Web-Based Online Beverage Ordering Application Using the Laravel Framework

Muhammad Naim Nasution, Zulfahmi Syahputra, Muhammad Zen

Abstract

Coffee has become a high-popularity beverage commodity in Indonesia, driven by a significant increase in consumption among the younger generation who use coffee shops as centers for social and work activities. This trend necessitates The Secret Coffee Shop's adoption of information technology to improve competitiveness and operational efficiency. This research aims to design and implement a web-based coffee ordering application as a service digitalization solution. The application integrates features for online ordering, menu management, order notifications, and payment systems, allowing customers to place orders from various devices without having to queue at the physical location. The system design is carried out using a systematic software development methodology, encompassing user requirements analysis, system design, implementation, and testing. The resulting application is expected to be able to streamline operational processes, manage order data, and reduce errors at The Secret Coffee Shop. Furthermore, the implementation of this system seeks to measure the enhancement of customer satisfaction and business operational performance, thereby enabling the provision of faster, more accurate, and innovative services to customers.

Keywords: *Ordering Application, Coffee Shop, Operational Efficiency, Customer Satisfaction, Web- Based.*

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Introduction

Coffee is one of the beverage commodities with high popularity in Indonesia [1]. According to reports, coffee consumption in Indonesia has increased significantly, especially among the younger generation who use cafes as both a gathering place and a workspace. This trend encourages many coffee shops to improve services and operational efficiency, including through the utilization of information technology. Digitalizing the coffee ordering service is a relevant solution to address this challenge, particularly in the Industry 4.0 era which emphasizes technology integration in various business sectors. Web-based ordering applications provide convenience for customers to place product orders without having to queue or be physically present at the location [2]. This can increase customer satisfaction and speed up the service process. Moreover, web-based technology is considered more flexible because it can be accessed from various devices, such as computers, tablets, and smartphones [3]. The Secret Coffee Shop, as one of the local coffee shops that wants to increase its competitiveness, requires a digital ordering system to simplify operational processes, manage order data, and provide a better user experience.

In this research, a web-based coffee ordering application was designed that integrates online ordering features, menu management, order notifications, and a payment system [2]. The design was carried out using a systematic software development method, starting from user needs analysis, system design, implementation, to testing. This application is expected to help The Secret Coffee Shop in improving operational efficiency, reducing ordering errors, and expanding their service reach.

This research not only focuses on application development but also measures the extent to which technology can increase customer satisfaction and the operational performance of the coffee shop business. With this system, The Secret Coffee Shop is expected to provide faster, more accurate, and innovative services to customers. Based on this explanation, the researcher concludes the title as: "Web-Based Beverage Ordering Application".

Literature Review

Application and Ordering

An application is a computer program or software designed to easily assist humans in performing specific tasks. Ordering is an agreement between two or more parties, namely between the provider of goods or services and the user. Thus, an ordering application is a software program designed to facilitate the process of ordering goods or services electronically [1].

Laravel Framework

Laravel is an open-source PHP framework based on the Model-View-Controller (MVC) pattern and is designed to improve software quality. This framework helps reduce development and maintenance costs, and offers a better experience in working with applications through clear, expressive, and efficient syntax [1].

Website

A website is a page of information available over the internet that can be accessed globally as long as it is connected to the internet. Each page has a unique address called a URL (Uniform Resource Locator), allowing users to access it easily [9]. A website is a page that can be accessed via the internet by users through software. A website consists of pages that contain information displayed by browsers such as Mozilla Firefox, Google Chrome, or others [10].

PHP

Website-based applications are created using the computer language PHP (Hypertext Preprocessor). Interactive and dynamic features are very important for websites developed

using PHP. Because a website is dynamic, its content can adapt to certain circumstances, such as displaying different items to each visitor. Meanwhile, the interactive feature of a website allows it to provide feedback to consumers by showing product search results. PHP is a serverside programming language, meaning the web server will execute the PHP script and return the result to the user's browser. Therefore, to start development with PHP, access to a PHPsupported server is required [12].

MySQL

MySQL is one of the SQL database management system software. Unlike conventional databases like .dat, .dbf, .mdb, MySQL has the advantage of being multithreaded and multi-user, and it supports network systems. MySQL is distributed for free under the GNU General Public License (GPL), but there is also a commercial version for certain parties who desire it [13].

UML

The Unified Modeling Language (UML) is a standard visual modeling language used in software engineering and information system development. UML provides a rich and varied notation for describing, designing, and documenting various aspects of a software system or information system. This aids in the effective understanding, communication, and documentation of system design [14][15].

Research Methodology Research Stages

The author chose to adopt the Waterfall Model (waterfall model) in this research due to its highly structured approach to the software development lifecycle. This methodology requires that each phase be completed sequentially, ensuring that the complete finalization of one stage is an absolute prerequisite before starting the next stage.

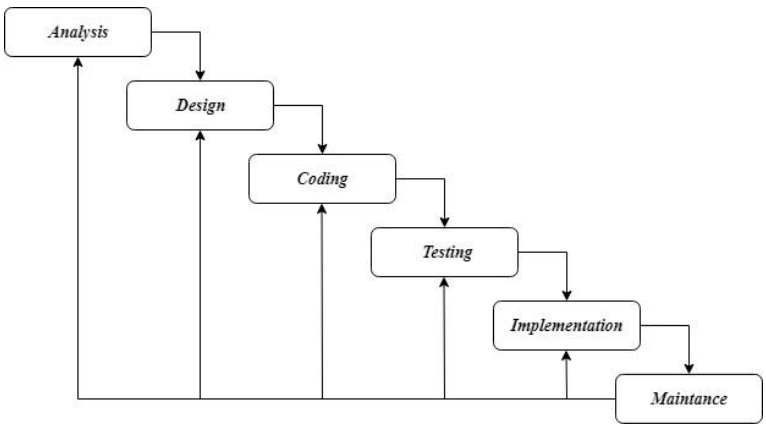


Figure 1. Research Stages

The Waterfall Method (Waterfall Model) is a highly structured and sequential approach to system development. This process consists of five main stages that must be completed linearly:

System Analysis

This initiation stage focuses on the gathering and detailing of information regarding all software requirements. Relevant data is obtained through various techniques, such as surveys, interviews, or direct observation. All successfully collected data is then thoroughly analyzed to produce a comprehensive software requirements specification document.

System Design

In this phase, the system architecture design is formulated. The goal is to present a complete overview of the system's structure and components as a guide for subsequent development steps.

System Implementation (Coding)

This phase involves the actual construction of the application (coding). The development process is carried out using appropriate programming languages and databases, based on the specifications established in the previous analysis and design stages.

System Testing

After the implementation stage is complete, the system undergoes thorough testing (integration and validation). The main goal of testing is to verify the system's functionality and to identify and fix potential defects (bugs) or operational issues before the system is released.

System Maintenance

This final stage includes periodic system maintenance post-implementation. Maintenance activities are carried out to improve the system's long-term effectiveness and performance, which may include system adaptation, correction, and the addition of new features in accordance with the evolution of user needs.

System Design

This research implements Object-Oriented modeling by utilizing UML (Unified Modeling Language). The UML diagrams used in this study include the Use Case Diagram and the Activity Diagram.

Use Case Diagram

The Use Case Diagram serves as a visualization tool to represent the interactions between actors (users or external systems) and the various functionalities or activities contained within the system being developed. Specifically, this diagram outlines the system's main processes and defines the involvement of each actor in these processes. The Use Case Diagram for the system being designed will be presented in Figure 2.

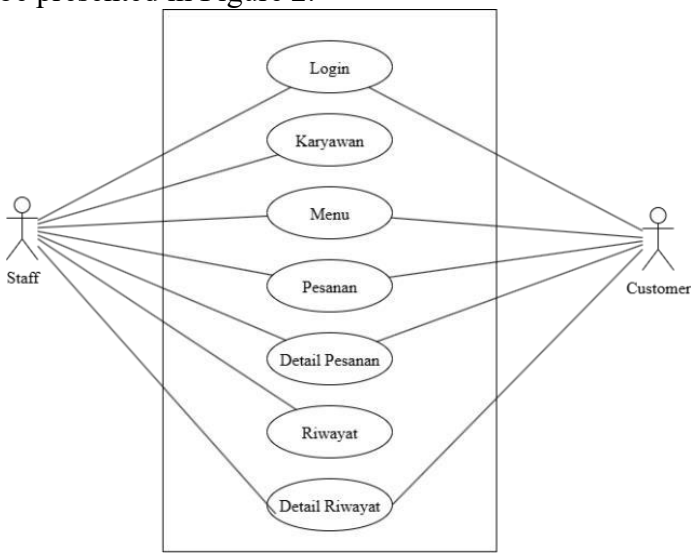


Figure 2. Use Case Diagram

Activity Diagram

The Activity Diagram in this system serves to visualize the entire workflow in detail. This diagram clearly maps out the initiation point, the various possible decision points that may occur, and the termination of each activity process.

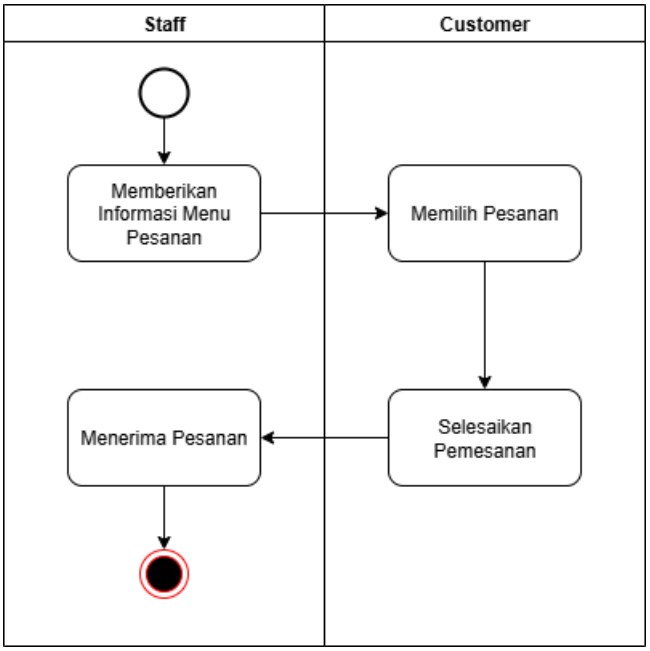


Figure 3. User Activity Diagram

The image is an Activity Diagram that visualizes the order process flow involving two main parties: the Staff and the Customer. The process begins when the Staff provides menu information. In parallel, the Customer selects the order. Following this, the Staff receives the selected order, and the process concludes with the Customer completing the order. This diagram shows a simple and sequential workflow for the ordering transaction.

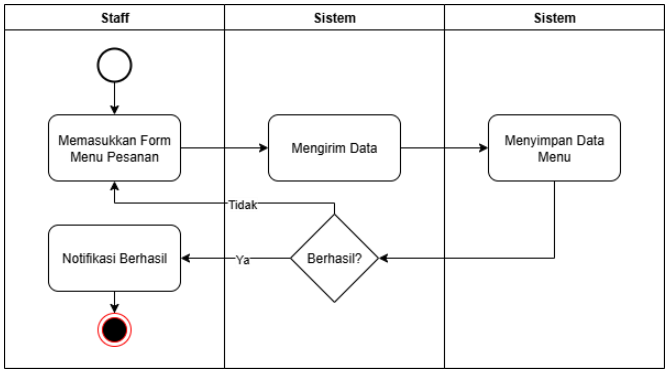


Figure 4. User Activity Diagram

This image presents an Activity Diagram that outlines the workflow for inputting and storing order menu data, involving the roles of the Staff and the System. The process begins when the Staff enters the Order Menu Form, whose data is then sent by the System to attempt Menu Data Storage. Subsequently, the System performs a check via a decision point to verify if the storage process was successful; if storage is successful, the Staff will receive a Success Notification and the process completely ends, but if storage fails, the workflow returns to the initial step for the Staff to re-enter the Order Menu Form.

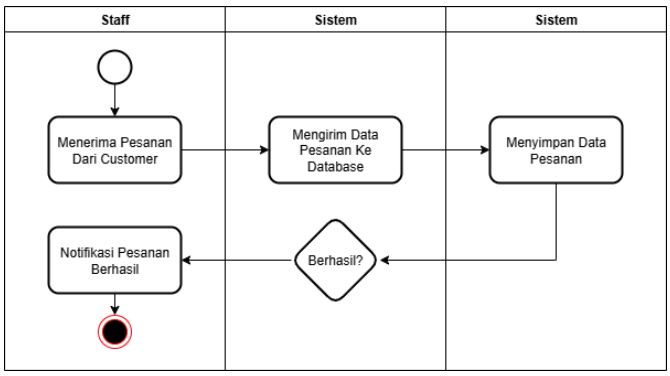


Figure 5. User Activity Diagram

This image displays an Activity Diagram that explains the workflow for receiving and storing orders, involving the Staff and the System. The process begins when the Staff receives an order from the Customer. This order data is then sent by the System to the Database, followed by an attempt to Store the Order Data. After the storage process, the System will check via a decision point whether the process was Successful (stored). If Yes (successful), the Staff will receive an Order Successful Notification, and the workflow is concluded.

Class Diagram

In the field of software development, the visual representation of a system is a crucial instrument for modeling, designing, and documenting both the structure and behavior of the system. One of the most dominant and frequently utilized visualization methods is the Class Diagram.

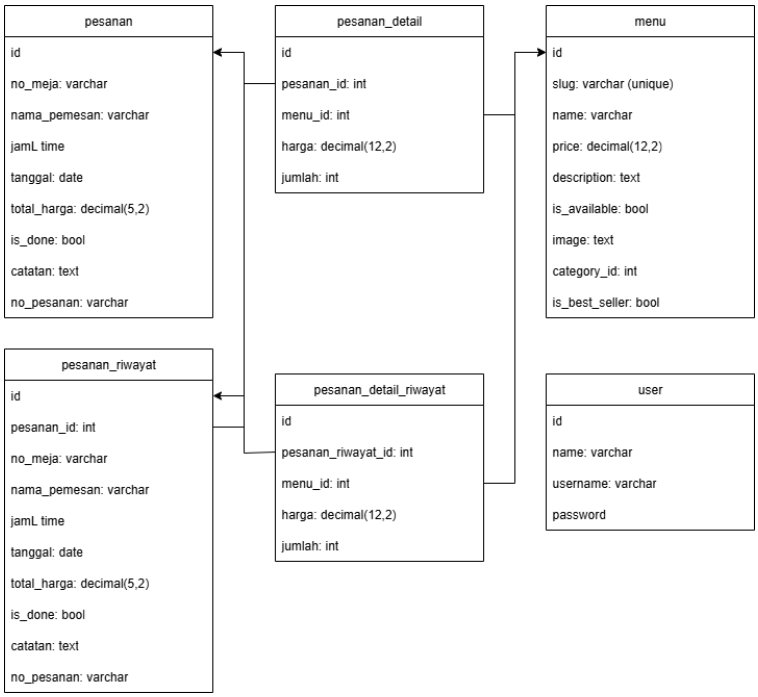


Figure 6. Class Diagram

Results Interface Homepage Display

This display is the homepage of the coffee ordering website for "The Secret Coffee Shop". The design is dominated by dark brown colors with visual elements of coffee cups and coffee beans. At the top, there is a simple navigation menu (Home, Order, Contact) and a "My Orders" button in the upper right corner, indicating the website's primary function as an ordering platform.

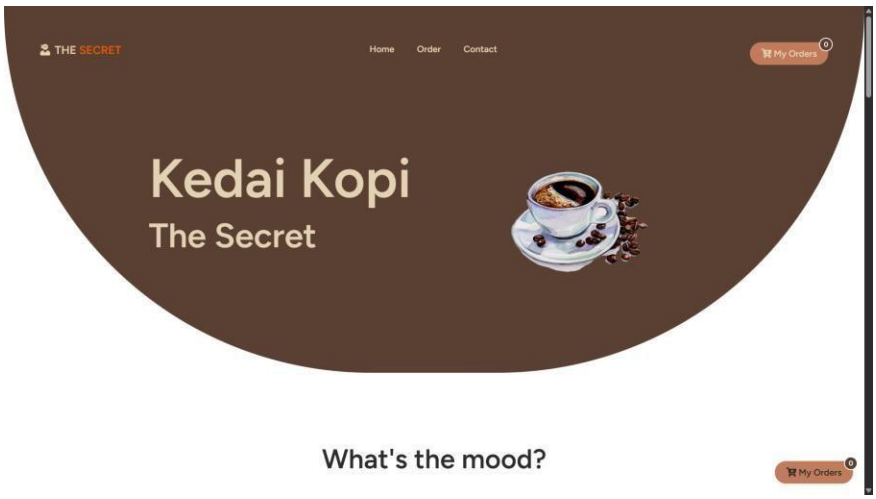


Figure 7. Homepage Display

Order Display

This is the coffee ordering menu (Order) display for the Coffee category on the website. The page shows a list of coffee products (such as Espresso, Americano, V60, Sanger, etc.) in a grid layout with product photos, names, brief descriptions, prices, and a "Pilih Menus" (Select Menu) button for adding items to the cart. Some items are marked with a "Best Seller" label, and prices range from Rp 10,000.00 to Rp 24,000.00. The "My Orders" button is also available in the lower right corner.

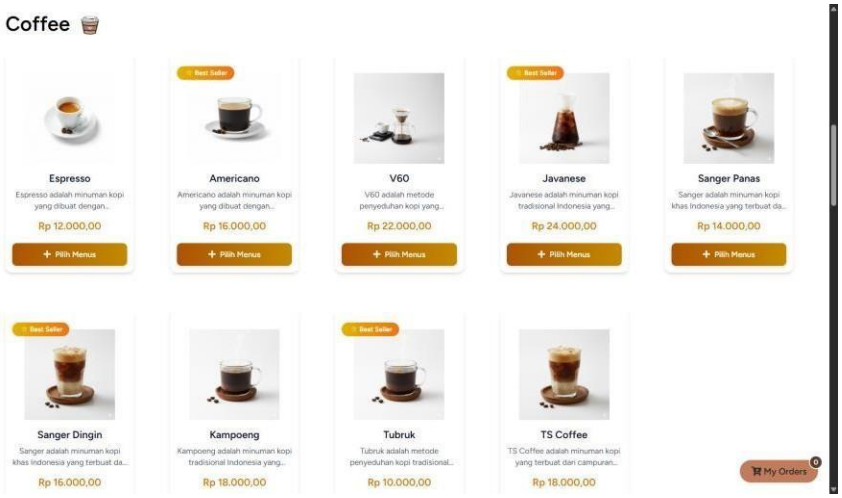


Figure 8. Order Display

Order Detail Information Display

This is a pop-up window that requests Customer Information before the order is processed. This window serves to collect essential data such as Table Number, Customer Name, and specific Notes regarding the order. Users can choose to proceed with the order or cancel the action. This display constitutes the final confirmation step in the order checkout process.

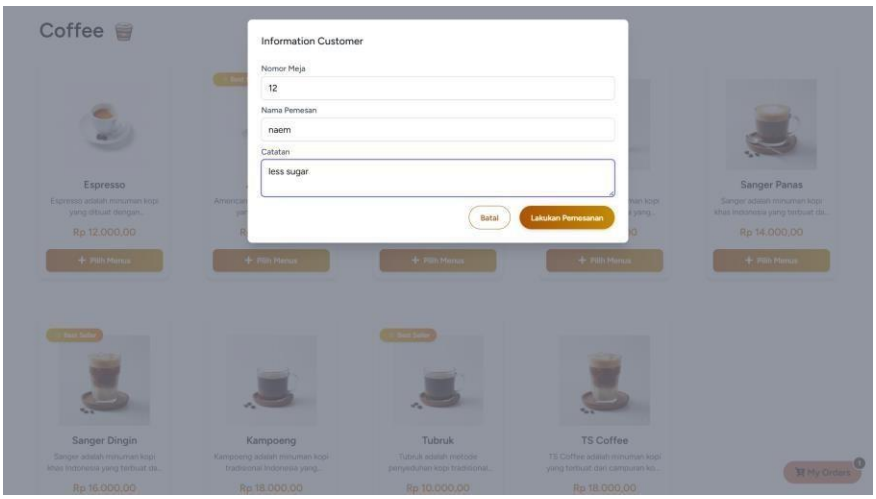


Figure 9. Order Detail Information Display

Staff Login Display

This is the login display intended for staff or administrators, featuring a minimalist white background and a coffee cup icon at the top. The login form contains two input fields: Username and Password, followed by a "Remember me" option (checkbox) and a black "LOG IN" button. This display serves as the access gate to the coffee shop's management or operational system.

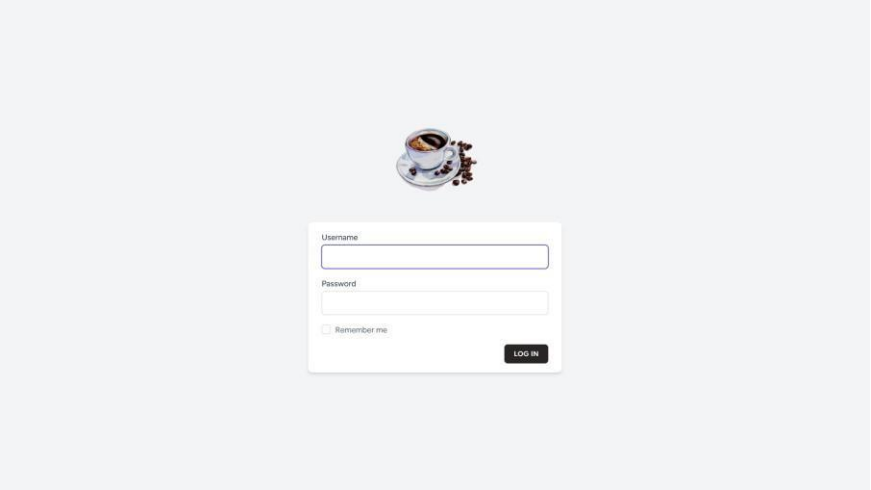


Figure 10. Staff Login Display

Staff Dashboard Display

This is the Dashboard display for staff management, featuring a navigation menu on the left side that includes Orders, History, and Manage Menu. The main section displays a list of incoming orders in card form. Each order card presents the table number, a summary of ordered items, the total price, and action buttons to view Order Details or Cancel Order. This display functions as the control center for staff to monitor and manage all ordering activities in realtime.



Figure 11. Staff Dashboard Display

Order Detail Display - Staff

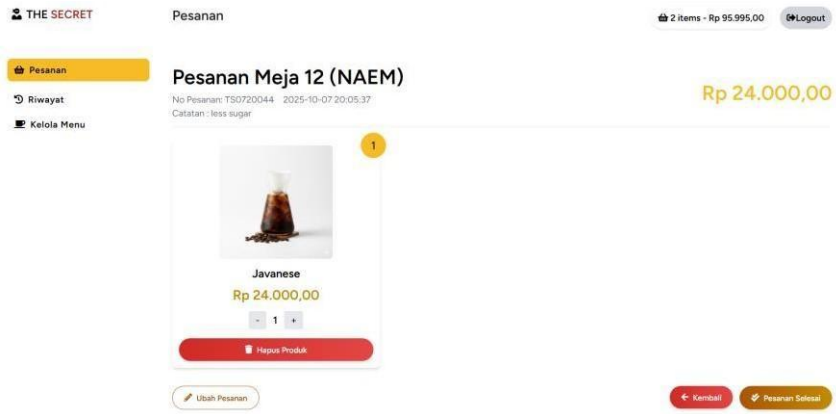


Figure 12. Order Detail Display - Staff

This is the Order detail display on the staff panel, which provides complete particulars regarding a single order transaction. The page shows the order number, time, total price, and any special notes provided by the customer. The ordered items are presented complete with photos, prices, and quantity controls. The staff has the option to modify the order or mark the order as Pesanan Selesai (Order Completed) using the action buttons at the bottom. Thisdisplay functions for verification and final processing before the order is served.

History Display - Staff

This is the Order History display on the staff panel, which serves to record all completed transactions. The page shows a complete list of "Past orders:" in a row format. Each row includes the order date, number of items, total price, and an "Order details" button to view the specifics of that transaction. The left-side navigation allows staff to switch between Current Orders, History, and Manage Menu.



Figure 13. History Display - Staff

History Detail Display - Staff

This is the Order History Detail display on the staff panel, which shows the complete particulars of a completed and delivered transaction. The page presents information such as the table number, order number, date, time, and customer notes. Details of the ordered items (such as 'Ginger') are presented along with the quantity, unit price, and final Total. On the right side, there is a status indicating that the order "sudah diantar" (has been delivered), and
at the bottom, buttons are available for "Kembali" (Back) and "Cetak Struk" (Print Receipt).

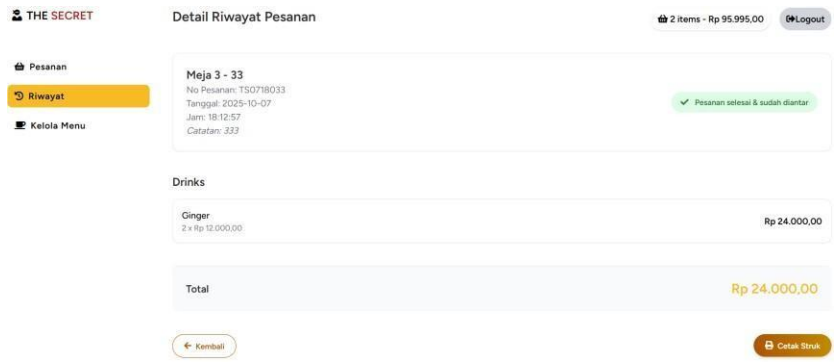


Figure 14. History Detail Display - Staff

Manage Menu Display - Staff

This is the Manage Menu display used by staff to organize the coffee shop's product list. The page shows the Menu List in a card format, with a "+ Tambah Menu" (Add Menu) option at the top. Each product card (for example, for various types of coffee) includes a photo, the item name, and two important action buttons at the bottom: "Ubah Menu" (Change Menu) and "Hapus Menu" (Delete Menu). This display serves as the main control tool for product catalog maintenance.

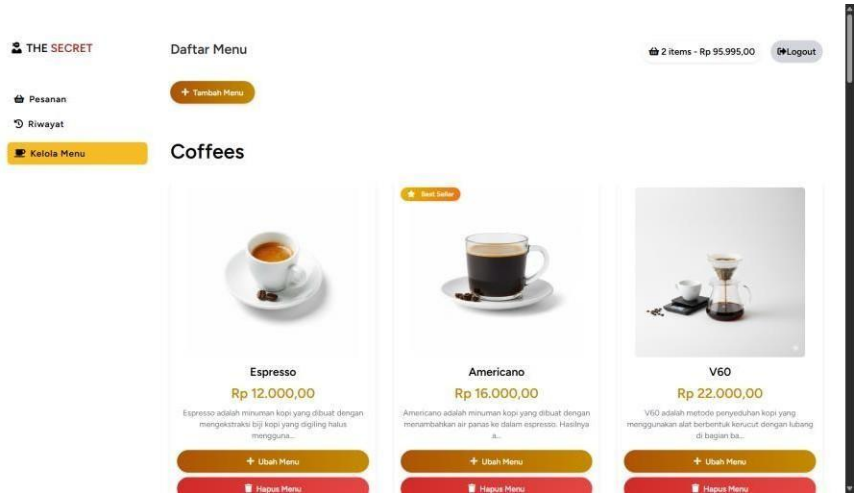


Figure 15. Manage Menu Display - Staff

3. Testing

Black box testing was carried out to verify the compliance of the functionality of the developed application. This process is executed by analyzing the output results after the system is run using prepared test data.

Table 1. Black Box Testing

No.	Test Scenario	Expected Result	Test Result
1.	Running the Website	Enter the website login page	Successful
2.	Inputting username and password	Enter the main page (dashboard)	Successful
3.	Selecting the dashboard	Display the dashboard page	Successful menu
4.	Selecting the user orders menu	Display the order data	Successful
5.	Selecting the history menu	Display the history data	Successful
6.	Selecting the manage menu menu	Display the menu data	Successful
7.	Selecting add order and save	Display a new order data form and return to the orders page	Successful

8.	Selecting add menu and save	Display a new menu data form and return to the menu page	Successful
9.	Clicking Logout	Close the account system and return to the initial page (login)	Successful

Conclusion

In conclusion, this research successfully designed a web-based coffee ordering application for The Secret Coffee Shop. This application is effective in digitalizing services, simplifying workflows, and increasing flexibility, which is ultimately crucial for improving operational efficiency and customer satisfaction in the digital era. Nevertheless, there are several key suggestions for further development; it is recommended that The Secret Coffee Shop focus on testing the system's resilience against high load to ensure the system does not crash during busy periods, add a customer loyalty feature to retain consumers, and integrate the system with raw material inventory management for better data accuracy and comprehensive efficiency.

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