WEBSITE-BASED ONLINE CASHIER APPLICATION USING RAPID APPLICATION DEVELOPMENT METHODOLOGY

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Abstract

The rapid growth of information technology has encouraged the adoption of digital systems in the food and beverage (F&B) industry, particularly in café operations. However, many cafés still rely on conventional cashier systems, resulting in inefficiencies, data inconsistencies, and delays in reporting. This study aims to design and develop a web-based online cashier application to support transaction management and improve operational efficiency in cafés using the Rapid Application Development (RAD) methodology. The RAD method was chosen due to its iterative and flexible development process, which is suitable for small- to medium-scale systems. The development stages include requirement planning, system analysis, design modeling, development, and implementation. The developed system supports real-time transaction recording, role-based user access, order processing, and sales reporting. The implementation results indicate that the system improves coordination between cashier, kitchen, and waiter, reduces transaction errors, and enhances service efficiency. Therefore, the proposed system can serve as an effective digital solution to support operational management and digital transformation in the café sector.

Keywords: Online Cashier System, Web-Based Application, Rapid Application Development, Café Management, Information System

1. INTRODUCTION

The rapid development of information technology has driven digital transformation across various business sectors, including cafés operating in the food and beverage (F&B) industry. As one form of F&B business, cafés are characterized by fast and dynamic transaction processes, which require systems capable of supporting accurate and efficient transaction recording and data management. However, many cafés still rely on conventional cashier systems or manual record-keeping, which may lead to recording errors, delayed reporting, and suboptimal sales data management, thereby affecting operational efficiency and business decision-making (Sihombing et al., 2025).

An online cashier system is a digital solution designed to support sales transactions and operational management in business environments. Web-based information systems enable real-time data processing, improve accessibility, and support operational efficiency for small and medium-sized enterprises. Previous studies indicate that the implementation of web-based systems can simplify operational activities and enhance system effectiveness through structured data management (Saprudin & Pratama, 2025).

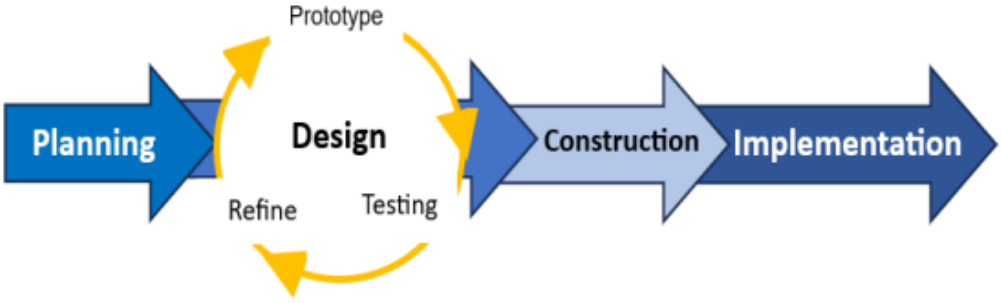
Despite the benefits offered by online cashier systems, many existing implementations are still limited to basic transaction processing and lack integration between operational roles such as cashier, kitchen staff, and waiters. In addition, the application of flexible and iterative development methodologies, such as Rapid Application Development (RAD), in developing integrated cashier systems for café operations remains limited. Therefore, this study aims to design and develop a web-based online cashier application using the RAD methodology to improve operational integration, transaction accuracy, and service efficiency in café businesses within the F&B sector (Yanuardi et al., 2024).

2. METHODOLOGY

This study uses the Rapid Application Development (RAD) method as a software development model in building a web-based online cashier application (Saprudin dan Pratama et al., 2025) states that the RAD method emphasizes rapid system development, design flexibility, and efficiency in cost and time. This method is suitable for developing small to medium scale systems, such as cashier applications for cafés in the Food and Beverage (F&B) sector.

RAD allows system development to be carried out iteratively with a primary focus on system functionality, so that changes in requirements can be minimized and system quality can be maintained (Yanuardi et al., 2024). This model also emphasizes the integration of planning, design, and implementation, enabling the system to be developed more effectively and efficiently.

Figure 1. Stages of the RAD Method (Riadi, I., Yudhana, A., & Elvina, A et al., 2024)



The RAD methodology applied in this study consists of the following stages:

2.1 Requirement Planning Stage

This stage aims to identify system requirements, scope, and development constraints for the online cashier application. Requirement identification is conducted through literature studies, analysis of similar online cashier systems, and an assessment of the general operational needs of cafés in the F&B sector. At this stage, the main system services are defined, including sales transaction recording, menu data management, and sales report generation.

2.2 System Design

The analysis modeling stage focuses on analyzing the overall system architecture. This analysis involves identifying system components, business process flows, and data relationships to be utilized in the online cashier application. The outcomes of this stage serve as the foundation for understanding the system structure prior to further design activities.

2.3 Design Modeling Stage

The design modeling stage is conducted to design the system based on the results obtained from the previous analysis stage. The design process includes the development of system workflows and database structures without creating a separate user interface prototype. The analysis and design stages may be carried out iteratively until a system design that meets the requirements of the online cashier application is achieved.

2.4 Development Stage

The development stage represents the implementation phase of the system based on the established design. During this stage, coding of the web-based online cashier application, database management, and the development of core features such as sales transactions, menu management, and sales data recapitulation are performed. Development efforts are focused on ensuring that the system functions in accordance with the defined requirements.

2.5 Implementation Stage

The implementation stage is the stage of applying the developed system. Before the system is used, basic functional checks are performed to ensure that each main feature operates properly. After the system is declared feasible, the online cashier application is ready to be used as a support for café operations.

FINDINGS AND DISCUSSION

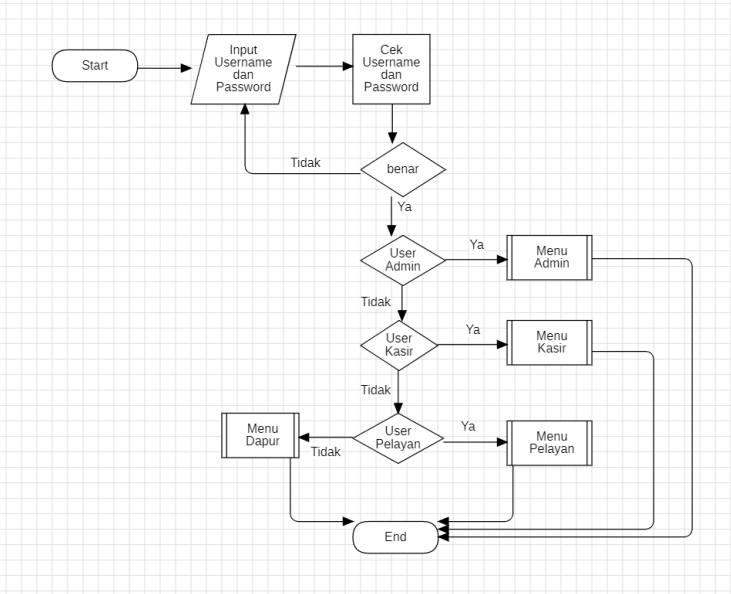
This section presents the findings obtained from the design and implementation of the web-based online cashier application developed using the Rapid Application Development (RAD) methodology. The discussion focuses on explaining the system design, implementation results, and the role of each system component in supporting café operational activities. Through this section, the effectiveness of the developed

system in addressing operational needs is analyzed based on system functionality, user roles, and workflow integration.

3.1 System Design

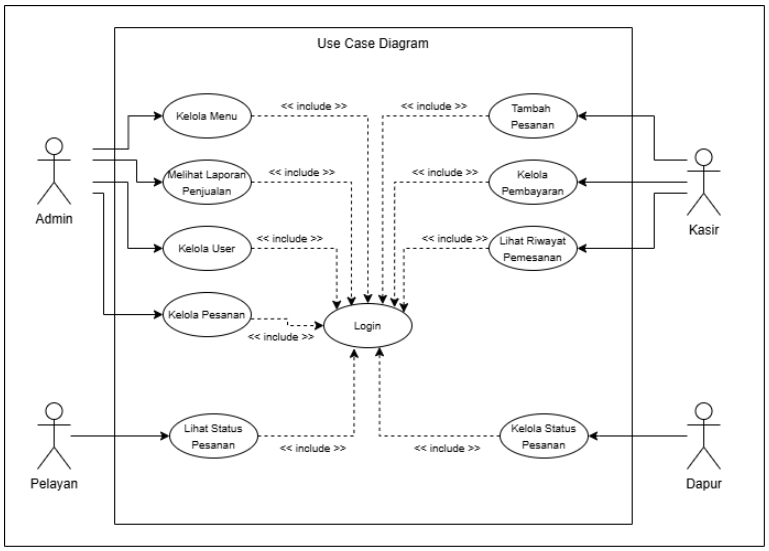
System design was conducted to describe the workflow and user interactions within the web-based online cashier application. The design process utilized use case diagrams and system flowcharts to visualize system functions as well as the distribution of user access rights. The system flowchart is presented as follows.

Figure 2. Flowchart



The system flowchart illustrates the user login process until the system directs users to the appropriate menu based on their access level. Username and password validation ensures that only authorized users can access the system. This structured workflow supports café operations by making them more effective and well-organized.

Figure 3. UseCase Diagram



The use case diagram shows the interaction between the system and three main actors: Admin, Cashier, and Waiter, each of whom has different access rights according to their respective roles. The Admin is responsible for managing system data, the Cashier handles sales transactions, and the Waiter accesses service related menus. This role distribution aims to improve system efficiency and security.

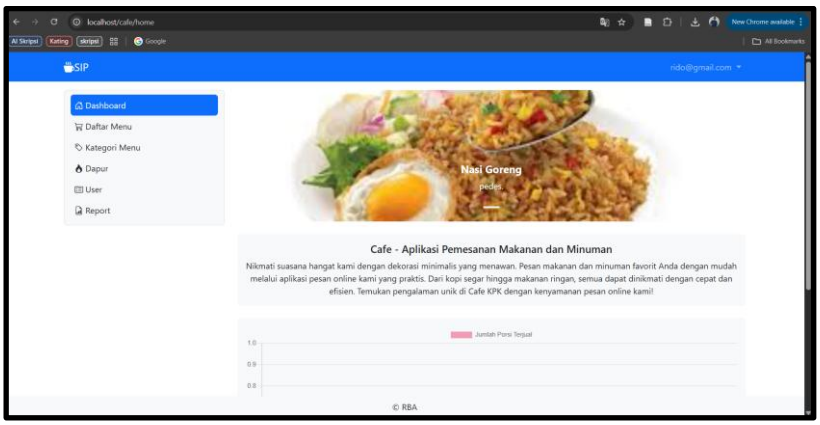
Based on the system design results described through the use case diagram and flowchart, the next stage is system implementation. This stage aims to realize the designed system into a web-based online cashier application. System implementation focuses on developing core functionalities in accordance with the defined workflows and access rights, ensuring that the system operates in line with café operational needs.

3.2 System Implementation

The system implementation stage represents the application of the system design results that were previously developed. At this stage, the system design is realized in the form of a web-based online cashier application by developing core functionalities according to the defined requirements. Implementation focuses on fulfilling system functionality, managing user access rights, and handling transaction data so that the system can effectively support café operations.

3.2.1 Admin

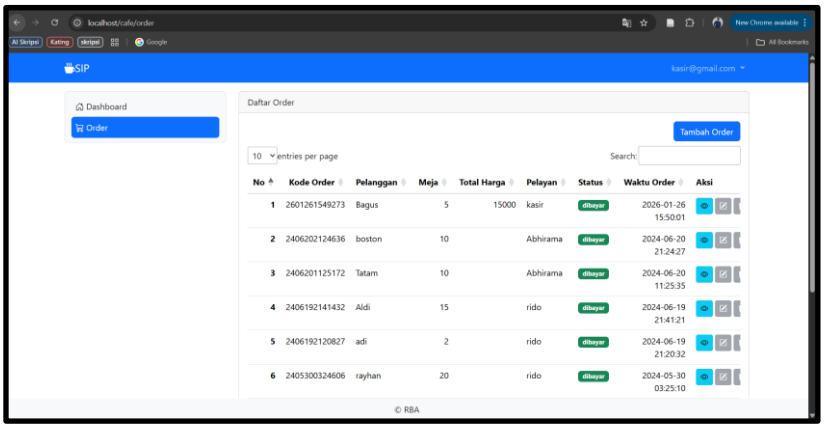
Figure 4. Dashboard Admin



The admin page serves as the central management interface of the web-based online cashier application. The admin has full access rights to the system, including managing menu data, menu categories, users, kitchen processes, as well as generating and monitoring sales reports. The dashboard also displays sales graphs to help administrators quickly monitor business performance. The implementation results indicate that the admin page effectively supports integrated and efficient café operational management.

3.1.2 Cashier

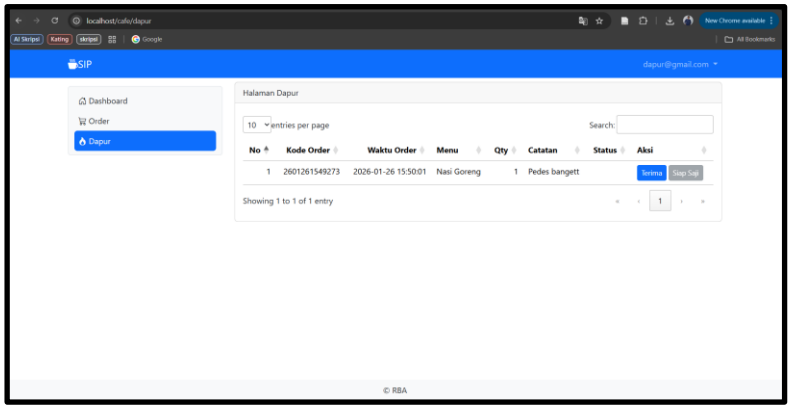
Figure 5. Cashier Page



The cashier page is used by cashier users to manage customer order transactions. This page displays a list of orders containing information such as order code, customer name, table number, total price, waiter name, payment status, and order time. Cashier users have access to add new orders, view order details, and update payment status. These features assist cashiers in recording and processing transactions accurately, thereby supporting smooth café operations.

3.1.3 Kitchen

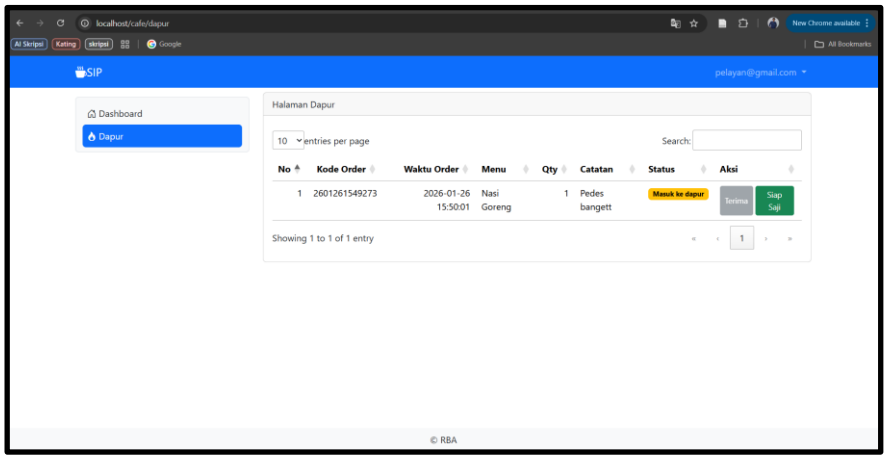
Figure 6. Kitchen Page



The kitchen page is used by kitchen staff to view and process incoming orders. Order information is displayed in detail, including order code, order time, menu items, quantities, and special notes. Kitchen users can update order status to accepted or ready to be served, which helps streamline and organize the food preparation process.

3.1.4 Waiter

Figure 7. Waiter Page



The waiter page is used to monitor customer order status in real time. The displayed information includes order code, order time, menu items, quantities, special notes, and order status. This feature enables waiters to identify orders that are still being processed as well as those that are ready to be served. As a result, coordination between the kitchen and waiters is improved, leading to faster and more efficient customer service.

3. CONCLUSION

Based on the development and implementation of the web-based online cashier application using the Rapid Application Development (RAD) methodology, it can be concluded that the system has successfully met the operational needs of café businesses in the food and beverage (F&B) sector. The application is capable of managing sales transactions, menu data, user access, and order processing in an integrated and structured manner.

The system supports role-based access for admin, cashier, kitchen, and waiter, enabling each user to perform tasks according to their responsibilities. The implementation results indicate that the system improves transaction accuracy, accelerates order processing, and facilitates real-time monitoring of sales data, thereby enhancing operational efficiency.

This study contributes to the application of the RAD methodology in developing an integrated web-based cashier system for café operations. Future research may focus on extending system features, such as mobile application integration, online payment gateways, or advanced sales analytics, to further enhance system functionality and scalability.

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