

# Design and Implementation of User Interface and User Experience in Online Sales Applications At Sugosha Pharmacy With User Centered Design Method

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**Abstract**—The health sector, such as pharmacies, is currently growing in line with technological developments from year to year. The existence of online drug distribution proves the development of the health sector, especially pharmacies. Circular Letter Number HK.02.01/MENKES/303/2020 to prevent the spread of COVID-19 from supporting online drug distribution, increase sales and prevent the spread of COVID-19, of course, needs to be done in all pharmacies, including Sugosha Pharmacy, which currently does not have a drug sales application. Based on these problems, Sugosha Pharmacy requires an online sales application, namely an e-commerce website. User interface and user experience are needed to design an e-commerce website to look attractive and easy to use. To design and implement the design, user-centred design is used. User-centered design is an iterative design process that requires designers to focus on users and their needs at every phase of the design process. This research produces the user interface and user experience of the Sugosha Pharmacy e-commerce website for sellers and buyers and a front-end for the Sugosha Pharmacy e-commerce website for sellers. System Usability Scale used to test the user interface design and user experience of the Sugosha Pharmacy e-commerce website. The Usability Scale system results in the seller's part design being used well and the buyer's part design being used very well. Then for the front-end of the e-commerce website, black box testing is carried out, producing features that run according to the design.

**Keywords**— *User Experience, User Interface, User Centered Design, E-Commerce, pharmacies*

## I. INTRODUCTION

One of the ways for people to maintain their health is by taking drugs that are obtained by buying them at pharmacies. Sugosha Pharmacy is one of the pharmacies operating in Bali. Precisely on Jl. Sedap Malam No. 393x, Kesiman, Kec. East Denpasar., Denpasar City. Currently, Sugosha Pharmacy has served many customers, but only in the conventional way, namely, the customer must come to the pharmacy every time they want to buy medicine.

The COVID-19 pandemic in Indonesia resulted in the need for innovations by providing an online drug purchase application to increase sales at the Sugosha Pharmacy. Based on letter number HK.02.01/MENKES/303/2020, health service facilities, including pharmacies, can provide electronic prescription services, and the delivery of pharmaceutical preparations, medical devices, consumable medical materials,

and/ health supplements in electronic prescriptions can be done securely. through delivery services or pharmaceutical, electronic system operators [1].

With the online sales application, Sugosha Pharmacy can take advantage of several advantages, such as pharmacy managers being able to carry out their transactions anywhere and anytime, pharmacy managers can also carry out promotions in the broader area. From the consumer side, they do not need to come to the pharmacy to choose and buy drugs. According to several studies, online sales have been widely applied to various types of shops and restaurants [2][3][4]. Based on this, an online sales application needs to be developed at Sugosha Pharmacy. Designing a good user interface and user experience design requires a design methodology. User-Centered Design (UCD) is one of the design methodologies that can be used. Researchers chose to use the User-Centered Design methodology because, according to [5], UCD is proven to produce applications that have a high level of usability. In addition, in some research methods, UCD is used to develop an application [6][7]. Based on this, the UCD method is more suitable to be used. Because apart from designing, the scope of this paper also implements designs made for the seller. This research also makes features suitable for pharmacy applications that are not owned by previous studies [6][7].

## II. RESEARCH METHODS

This study uses a user-centered design (UCD) research method. User-centered design is an interactive process in which the design and evaluation steps are made from the beginning of the project to the implementation stage [8]. In addition, user-centered design (UCD) is a design process that always involves users and their needs in every phase of the design process [9]. User-centered design has stages in its development methodology that must be passed iteratively. These stages can be described as shown in Figure 1 [10].

This research goes through the four stages shown in Figure 1, namely understand the context of use, specify user requirements, design solutions and evaluate against requirements.

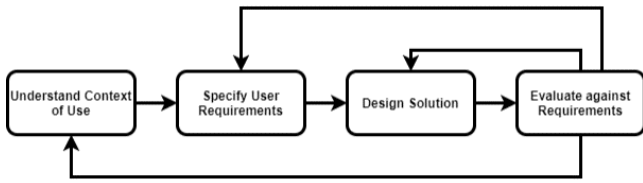


Fig. 1. Stages of the user centered design process [10]

In the understand context of use stage, the researcher identifies users who will use the application by conducting interviews with the owner and employees of Sugosha Pharmacy as sellers, then Sugosha Pharmacy customers as buyers. Understand context of use is done to identify whom the user is by understanding the characteristics, tasks, work, and environment of the user who will use the system [11].

The next step is specifying user requirements. This stage can help designers understand users and how designers meet their needs [10]. Researchers identify what users need from the application by creating personas, journey map, a list of user needs features, and application diagrams. Personas are a good starting point in designing user experiences because they explain the characteristics and daily lives of the end-users who will use our design [12]. The journey map helps the writer to visualize the process carried out by the user to achieve the goal [13]. The list of user requirements features helps the user to describe what features the user wants. Then, the application diagram is created using the Unified Modeling Language (UML). UML is used to help communicate some aspects of the system [14]. In UML, many parts can be used, but not all parts must be created [15]. The parts of UML that are made are use cases, activity diagrams, deployment diagrams, class diagrams, sequence diagrams, and entity-relationship diagrams.

At the design solution stage, there are activities to design wireframes, mockups, prototypes and implement the front-end. The solution design stage is developing a solution based on the needs obtained at the specify user requirements stage. This stage will go through many stages, starting from the rough concept stage, the prototype stage, to the complete design stage [16].

Then, the evaluate against requirements stage is carried out to determine whether the solution made is following the user and meets the wishes of the user [6]. Researchers evaluate the design completed on the prototype made at the design solution stage using the System usability scale (SUS). A system usability scale is a survey method used to evaluate the usability of various products or services [17]. The system usability scale is a quantitative usability test [18]. According to [19], quantitative testing was carried out to measure the usability level of the unity of the website. In addition to evaluating the design, at this stage, the researcher also evaluates the implementation that has been made using black-box testing. Black box testing is a test that is used to test the functionality of the application that has been designed [20]. Black box testing is a test that only pays attention to the results that are run and ensure the function of the software [21]. After getting the evaluation results, if the evaluation results received cannot be accepted by the user, then the work stage will return to the design solution stage, but if the evaluation results obtained are acceptable to the user, then the work stage will be completed and proceed to write conclusions.

### III. RESULTS AND DISCUSSION

#### A. Understand context of use

Users in the online sales application at Sugosha Pharmacy are divided into two, namely buyers and sellers. The buyer is the user who makes purchases on the online sales application at the Sugosha Pharmacy. Then the seller is the user who manages the products and transactions in the online sales application at the Sugosha Pharmacy. At this stage, interviews were also conducted. Interviews were conducted with the owner of the Sugosha Pharmacy, four employees of the Sugosha Pharmacy and five buyers at the Sugosha Pharmacy. The interview was conducted by preparing several questions to be asked and the interview was conducted in the type of structured interview. The results at this stage are in the form of conclusions from interviews with sellers and buyers.

#### B. Specify user requirements

After getting the results from the interview stage, analysis and discussion are carried out to create a persona that helps determine what users will use the product. Persona design resulted in a buyer persona named Putu Wira and a seller persona named Made Tracy.

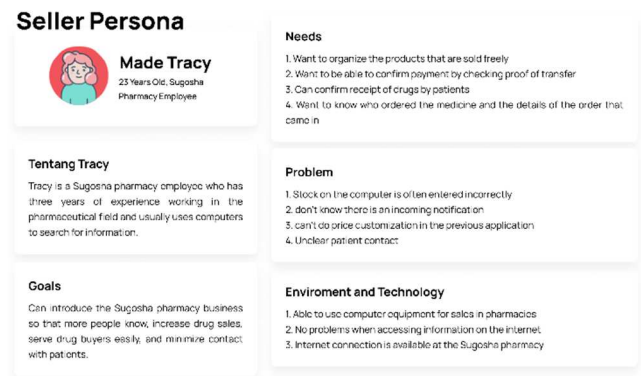


Fig. 2. Seller persona results

Figure 2 is a seller persona design based on interviews with the owner and four employees of the Sugosha Pharmacy.

#### Buyer Personas



Fig. 3. Buyer persona results

Figure 3 is a buyer persona design based on interviews with five pharmacy customers. From the designed seller and buyer personas, it is known that the goals of the two have some similarities. Both users need to simplify the process of buying

and selling drugs and want to reduce direct contact with many people.

Furthermore, to illustrate how the process is usually carried out by selling actors to process transactions and buyer actors to buy products on online drug sales websites, a journey map for the two actors is designed. The seller's journey map to process transactions through the online sales website, the scenario of the seller being on guard realizing that there is a transaction notification from the sales website. The seller wants to quickly complete the transaction and immediately get a sale for his Pharmacy. To complete a transaction through the website, the seller goes through four stages. In the transaction search stage, the transaction detail is the viewing stage, the transaction verification stage, and the drug delivery stage. The buyer's journey map to buy products at the Pharmacy through the online sales website has a scenario like the following, Wira is an employee domiciled in Bali. Wira felt unwell and needed to buy fever medicine, so Wira decided to buy medicine online through an online sales website. To complete the scenario, the buyer goes through four stages. The stage of finding the website, choosing the drug, the stage of the drug payment process, and the stage of drug delivery.

From the results of the persona design and journey map, a discussion was held with the team to decide what features users need for online sales applications at Sugosha Pharmacy. The features needed are register, login, and change profile for features that sellers and buyers can do. Then the change password feature, receive order notifications, manage categories, manage products, manage transactions, view proof of transfer, confirm orders, cancel orders, view drug prescriptions, and send drug lists that sellers can do only. Then features search for drugs, view drug catalogs, view drug categories, view drug details, buy drugs, upload prescriptions, redeem prescriptions, check status, view transaction details, confirm goods arrive and cancel transactions that buyers can make.

In the next stage, use cases are designed to determine how system features interact with users. The use case design discussed with the team resulted in two applications designed, namely the online selling application of the seller's Sugosha Pharmacy and the online sales application of the buyer's Sugosha Pharmacy.

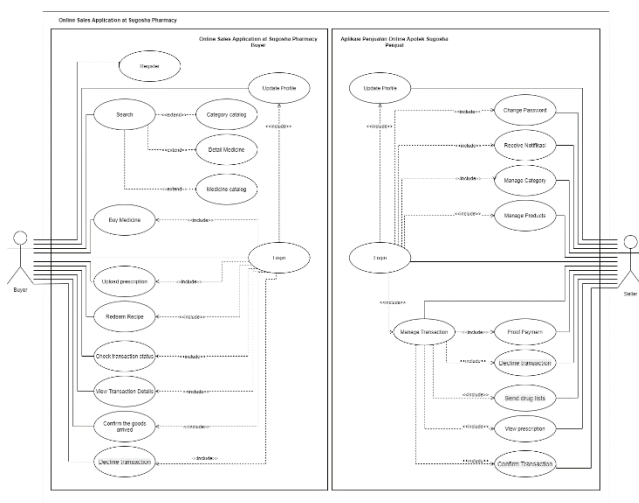


Fig. 4. Use case results

There are two actors in the designed use case, namely the buyer and seller actor, as shown in Figure 4 resulting from the designed use case.

The next step is to design an activity diagram based on all use cases. The design of the activity diagram makes it easy to understand the flow of each feature needed by the user. One of the activity diagrams created is an activity diagram for receiving notifications. Activity diagrams receive notifications starting from the seller logging in to the website. After successful login, the system will display a successful login notification and redirect to the home page. Next, when the seller presses the notification icon. The system will display a list of incoming order notifications.

Next, a deployment diagram, class diagram, sequence diagram, and entity relationship diagram are made to help implement the design. Deployment diagram is designed to illustrate the interaction of software and hardware so as to know what software the system is using and where it is running. To find out what classes exist in the sales application at Sugosha Pharmacy and the class's attributes, and the interactions between classes in the online sales application at Sugosha Pharmacy, several class diagrams were made. Furthermore, the design of the sequence diagram helps to determine the interaction of objects with users in each ongoing use case. Finally, to find out how the relationship between the data in the database on the online sales application at Sugosha Pharmacy, an entity-relationship diagram (ERD) was made.

### C. Design Solution

The design solution offered are divided into the user interface design phase and the user interface implementation phase. The user interface design stage begins with creating a wireframe display, then mockups and prototypes. After that, the user interface implementation phase begins when the user interface design has passed the test and has been accepted by the user. At this user interface implementation stage, the seller's user interface design is implemented into a frontend display.

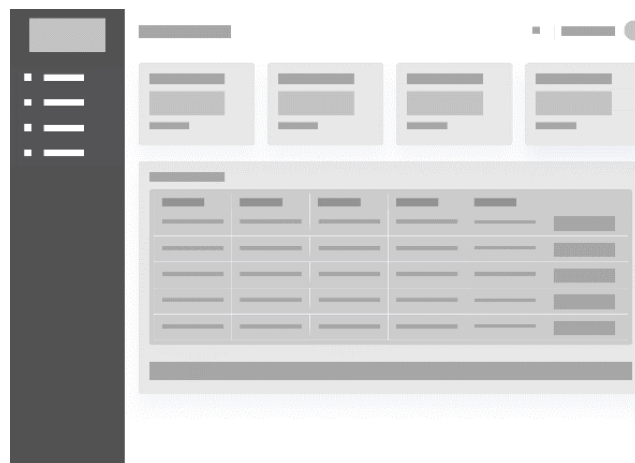


Fig. 5. Home page wireframe seller

First, on design wireframes, it helps the writer know the information architecture and the layout of the information on the online drug sales website at Sugosha Pharmacy. The design of the wireframe display produces a wireframe display for the seller's and buyer application.

Next, the mockup is designed based on the wireframe. Before designing the mockup according to the content and layout on the wireframe, a design system was created that helped create a design that was made similar and comfortable for users to see. The system design consists of a color scheme, font selection, buttons, and icons.

After finishing designing a mockup for the entire page in the online sales application at Sugosha Pharmacy, a prototype was made. The prototype is shown to the user to validate whether the design has met the user's needs. Prototype design is made by making connections between mockup designs using the help of the Figma platform so that the design can interact with users.

Finally, implements user interface design of the seller's department that has passed the evaluation into the form of a frontend. The implementation is carried out using the reactjs framework and using the provided API to exchange data.

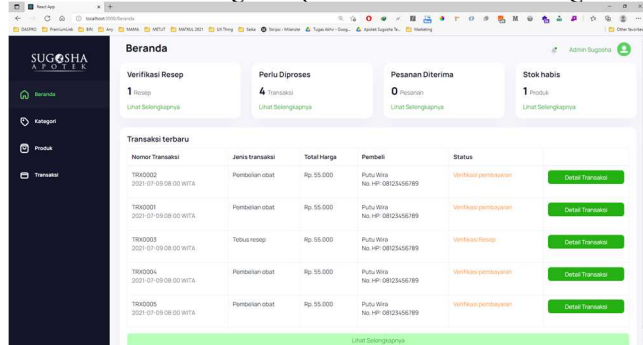


Fig. 6. Implementation results home page seller

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#### D. Evaluate Againsts Requirements

The evaluation against requirements stage is the last stage in the user-centered design method. The test was carried out twice, the Testing of user interface designs and the black box test.

Testing of user interface designs is carried out using the system usability scale (SUS) method with the help of Google forms. There are two forms created, namely the seller's and buyer's SUS form. The seller's SUS form was distributed to 20 employees at the pharmacy to test the design of the seller's department. While the buyer SUS form was distributed to 20 buyers at the pharmacy to test the design of the buyer's section. Details of the SUS statement can be seen in table 1. The ten statements are used for the measurement of SUS [17].

TABLE I. 10 SUS STATMENTS

No.	statements
1	I will use/visit this app often.
2	I find this site too complex.
3	I think this feature is easy to use.
4	I think I need help from a technical person to be able to use this feature.

No.	statements
5	I found that there are a variety of features that are well integrated into the system.
6	I think there are a lot of inconsistent things in this feature.
7	I think the majority of users will be able to learn this feature quickly.
8	I find this feature very cumbersome to use.
9	I really believe I can use this feature.
10	I have to learn a lot of things first before I can use this feature.

Fig. 7. 10 SUS Statements [17]

After getting a score for each statement from the SUS form of the seller and the buyer, the SUS score of each respondent is calculated using the following steps [16]:

- For odd-numbered statements, the value of the respondent is subtracted by one.
- For even-numbered statements, subtracts five from the respondent's score.
- Then, add up the odd and even values of each respondent and multiply by 2.5.

After getting the average SUS score, the score is compared with the SUS score scale in Figure 8 [22].

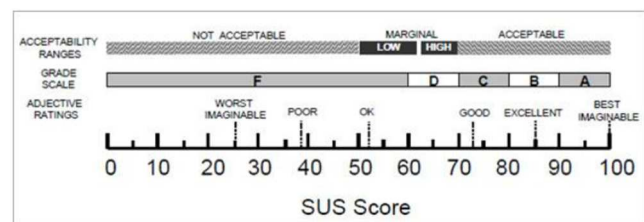


Fig. 8. SUS score scale [22]

Then get the test results that the online sales application design at the Sugosha Pharmacy is the seller's section which gets an average score of 76,375, so it includes a good rating which means users will accept it. Then for the online sales application design at Sugosha Pharmacy, the buyer section who gets an average score of 80.00 is classified as excellent. This means that the user very well accepts the design. This result is also in accordance with the results of previous studies [7], which showed an excellent evaluation score. So that UCD is indeed suitable to be implemented in e-commerce design.

Then for black box testing, it is carried out to the owner of Sugosha Pharmacy by providing a test case that has been made previously. From the results of the black box testing carried out, it is known that all the functionality of the seller's part of the application implementation has been running according to the design because all the test cases made were successfully executed.

## IV. CONCLUSION

Designing user experience and user interfaces with the UCD method on the Sugosha Pharmacy e-commerce application through four stages, including understanding the context of use, specifying user requirements, design solutions, and evaluating against requirements.

The implementation of the user experience and user interface design on the Sugosha Pharmacy e-commerce application is carried out when the user experience and user

interface design on the Sugosha Pharmacy e-commerce application has been validated and has been accepted by the user. Then the implementation carried out using the help of the Reactjs framework uses the API that has been provided to exchange data and is implemented only as a frontend of the user experience and user interface design on the e-commerce application of the Sugosha Pharmacy for the seller

The evaluation of the user experience and user interface design on the Sugosha Pharmacy e-commerce application resulted in an average SUS score of 76,375, which means the design is acceptable to the user (acceptable) well. Which means the user very well accepts the design. Then for the results of the evaluation of the implementation of the user experience and user interface on the Sugosha Pharmacy e-commerce application, which was carried out using a black box, it stated that all the functionality of the application implementation on the seller's part had been running according to the design, judging by the results of successful tests in each test case that was run.

UCD is highly recommended for e-commerce pharmacies because it produces an application design that is easy to use by pharmacies to manage the goods sold and buyers who make it easy to purchase the needed drugs.

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