Design and build of web-based point of sales application using laravel framework

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Article Info	ABSTRACT=
	Tatiawan Store faces several challenges in financial and stock management, such as difficulties in financial tracking and inefficient stock management. Transaction recording that still uses manual books often causes errors and difficulties in monitoring cash flow. In addition, the lack of monitoring of stock results in shortages or excess stock which has a negative impact on sales and store profits. To overcome this problem, a cashier website was developed using the Waterfall development method. With the Tatiawan Store Online Cashier System, with transaction management features, products, categories, and stocks become more efficient and structured. This system is also equipped with user management that uses role-based access control, ensuring that only users with certain permissions can access certain features. From the various explanations that have been described in this report, it can be concluded that the system developed is able to improve efficiency and structure in store management, as well as ensure the security of feature access according to the user's role.

INTRODUCTION

In the era of technology like today, computers play an increasing role in various aspects of human life (Asih et al., 2020). Along with the times, the development of information technology is increasingly rapid. Therefore, more and more new ideas emerge in the world of information technology. It is undeniable that many people are involved in the world of information technology because in terms of community life, communication and information will definitely be involved (Hakim, 2019).

Tatiawan Shop is a shop that sells complete goods to meet the needs of the surrounding community, and is a mainstay of the surrounding community to buy groceries or others. The constraints in the Tatiawan shop have a system that is still manual, where each purchase is still served and calculated manually, also when recording income at the Tatiawan shop still uses records through books, this illustrates the process of recording income, not to mention if the book is damaged, then the shop owner does not have a backup record. The method of writing transactions that still uses a manual approach is the main source of inefficiency in this process. This is proven by the frequent reduction in stock of goods causing shortages or excess stock, which can have an impact on sales and store profits. This activity not only takes significant time but also creates uncertainty related to the accuracy of the financial reports produced.

Based on the background description that has been explained above, the author takes the title "Design and Construction of a Web-Based Cashier Application Using the Laravel Framework Case Study: Tatiawan Store".

RESEARCH METHODS

There are two methods used in the development of this Cashier application system, namely:

1. Data Collection Method

In the project "Design and Construction of a Web-Based Cashier Application Using the Laravel Framework Case Study: Tatiawan Store," data was obtained from two sources: primary data collected directly from the research object, and secondary data obtained from other sources. Data collection

techniques include direct observation of the processes and systems at Tatiawan Store, as well as interviews with store managers

2. System Development Method

In developing this application, the author uses the waterfall method, which is carried out systematically starting from the system requirements stage, analysis, design, coding, testing, to maintenance. Each stage must be completed sequentially without jumping to the next stage, similar to a waterfall flow. The stages of application creation can be seen in the image below.
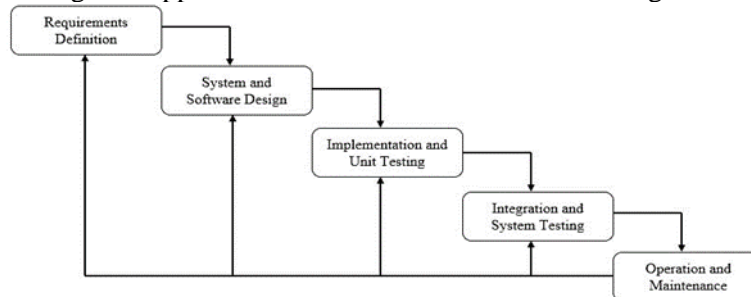

Figure 1. Waterfall Method Stages

RESULTS AND DISCUSSION

Analysis is the stage where existing or future systems are understood, modeled, and evaluated so that the objectives of the application or project can be achieved. The role of system analysis is very significant in the project creation process, because it helps identify constraints, analyze requirements, plan solutions, and ensure that the system or application being developed can meet user needs and established objectives.

1. Functional Requirements Analysis

In the system design process, functional requirements analysis plays a very crucial role in development. In this case, the Unified Modeling Language (UML) is used, which involves several types of diagrams, including Use Case Diagrams, Activity Diagrams, Class Diagrams, and Sequence Diagrams.

2. Non-Functional Requirements Analysis

In the system development stage, non-functional requirements analysis plays a central role in determining the required specifications. These specifications include the elements and components needed from design to system implementation. In addition, requirements analysis also plays a key role in identifying the types of inputs required by the system, the outputs produced, and the processing that must be carried out to produce the desired results. Listed below are the non-functional requirements:

    a. Hardware Analysis

    The hardware used to run the application is as follows:
1) Android 7.1
2) 2 GB RAM
3) 512 GB SSD

    b. Software Analysis

    In designing software, various factors that are needed must be met to suit the purpose and intent of the software. Some supporting software are as follows:
1) Operating System: Windows 10
2) Text Editor: Visual Studio Code
3) UI Design: Figma
4) Database: MySQL
5) Frontend and Backend: Laravel

Design

Design Analysis explains the design or description of the system that will be proposed to create a cashier application. This system design is described through UML (Unified Modeling Language) tools

consisting of: Use Case Diagram, Activity Diagram, Class Diagram, Sequence Diagram. The following is a system design through the types of diagrams used in creating this system, including:

a. Use Case Diagram

A Use Case Diagram is a graphical depiction of some or all actors, use cases, and interactions between them that introduce a system. The following is a use case diagram of the cashier application:

1) Use Case Diagram admin

Figure 2. Use Case Diagram Admin

Description of the admin use case diagram scenario:

Identification			
No. Use Case	1		
Nama Use Case	Login		
Aktor	Admin		
No **Actor Action**		**No**	**System Response**
1. Fill in the username and password in the login column..			
		2.	Verify the email and password filled in by the Actor
		3.	If the email and password are correct, you will go directly to the dashboard, if not, the system will display an error notification and return to the login form.

b. Sequence Diagram

Sequence Diagram is a diagram used to describe the interaction between objects and communication between these objects, also used to describe the behavior of scenarios and provide clarity for several objects and messages placed between them. The following is a sequence diagram created by the author to design a cashier application:
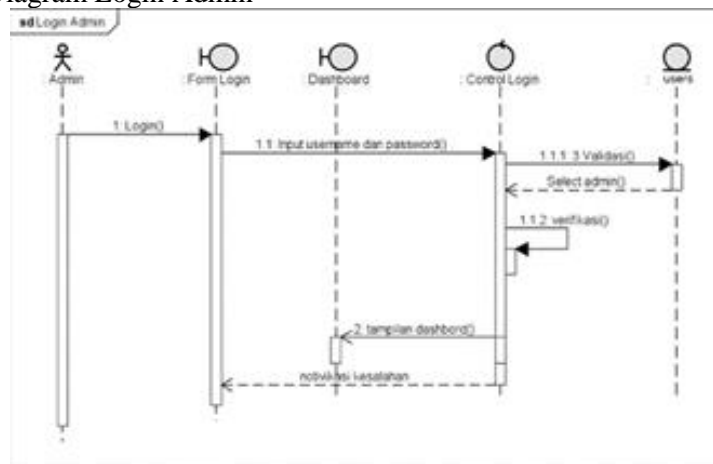
1) Sequence Diagram Login Admin

Figure 3. Sequence Diagram Login Admin
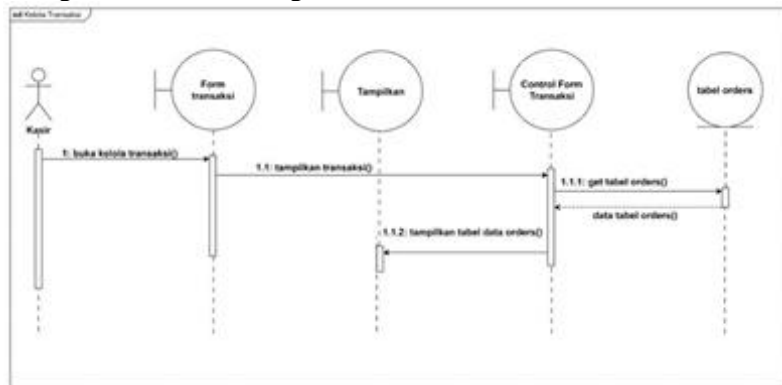
2) Sequence Diagram Cashier Manages Transactions

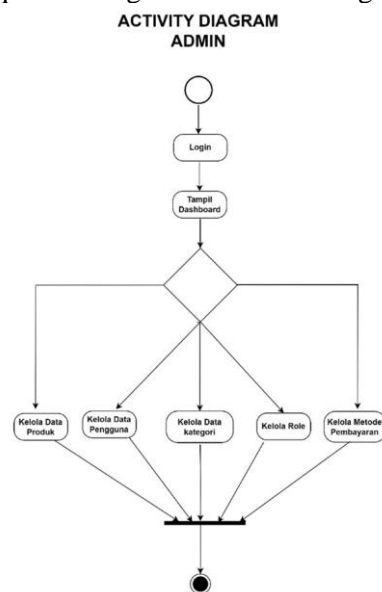Figure 4. Sequence Diagram Cashier Manage Transactions

Figure 5. Activity Diagram Admin
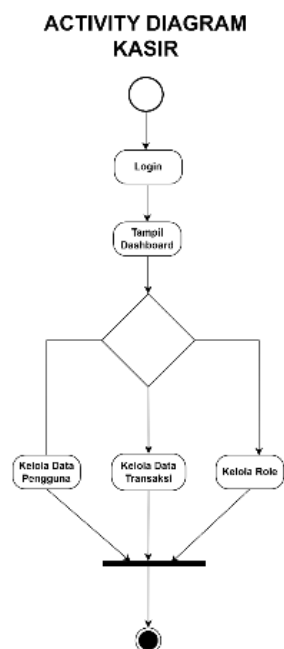
3) Activity Diagram Kasir

Figure 6. Activity Diagram Kasir

c. Class Diagram

A Class Diagram is a diagram that describes classes related to a system between one another, containing attributes and operations. The following is a class diagram created by the author to design a cashier application:
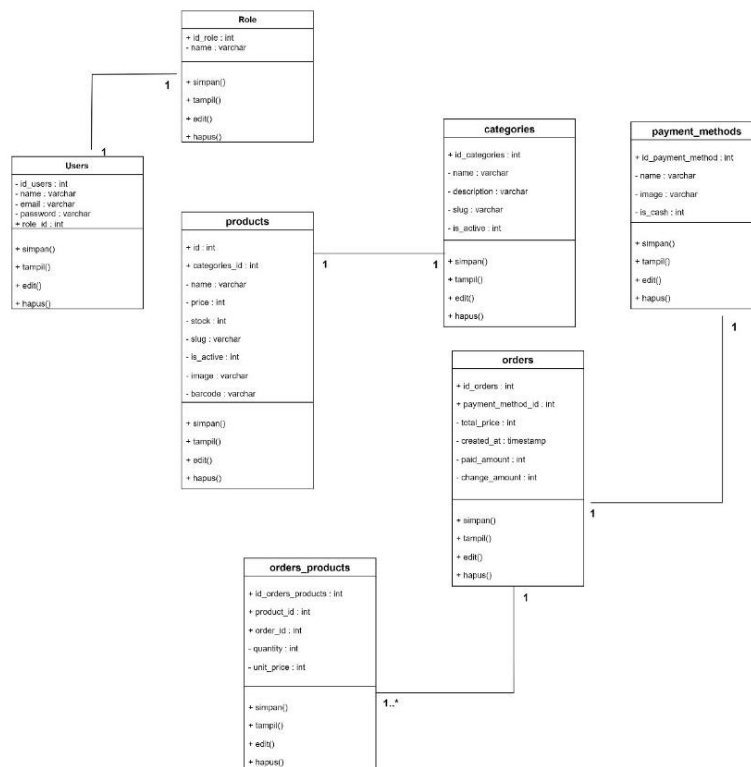

Figure 7. Class Diagram

Program Testing Results

After all system designs have been implemented using a programming language, the next stage is to test the program or application. Testing is carried out to minimize the discovery of program conditions that do not match the existing design. In addition, program testing aims to find errors or bugs as early as possible that occur in the program.

In this study, the author conducted testing using the Blackbox method, this method is a testing method that focuses on software functionality. This method is used to find errors in categories such as incorrect or missing functions, interface errors, errors in data structure factors and performance errors. The following is a display of the User Interface and User Interface Implementation of the Cashier application:
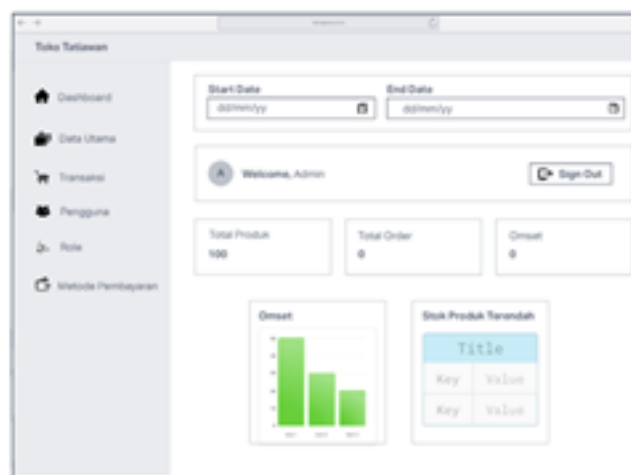

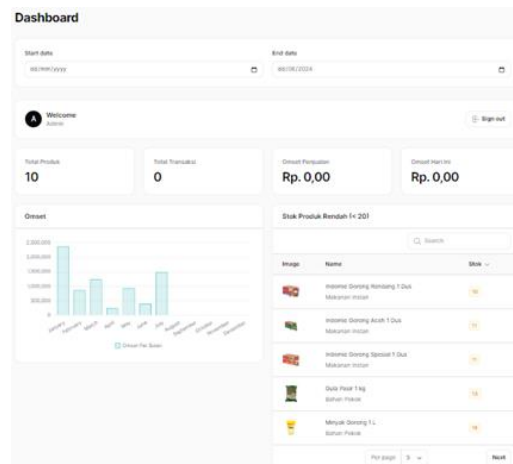**Figure 8. Wireframe Halaman Dashboard**

Figure 9. Implementation of Dashboard Page Wireframe

CONCLUSION

From the various explanations that have been described in this report, it can be concluded that with the Tatiawan Store Online Cashier System, transaction, product, category and stock management at Tatiawan Store becomes more efficient and structured. Then this application is also designed to perform user management with role-based access control, which ensures that only users with certain permissions can access certain features.

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