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User Interface Modeling for Rental Information System Using a User-Centered Design (Case Study: Multimedia Equipment Rental)

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Abstract

Logik Filter is a business that focuses on technological creativity such as rental lighting, lighting installation services, multimedia, and art installations. Rentals at Lojik Filter can only be done via whatsapp or direct transaction. This type of transaction process requires many steps and consumes more time. This business requires a website to ease customers from various regions to rent equipment or order services. To develop this website, a user interface (UI) is needed that can meet user needs and make it easier for them to get information and make rentals. A user-centered design (UCD) approach is used to design a rental website UI according to the needs of customers and the business processes of Logik Filter. This research aims to design a rental website UI using UCD approach. UCD in this research is carried out in four stages: discovering requirements, designing alternative, prototyping, and evaluation. Usability testing in the evaluation stage uses a Single Ease Question (SEQ) metric. Based on the research conducted, the proposed UI model for this multimedia equipment rental information system meets the users' needs. A SEQ value of 6,2 indicates that the UI design has a good level of usability and is easy to use. This UI design will be used in developing a rental information system.

Keywords: user interface, user-centered design, rental, information system, rental information system

1 Introduction

A lighting setup or other multimedia equipment is important element of an event. Good lighting and multimedia equipment will be capable of turning on the atmosphere and creating interesting sights during each show [1]. This service is often used for birthday parties, weddings, stage entertainment, and other events. Businesses in the fields of lighting, multimedia, and installation art are booming. This venture can make a quick profit [2] because it has a large consumer base.

One perpetrator's business in the rental business of lighting and multimedia, as well as objects from this research, is Lojik Filter. Lojik Filter is a group of young people in Banjarmasin who work in the field of technology development in art. Since 2020, Lojik Filter has focused on

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creativity technology like lighting rental, lighting installation services, multimedia, and installation art that can provide a pleasant experience to the audience.

Currently, rentals at Lojik Filter can only be done via Whatsapp or direct transaction. Information about equipment is only available through WhatsApp Snaps, and customers should make a direct message with the admin first. If customer want to order or rent, do it with admin through direct messages. This type of transaction process requires many steps and consumes more time. In addition, the number of Lojik Filter consumers is increasing from year to year. They needed to a website to help customers from various areas access information and automate renting equipment. To develop this website, a user interface (UI) is needed that can meet user needs and make it easier for them to get information and make rentals. The user-centered design (UCD) method is used to design the UI of the Lojik Filter website. The UCD process focuses on the user so that they can produce applications that suit their needs and desires.

The UCD method has been widely used in designing the UI of rental information system. [3] applied UCD to determine a photographer rental website design from 2 proposed design alternatives. Usability testing with the system usability scale (SUS) shows that designs made by Figma have higher scores than designs made using Adobe XD. UCD is also used [4] to design websites for event vendors and EO service providers. The proposed design prototype is able to meet user needs in the first iteration of cognitive walkthrough testing. In this research, UCD was used to design the UI of a rental information system. Usability testing using the Single Ease Question (SEQ) metric is carried out to test the design solution in prototype form. SEQ is used because of its ease in providing values and being able to find out user responses quickly [5].

Lojik Filter customers have a variety of ages and abilities in using technology. Therefore, this research aims to design a rental website UI using UCD approach, so it is hoped that the website designs will meet customer needs, useful and increasing the usability value [6]. The result of this research is a prototype (high-fidelity UI) of rental information system and a usability testing score.

2 Literature Review

User-centered design (UCD) is one of popular methods for developing user interface. According to Jokela, UCD is an iterative method to design the desired interface and fulfill users' needs [7]. The aim of UCD is to involve users in designing process to make users have pleasant attachment and experience in using the application. Besides, another purpose of UCD is to increase users' satisfaction and adapt the design according to their expectations [8].

UCD is an approach which centerd to the users, this method consists of 4 activities [9] they are: 1) discovering requirements, 2) designing alternatives, 3) prototyping, and 4) evaluation. UCD has been applied in rental information system development, as shown in Table 1 below.

Table 1: Previous Studies

Author	Title	Result
[3]	User Interface Design of Website Roll as Online Marketplace for Photographer Rental Using User Centered Design Method	• Implement four main stages in UCD: specify context of use, specify requirements, produce design solution, and evaluate design • There are 2 design alternatives, usability testing with the SUS metric shows that design B, which is made by Figma has higher scores than

Author	Title	Result
		design A, which is made using Adobe XD. The proposed design could meet user needs to find a photographer rental.
[10]	UI/UX Design Design for Online Rice Field Rental Applications at Tanjungsari Village, Jember Regency Using the User Method Centralized Design (UCD)	• UCD is implemented in 7 stages: problem identification, user requirements management, solution design, evaluation, implementation, maintanance, management and development • The result of usability testing shows that user can accept the rice field rental application's user interface. Besides that, the result of 5-second testing gives a good image of consumers' interest, especially in designing page promos for Qurban.
[4]	User Interface Design and User Experience In IVENT E-Commerce Application Using User-Centered Design Method	• Implementing 5 stages of UCD: user research, gathering solution, create design solution, prototyping, user usability • Testing is using Cognitive Walkthrough methods. UI of the Ivent e-commerce website application successfully meets the user's needs for looking for a vendor or EO.

3 Methodology

3.1 Research Stage

This research was carried out in five stages, which are: literature study, formulation of the problem, planning research methodology, implementing UCD, and conclusion writing. At the UCD implementation stage, it is carried out in four stages, namely: discovering requirements, designing alternatives, prototyping, and evaluation. Fig. 1 shows the stages of the research carried out

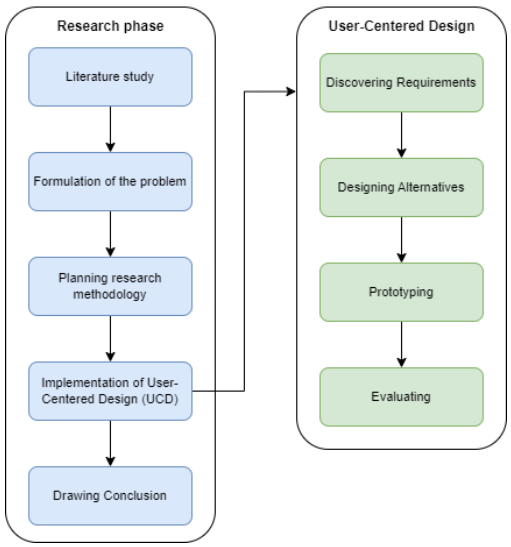

Fig 1: Research Methodology

3.2 Implementation of User Centered Desain (UCD)

UCD implementation is done to ensure that the rental information system meets user needs. Design development that applies UCD methods consists of four activities, they are:

1. Discovering Requirements
   At this stage research is carried out on users, namely customers and business owners. Research was conducted by interview method to find information about business processes. In addition, a literature study was also carried out on research, books, and journals relevant to this research. The results of this activity are personas and user flows that reflect the characteristics and needs of users.
2. Designing Alternatives
   At this stage, a rental information system interface design is made. The personas and user flows that have been obtained in the previous stages are the basis for making alternatives design.
3. Prototyping
   At this stage, UI design development using Figma began. Figma is used to create high-fidelity information system prototypes. The resulting prototype is expected to provide design experience and experience using the application.
4. Evaluating
   At this stage, usability testing is done by testing the prototype with the user. The evaluation stage is carried out to test the proposed design solutions and to obtain recommendations from participants. Evaluation is carried out by presenting the UI design to the user and providing activity scenarios that must be carried out by the user. The purpose of this test is to determine whether the prototype created can solve the problem and meet the users' need

4 Result and Discussion

4.1 Discovering Requirements

Identification of user needs are made by interview methods towards five customers of Lojik Filter. Interviews are doing by giving common questions such as user information, product information access, rent transaction, difficulties during transaction and suggestions toward Lojik Filter. This process is done to define persona and architect information to develop information system. Persona are created to get a description of the general user [11] and are representations of the user based on data interviews [7]. Persona in this research describe somebody named Aryanda Ashyura, a semester VI student at the Politeknik Negeri Banjarmasin. Aryanda is on one of the committees for campus activities, and he was assigned to rent multimedia equipment. He is quite familiar with using technology and already often does transactions online. Suggestions and input from Aryanda will become the source for solution design system information to be built. Fig 2 shows the user flow information system to be developed

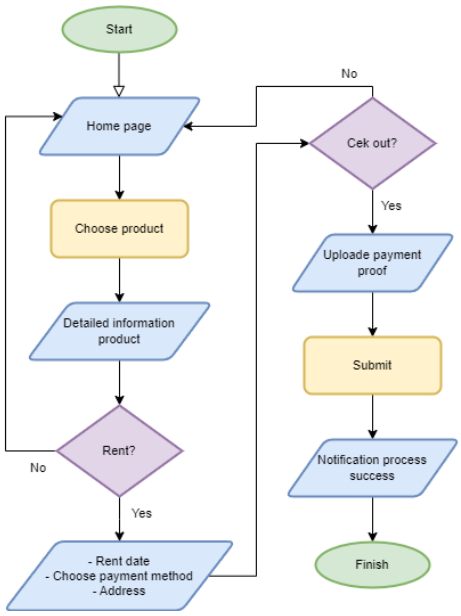

Fig 2: User flow Rental Information System

4.2 Designing Alternatives

This stage recommend alternatives design to meets users' needs. Alternative design file is a must component on the prototype. As for the component design, the proposed alternative to the user is shown in Table 2:

Table 2: Alternative designs proposed

No	Material Component	Explanation
1	Showing complete product information	Users can see complete product information. Products are also equipped with photo, motion pictures and video
2	Providing rating feature and customers' review	Users can view product/ service rate and review
3	Providing various payment methods	Users can choose payment methods such as COD (cash on delivery), transfer, credit cards, e- wallet, etc.
4	Providing notification feature	User needs notification feature for quick access status

4.3 Making Prototype

At this stage, clickable prototypes are made using Figma. Prototype can display functionality system information to be developed. A list of components on the design alternatives and *Shneiderman's Eight Golden Rules* for developing UI were used as guidelines in make prototype. The first page created is the item detail page. This page will display all the information about the product that the user wants to know. In addition, product visuals are also displayed in the form of photos, motion pictures, and videos. This multimedia content will provide a clear description of the product and an attractive visual appearance. It will attract consumer interest and also encourage consumers to rent because they have easy access to view and select products [12].

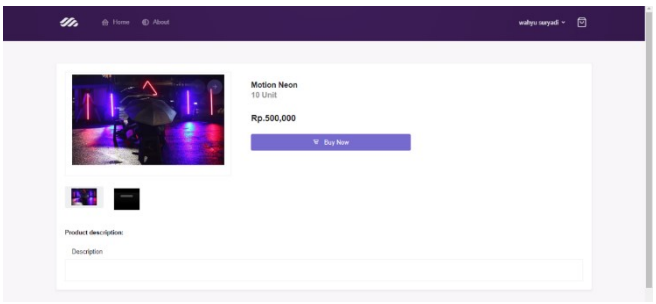

Fig 3: Product Details Page User Interface

Product page also features customer ratings and reviews. On this page, users can see the ratings and reviews of customers. Diaz stated that customer reviews are a form of marketing communication in digital media [13]. Ratings and reviews can be information as well as recommendations for customers to make transactions. This feature can be additional information that can influence customer assumptions and decisions. In addition, the review feature is one aspect that influence the credibility of online shop [13].

The next page is transaction page which contains various kind of payments. This page will provide traditional and digital payment system. Traditional payment system are COD (cash on delivery), credit card, etc. While digital payment systems are internet banking, mobile banking, e-wallet, etc. This option will help customers to do the transaction [14], and it will increase customer satisfaction toward the application used.

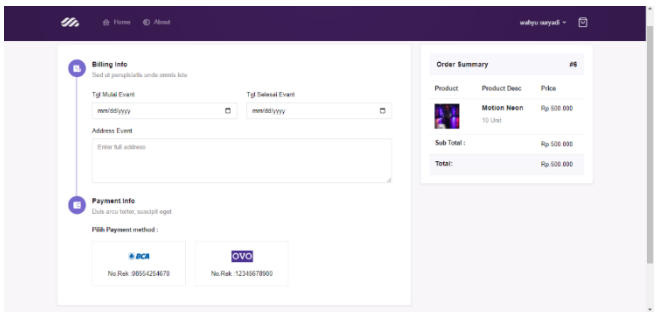

Fig 4: Transaction Page User Interface

The last page is notification page. This feature is made by adding icon badge on username. This Icon badge will give quick access for users to open notification page. Detail of notification can be seen by clicking notification row.

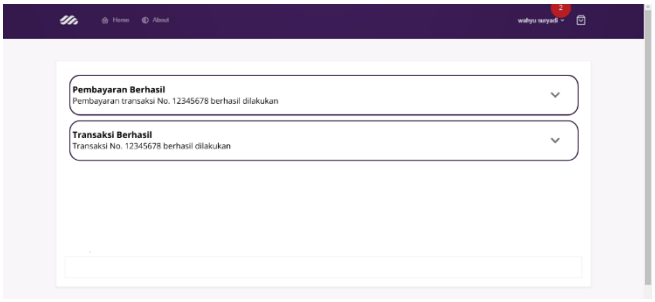

Fig 5: Notification Page User Interface

4.4 Evaluating

Stage evaluation design is done with prototype testing. Clickable prototype that has been made tested to the user directly. Interview *method was* used to see how participants' visual preferences relate to the proposed prototype. Five participants who have selected at the stage identification user used back on this stage. This activity done to get a consistent return. Participants are served with a suitable prototype based on users' needs, they have to finish tasks based on habit when they use system information. This task scenarios consist of:

1. Understanding home page and transaction flow
2. Access product information
3. Access rating feature and customer review
4. Rent product and choose payment methods
5. Login to do the transaction
6. Submit payment proof
7. Access users' notification

In carrying out the scenario, users are asked to give an evaluation of the design given in every scenario. Metrik used to usability testing prototype is Single Ease Question (SEQ). SEQ is a 1-7 scale used to measure convenience and also to find out how well design of the system interface [15]. This technique is efficient and does not disrupt the test flow because it only asks one question about the ease-of-use aspect of the application.

The test results using the scenarios that have been given are fairly easy and can be completed well by the participants. Almost all participants did not experience errors in running the test scenario. This proves that the experience obtained is not difficult for users who use the application. The participants' SEQ results on the proposed prototype are presented in Table 2

Table 3: Partisipants SEQ Score

Participant	SEQ Partisipant score							Avg
	T1	T2	T3	T4	T5	T6	T7	
P1	7	7	7	7	7	7	7	7
P2	6	6	6	6	6	6	6	6
P3	7	7	7	7	7	7	7	7
P4	6	6	6	6	6	6	6	6
P5	5	5	5	5	5	5	5	5
SEQ Average								**6,2**

A SEQ score of 5,5 shows success parameters that can be used as a reference. SEQ scores in Table 2 show 6,2, which indicates that the prototype rental information system has a good usability rate and is easy to operate. This UI design will be used in developing a rental information system. Recommendations given by participants will be used for the next design in the future.

5 Conclusion

Based on research using a user-centered design approach, the user interface model proposed for multimedia equipment rental information system meets user needs. Using this prototype, users can access information and make rental transactions easily. Usability testing uses The SEQ metric shows scores of 6,2, which means that the UI design has good usability and is easy to operate.

For future research, it is suggested to increase the number of participants of various backgrounds

and ages.

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