



IMPLEMENTATION OF USER CENTERED DESIGN METHOD ON WEB-BASED STOCK APP

Mutiara Br Samosir¹, Volvo Sihombing², Rahmadani Pane³

^{1,2,3} Faculty of Science and Technology, Informatics Management University of Labuhanbatu, Rantauprapat, 21418, Indonesia

Email: mutiarasamosir1012@gmail.com¹, volvolumbantoruan@gmail.com², rahmadanipane@gmail.com³

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ABSTRACT

The increasing growth of technology necessitates that business professionals have particular, realistic, and actual data processing information systems as well as the confidence to operate within their human limitations. A strong data processing system has a significant impact on the formal and informal success of an organization. Therefore, the researcher aims to design and develop a web-based stock application utilizing the UCD (User-Centered Design) methodology and design modeling with UML (Unified Modeling Language), the most effective tool for object-oriented system development. The researcher employs the UCD approach because it is a method for designing and creating systems that place the users at the centre of the application creation and design process. In this study, the researcher collects data by identifying problems, conducting a literature review, and distributing questionnaires to assess user requirements. With a weighted score of 5 for respondents who strongly agree, 4 for respondents who agree, 3 for respondents who are neutral, 2 for respondents who do not agree, and 1 for respondents who strongly disagree, the results of the questionnaire are presented utilizing a Likert scale to measure a person's perspective, attitudes, and perceptions of an event. Thus, the program was developed in accordance with user requirements and is usable.

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1. Introduction

Technological developments are increasing. We can see from these developments that people have started to use things that are practical and fast. Likewise, technological developments that have come with different versions of the display (Sitinjak et al., 2021). This is certainly very concerned by all organizational sectors, both formal and informal, to take advantage of this as a driving force in the world of work to produce specific, practical and actual information (Huda & Amalia, 2020).

The information system is a system in an organization that connects the needs of managerial data processing by providing certain reports (Feladi & Lesmana, 2018). Managing data well and quickly is a necessary strategy to survive from other competitors (Sihombing & Nataliani, 2021) and advancing the sector of the organization (Wanti, 2019). However, behind this strategy many businessmen are negligent in managing data processing. One of them is negligent in knowing the purchasing power of customers, and the needs of customers marketed by the company itself which results in excess products, unbalance, and loss of customers. So vulnerable to failure, loss, and even out of business in the near future. Therefore, the author designed and created a stock application. In this case, the authors take samples of electronic goods. The web-based electronic goods application is designed with complete features so as to help users to record, manage, and summarize all business or commercial process activities as well as print electronic goods data reports accurately, efficiently, and effectively. The author also provides security features on the electronic stock application by entering a password when logging into the application as well as other features such as:



change password feature, change profile feature, and self-identity feature. That way, users can control and supervise the data processing process.

The web is a collection of pages consisting of several pages that present information in the form of images, sound, and text in digital form (Rizky & Ramdhani, 2019). Web information is distributed through the Hypertext Markup Language (HTML) approach and the protocol used is Hypertext Transfer Protocol (HTTP)(Mubarak, 2019). This web-based stock application is also built by creating program code by applying the PHP and javascript programming languages through the codeigniter framework and making the database using Mysql.

The UCD (User Centered Design) method is a new method in system development (Firdaus & Hidayatullah, 2022). UCD is a method that is widely applied in describing the design and manufacture of systems. The concept of UCD is the user as the reference point of the system development process and objectives, the system environment is entirely based on the user or user experience(Sari et al., 2021) as well as design modeling using UML (Unified Modeling Language) which is one of the best tools in the world for system-oriented development. object(Voutama, 2022).

This research starts from collecting data by doing three things, namely identifying problems, conducting literature studies obtained from journal or book references to obtain related information and analyzing user needs by distributing questionnaires and then the results of the questionnaires are presented using a Likert scale. Questionnaire method aims to measure user needs(Riyadi, 2019).

The Likert scale is one of the measurements to measure the point of view, attitudes and perceptions of a person or group on an event by giving five questions consisting of strongly agree, agree, neutral, disagree, and strongly disagree (Panday, 2020) with a weighted value of 5, 4 , 3, 2, and 1.

2. Method

2.1 Data Collection

At this stage, three things will be done, namely identifying problems, studying literature, and conducting questionnaires. The first stage is identifying the problem by conducting a search and collecting literature with literature studies to produce several results information about this research topic. The second stage, after the materials and data obtained from the literature study can be used to develop research and overcome existing problems. The third stage is to conduct a questionnaire to potential users.

2.2 System Design

There are five stages in the UCD method:

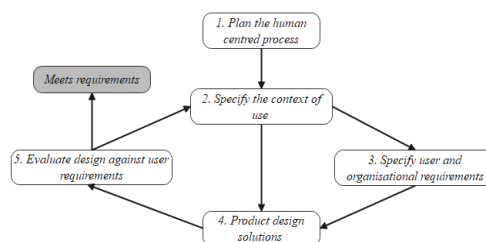


Fig 1. User Centered Design Stages

a) Plan the human centered process

Perform analysis and theory related to existing problems to build a system that is centered and aims based on user needs.

b) Specify the context of use

This stage is done to see the characteristics of the user. This stage will explain what and under what conditions the user will use the product.

c) Specufy user and organisational requirements

This stage will identify user needs and organizational needs for the system to be built.

d) Product design solutions

This stage is done to build a design as a solution to the problem which is being analyzed.

e) Evaluate design against user requirements

At this stage, an evaluation of the design that has been done in the previous stage where the design must meet the requirements required by the user. This stage is also used to see whether user and organizational goals have been achieved.

3. Results and Discussion

3.1 Data Collection Stage

The collection of data and information is done by studying several literature studies which are obtained from reference books, journals, or data related to the object of research as material or the basis for problem solving.

a) Problem Identification

Identification of the initial problem is less effective and efficient way of processing data items that are manual so that the vulnerability of running out of stock on goods and out of balance even triggers bankruptcy.

b) Literature Study

Literature study was done through library research to claim information about anything related to the topic of this research. The materials and data of this study are used to answer the identification of the problems found.

c) Questionnaire

In order to obtain information and data, a questionnaire of 30 respondents was distributed. Here are the questions for the questionnaire:

TABLE I
USER CHARACTER NEEDS ANALYSIS QUESTIONNAIRE

Question	Likert Scale Score					Total
	5	4	3	2	1	
	SA	A	N	DA	SDA	
Do you agree that the application can print and make reports on goods data?	16	3	8	2	1	30
Do you agree with security features such as passwords when logging in to the application?	20	6	3	1		30

Based on the questionnaire on the 30 respondents above, the data was analyzed using the following Likert scale measurements:

Index (%) = total skor / Y x 100, maximum Score (Y) = highest score likert x number of respondents
 minimum Score (X) = lowest score likert x number of respondents, after the above calculations, then the calculation is done for interval analysis, total score = total respondents x Likert score

TABLE II
PERCENTAGE VALUE

Interval	Information
0% - 19,99%	Strongly Disagree
20% - 39,99%	Disagree
40% - 59,99%	Neutral
60% - 79,9%	Agree
80% - 100%	Strongly Agree

The following are the results of the calculation of the assessment interval in the detailed questionnaire analysis below :



TABLE III
TOTAL QUESTIONNAIRE SCORE AND INDEX RESULTS

Questions	Respondents					Total	Score Index (%)
	Likert Scale Score						
	5 (SA)	4 (A)	3 (N)	2 (DA)	1 (SDA)		
Do you agree that the application can Print and generate reports goods data?	80	12	24	4	1	121	80,66
Do you agree with security features such as passwords when loggi to the application?	100	24	9	2		135	90

The results of the analysis show that the analysis of the needs of the 30 respondents above, 80.66% of users strongly agree that the application can print and report goods data and 90% of users strongly agree that there are security features.

TABLE IV
USER CHARACTERISTIC NEEDS ANALYSIS QUESTIONNAIRE

Questions	Respondents			Informations
	Yes	No		
Do you agree with the additional features On application ? if you agree, what do you think features What needs to be added?	25	5		- profile change feature - change password feature
Do you need to identify yourself or the user in the application? if you agree, what identification should be included.	28	2		- name - address - no cellphone - last login

The results of the questionnaire indicate that respondents need a stock application with additional features, namely the profile change feature, change password feature, and self-identity feature which includes name, address, cellphone number, and the last login to the application.

3.2 Design Stage

The system design is used by the User Centered Design (UCD) method. This method focuses on the user aspect. That is, every process carried out involves the user's perspective. The purpose of using this method approach is to produce products with high usability values (Akbar et al., 2020). There are 4 steps in the UCD process, namely:

a. Specify the Context of Use (Understanding and Defining User Context)

It can be seen in table 1. User Characteristics Needs Analysis Questionnaire that the results of the questionnaire that have been done by respondents or users are more dominant in answering Yes. On the results of these respondents, it can be determined what kind of stock application will be designed or made.

b. Specify User and Organizational Requirements (Determining User and Organizational Needs)

This stage describes the needs of users on the application to be built. Based on the questionnaire obtained from table III and table IV, it can be concluded that user needs can be seen in the following table:

TABLE V
USERS NEEDS

Application	Information
Stock App	report feature and print report
Web-based	security features there is a profile change feature change password feature identity feature



3.3 Product Design Solutions (Generated Design Solution)

At this stage, a stock application design is done based on the questionnaire that has been obtained. This stage consists of several designs, namely:

a. Process Design

The process design is done based on the UML (*Unified Modeling Language*) model which consists of several designs, namely:

1. **Use Case Diagram** is a diagram that explains the benefits and functionality of the application created and how the application can interact with users (Putra H, 2018).

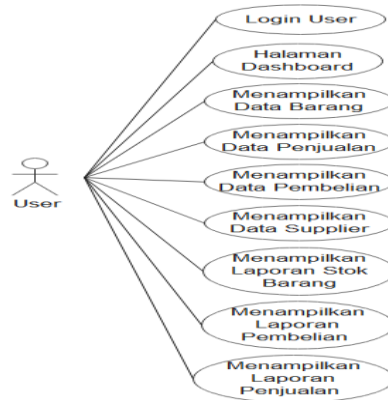


Fig 2. Use Case Diagram Stock App

2. **Activity Diagram** is a description of the processes that occur in the application and the user starts the activity starts until the activity is finished (Liantoni & Yusincha, 2018).

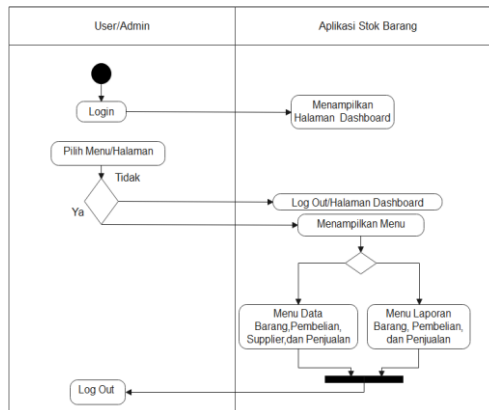


Fig 3. Activity Diagram Stock App

3. Class Diagram

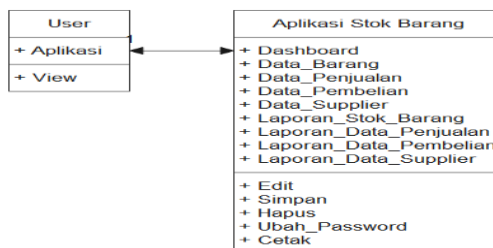


Fig 4. Class Diagram Stock App

4. Sequence Diagram

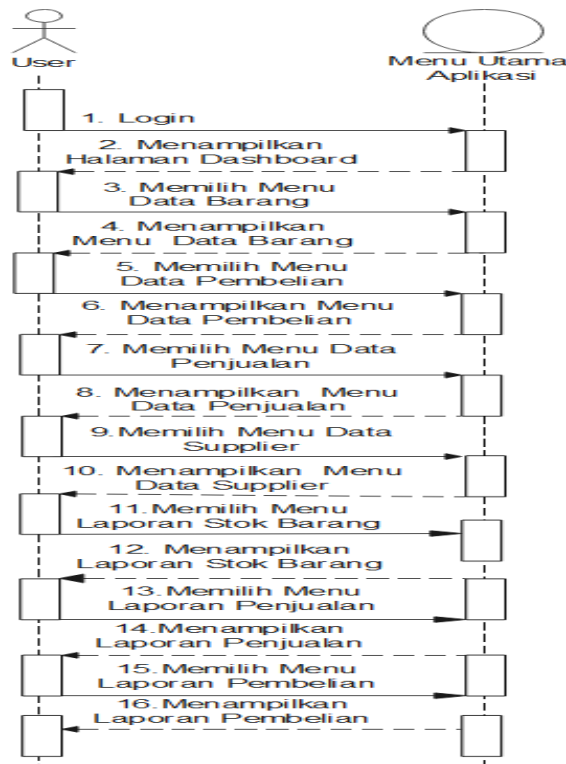


Fig 5. Sequence Diagram Stock App

3.4 Result

a. Login Display

The login page is the initial display on the stock application and there are two input forms, namely the username form and the password form to enter the application.

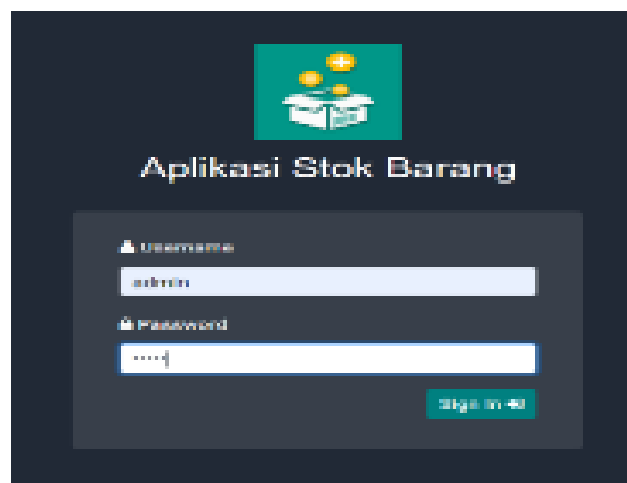


Fig 6. Login Display

b. Dashboard Display

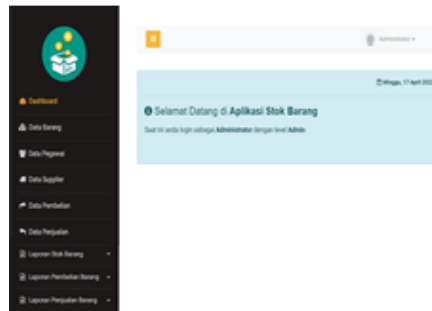


Fig 7. Dashboard Display

c. Item Data Menu Display

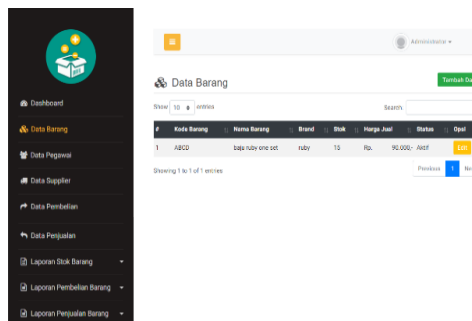


Fig 8. Item Data Menu Display

d. Display Employee Data Menu

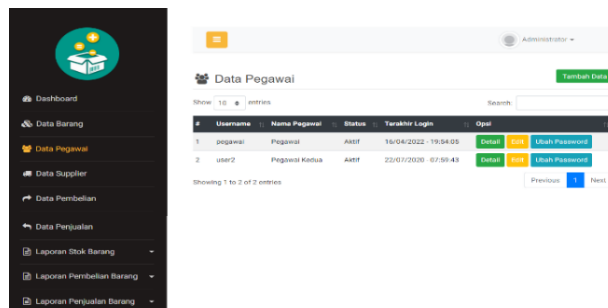


Fig 9. Display Employee Data Menu

e. Display Supplier Data Menu

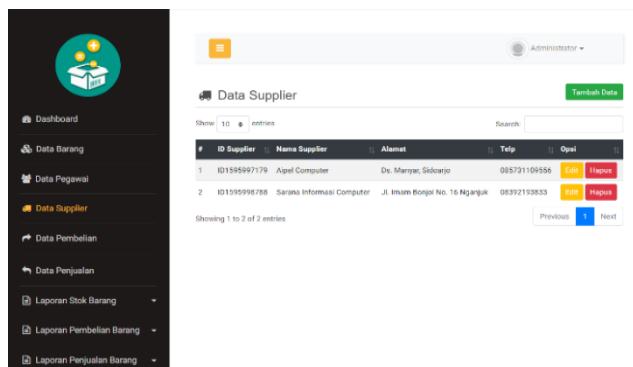


Fig 10. Display Supplier Data Menu

f. Display of Purchase Data Menu

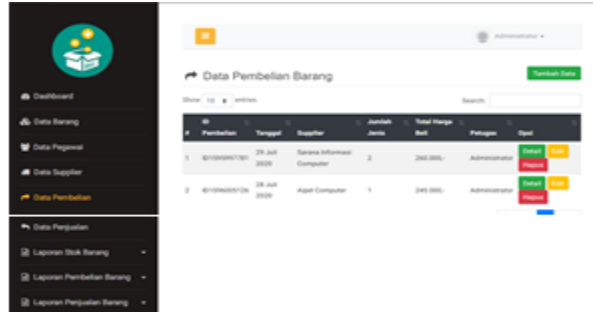


Fig 11. Display of Purchase Data Menu

g. Display of Sales Data Menu

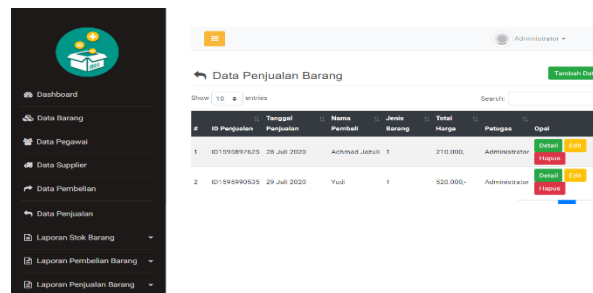


Fig 12. Display of Sales Data Menu

h. Menu Display of Stock Items Report

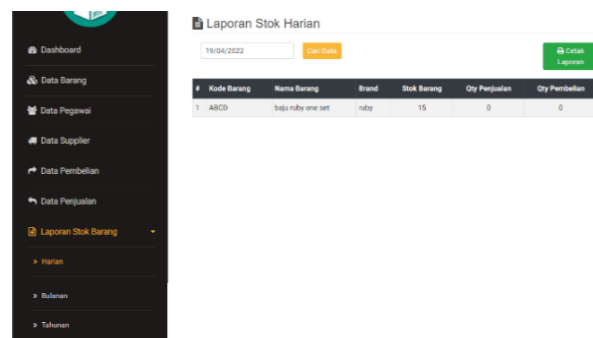


Fig 13. Menu Display of Stock Items Report

i. Display of Purchase Report Menu



Fig 14. Menu Display of Purchase Report Menu

j. Sales Report Menu Display

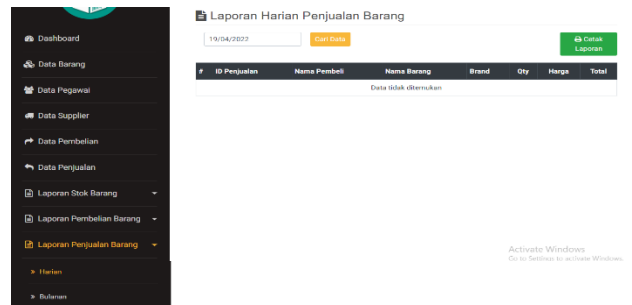


Fig 15. Sales Report Menu Display

4 Conclusion

Based on the results of the discussion and design results, it is found that the results of the research have been successfully done with the help of the UCD (User Centered Design) method, UML (Unified Modeling Language) design modeling and the Likert scale measurement assistance which measures the user's point of view, perception and attitude towards the stock application. . Thus, a web-based stock application has been successfully created according to user needs, namely a stock application with profile editing features, security in the form of passwords and changing passwords, report printing and reporting features, and self-identity features.

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