1	5	1	5	1	5	1	5	1	39	97,5
											Average	90,625

In table 3, we can see the results of the testing carried out by 8 participants who tried the prototype with the flow of searching for applications as desired (filtering vacancies based on needs or desires), producing an average value of 90,625.

Table 4. SUS Table Scenario 3

											R/P	1	2
											3 4	5	6
											7 8	9	10
											Σ	$\Sigma * 2,5$	
1	5	1	5	1	5	1	5	1	5	1			
2	3	1	5	1	5	1	5	1	5	1			
3	5	1	5	1	5	1	5	1	5	1	40	100	
4	5	1	5	1	5	1	5	1	5	1	38	95	
5	4	1	4	1	5	1	4	1	5	1	40	100	
6	5	1	5	1	5	1	5	1	5	1	40	100	
7	5	1	5	1	5	1	5	1	5	1	37	92,5	
8	5	1	5	2	5	1	5	1	5	1	40	100	
											40	100	
											39	97,5	
											Average	98,125	

In table 4, we can see the testing results carried out by 8 participants who tried the prototype with the flow of sending the application producing an average value of 98,125.

Table 5. SUS Table Scenario 4

R/P	1	2	3	4	5	6	7	8	9	10	Σ	$\Sigma * 2,5$
1	5	1	5	1	5	1	5	1	5	1	40	100
2	4	1	5	1	5	1	5	1	5	1	39	97,5
3	5	1	5	1	5	1	5	1	5	1	40	100
4	5	1	5	1	5	1	5	1	5	1	40	100

5	5	1	4	1	5	1	4	1	5	2	37	92,5
6	5	1	5	1	5	1	5	1	5	1	40	100
7	5	1	5	1	5	1	5	1	5	1	40	100
8	5	1	5	1	5	1	5	1	5	1	40	100
Average											98,75	

In table 5, we can see the testing results carried out by 8 participants who tried the prototype with the flow of checking the application status producing an average value of 98,75.

3.7. Conclusion

The final results of the UIUX design assessment that have been made scored sequentially are 89.6, 90.6, 98.1, and 98.7, as shown in tables 3, 4, 5, and 6. From the results of these assessments, the average value for all features that have been designed is 94.2. These results it is in accordance with the acceptability score of the usability scale system based on Figure 2. The interface that has been designed has a score above excellent Level, with the acceptance value in the form of acceptable area. This means the solution that was created and based on prototype validation, the interface that has been designed can solve the problem that students faced, and no need for iteration of any steps of the research.

3.8. Discussion

Based on these results, we can use design thinking to solve the problem analytically and creatively put ourselves as users [13]. In the empathy process, selected participants are participants who determine certain considerations, so that the variables sample is participants who are going to do internships in the next semester.

Variables used as a sample were 46 variables which all of them were students in Institute Teknologi Telkom Purwokerto.

The accuracy of the results obtained in this research was satisfactory, which can be seen from the average results measured by the sus parameter, which is above the excellent level with the acceptance level is acceptable in the sus parameter.

The future work in this study is system design. By using a new method, hopefully, it can improve the ability to problem-solve internship opportunities that will be faced. If the system has a better ability of findings internships opportunity, it can be used to help students find internships places earlier and according to their wish.

4. CONCLUSION

After applying the Design Thinking Method and System Usability Scale for the design interface of mobile apps to help students find internships places, it can be concluded that mobile apps were able to solve the problem students face.

The designed interface tested result showed that the final results of the UIUX design assessment made scored sequentially are 89.6, 90.6, 98.1, and 98.7, as shown in tables 3, 4, 5, and 6. From the results of these assessments, the average value for all features that have been designed is 94.2. From these results, it is in accordance with the provisions of the usability scale system in Table 2. The interface that has been designed has a score that is above the Excellent level. With the acceptance value in the form of

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