

# Design Of Health Service Mobile Application Interface Using User Centered Design Method

Berliana Kemala Dewi<sup>1)</sup>, Meriska Defriani<sup>2)</sup>, M. Agus Sunandar<sup>3)</sup>

<sup>1,2,3)</sup>Sekolah Tinggi Teknologi Wastukencana, Indonesia

<sup>1)</sup>[berlianakd30@gmail.com](mailto:berlianakd30@gmail.com), <sup>2)</sup>[meriska@wastukencana.ac.id](mailto:meriska@wastukencana.ac.id), <sup>3)</sup>[agoes.61@wastukencana.ac.id](mailto:agoes.61@wastukencana.ac.id)

**Submitted** : Nov 17, 2022 | **Accepted** : Dec 15, 2022 | **Published** : Jan 1, 2023

**Abstract:** In this modern era, many things that have been digitized indirectly help in community activities, especially in obtaining public service facilities. This clinic is one of the public facilities in Purwakarta Regency which is engaged in health services to facilitate services to the community. One of the efforts of this Clinic is to continue to provide effective and efficient health facilities under any circumstances and aims to increase the attractiveness of patients to the clinic. The purpose of this research is to design a health service mobile application interface using the User Centered Design method to provide health service information to the general public. User centered design is a design process that focuses on user needs, by carrying out 5 stages, namely Understand Context of Use, Specify User Requirements, Design Solutions, Evaluate Against Requirements. Products developed using this method are optimized for users and emphasized on how the user needs or wants to use a product. Interface testing uses the Single Ease Question as a measure of the success rate of interface design that has been made. The results of this study resulted in an interface design that is in accordance with the characteristics of the general public, this is evidenced by the results of the evaluation using the Single Ease Question getting an average score of 6.7 out of 5 assignments given to 5 respondents during the testing stage, so it can be concluded that the score It has a good level of convenience and is easy to use.

**Keywords:** User Interface, User Centered Design, Health Services, Single Ease Question, High Fidelity Prototype

## INTRODUCTION

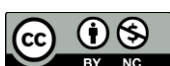
The current technological developments are so fast that the dissemination of information can be done quickly so that it has a big impact on society. In this modern era, many things that have been digitized indirectly help in community activities, especially in obtaining public service facilities. The Asri Kemala Dewi Clinic is one of the clinics in Purwakarta Regency which is engaged in health services to make it easier for people to get health services. One of the clinic's efforts is to continue to provide effective and efficient health facilities that aim to increase the attractiveness of patients to the clinic by utilizing the role of information technology by realizing mobile application-based health services.

Design is the process of creating effective means of communication between humans and computers, or currently called mobile applications. The design of the user interface needs to be done correctly because it will shape the user's perception of a software to be used and must also pay attention to ease of use so that it is easily accepted by the general public. This clinic requires interface design in realizing mobile-based applications and maintaining health services so that they remain efficient and can provide convenience for prospective users. Because efficient service is one of the keys to attracting consumer interest and creating customer satisfaction. Therefore, the role of digitization is needed to design interfaces that can facilitate access for the general public in obtaining health services without having to visit the clinic directly.

This study aims to design a health service mobile application interface using the User Centered Design method to provide health service information to the general public. User Centered Design is a design process that focuses on user needs (Sagala et al., 2020). The purpose of using User Centered Design is to increase the value of satisfaction and comfort that users will feel when using the system (Savira, 2020).

Based on previous research that the authors observed, research related to user interface design uses User Centered Design. Research was conducted in 2020 by Rizky Bagus Paramadani with the title "Development of

\*name of corresponding author



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the SIMRS User Interface and User Experience to Improve Hospital Health Services for the Pharmacy Section". This UI development uses the User Centered Design method. This research resulted in a UI design that was successfully developed in trials with the System Usability Scale obtaining a result of 78 which can be categorized as good. As for testing the user experience, the results are good and above average (Paramadani et al., 2020).

## LITERATURE REVIEW

### User Interface

User Interface (UI) is an interactive system component (software or hardware) that provides information and control for the user to complete certain tasks with an interactive system. The user interface can be internal or external users. The design varies greatly depending on factors such as the purpose of the interface, user characteristics, and the characteristics of a particular interface device (Ramadhan et al., 2021). The interface is one part of the software that relates directly to the user. Users interact with the software system through the user interface (Nugraha et al., 2017).

### User Centered Design

User Centered Design is a design process that focuses on user needs. Products developed using the UCD approach are optimized for end-users need or desire end-users to use a product. The design is designed with adaptation to behavior or behavior in using the product so that the product being developed does not force the user to change his behavior when using the product. The goal is that the developed product can be useful and easy to use for users (Sagala et al., 2020). Products developed using the UCD approach are optimized for end-users and emphasize how end-users need or desire to use a product. This is a benchmark for how convenient it is to use, manage, be effective, and how useful the product is for users (Anggie Sinaga, 2021).

The user is the central point involved in each stage of User Centered Design (Sabilatunnajah et al., 2021). The concept of User Centered Design is that the user is at the center of the system development process, and the goals or properties, context and system environment are all from the user experience. In the User Centered Design process, there are 4 steps that are carried out in iterations as shown in Figure 1 (Ramadhan et al., 2021).

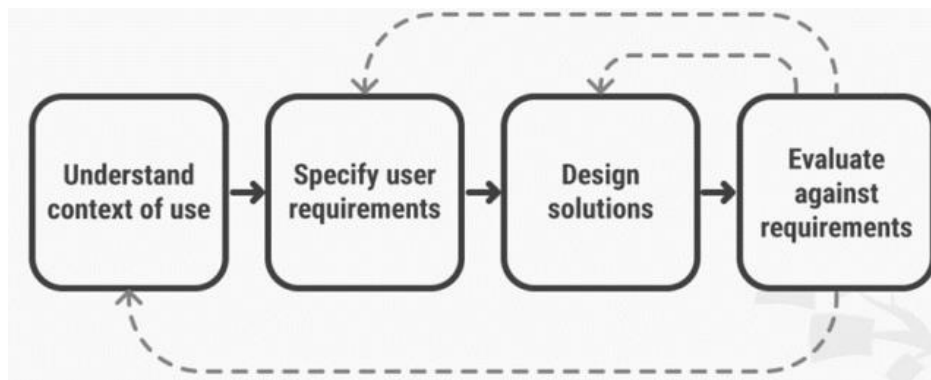


Fig 1. User Centered Design  
Source: (Interaction Design Council, 2018)

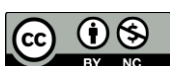
In User Centered Design there are four stages in it, including Understand Context of Use, Specify User Requirements, Design Solutions, Evaluate Against Requirements. The first stage in User Centered Design is Understand Context of Use, understanding the context of using the application to be built. Apart from determining potential application users, the purpose of this stage is to collect information from potential users. Specify User Requirements, at this stage identify a detailed list of user requirements, in order to find out user needs. User requirements are obtained when identifying problems. Design Solutions, designing products according to the problem analysis that has been obtained according to the needs of the user. Evaluate Against Requirements, at this last stage is to validate or test the interface design that has been made.

### Single Ease Question

The Single Ease Question is a testing method that is carried out after participants interact with the prototype and complete each task. During the test the test participants will complete the task, while the facilitator will observe them (Ramadhan et al., 2021).

The Single Ease Question is a questionnaire method that is used after the respondent carries out a task or task in a test. The reason for using Single Ease Question is that the facilitator can find out quickly the responses from

\*name of corresponding author



the respondents to the existing problems in completing the task. In addition, respondents will find it easier to give an assessment because it is done after carrying out task given (Fahrudin & Ilyasa, 2021).

According to (Sauro & Lewis, 2012), Single Ease Question is a rating scale with points 1 to 7 to assess the level of difficulty or ease of a task carried out by the user and a task will be said to be difficult if the user gives value 5 and below. When usability testing takes place, respondents will be asked to perform several tasks and give a value of 1-7 for each task given. The results of carrying out the task are assessed on a 1-7 point rating scale ranging from very difficult which is indicated by number 1 to very easy which is indicated by number 7. For an average SEQ score  $\leq 5$ , the task has a low level of ease so has scores that are below average (Muliani et al., 2020). Examiners will ask participants to assess the overall appearance of the interface that has been made and how easy it is for them to complete the given task with a rating scale which has seven points in (Ramadhan et al., 2021). Figure 2 represents the 7 point scale of SEQ.

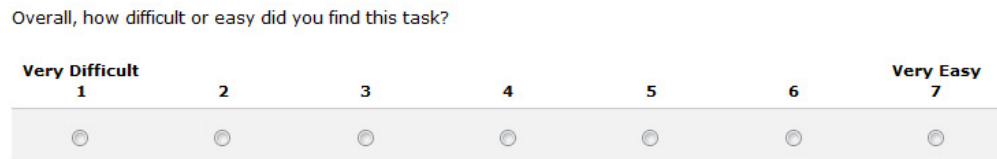


Fig 2. Scale Single Ease Question  
Source: (Sauro & Lewis, 2012)

According to (Sauro & Lewis, 2012) the Single Ease Question (SEQ) consists of one question with a Likert scale of 1 to 7 from the choices, namely: very difficult, difficult, moderately difficult, neutral, fairly easy, easy, and very easy (Romadhanti & Aknuranda, 2020). The Single Ease Question is carried out after the respondent completes the task, but it should be noted that 1 Single Ease Question only applies to 1 task. After completing task, the respondent was asked to rate how difficult or easy task was (Hadafi & Herlambang, 2021). The following is a table of single ease question:

Table 1  
Explanation of the Scale of SEQ

Response	Value
1	Very difficult
2	Difficult
3	Fairly difficult
4	Neutral
5	Fairly easy
6	Easy
7	Very easy

Table 2  
Research Instrument

Score Range	Interpretation
1 – 1,9	Very difficult
2 – 2,9	Difficult
3 – 3,9	Fairly difficult
4 – 4,9	Neutral
5 – 5,9	Fairly easy
6 – 6,9	Easy
7	Very easy

## METHOD

The methodology used in this study is shown in Fig 3.

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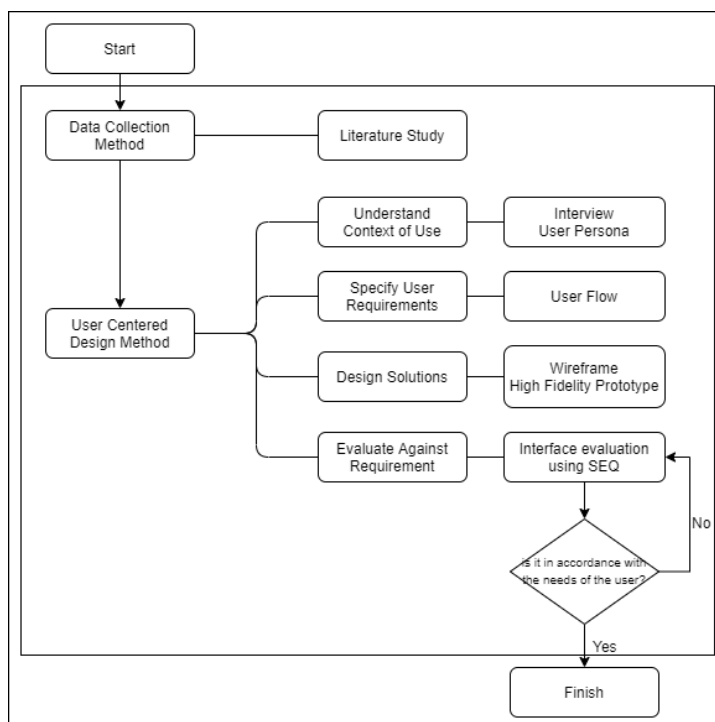


Fig 3. Research methodology

### Data Collection Method

The collection of literature studies in this research was carried out to obtain scientific sources as well as previous studies that could be used as a basis for designing mobile health service application interfaces using the User Centered Design method, the Single Ease Question, and other literature studies. related to this research. A literature study was conducted to better understand what needs to be done in designing interfaces by reviewing several journals, books, e-books, and other media.

### Understand Context of Use

The first stage in User Centered Design is to understand the context of using the application to be built. Apart from determining potential application users, the purpose of this stage is to collect information from potential users. The author conducts interviews as a form of understanding the user context. Interviews were conducted with five general public as respondents. Then the results of the interview will be compiled into a user persona.

### Specify User Requirements

In the specify user requirements stage, there are two work points, namely determining user needs based on the results of user needs in the user persona and creating user flow. After obtaining the profile of the prospective user and the required information, proceed with specifying the user's needs. User requirements that have been specified are then processed and generate user flow.

### Design Solutions

In this stage contains ideas to find solutions to the problems that have been obtained. At this stage, the interface design is carried out according to the results of the analysis of user needs. And finally, Wireframe is a sketch or framework that aims to arrange items on a view before the actual design process is created. The author uses Figma tools to create an interface design. The result of this stage is a high-fidelity prototype that is ready to be tested on users.

### Evaluate Against Requirement

At this stage an evaluation is carried out using the Single Ease Question (SEQ) as a measure of the level of success of an interface design that has been made. At this stage using the Single Ease Question (SEQ) which aims to evaluate the results of the high-fidelity prototype that has been made.

\*name of corresponding author



## RESULT


### Understand Context of Use

Table 3  
Conclusion of the interview with the respondent

No.	Conclusion
1	On average, they feel problems such as the transaction process which is quite difficult
2	The length of the queue, want to get information on the queue at the Clinic
3	The interface display on the health care mobile application that has been used is less attractive
4	Absence of consultation with a doctor online
5	There is no feature of purchasing drugs online.

Table 4 is a table of the User Persona of one of the respondents.

Table 4  
User persona from Youky Arie Sandy

	
Demographic	<ol style="list-style-type: none"> <li>1. Name: Youky Arie Sandi</li> <li>2. Gender: Woman</li> <li>3. Age: 22 years</li> <li>4. Status: Not Married</li> <li>5. Address: Purwakarta</li> <li>6. Profession: General Public/Students</li> </ol>
Behavior	<ol style="list-style-type: none"> <li>1. Able to operate cellphones properly</li> <li>2. Accustomed to using internet technology</li> <li>3. Using the mobile app</li> </ol>
Environment and Technology	Using a smartphone with android operation system
Attitude and Activity	<ol style="list-style-type: none"> <li>1. His daily life utilizes internet technology and mobile applications</li> <li>2. Often use smartphones to help with their activities</li> </ol>
Problem	The health service mobile application that has been used is PeduliLindungi, the problems felt by users in the PeduliLindungi application only inform the spread of COVID-19 and QR scanning, there is no consultation feature with doctors.
Needs	The existence of online registration will be better, so that we can estimate when we come to the clinic without the need to wait long or wait in line, because as sophisticated as an application is, the examination still needs to be done by the doctor directly. And it is necessary to have a consultation feature with a doctor.

### Specify User Requirements

The following is a conclusion on user needs obtained from user needs in user persona with the following results:

Table 5  
User Needs

No.	Result
1	Can consult a doctor online
2	Can make an Appointment with a Doctor online
3	Get queue information at the Clinic

\*name of corresponding author

No.	Result
4	Can buy medicines and vitamins online to facilitate the transaction process
5	Interface of healthcare mobile application with features that provide information about health that is interesting and easy to understand by users

The user needs that have been specified are then processed and generate user flow. In this study, there are several user flows, this user flow is generated from ideas generated based on user problems, including user habits in using health service mobile applications.

Figure 4 is the user flow of one of the features, which is the main feature, the online consultation feature with a doctor.

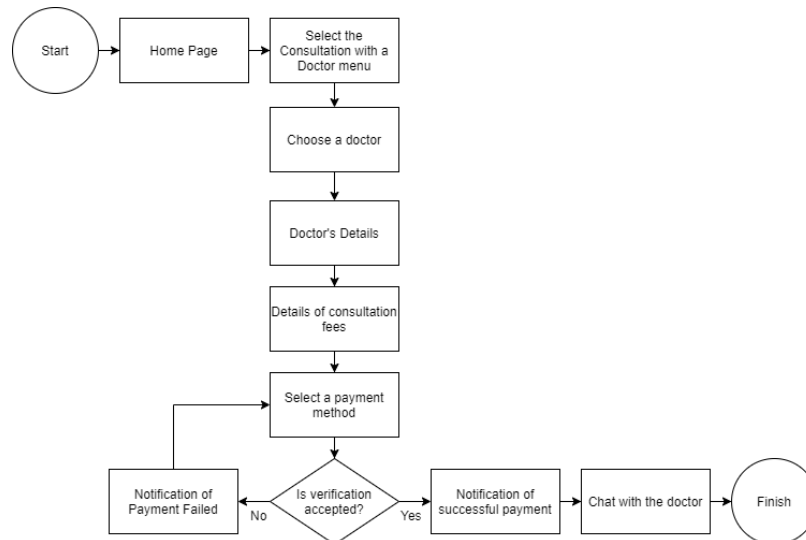
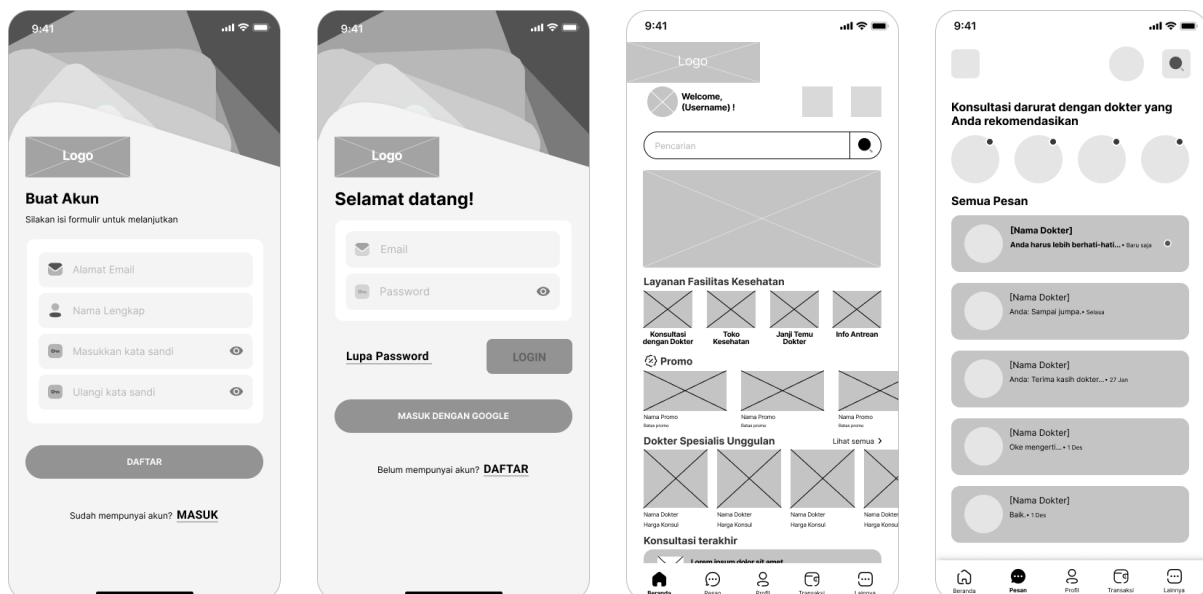


Fig 4. User flow User Flow Online Consultation Feature with Doctor

### Design Solutions

Fig 5 is a wireframe. In the wireframe image is the page of the Registration, Login, Homepage, Online Consultation Feature with Doctor, Queue Information Features, Features of the purchase of drugs and vitamins, Health Article Features, and Payment methods.



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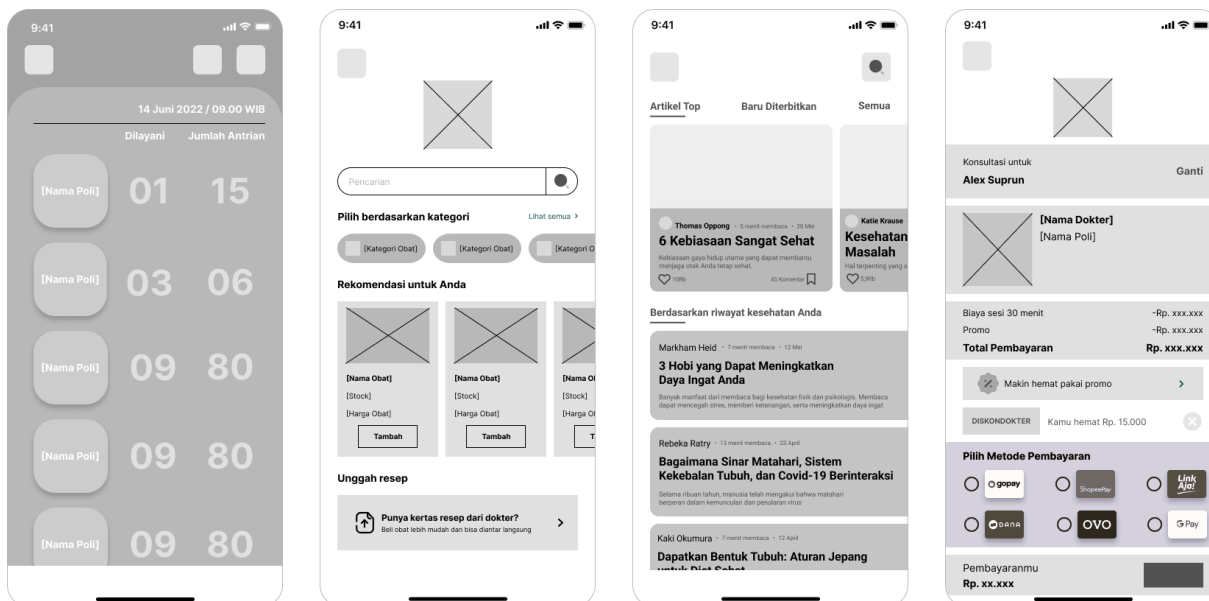
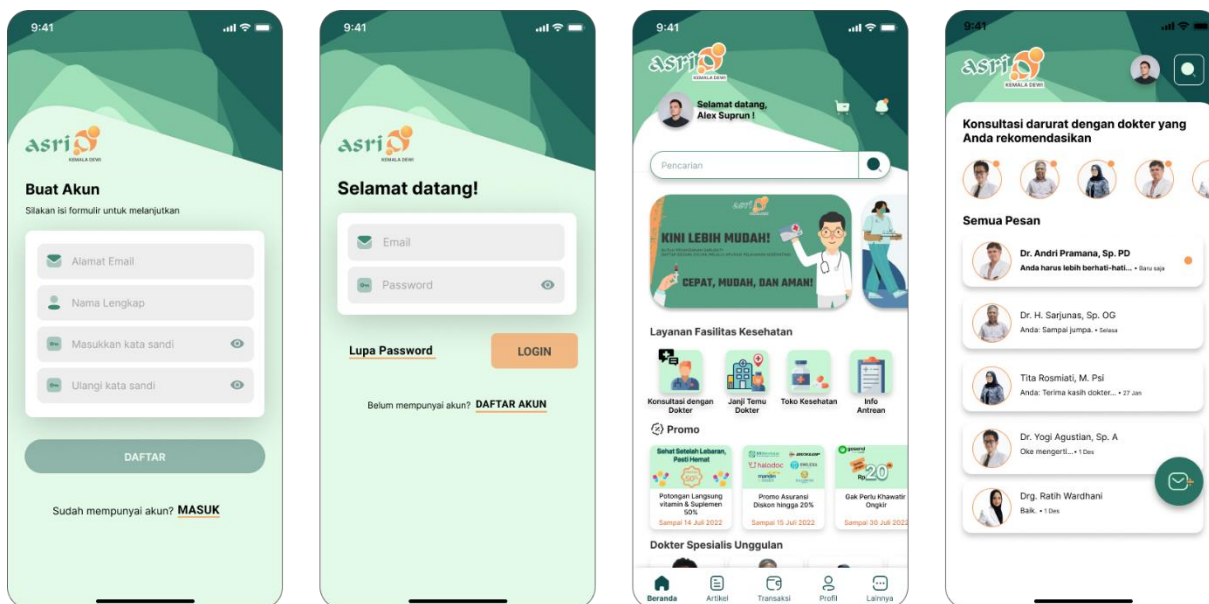


Fig 5. Wireframe

**High Fidelity Prototype**

Fig 6 is a prototype. In the prototype image is the page of the Registration, Login, Homepage, Online Consultation Feature with Doctor, Queue Information Features, Features of the purchase of drugs and vitamins, Health Article Features, and Payment methods.



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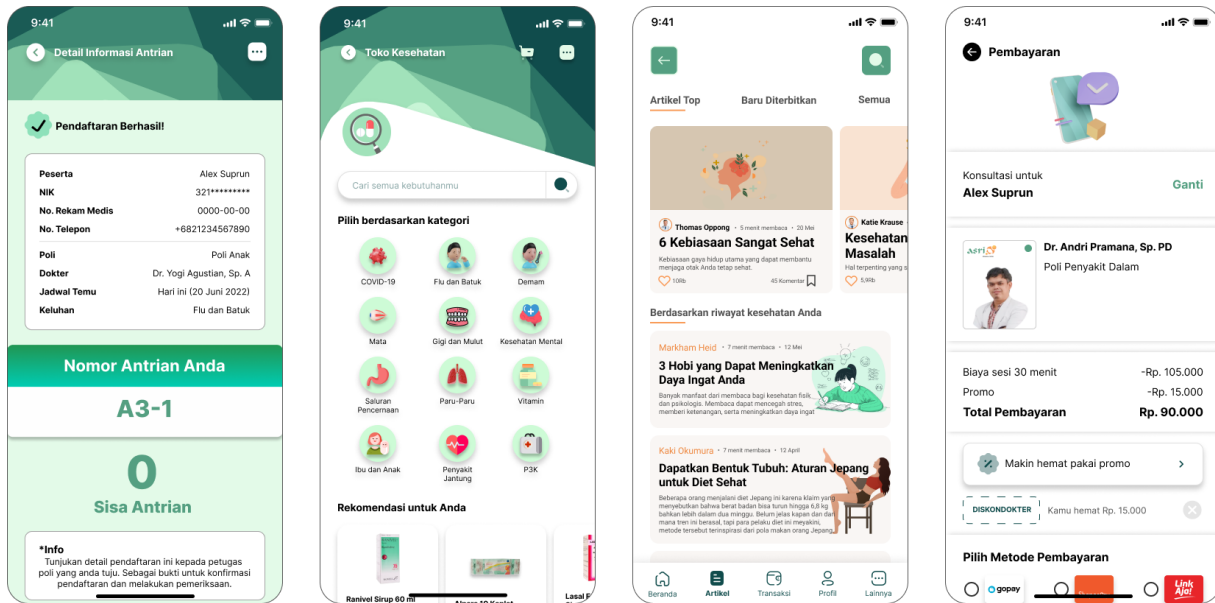


Fig 6. High Fidelity Prototype

**Evaluate Against Requirements**

Here is a table of the tasks tested on potential users:

Table 6  
Tested tasks

No.	Task	Task Description
1	Account Registration and Login	Register an account first, after that login using the account that has been registered
2	Online consultation with a Doctor	Conducting a health consultation with a doctor online
3	Online Doctor Appointments and Queuing Information	Make a doctor's appointment online and view the queue information in the Clinic
4	Purchase of Drugs and Vitamins	Buying drugs and vitamins on the Health Store page
5	Health Articles	View and review an article selected by potential users.

The value of the questionnaire starts from the numbers 1 to 7. The calculation of the single ease question questionnaire is the value per task summed and the average value of the tasks obtained is summed and then divided by the number of tasks given. Evaluation of the assigned task by providing a questionnaire after the respondent has completed the assigned task. The results of the questionnaire provided are an assessment of respondents' satisfaction with values of 1 to 7.

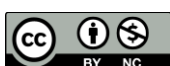
**DISCUSSIONS**

Table 7 is the result of the Single Ease Question assessment from five respondents.

Table 7  
Average overall result from Single Ease Question

Task	No. Respondents					Average
	R1	R2	R3	R4	R5	
T1	7	7	7	7	7	7
T2	5	7	6	7	6	6,2
T3	6	7	6	7	7	6,6
T4	7	7	7	7	7	7
T5	7	6	7	7	7	6,8
Average SEQ Score						6,7

\*name of corresponding author





After the author conducted an interview with the respondents, the results of the Single Ease Question value given by the respondents after working on the task. All tasks given to respondents amounted to 5 tasks with an average SEQ score on each task, namely  $> 5$  so that the results obtained showed that the prototype of the health service mobile application interface "Asri Kemala Dewi Clinic" in this study had a good level of ease and was easy to use.

According to Sauro (2012) the result of a task's SEQ score is said to be difficult if the score is below 5 (Fitri Resdiyani, Ismiarta Aknuranda, 2021). Therefore, having an average score of 6.7 health service mobile application "Asri Kemala Dewi Clinic" can be interpreted as very easy to use.

## CONCLUSION

In this study, it is proposed to use a mobile as a media for health services that can be used by the general public with an interface that is tailored to the characteristics of the user. Based on the results of tests conducted by the authors on prototype application mobile "Asri Kemala Dewi Clinic", it can be concluded that prototype tested by 5 respondents can be understood by users. This research can produce an interface design that is in accordance with the characteristics of the general public by using the User Centered Design. This is evidenced by the results of evaluating the design mobile "Asri Kemala Dewi Clinic" with 94 pages of interface design or prototype that was successfully designed in this study has a good level of ease using the Single Ease Question that has been done and got an average score. an average of 6.7 out of 5 tasks given to 5 respondents during testing. The score gets the easy category which means it is appropriate and acceptable to users.

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\*name of corresponding author



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