

UI/UX Design of ineffable psychological counseling mobile application using design Thinking Method

Lintang Nuril Islami¹⁾, Meriska Defriani²⁾, Teguh Iman Hermanto³⁾

^{1,2,3)}STT Wastukencana, Indonesia

¹⁾l.nurilislami@gmail.com, ²⁾meriska@wastukencana.ac.id, ³⁾teguhiman@wastukencana.ac.id

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Abstract: Application design is one of the important things in application development because the application that has a bad design will cause discomfort and confusion for users, especially in health applications, which have their own difficulties where application design must focus on what users need to be easy to understand, especially mental health application because there are still few application for mental health or self-care even though since the pandemic, mental health problems have increased drastically, this makes many people seek help in mental help. Design thinking is a method used to solve a problem where the solution comes from that user's experiences or needs. The Design Thinking method consists of five stages: Empathize, Define, Ideate, Prototype, and Test. In the test step, testing was carried out using the Cognitive Walkthrough method with the help of the Maze tool with a learnability value of 97%, an error rate of 0.04, time-based efficiency of 0.05 task/second, and the MIUS value of each task were obtained a fairly high value indicating that design prototype is easy to use, easy to understand and efficient. While the MAUS score got a score of 94, which was included in the high level, indicating that the interface design was feasible to be implemented.

Keywords: Design Thinking; Mobile Application; Cognitive Walkthrough; Usability Testing; User Interface; User Experience; Mental health; Counseling

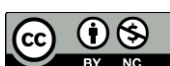
INTRODUCTION

The covid-19 pandemic that has occurred for two years has impacted several things such as health, especially mental health. According to research data from the Global Prevalence and burden of depression and anxiety disorder in 204 countries, stated that in various countries during the covid-19 pandemic, common mental health disorders such as depression and anxiety increased drastically by more than 25% (Santomauro et al., 2021). Meanwhile, in Indonesia, the Ministry of Health of the Republic of Indonesia stated that the number of cases of mental health disorders such as depression and anxiety increased to 6.5%, meaning that around 12 million people have increased in mental disorder during the pandemic (Putra, 2021). The increase in mental illness makes many people seek psychological or mental help, but there are no counseling providers in every region of Indonesia.

The impact of the Covid-19 pandemic on the economy is one of the toughest considerations when choosing online counseling by various psychological services because the price of counseling is still too expensive. Therefore many communities and mental health activists provide free online counseling. However, the problem with this free online counseling is the registration announced on Social media Instagram using the Instagram stories feature. This is considered less effective because Instagram stories only last 24 hours, so many people are left behind with counseling information. The next problem is when waiting for registration for the next counseling, it will be confusing for mental help seekers because they do not know how to reduce their anxiety even though there is a method, namely catharsis, which purposes to reduce stress and anxiety, such as journaling, meditation, listening music, art. Therefore, it is necessary to innovate an application that can accommodate free online counseling to connect the community of mental health activists with a user who needs mental assistance.

In developing an application, it's not only seen from the function and usability of the application but also the User Interface (UI). The UI design process is important because the application interface is a communication medium between application developers and users so the user can easily understand the application. Then the user interface design must focus on the user's needs (Efrain, Setiawan, Huang, & Herlina Rochadiani, 2021). Then the application that has a bad design can cause inconvenience and confusion for users using the

*name of corresponding author



application. Therefore, the researcher will develop from the side of the mobile application interface according to the user's wishes and needs using Design thinking. Design thinking is a method of solving a problem where the solution will focus on the user (Haryuda, Asfi, & Fahrudin, 2021). The Design thinking method was used by Haryuda et al. to design a web-based UI/UX at Laportea Company. The test step using the maze design tool resulted in a learnability value of 91%, and the results of data analysis obtained a value of 86.1%. This indicates that the method and tests used can produce a product prototype that suits user needs (Haryuda et al., 2021).

LITERATURE REVIEW

User Interface (UI)

User Interface is the display of a machine or computer that interacts directly with the user. The interface design must be considered to produce a good application design (Fahrudin & Ilyasa, 2021). UI is the knowledge of the graphical layout of a web or application with its scope buttons that can be clicked by the user, text, image, text entry fields, and all items that will interact with the user (Muhyidin, Sulhan, & Sevtiana, 2020).

User Experience (UX)

User experience is the perception and response of users about a product, system, or service, which aims to improve the quality of each product or application service to meet user needs appropriately (Fahrudin & Ilyasa, 2021).

Design Thinking

A solution-based problem-solving method that focuses on the user experience, which is iterative (Haryuda et al., 2021). There are five steps of design thinking: Empathize, Define, Ideate, Prototype, and Test. Fig 1 is a step of design thinking

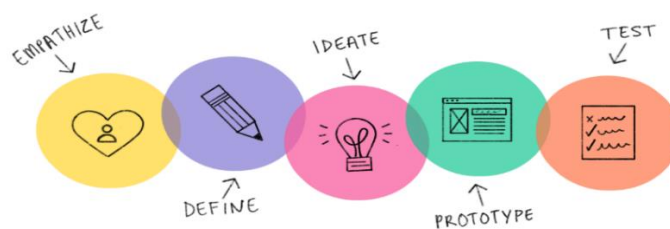


Fig 1 Step of design thinking (Maharani et al., 2022)

The explanation of each stage of the design thinking method is: Empathize is the step of understanding the problems experienced by users. Define is a process of getting the user's point of view and understanding what the user needs. Ideate is the process of finding a solution to a user's problem. Prototype is the step of the process of designing a product or application to be built. Test is a technique used to carry out evaluation activities. This step is implemented to collect user feedback on the prototype that has been designed (Maharani et al., 2022).

Usability Testing

Usability testing will show how easy user interfaces are to use. Usability basically is the quality level of the system or application that is easy to learn, easy to use, and encourages users to use (Harwati & Widodo, 2017). According to Jacob Nielsen, the number of respondents needed to conduct testing is only around 5-15 users (Ardyani, Krisnanik, & Isnainiyah, 2020). In general, there requirements must be fulfilled for an application reaches the ideal level of usability they are:

1. Learnability

Describes the user's comfort level in learning the application to meet basic tasks when first using the app (Harwati & Widodo, 2017). The learnability aspect is obtained by calculating the success rate, using equation (1).

$$\text{Success rate} = \frac{(\text{Success task} + (\text{Partial success} \times 0.05))}{\text{Total task}} \times 100\% \quad (1)$$

Effectiveness

Describes the number of errors in the form of slips, unintentional action, errors, or omissions made by the user when completing the scenario task (Arga Kusumah, Rokhmawati, & Amalia, 2019). The effectiveness aspect is obtained from calculating the error rate, using equation (2)

$$\text{Error rate} = \frac{(\text{Total error})}{\text{Total opportunity}} \times 100\% \quad (2)$$

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Efficiency

To explain the level of speed in completing a task after studying the application or prototype (Harwati & Widodo, 2017). The efficiency aspect is obtained from the calculation of time-based efficiency using equation (3)

$$\text{Time based efficiency} = \frac{\sum_{j=1}^R \sum_{i=1}^N \frac{n_{ij}}{t_{ij}}}{NR} \quad (3)$$

Cognitive walkthrough

Cognitive walkthrough is a testing method used to evaluate the usability of a user interface based on exploratory learning, which means the user will complete several tasks by trial and error (Sholikhin, Adams, & Akbar, 2018). According to Jacob and John, the cognitive walkthrough has two steps. The first step is preparation, a literature study literature must be done, determining who the respondent is and making a scenario task to be done by the respondent. The second step is executing the walkthrough action sequence and recording the problem (Defriani, Resmi, & Jaelani, 2021).

Maze

Maze is a system testing tool, especially automated usability testing such as click tests, missions for users to complete tasks, and open and closed survey questions (Sanchez, 2021). The maze design will calculate the test scores that have been done into several values, such as:

Screen Usability Scores (SCUS)

SCUS is a usability score for every screen in the expected paths. The score reflects how easy it is for a user to perform with a prototype. A high usability score indicates the design will be easy to use and intuitive (Kinney, 2021).

Mission Usability Score (MIUS)

MIUS is a usability score for each task. A high MIUS score indicates the finished product will be usable, intuitive, and efficient (Kinney, 2021).

Maze usability Score (MAUS)

MAUS is an average of the usability score for every mission or MIUS. The MAUS score can be intended as the final value of usability testing and be a determinant of whether a design is easy to use or not (Glowdy, Fauzi, & Alam, 2020). According to (Glowdy et al., 2020) table 1 is the level of the MAUS score.

Table 1 Level of the MAUS

No.	Score Level	Score Range
1	Low	0 - 50
2	Medium	50 – 80
3	High	80 - 100

METHOD

The methodology used in this study refers to the design thinking method. Fig 2 describes the research methodology carried out.

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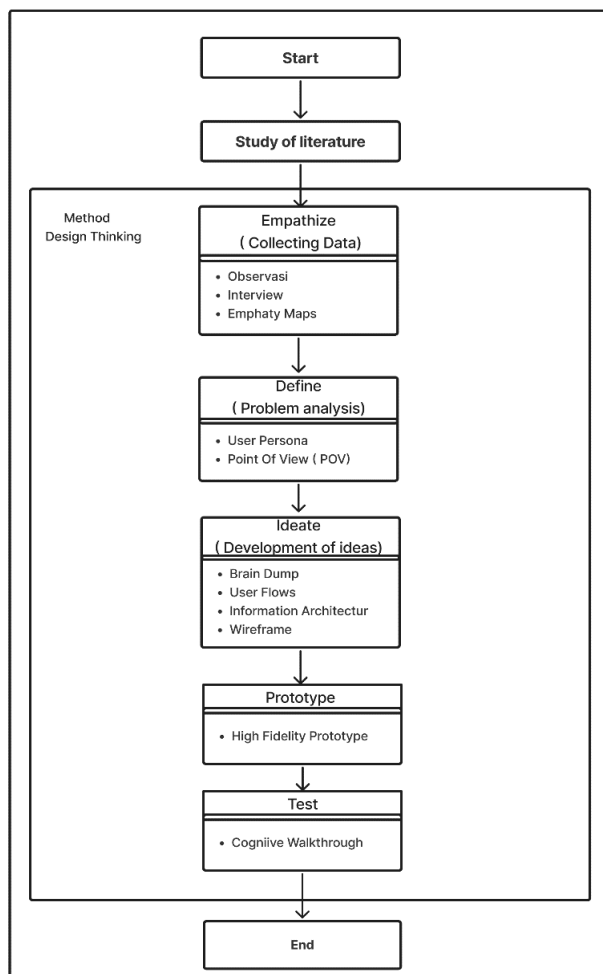


Fig 2 Research methodology

Empathize

At this step, the researcher will make observations on several online counseling services, both paid and free. Then, the researcher will conduct interviews with three resource persons, then the results of the interviews will be collected and analyzed into an empathy map.

Define

After getting data on the problems experienced by the user, the next step is to create a user persona that aims to understand the needs and problem experienced by the user so that researchers can understand what features the user wants. Then the next process is the creation of a point of view (POV), which aims as the main guide in designing, which is a statement of the problem from the user's point of view.

Ideate

At this step, the process of designing a solution is carried out from the results of the problem obtained from the previous step. Finding a solution using the brain dump method is the same as the brainstorming method using the FigmaJam feature to record ideas or solutions. The Next process is the creation of Information Architecture a sitemap or design structure that contains an information framework related to the feature that exists in the applications. The next process is the creation of user flows which aims to show the flow when users access or use the application. The last process is the creation of a wireframe or a simple design of the application interface.

Prototype

At this step, the interface design of the application is made using the Figma application to create a high-fidelity prototype.

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Test

At the step of testing using the cognitive walkthrough method, testing will be carried out on 6 respondents with the help of the Maze tool to record the results of the respondent’s interaction with the interface.

RESULT

Empathize

After conducting interviews with 3 respondents, the results of the interviews were analyzed, and empathy maps were made for each respondent. In this study, the researcher used four quadrant empathy maps. The results of the empathy maps of one respondent, see fig 3



Fig 3. Empathy Maps Indah Handayani

Define

User persona

The result of the user persona of one of the respondents can be seen in fig 4



Fig 4. User Persona Indah Handayani

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Point Of View

The results of the Point of View can be seen in table 2

Table 2 Point Of View result

User	Need	Insight
Feti Fitrianiingsih	Applications that contain information about registration for free online counseling	Users feel it will be easier to find information about registration for free counseling

Ideate

Solution Idea

At this step, the researchers carry out the process of finding solutions to the problems experienced by the user, the solution idea can be seen in fig 5

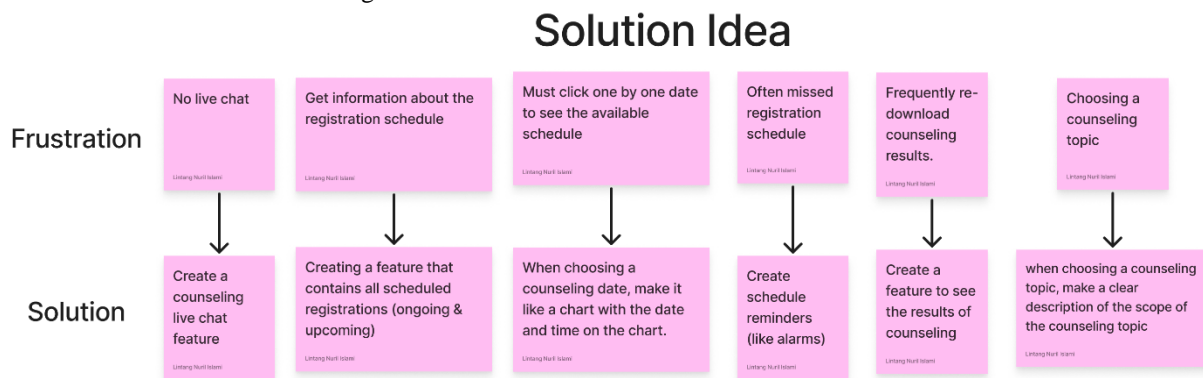


Fig 5 Solution Idea results

Prioritization Idea

This process creates the Importance Urgency, which serves to select the features to be built on the application prototype, these features come from the suggestions of researchers and users. The result of prioritization of ideas, see fig 6

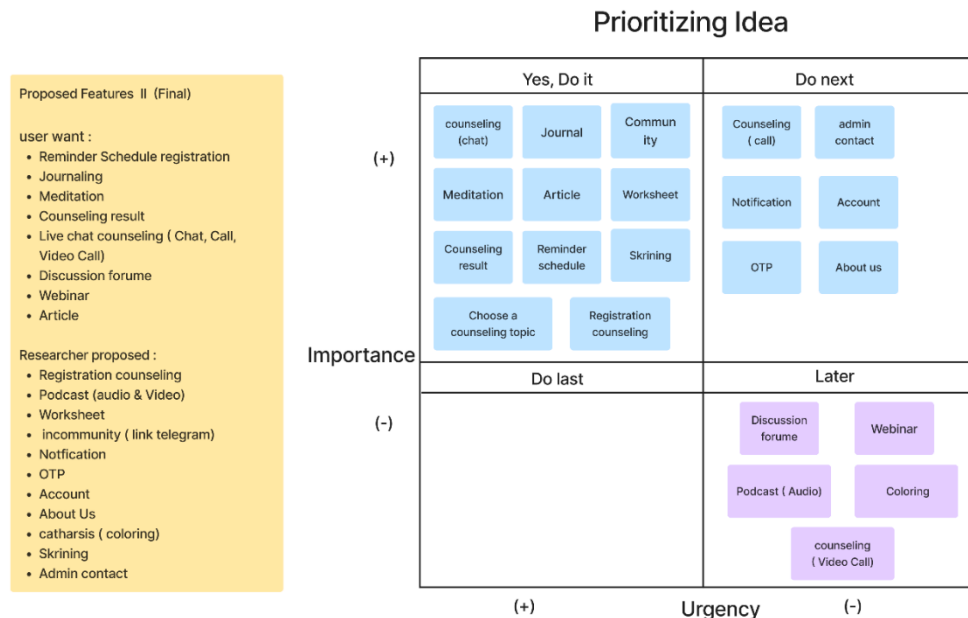


Fig. 6 Prioritization Idea

There are four charts, namely Yes Do it, which means the feature is important ad urgent or prioritized to be made. There is a Do Next chart which mean the feature is important but no too urgent or can be a complementary feature of the applications. The next chart is Do Last, which means the feature is not too

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important but urgent, and the last chart is Later which means the feature is not too important and not too urgent or should not be built I the feature for now.

Information Architecture

Information Architecture which contains the application sitemap to be created, see fig 7

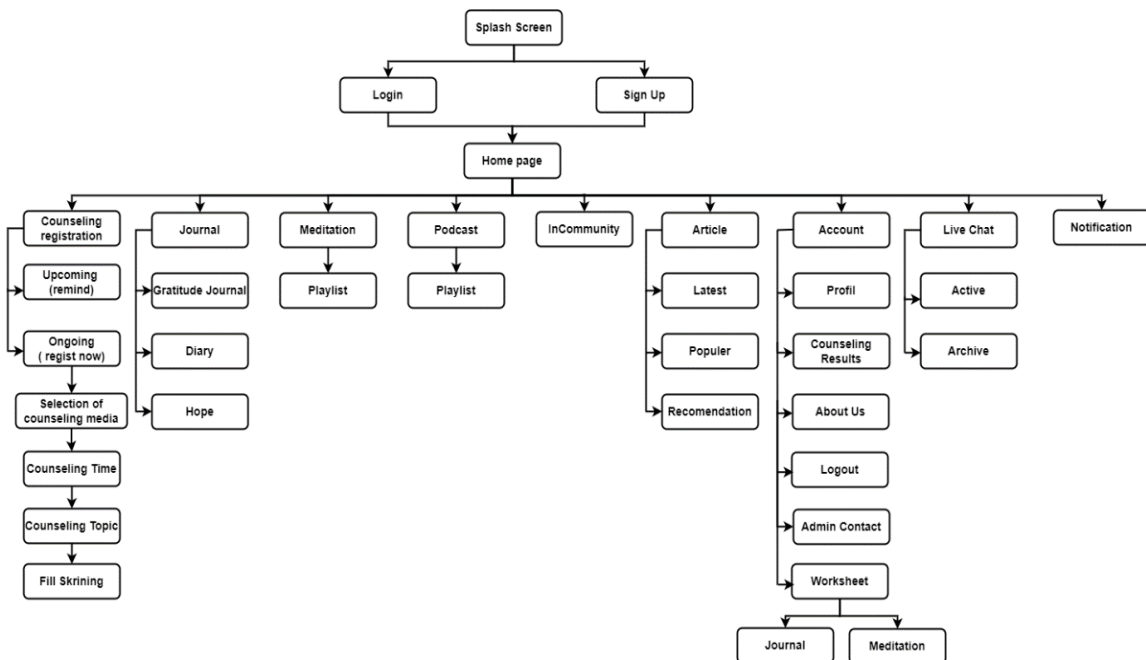


Fig. 7 Information Architecture of Ineffable Counseling App

User Flows

The result of one of the user flows that has been created is the counseling registration user flow, see fig 8

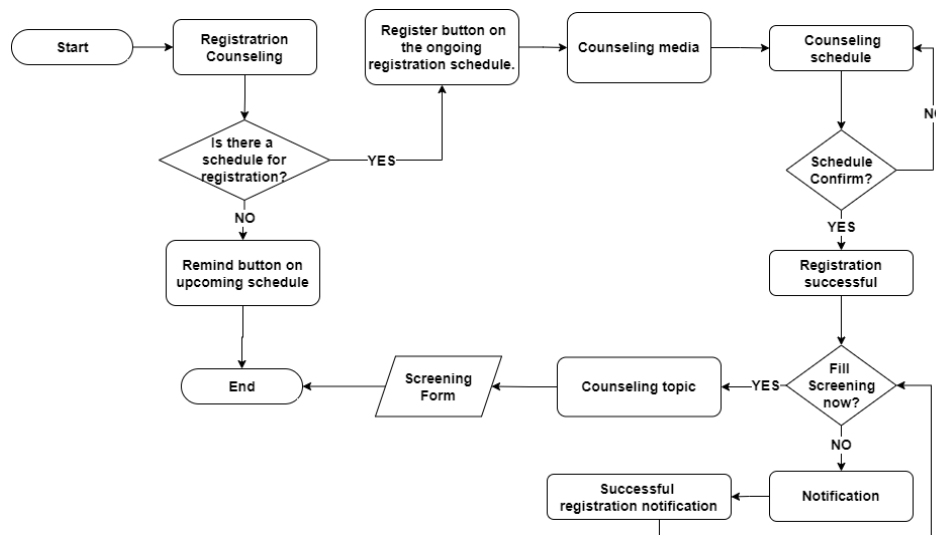


Fig. 8 User flows counseling registration

Wireframe

The results of one of the wireframe that has been created can be seen in fig 9

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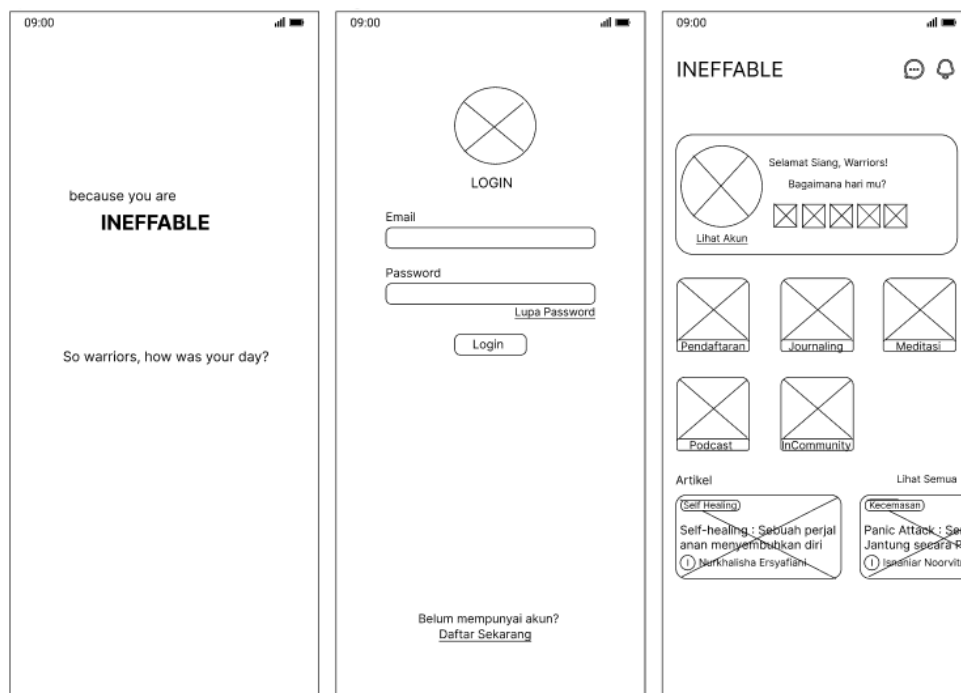


Fig. 9 Wireframe

Prototype

At this step, a mockup is made, and then the prototype is carried out so that it can interact between one frame and other. Prototype can be seen in fig 10

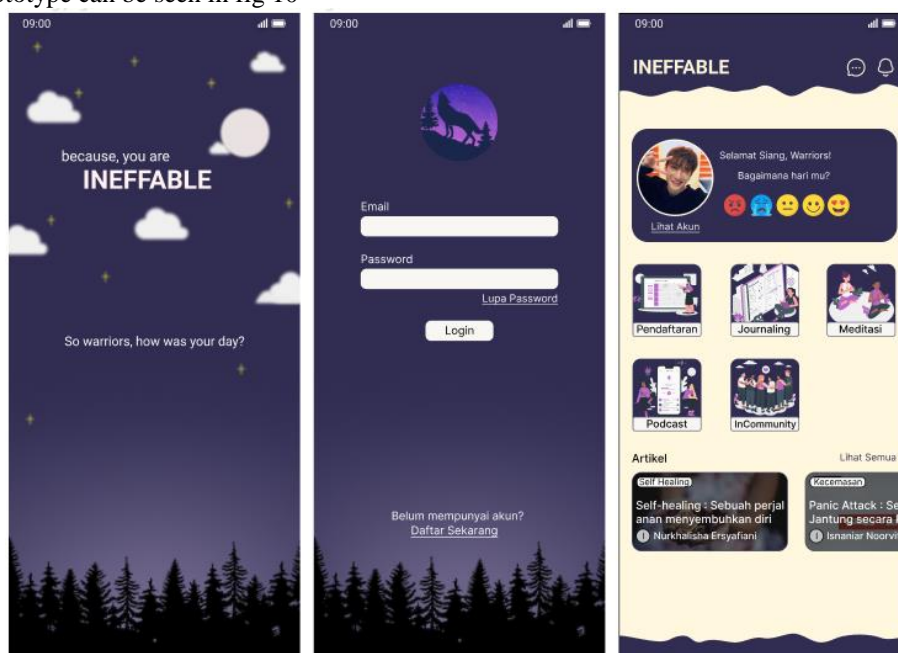


Fig.10 Prototype

Test

At the test step, using a cognitive walkthrough where this stage divide into 2 stages, they are Preparation step

The results of this stage is to determine what tasks will be done by the respondent, the task can be seen in table 3 Table 3 Task will be done by respondent

No. Task	Task	Number of step
1	Register and Login Application	16

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2	Registering Counseling and setting registration reminder	11
3	Selecting a counseling Topic and filling screening	14
4	Make a Journal (Gratitude journal)	12
5	Make a Journal (Diary) and view the diary	12
6	Make a Journal (Journal of hope)	11
7	Doing Meditation	5
8	Listening to Podcast	5
9	Reading Articles	6
10	Join Incommunity	4
11	Doing counseling	10
12	Viewing counseling results and working on worksheets	8
13	Contact admin and view about us	9
14	Logout the application then forget the password and re-login	13

Execution step

The results of this process produce some test data such as:

Data on task completion by each respondent can be seen in table 4

Table 4 Test task completion data

	T-1	T-2	T-3	T-4	T-5	T-6	T-7	T-8	T-9	T-10	T-11	T-12	T-13	T-14
R1	S	S	P	S	S	S	S	S	P	P	S	S	S	S
R2	S	S	P	S	S	S	S	S	P	S	S	S	S	S
R3	S	S	S	S	S	S	S	S	S	S	S	S	S	S
R4	S	S	S	S	S	S	S	S	S	S	S	S	S	S
R5	S	S	S	S	S	S	S	S	S	S	S	S	S	S
R6	S	S	S	S	S	S	S	S	S	S	S	S	S	S
T = Task	R = Respondent			S = Success			P= Partial Success			F = Fail				

Data on task scenario errors experienced by user, can be seen in table 5

Table 5 Task scenario error data

	T-1	T-2	T-3	T-4	T-5	T-6	T-7	T-8	T-9	T-10	T-11	T-12	T-13	T-14
R1	1	0	0	3	1	0	0	0	1	1	3	0	0	0
R2	0	0	0	0	0	0	0	0	1	0	0	0	1	0
R3	0	0	0	0	1	0	0	0	2	0	2	0	0	0
R4	1	0	0	2	1	0	1	0	0	0	0	0	1	0
R5	0	1	0	1	1	2	0	0	0	0	0	0	0	0
R6	1	0	0	0	0	0	0	0	0	0	1	2	0	2
Total	3	1	0	6	3	2	1	0	4	1	6	2	2	2
Number of errors = 33														

Data on task completion time by each respondents, can be seen in table 6

Table 6 Task completion time by each respondents

	Task-1	Task-2	Task-3	Task-4	Task-5	Task-6	Task-7	Task-8	Task-9	Task-10	Task-11	Task-12	Task-13	Task-14
R1	41,53	23,33	37,61	33,76	26,75	21,79	11,00	11,82	24,11	16,18	40,11	25,54	19,42	25,56
R2	26,21	30,06	50,36	22,39	19,16	21,92	8,60	7,37	14,16	7,59	27,77	23,74	31,37	23,74
R3	32,95	18,56	25,76	19,03	24,24	17,20	7,04	8,57	14,08	7,63	30,22	22,73	23,64	22,73
R4	34,41	19,03	24,90	32,26	16,02	20,16	8,22	5,53	7,94	7,43	18,72	30,53	18,46	20,52
R5	26,07	74,69	30,53	22,02	19,01	38,89	27,07	26,03	9,48	11,23	49,82	40,75	40,35	40,75
R6	30,33	15,16	21,38	18,39	14,94	13,77	4,99	7,41	9,93	4,70	17,46	20,83	14,73	20,83

Mission Usability Score (MIUS)

MIUS data value can be seen in table 7

Table 7 Mission Usability Score

No. Task	Mission Usability Score (MIUS)
1	99

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2	10
3	83
4	97
5	98
6	98
7	100
8	100
9	79
10	90
11	89
12	99
13	89
14	99
Total	1320

The value between task is quite high, this indicates that the prototype is easy to use, easy to understand, end efficient.

DISCUSSIONS

Feature selection process

Before making what features will be made in prioritizing ideas, there is a feature selection process using impact effort, which measures the features desired by users that have a good impact on application features but have an effort that can be implemented or used feature, The results of the impact effect can be seen in fig 11

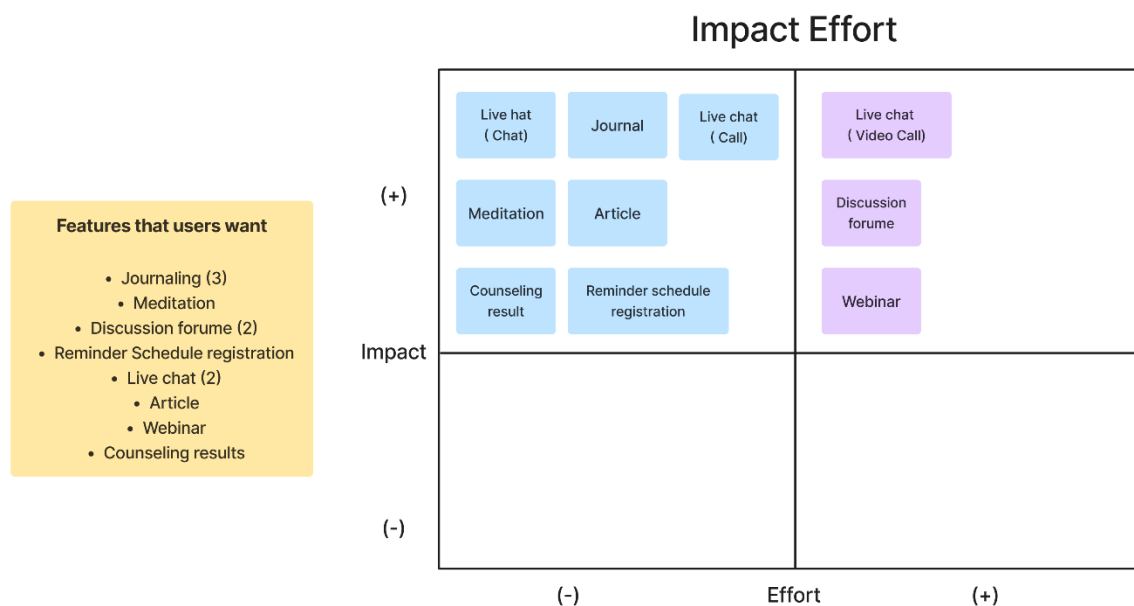


Fig. 11 Impact Effort

The blue note in the impact (+) effort (-) section indicates that the features contained in the chart are features that had a good impact but require little effort to create. Meanwhile, the purple note in impact (+) effort (+) indicates that this feature had a good impact and requires much effort. Therefore, for the features on the purple note, it is necessary to reframing the problem to see the problem of the feature to find a solution from a new perspective. Reframing the problem can be seen in fig 12

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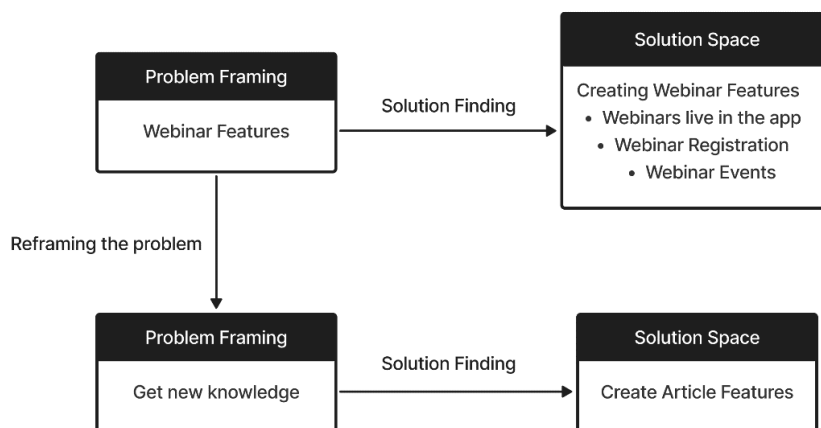


Fig. 12 Reframing the problem of discussion forum feature

Figure 12 shows that if the user wants a Webinar feature, the solution is to create a webinar feature where can, but it is felt that it will require much effort for developers. So when the reframing problem is done, it found that what the user really wants is to get new knowledge, then the solution for that is to create an article feature.

Analysis of Test Results

Learnability Aspect

Learnability is calculated by calculating the success rate by looking at the data on the completion of the test task, which can be seen in the table 4. to calculate the success rate, equation(1) is used

$$\begin{aligned} \text{Success Rate} &= \frac{(\text{Success task} + (\text{Partial Success} \times 0.5))}{\text{Total Task}} \times 100 \% \\ &= \frac{(79 + (5 \times 0.5))}{6 \times 14} \times 100\% = 97\% \end{aligned}$$

After calculating the results of the ineffable counseling mobile application prototype, it has an average task completion of 97% of scenarios correctly. According to Sauro the average completion rate or success rate is 78% (Sauro, 2011). Which indicate that the learnability level of the prototype design is still above average, and the application design is easy to learn.

The aspect of Effectiveness.

Effectiveness is calculated by looking at the data on the scenario error can be seen in table 5, to calculate the error, used equation 2.

$$\begin{aligned} \text{Error rate} &= \frac{(\text{Total Error})}{\text{Total Opportunity}} \times 100\% \\ &= \frac{(33)}{137 \times 6} \times 100\% = 4\% \end{aligned}$$

After calculating the Ineffable counseling mobile application prototype results, it has an average error rate of 0.04% or 4% error rate, so the obtained quality level value is 96%. According to Mifsud the average error value of one task is 0.7 with 2 out of 3 users making errors (Mifsud, 2015). Which indicate that the design prototype's effectiveness is still above average and the application design is effective to use or implement.

The aspect of Efficiency

Efficiency is calculated by looking at the data on the time-based, which can be seen in table 6, to calculate the time-based using equation 3. From the calculation of time-based efficiency, the result is 0.05 task/second, which shows that the respondent can complete 5% of each task given every second, and each task takes an average of 22 seconds to complete the task.

MAUS value

As for the MAUS value, it is obtained from the average result of the MIUS, where after a calculation is carried out, the result of the MUAS value is 94. The level of MAUS score in table 1 shows that the value of 94 is included in the high level, indicating that the interface design is feasible to implement.

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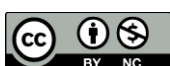
CONCLUSION

This research resulted in the design of a prototype application for mental health online counseling with several features, one of the feature is to collect information about available free online counseling, with journaling and meditation features. Based on the explanation in the previous section, it can be concluded that the design thinking method can be applied to recommendations for developing mobile-based application designs. The results of the application can meet user needs. This can be seen from the evaluation result where the learnability value is 97%, the error rate is 0.04, time-based efficiency is 0.05 tasks/second, While the MAUS score get a score go a score of 94, which was include in the high level, indicating that the interface design was feasible to be implemented.

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*name of corresponding author



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