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Modeling Inventory Systems Using The User Experience Design Model Method

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Abstract: Information systems are the process of collecting and processing transaction data and communicating data into information for decision-making. User Experience Design (UXD) is the process of developing a product to increase user satisfaction with a product by increasing usability, accessibility, and satisfaction provided in the interaction with a product or application. The main factor in the success of application developers depends on the user experience that users feel, therefore it is very important to make this a priority in developing designs. This method is able to make your design look neat, simple, intuitive, flexible, and attractive as well as provide a different experience to users of your product or service and make you look unique in front of other competitors. Modeling the inventory system uses a user centered design model with five stages, namely empethized, define problem statements, indentation, and prototype. The results of this study are in accordance with the needs of users in creating a web-based inventory information system that can overcome the problems faced by the school. The results of testing the inventory application using the blackbox testing model which has a value of 100% in accordance with testing the functionality of the system, and the test results using web quality 4.0 obtained a total score of 91.53%. Based on this, the Web Quality 4.0 test results have very good criteria.
Keywords: Application; Blackbox; Prototype; UXD; Web Quality

1. INTRODUCING

Information technology, one example of a computer, can help speed up the work being done, by using a computer will be more accurate and consistent in doing calculations[1]. In the current era of the industrial revolution 4.0, various activities carried out by humans are stored in digital records. Today's digital activities are inherent in almost all environments and fields. Although not all environments and fields have implemented it due to the limitations of the information system components[2]. Examples of activities that are commonly carried out digitally on a daily basis are social media, online shopping, internet banking, access to academic information systems, and so on[3].

Inventory is a complete list of goods in a company or agency, both those that come out and those that come in, whether tangible or not. This list of items is written in one special book and must be complete without missing anything. The goal is to analyze the supporting tools for the company's activities, wealth and capital. Items that enter the room

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or laboratory can be in the form of machines, tools, computers, or furniture. The room or laboratory each records incoming goods. Damaged or unusable items are also on record. The problem sometimes arises is that the recording is carried out by each room or laboratory, the Administrative Department must report for all, the recording overlaps and it is not uncommon for the amount to be redundant or less.

Based on the problems that have been stated, this research provides solutions in the development of library administration information systems using user experience design. User experience design is a catalyst to provide answers to user problems by prioritizing user satisfaction in designing applications[4]. This method aims to identify, find the needs, and difficulties of the users, in order to understand the design of the application being made as well as to improve the quality and make the application design so that it can be better and in accordance with the wishes of the target users.

Modeling the inventory system using user experience design, users can better understand and easily use the application created to maximize the performance of administrative staff in managing inventory administration, namely the process of collecting goods data, the process of borrowing goods, the process of moving goods and collecting data on the number of inventory items. And it is expected to produce applications with a more modern, user friendly and responsive design when used.

Some previous research related to the user experience design model, namely the first is designing a library administration information system with user experience design at SMP Negeri 5 Bandarlampung using the user centered design method which has 5 stages namely, empethized, define problem statements, indentation, and prototype according to user needs in library[5]. In the next study, the method used in this research is design thinking from the beginning to the end, so as to produce a good level of user experience. From the evaluation results obtained from prototype testing using the System Usability Scale (SUS) and the User Experience Questionnaire (UEQ) with the results of learnability 62.5, usability 82.2, SUS score 78.8 and group impressions of attractiveness 2.197, perspicuity 2.275, efficiency 2.150, dependability 2.050, stimulation 2.383, novelties 2,089. Overall test results get good and excellent results[6]. Subsequent research The Human-Centered Design Method is an approach to developing and designing systems that focuses on users according to aspects of user needs and habits. This study aims to find and better understand the problems faced by users so as to conduct tests to find out whether the solutions provided are understandable and easy to use by users[7]. Subsequent research Website plays an important role for an agency or organization. In measuring a good website, one of which can be seen from a UI (User Interface) that has an attractive appearance and UX (User Experience) to increase the comfort of website users. In developing the front end of the library website using the UCD (User Centered Design) method, bootstrap framework, HTML5 programming language, CSS and Javascript. At the design evaluation stage in the form of a wireframe using the SUS (System Usability Scale) method to get a score of 83, blackbox testing to measure website functionality gets results according to the scenario, UEQ (User Experience Questionnaire) testing to measure the comfort level of website users gets positive results[8].

Information systems are the process of collecting and processing transaction data and communicating data into information for decision making[9]. User Experience Design (UXD) is the process of developing a product to increase user satisfaction with a product by increasing usability, accessibility, and satisfaction provided in interaction with a product or application[5]. The main factor in the success of application developers depends on the user experience that users feel, therefore it is very important to make this a priority in developing designs. This method is able to make your design look neat, simple, intuisive, flexible, and attractive as well as provide a different experience to users of your product or service and make you look unique in front of other competitors[10], [11].

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2. RESEARCH METHOD

The stages of research carried out in this study can be seen in figure 1 below.

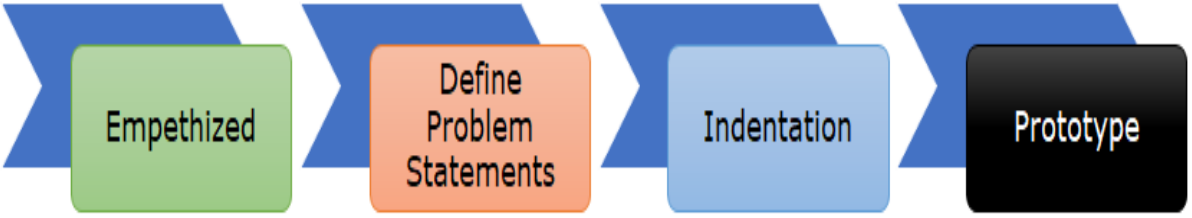

Figure 1. Research Stage

The method carried out in this study, namely user centered design, is a method in design that focuses on user needs[7], [12]. The design of the application developed through UCD will be optimized and the focus will be placed on the needs of the end user, so it is expected that the application will follow the needs of the user, and the user can use the application without changing its behavior.

Empethized

In this stage, the author understands the existing problems. The problem sometimes arises is that the recording is carried out by each room or laboratory, the Administrative Department must report for all, the recording overlaps and it is not uncommon for the amount to be redundant or less[7].

Define Problem Statements

In this stage, the author must have data on who will use the application later. Here is the historical data that will use the application later or what is often called a persona. The persona table can be seen in table 1.

Table 1. Description of App User

User	Frequently Used Technology
Administrative Staff	1) Desktop App Desktop app usage is often used with a usage percentage of 55%. 2) Web Applications The use of web applications is often used with a percentage of usage that is 80%. 3) Smartphones Smartphone usage is often used with a usage percentage of 70% 4) Social Media The use of social media applications is often used with a percentage of use of 90%
Headmaster	1) Desktop App Desktop app usage is often used with a usage percentage of 80%. 2) Web Applications The use of web applications is often used with a percentage of usage that is 80%. 3) Smartphones Smartphone usage is often used with a usage percentage of 85% 4) Social Media The use of social media applications is often used with a percentage of use of 95%

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Indentation

In this stage, the indentation from the author is by making a library registration adm information system application to overcome problems that occur in libraries. It is hoped that in making this application can help school activities in managing inventory data.

Prototype

In this stage the author shares the design created for the application based on the user. The design of the application by user can be seen in table 2.

Table 2. Application Design

User	Frequently Used Technology
Administrative Staff	1. Users can sign in to the application. 2. Users can manage room data. 3. Users can manage inventory item data. 4. Users can manage inventory item receipt data. 5. Users can view and print inventory item acceptance reports. 6. Users can log out of the application.
Headmaster	1. Users can sign in to the application. 2. Users can view and print inventory item acceptance reports. 3. Users can log out of the application.

3. RESULT AND DISCUSSIONS

Use case diagram is a modeling to describe the behavior of the system to be created. A use case diagram describes an interaction between one or more actors and the system to be created. Use case diagram modeling inventory systems using the user experience design model method in figure 2 below.

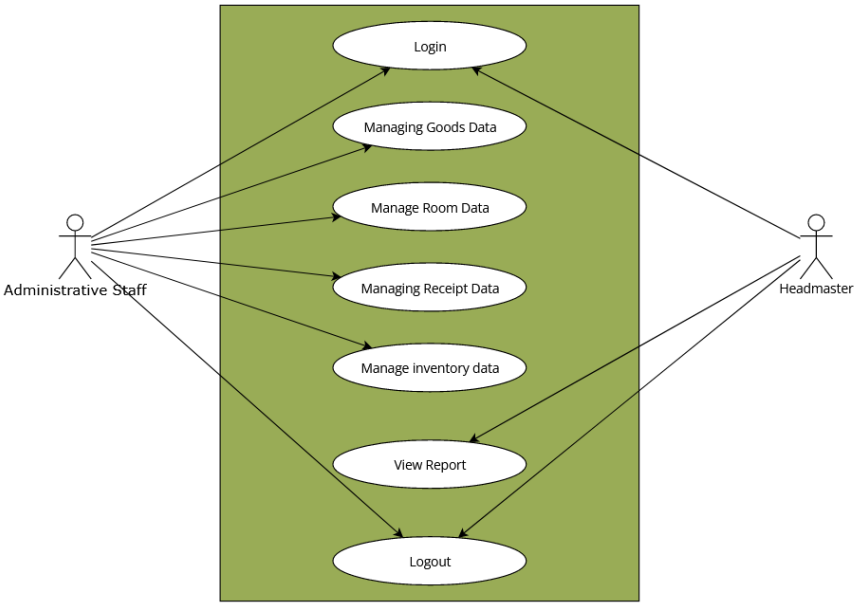

Figure 2. Usecase Diagram

The usecase diagram above has 2 actors, namely administrative staff and headmaster. actors administrative staff can perform login usecase, manage goods data usecase, manage room data usecase, managing receipt data usecase, manage inventory data usecase, and logout usecase. headmaster actors can perform usecase login, usecase view report, and usecase logout.

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Application Interface Implementation

The implementation of the login page is the first-time view for accessing the application used. The login page display can be seen in the following figure 3.

Figure 3. Implementasi Interface Login

The implementation display of the login page serves to login the application, the user must enter the username and password that have been registered in the MySql database. The login page display has a username text input component that functions to enter the registered username, a password text input that functions to enter a registered password, and a login button that functions to validate the username and password stored in the database. If it has been registered, the system will display a dashboard page, but if it is not registered then the system will give a warning to enter the correct username and password.

The implementation of the dashboard page is the display when the user successfully logs in. The implementation of the dashboard page can be seen in the following figure 4.

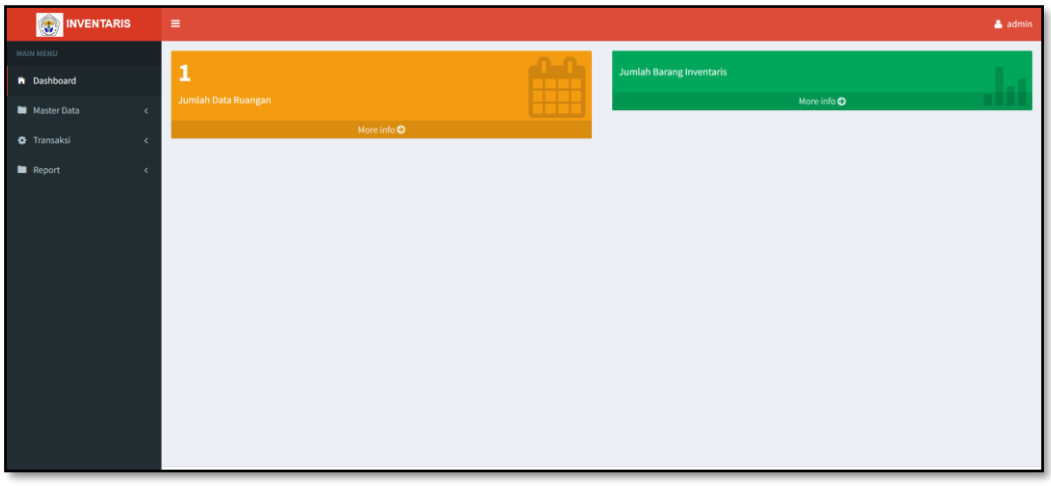

Figure 4. Implementasi Interface Dashboard

The dashboard page contains information about the menu that can be accessed by users in the Implementation of the inventory system that has been created. Menus that can be accessed by users are master data, transactions, and reports.

The implementation of the item inventory data page is a display when the user selects the item inventory data menu. Item inventory data list page to view all inventory data

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stored in the database. The implementation of the inventory data list page can be seen in the following figure 5.

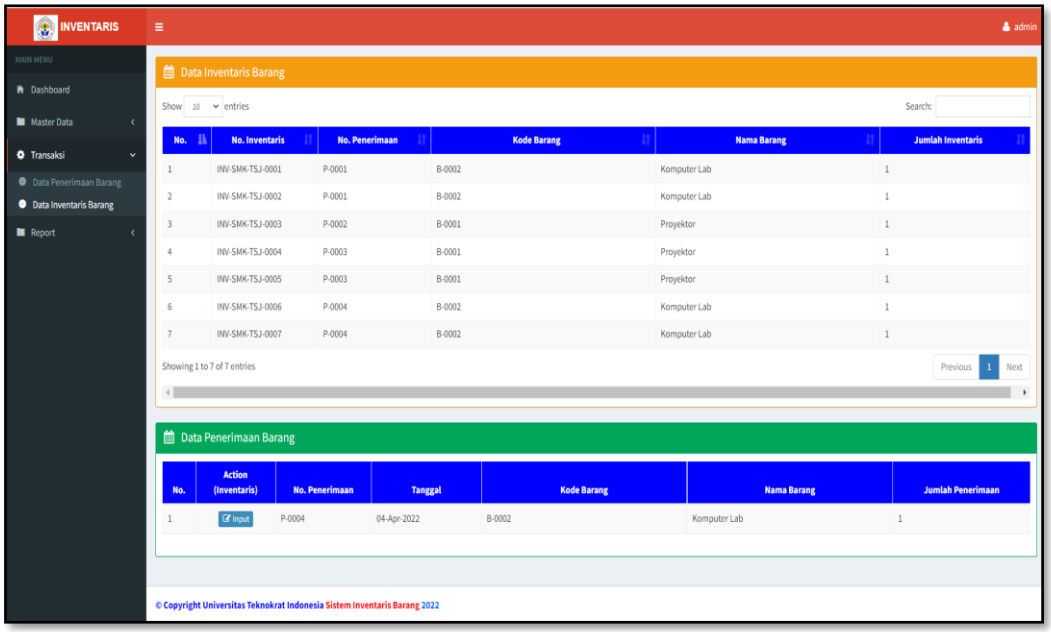

Figure 5. Implementasi Interface Inventory of Goods

Inventory data list page to see all inventory data stored in the database, namely inventory number, receipt number, item code, item name, and inventory amount. There is a data input button that functions to enter the new inventory data input page.

The implementation of the inventory data input page can be seen in the following figure 6.

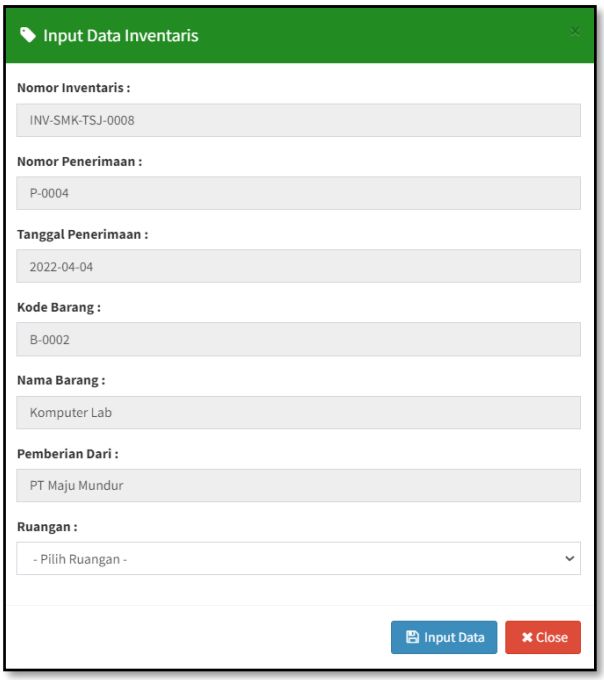

Figure 6. Implementasi Interface Input Inventory of Goods

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The item inventory data input page to input new item inventory data is inventory number input, input receipt number input date of receipt, item code input, item name input, input from gift, and room input. There is a close button to close the inventory data input page. The data input button serves to store inventory data of goods that have been inputted by the user.

System Testing

Black box testing or often known as functional testing is a software testing method used to test software without knowing the internal structure of the code or program. Testing is performed on the application to ensure that it can run correctly according to its expected needs and goals. The process of testing the application will use black box testing. The results of the black box testing from the 6 test components that have been carried out, the results are obtained, namely:

Table 3. Blackbox Testing Results

Test Criteria	Number of Answers	
	Yes	No
Login Page	3	0
Room Data Page	2	0
Item Data Page	2	0
Goods Receipt Data Page	2	0
Item Inventory Data Page	2	0
Report Print Page	2	0
Total Answers	**13**	**0**

Based on the results of the recapitulation of the 6 test criteria that have been carried out, the results of the number of answers from respondents are obtained, namely having a value of 100% in accordance with testing the functionality of the system using blackbox testing.

Web quality testing to determine the quality of information on the application being built. Results of web quality testing for usability indicators that have been carried out in the table 4.

Table 3. Web Quality 4.0 Testing Results

No	Criteria	Actual Score	Ideal Score
1	Indikator Usability	187	200
2	Indikator Information Quality	156	175
3	Indikator Service Interaction	161	175
4	Indikator User Satisfaction	91	100
	Total	595	650

$$SkorTotal = \frac{(187 + 156 + 161 + 91)}{(200 + 175 + 175 + 100)} x\ 100\ \%$$
$$= \frac{595}{650} x\ 100\ \%$$
$$= 91{,}53\%$$

From the results of processing test recapitulation data, the actual score has a value of 595, and the ideal score has a value of 650. From the actual score and the ideal score, a total score of 91.53% was obtained. Based on this, the Web Quality 4.0 test results have excellent criteria.

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4. CONCLUSION

Modeling the inventory system uses a user centered design model with five stages, namely Empethized, Define Problem Statements, Indentation, and Prototype. The results of this study are in accordance with the needs of users in creating a web-based inventory information system that can overcome the problems faced by the school. The results of testing the inventory application using the blackbox testing model which has a value of 100% in accordance with testing the functionality of the system, and the test results using web quality 4.0 obtained a total score of 91.53%. Based on this, the Web Quality 4.0 test results have very good criteria.

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