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Design of Product Catalog Website for Kukerku_Ncip Using Waterfall Method and Laravel Framework

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Abstract

The development of information technology encourages MSMEs to switch to digital platforms to improve the efficiency of promotion and product management. Kukerku_Ncip, an MSME that sells pastries, still promotes its products manually. To overcome this, a Laravel-based product catalog website was designed using the Waterfall method. This method was chosen because it has structured stages ranging from analysis, design, implementation, to testing. The developed website has main features such as product pages, categories, customer testimonials, and an admin dashboard for management. Testing with the black box method shows that all features function as needed. This website is expected to increase the effectiveness of promotion and facilitate customers in obtaining product information digitally, efficiently, and organized.

Keywords: *Black Box Testing, Kukerku_Ncip, Laravel, Product Catalog Website, Waterfall Method.*

1. Introduction

The rapid development of information technology in the Society 5.0 era promises various conveniences in the activities of using technology [1]. The rapid development of information technology has encouraged micro, small, and medium businesses (MSMEs) to use digital platforms in marketing products. This certainly has an impact on daily activities including the marketing sector of food product. One of the important tools for marketing for the perpetrators is the website of the website [2].
Kukerku_Ncip is a home-based business engaged in the food sector that serves various pastries. Currently, the sales promotion process is still carried out manually and through social media, which has limitations in systematically managing products. Therefore, an information system is needed in the form of a product catalog website that is able to display a list of products digitally and increase promotional efficiency.

Kukerku_Ncip does not yet have a product catalog platform, so it is an opportunity to create a product catalog website. Upon closer inspection of the research conducted [3] on Nyuemilteros MSMEs, it is evident that the waterfall method can help systematically approach the creation of MSME catalog websites, thus strengthening the case for using the same methodology.
A number of previous studies support the urgency of developing catalog websites for MSMEs. For example, in a study by Indra & Hafiz, the Waterfall methodology can be adapted and used effectively in making software applications [4]. Other research also states that the use of the Waterfall method in developing a product catalog system provides results that are more structured and easy to maintain [5].

Waterfall system development method, which includes the steps of requirements analysis, design, implementation, testing and maintenance. This website has increased efficiency in promotion and made it easier for customers to get product information.
Laravel is a PHP-based framework that is open-source and applies the Model-View-Controller (MVC) architecture pattern [6]. The use of Laravel allows web application development to be more structured, efficient, and easy to maintain. Features such as flexible routing, ORM (Eloquent) for database interaction, and a built-in authentication system strongly support the development of web-based product catalog applications such us those needed by Kukerku_Ncip.

Meanwhile, MySQL is used as a relational database management system in charge of storing product data, categories, customer testimonials, and admin data in a structured manner. The combination of Laravel and MySQL provides stability and good integration, and supports ease of data management through the interface that has been designed.
By combining modern Laravel and MySQL technologies with a structured system development approach through the Waterfall method, it is hoped that the resulting product catalog website can meet the needs of MSMEs functionally, efficiently, and sustainably. With the design of this catalog website, it is hoped that Kukerku_Ncip can increase the effectiveness of its product promotion, expand customer reach, and simplify the process of managing product information digitally.

2. Research Method

This study consists of several main stages, namely literature studies, observation, interviews, waterfall methods. The following is the flowchart of the flow of research process, including:

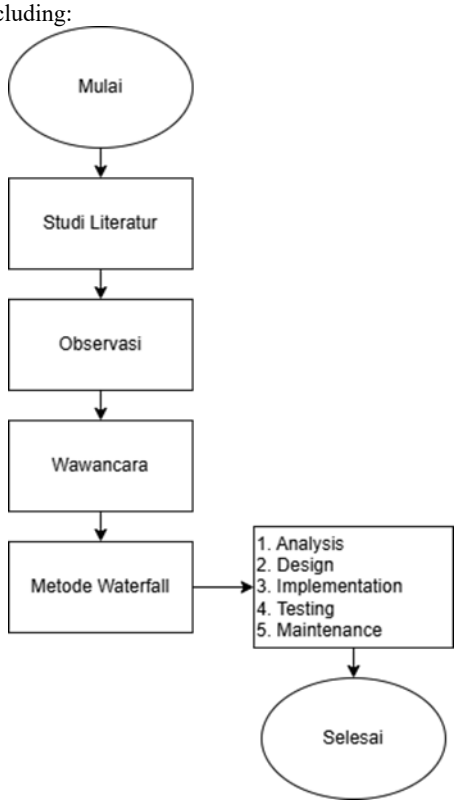

Fig. 1: Flowchart The flow of the research process

2.1. Literature study

Previous studies of designing web -based information systems, product catalog websites, and waterfall methods. As well as technology related to the design and development of web -based catalog applications for kukerku_ncip using HTML, CSS, Javascript, and Laravel. The programming language and famework used are functions to create a systematic and dynamic website display [5].

2.2. Observation

Observation is a methodological approach to the acquisition of information through direct supervision of the subject being investigated [7].

2.3. Interview

Direct interviews represent a very effective approach for data acquisition.

2.4. Waterfall Method

Waterfall methodology is a methodical and organized paradigm for software development, and it is important to apply this approach within the framework of designing a web-based application for bag sales [8]. This method approach includes a number of stages such as requirements analysis, design, implementation, testing, and maintenance. The Waterfall model is considered appropriate for software development projects that have clear and defined requirements specifications, and supports a systematic and structured work process for developers [9].

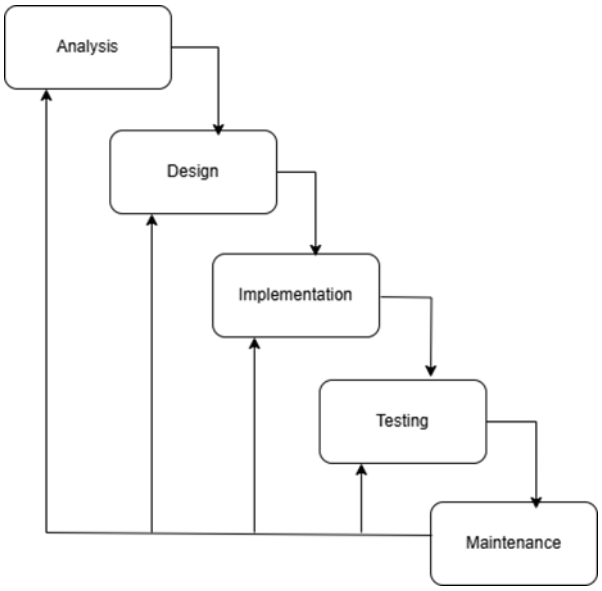

Fig. 2: Waterfall method

1. Analysis
   Analyzing the results of observations and interviews to identify system requirements. The main problem is manual promotion which is less effective, so a structured product catalog system is needed.
2. Design
   Designing the structure and appearance of the system, including:
   a. Class Diagram to show the class structure and its relationship.
   b. Use Case Diagram to explain the interaction between actors and the system.
3. Implementation
   Translate the design into program code using Laravel and MySQL. This stage includes creating product features, categories, testimonials, and admin content management.
4. Testing
   Using the Black Box method to ensure system functions run according to specifications.
5. Maintenance
   Perform maintenance and development of the system an ongoing basis.

3. Result And Discussion

3.1 Needs Analysis

Through observations and interviews with business owners and several samples of Kukerku_Ncip customers. Several problems were found in the promotional media. carried out so far, starting from promotions on social media using brochures which are still very simple. This interview revealed the needs expected by Kukerku_Ncip for systemized and efficient product management.

3.2 Design Analysis

1. Class Diagram

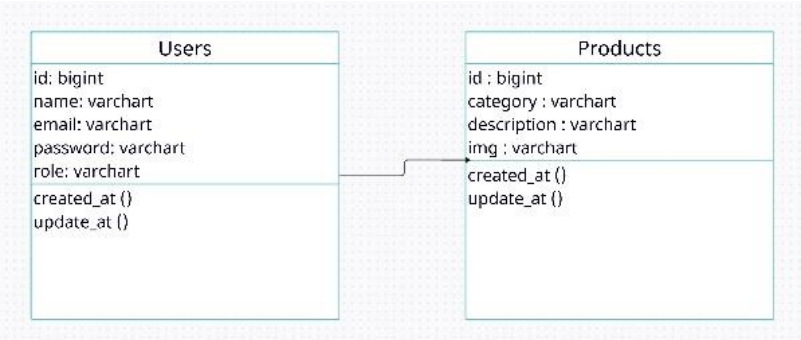

Fig. 3: Class Diagram User Admin

2. Usecase Diagram

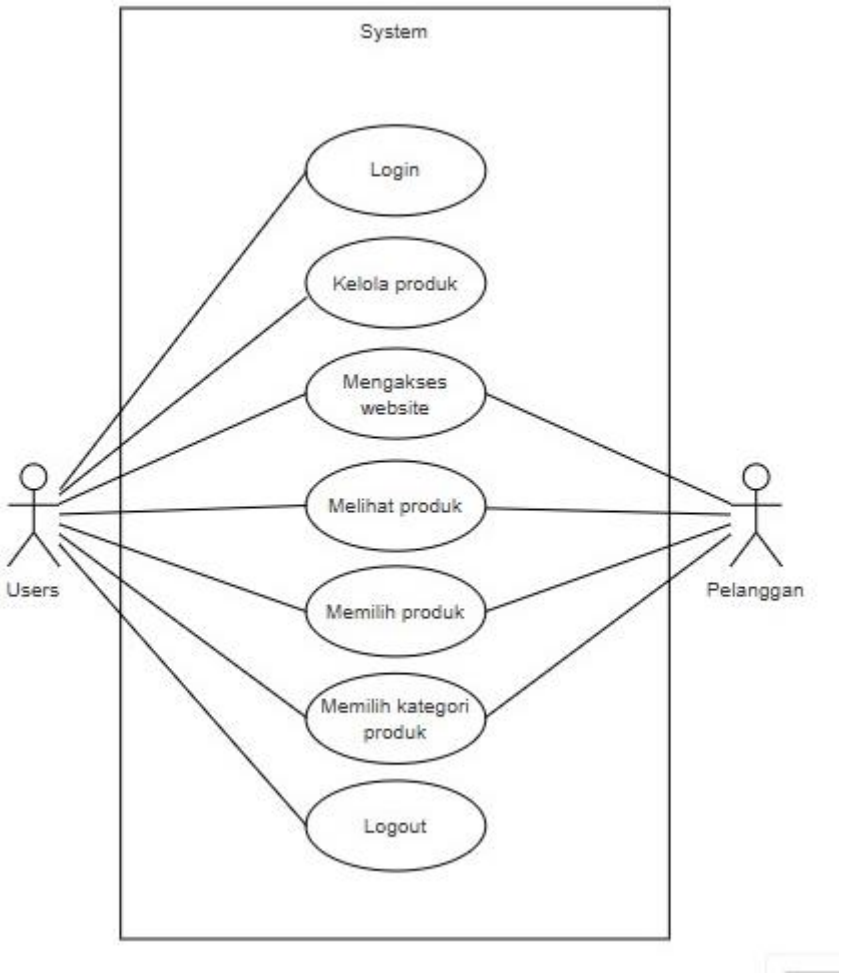

Fig. 4: Usecase diagram

3.3 Implementation

1. Login Page

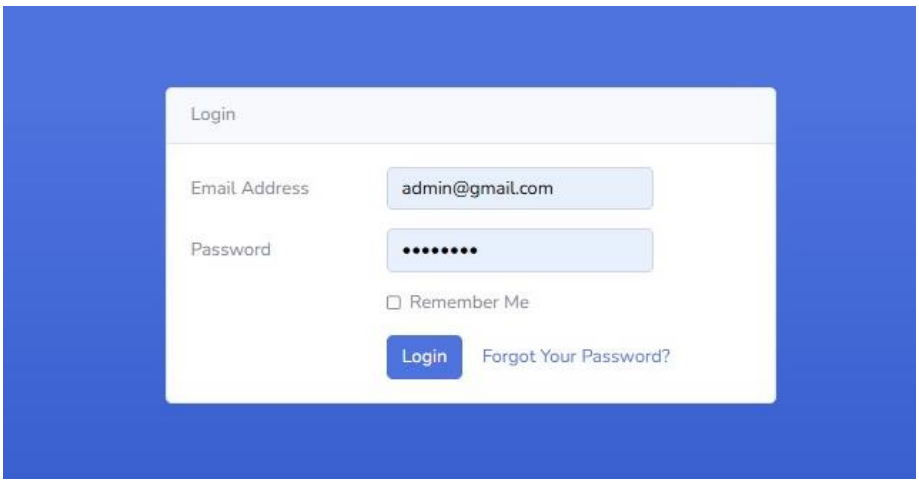

Fig. 5: User login page

This page is the entrance for admins to access the system. Admins need to enter a registered email address and password to be able to manage product data. This feature is designed to maintain system security and control. Main functions: Access to the catalog data management panel.

2. Product List Page

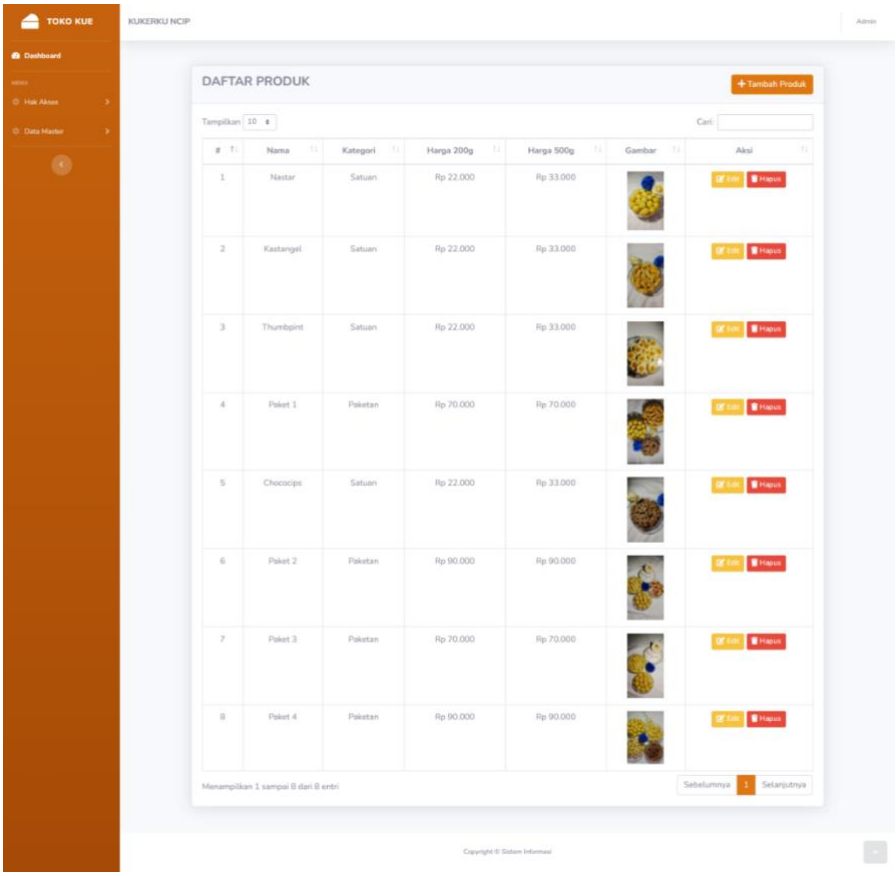

Fig. 6: Product list page

This page allows the admin to add, chance, and delete products from the catalog. In this view, admins can view the entire product list, including information such as product name, price, and short description. Main fuctions: CRUD (Create, Read, Update, Delete) of products and dynamic management of catalog data.

3. Product Page

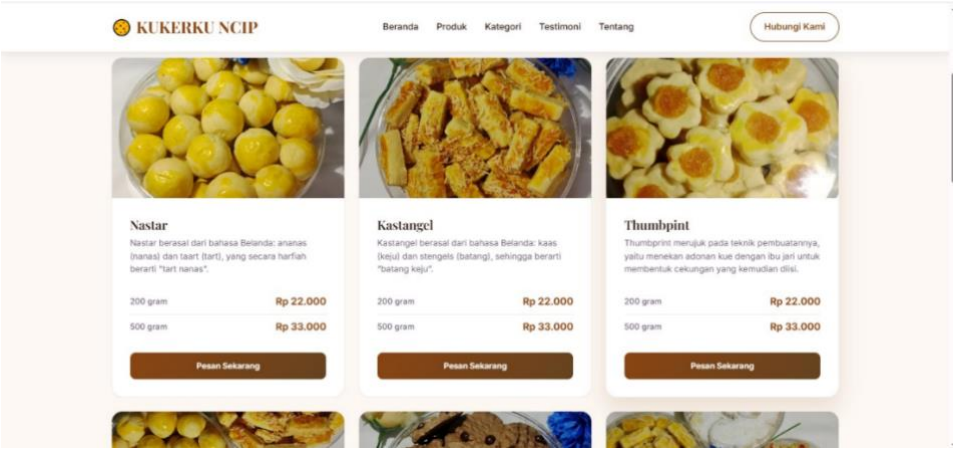

Fig. 7: Product page

This page is intended for users or costumers. Website visitor can see all the products offered by Kukerku_Ncip complete with photos, descriptions, prices, and order buttons connected to WhatsApp. The main function is to display the product list informatively and make it easier for customers to choose and place orders.

4. Product Category Page

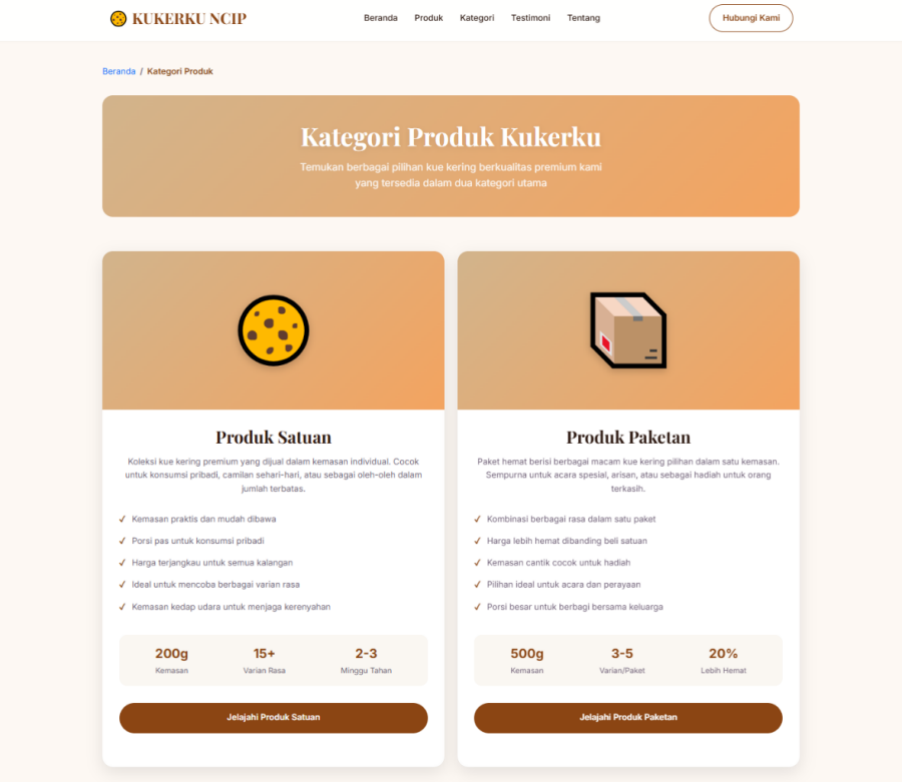

Fig. 8: Product category page

On this page, there are 2 categories available on Kukerku_Ncip, namely the unit category and package category. This classification aims to facilitate customer navigation in exploring products according to their needs. The main function is to filter products by category type.

3.4 Testing Results

To verify that the product catalog website on Kukerku_Ncip has been successfully created. Then testing is done using black box testing. Black box is a method that tests the function of a system based on specifications, without analysis of the design or program code.

1. Black Box Testing on Admin Users

Tab. 1: Black Box Testing on Admin Users

No	Testing	Test Case	Result	Status
1	Login Menu	Enter the appropriate data into the login form. Email Address: admin@gmail.com Password: admin123	Success login to the product management website.	Success
2	Add Product	Fill in and adjust the items that will be entered into the product catalog storefront.	Success save and add products to the catalog website.	Success
3	Edit Button	Click the edit button and customize what will be edited.	Success edit the product as expected.	Success
4	Delete Button	Click the delete button and confirm if you want to delete this product.	Success delete after confirmation.	Success

2. Black Box Testing on Costumers

Tab. 1: Black Box Testing on Costumers

No	Testing	Test Case	Result	Status
1	Home Menu	Click the home menu.	Displays the homepage, information about Kukerku_Ncip, featured products and contacts listed on the footer of the homepage.	Success
2	Product Menu	Click the product menu.	Displays a product page that contains a variety of product, descriptions and prices. And can order if you want to buy via WhatsApp.	Success

3	Category Menu	Click the category menu.	Displays a category page containing 2 categories, namely units and packages.	Success
4	Testimonial Menu	Click the testimonial menu.	Displays a tesimonial page that contains several testimonials from customers who have bought Kukerku_Ncip.	Success
5	About Menu	Click the about menu.	Displays a page containing the Kukerku_Ncip trip.	Success
6	Contact Us	Click the contact us menu.	Displays a page containing contacts from Kukerku_Ncip.	Success

4. Conclusion

The Kukerku_Ncip product catalog website was successfully designed and implemented using the Waterfall method in a structured manner, from analysis to testing. This system contains features such as homepage, products, categories, testimonials, contacts, and admin pages. All features are tested using the black box method and run according to specifications. The design results answer the problem formulation by presenting a website that is easy to use, efficient, and supports promotion and product management. The use of Laravel and MySQL also ensures the stability and ease of system management, while improving access to information and professionalism of product presentation. For further development, it is expected to add basket and online payment features, and optimize the UI/UX display to be more responsive on various devices. So that it can make customers feel more comfortable in transactions.

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