

# Designing a Food Ordering Application System at Esthetic Cafe Using the Laravel Framework

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## Abstract

The rapid advancement of information technology has significantly influenced the culinary business sector, particularly in enhancing service efficiency and customer experience. Esthetic Cafe, as a small-to-medium-sized enterprise, faces challenges in streamlining its food ordering process, which has traditionally been conducted manually. This research aims to design and develop a web-based food ordering application system using the Laravel framework to improve operational workflow, minimize order errors, and enhance customer satisfaction. The study adopts the Research and Development (R&D) methodology and implements the Waterfall model to guide the software development life cycle. The stages include requirements analysis, system design, implementation using Laravel, system testing with black box methods, and real-world deployment. The Laravel framework was chosen due to its MVC architecture, scalability, security features, and strong community support. The system provides core functionalities such as user registration and login, menu browsing, cart management, order placement, table selection, simulated payment processing, and transaction history tracking. For administrators, the system includes modules for product and category management, order confirmation, and transaction monitoring. The user interface was designed to be intuitive and responsive, focusing on user convenience and accessibility. Testing results from twelve black box scenarios demonstrated that all system features operated as expected, with successful interactions and accurate system responses. No major errors were identified, confirming the reliability and functionality of the application. In conclusion, the implementation of this food ordering system significantly improves service quality and operational efficiency at Esthetic Cafe. The system also provides a digital solution that supports the business's transition into the digital era. This study shows that web-based applications developed with Laravel can effectively meet the technological needs of small culinary businesses and support sustainable digital transformation.

*Keywords:* Food Ordering System, Laravel Framework, Web Application, Esthetic Cafe, MVC, Black Box Testing.

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## 1. Introduction

The rapid advancement of information technology has significantly reshaped the operational landscape of small and medium-sized enterprises (SMEs), particularly in the food and beverage industry. Digital platforms have become essential for improving customer experience, streamlining transactions, and maintaining competitiveness (Alalwan, 2020; Kumar & Reinartz, 2016). One of the most impactful transformations has been the adoption of online food ordering systems, which allow customers to place orders conveniently while offering businesses real-time data access and operational efficiency (Ahmed & Hussain, 2021; Okumus et al., 2018).

Esthetic Cafe, a local SME operating in the culinary sector, continues to rely on manual order-taking processes, which are prone to errors, delays, and inefficiencies in service delivery. In response to growing customer expectations for faster and technology-driven services, there is a critical need to develop a robust digital ordering solution. Mobile and web-based food ordering systems have been proven to enhance service accuracy, reduce wait times, and increase customer satisfaction (Alsamydai & Yousif, 2019; Lee & Raghu, 2014).

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Laravel, a PHP-based framework, offers an efficient and secure foundation for developing web applications, featuring structured MVC architecture, built-in authentication, and modular scalability (Ghosh, 2021). Studies show that Laravel is well-suited for building ordering systems due to its performance and integration capabilities (Gupta & Pathak, 2018). Furthermore, incorporating secure payment simulations and order tracking features aligns with customer expectations for transparency and trust (Cao & Liu, 2021; Lin, 2011).

This research aims to develop a web-based food ordering system for Esthetic Cafe using Laravel, focusing on improving service efficiency, order accuracy, and customer satisfaction. By integrating ordering features, table reservation, transaction history, and an admin dashboard, the system is expected to support digital transformation efforts and enhance operational performance.

## 2. Literature Review

### 2.1. Food Ordering Information System

Online food ordering systems are digital platforms that allow customers to order food remotely via web or mobile applications. These systems streamline operations and reduce manual errors, providing better customer experience and data-driven insights for business decisions (Ahmed & Hussain, 2021; Alsamydai & Yousif, 2019). Studies have shown that such systems significantly enhance customer satisfaction by offering faster service and improved accuracy (Lee & Raghu, 2014; Okumus et al., 2018). Furthermore, customers prefer ordering systems that integrate intuitive design, real-time updates, and transaction transparency (Cao & Liu, 2021).

### 2.2. Laravel Framework

Laravel is a PHP framework built on the MVC (Model-View-Controller) architecture, widely used for web application development. It supports clean code structure, RESTful routing, built-in authentication, and secure data handling (Ghosh, 2021). Laravel's Eloquent ORM simplifies database interactions, and its blade templating engine supports dynamic UI rendering (Gupta & Pathak, 2018). Developers favor Laravel for its scalability, comprehensive documentation, and robust community support, which make it ideal for building food ordering platforms (Akter et al., 2016).

### 2.3. Adoption of Mobile and Web-Based Services in F&B Sector

The increasing use of mobile and web platforms in the food and beverage (F&B) industry reflects changing consumer behavior towards digital convenience. Research indicates that online ordering services contribute to operational efficiency and greater customer loyalty (Alalwan, 2020; Shankar & Balasubramanian, 2009). Customers value applications that provide a seamless ordering journey—from menu browsing to payment confirmation—and are more likely to reuse services that offer satisfaction and trust (Chandra et al., 2010; Lin, 2011).

### 2.4. User Trust and Security in Ordering Systems

Trust plays a pivotal role in the adoption of digital systems, especially those involving sensitive information like personal data and payments. Secure system design, reliable authentication, and encryption mechanisms increase customer confidence (Lin, 2011; Cao & Liu, 2021). Laravel addresses this concern with CSRF protection, hashed password storage, and data validation features built into its core (Ghosh, 2021).

### 2.5. Application Security and Efficiency

Evaluating the effectiveness of food ordering systems includes functional testing, user satisfaction analysis, and performance measurement. Black box testing is often applied to ensure that all system features work as intended (Ahmed & Hussain, 2021). Usability testing also helps in refining the user interface based on actual user behavior and feedback (Pang & Law, 2017; Wang et al., 2002). Integration of customer feedback is crucial to the continued development and acceptance of such systems.

### 3. Methods

#### 3.1. Research Approach

This study uses a Research and Development (R&D) approach with the objective of designing and developing a web-based food ordering application system using the Laravel framework. This method is employed to produce a functional product in the form of an information system that can be directly applied at Esthetic Cafe to enhance the efficiency of food ordering services.

The software development method used in this research is the Waterfall Model, as it provides a systematic and structured workflow starting from analysis to implementation and maintenance. This model is suitable for systems where the requirements are clearly defined and stable (Pressman, 2014).

#### 3.2. System Development Stages

##### 3.2.1. System Requirements Analysis

The initial phase involves direct observation at Esthetic Cafe and interviews with the owner and staff to identify existing problems and system requirements. The data collected is used to determine the features to be developed in the application, such as menu management, ordering, transactions, and sales reporting.

##### 3.2.2. System Design

The system design phase includes creating Use Case Diagrams, Activity Diagrams, and Entity Relationship Diagrams (ERDs) to illustrate the business processes and relationships between data entities. The user interface (UI) design is crafted following principles of accessibility and user-friendliness. Additionally, the database structure is designed to support efficient transaction data storage and processing.

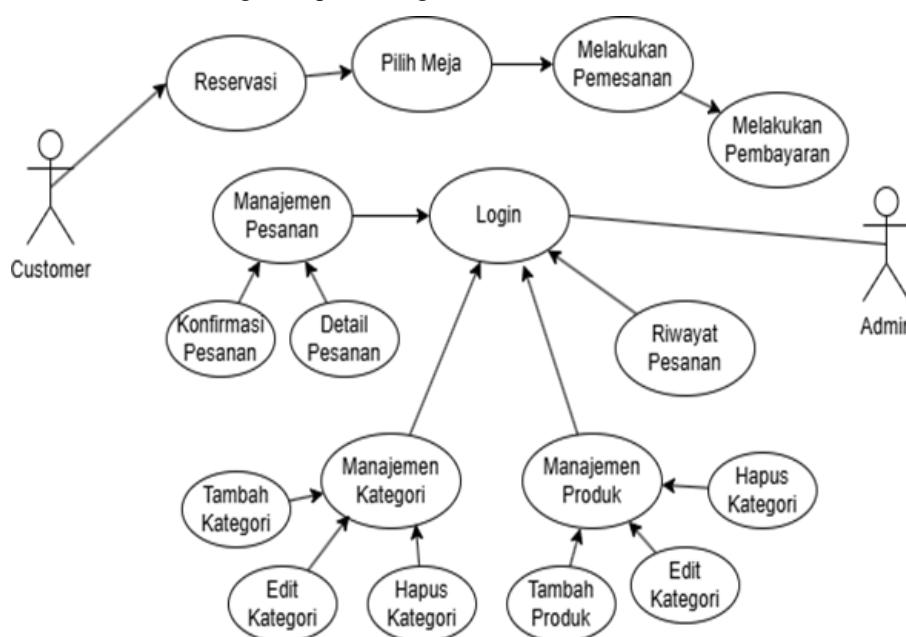


Figure 1. Use Case Diagram

Figure 1 illustrates the Use Case Diagram for the food ordering application at Esthetic Cafe. The system involves two primary actors: the Customer and the Admin. Customers can interact with features such as making a reservation, selecting a table, placing an order, making a payment, and viewing order history. They must first log in to access these functionalities. The Admin, on the other hand, has access to order management, which includes order confirmation and viewing order details. Additionally, the Admin can manage product data and categories by performing actions such as adding, editing, and deleting categories and products. This diagram provides a clear overview of the interactions between users and the system, outlining the functional scope of the application.

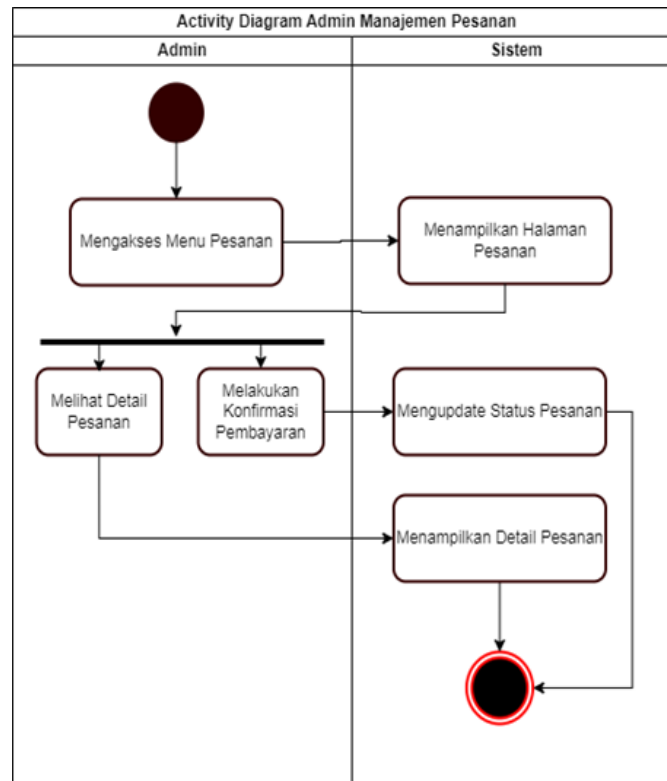


Figure 2. Activity Diagram Booking

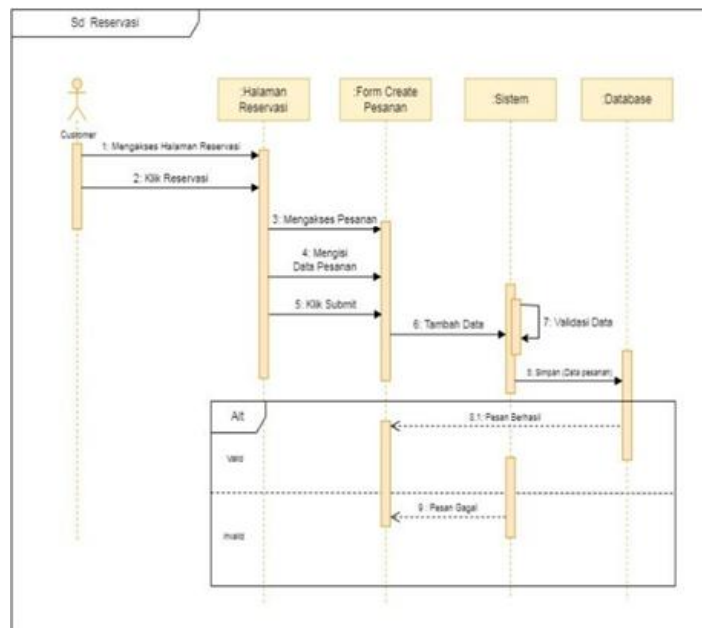


Figure 3. Sequence Diagram Booking

Figure 2 illustrates the Activity Diagram for the Admin Order Management process within the food ordering system. The process begins when the admin accesses the order menu, prompting the system to display the order page. From there, the admin can choose to view detailed order information or confirm the payment. If the admin confirms the payment, the system updates the order status accordingly. When the admin selects to view the order details, the system retrieves and displays the corresponding information. This diagram clearly outlines the sequence of interactions between the admin and the system, highlighting the flow of control and data in managing customer orders efficiently.

Figure 3 presents the Sequence Diagram for the reservation process in the food ordering system. The interaction begins when the Customer accesses the reservation page and clicks the “Reservation” button. The system navigates to the Create Order Form, where the customer enters reservation details and submits the form. The system then adds the data and sends it for validation. If the data is valid, it proceeds to save the reservation in the Database, and the system returns a confirmation message indicating that the reservation was successful. If the data is invalid, the system returns a failure message. This sequence diagram clearly represents the step-by-step communication between the user interface, system processes, and database during a reservation transaction.

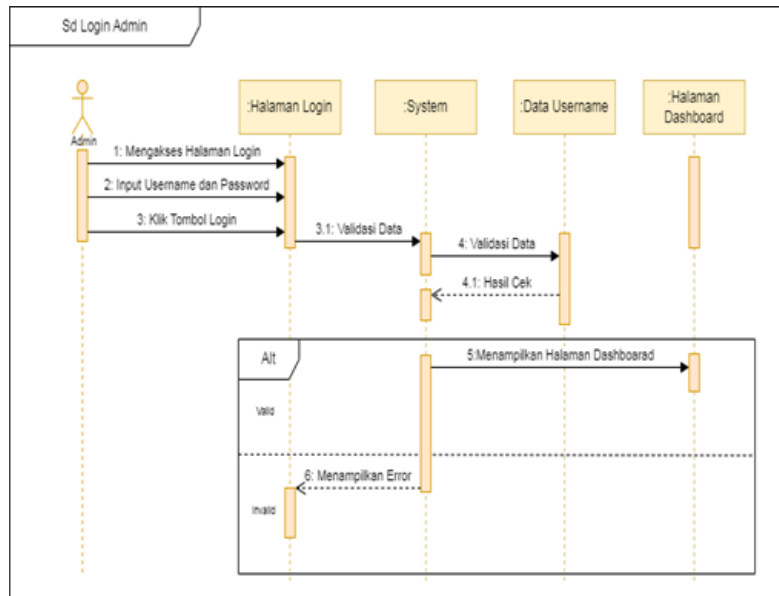


Figure 4. SD Login Admin

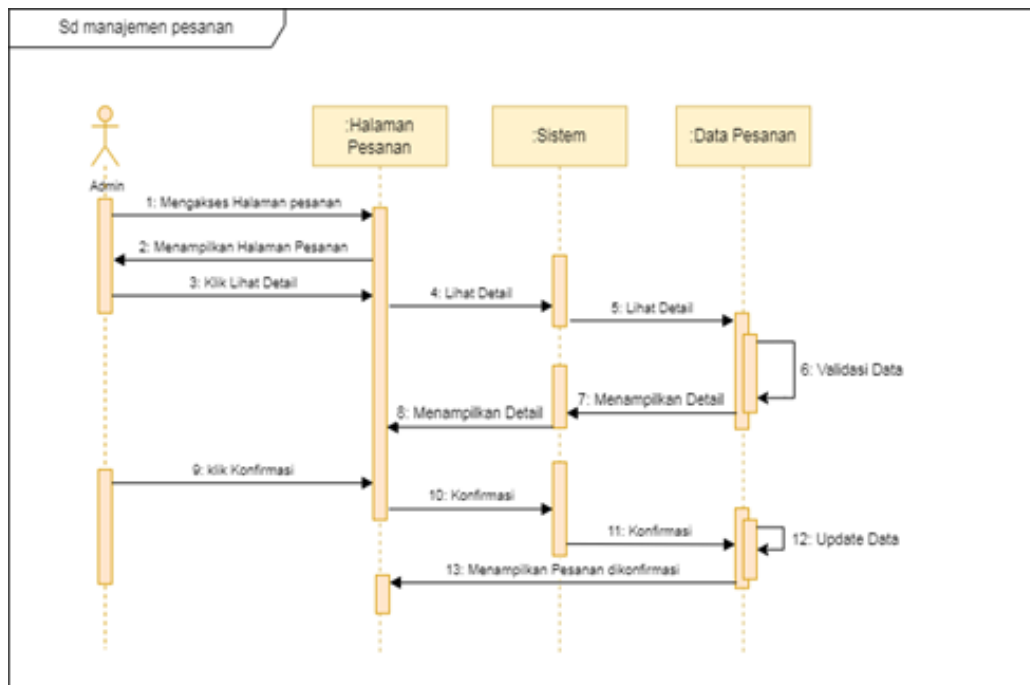


Figure 5. SD Management Booking

The Figure 4 illustrates the sequence of interactions during the Admin login process. It begins when the Admin accesses the login page and inputs a valid or invalid username and password combination. Upon clicking the login button, the login page sends the input data to the system for validation. The system then proceeds to validate the credentials by

referencing the username data. If the input is valid, the system returns a positive result and displays the admin dashboard page. Conversely, if the input is invalid, the system returns an error message indicating that the login attempt has failed. This sequence ensures a secure and structured login process for admin users through proper data validation and response handling.

This sequence diagram (Figure 5) illustrates the interaction flow in the order management process conducted by an Admin. The process begins when the Admin accesses the order page and the system displays the list of orders. The Admin then clicks to view order details, prompting the system to retrieve and validate order data from the database. Once validated, the detailed order information is displayed on the screen. If the Admin proceeds to confirm the order, the system sends the confirmation request to the database, updates the order status, and returns a confirmation message indicating that the order has been successfully processed. This diagram demonstrates a clear sequence of user and system actions in managing and confirming customer orders, ensuring data accuracy and operational efficiency.

### 3.2.3. System Development

The system is developed using Laravel, a PHP-based MVC framework that supports efficient coding, data security, and application modularity. The programming languages used include PHP for the backend and HTML/CSS and JavaScript for the frontend. The database system used is MySQL due to its flexibility and seamless integration with Laravel.

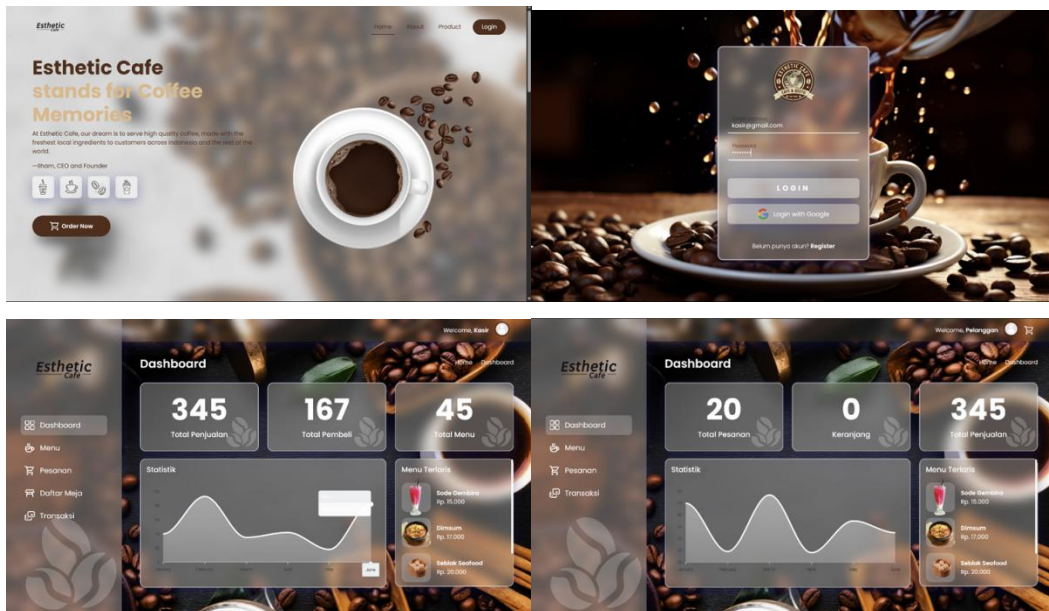


Figure 6. Implementation

Figure 6 shows the Implementation View of the home page of the Esthetic Cafe food ordering application. The interface presents a clean, modern design featuring a central thematic image of a coffee cup, emphasizing the brand’s identity. The tagline “Esthetic Cafe stands for Coffee Memories” is prominently displayed, aligning with the business’s mission to serve high-quality coffee made with fresh local ingredients. Navigation elements such as Home, About, Product, and a Login button are neatly arranged in the top-right corner, ensuring easy access. Below the introductory text, there are visually intuitive icons representing coffee-related categories and a bold Order Now button, which encourages user interaction. The design emphasizes usability, aesthetic appeal, and brand identity, making it an effective landing page for engaging customers.

### 3.2.4. System Testing

System testing is conducted using the Black Box Testing method, which focuses on testing the application’s functionality based on user requirements without examining the internal code structure (Sommerville, 2016). Each feature—such as menu ordering, payment processing, data management, and report generation—is tested to ensure it performs as expected.

**Table 1.** Black Box Testing

No	Feature Tested	Scenario Description	Input	Expected Result	Result
1	Customer Login	User logs in with correct email and password	Valid Email & Password	Successfully logged in to customer dashboard	Success
2	Failed Login	User logs in with incorrect credentials	Incorrect Email or Password	Error message “Login failed” is displayed	Success
3	View Menu	User opens the menu page	Click “Menu”	Menu list displayed with images, names, prices, and buttons	Success
4	Add Menu to Cart	User selects a menu item and clicks “Add to Cart”	Click “Add to Cart” button	Menu item is added to the cart list	Success
5	View Cart	User opens the cart after adding menu items	Click cart icon	Order list is displayed with quantity and total price	Success
6	Place Order	User clicks “Order Now” after selecting menu items	Click “Order Now” button	Order is saved and appears in transaction history	Success
7	View Transaction History	User opens the transaction page	Click “Transaction”	List of previous orders displayed with their status	Success
8	View Transaction Details	User clicks the eye icon on the transaction list	Click eye icon	Order details are displayed on the right side	Success
9	Payment	User selects payment method and completes the transaction	Select “Transfer”, click “Pay”	Order status changes to “Paid” and “Done”	Success
10	View Table List	User opens the table list page	Click “Table List”	List of available and occupied tables is displayed	Success
11	Choose Table Number	User selects a table number during ordering	Choose table 1, 2, etc.	Selected table number is saved in the transaction data	Success
12	Logout	User clicks logout	Click “Logout”	User is logged out and redirected to the login page	Success

### 3.2.5. Implementation and Evaluation

After successful testing, the system is implemented in the operational environment of Esthetic Cafe. Evaluation is carried out by collecting feedback from users (admin, cashier, and customers) to assess the effectiveness of the application and identify any areas that may require improvement.

## 4. Result and Discussion

### 4.1. Result System Implementation

The implementation of the food ordering system for Esthetic Cafe was successfully carried out based on the results of the previous design stages. Using the Laravel framework, the development process followed a structured Model-View-Controller (MVC) architecture to ensure scalability, maintainability, and security. The homepage features an attractive user interface with a modern coffee-themed design, clear branding, and easy navigation. Customers are welcomed with concise information about the café’s mission, a call-to-action button, and intuitive icons representing menu categories.

Several key features were implemented in this system. These include user login and registration, menu browsing with product details and pricing, and the ability to add items to the cart. Customers can view their cart, select a table number,

and proceed with placing an order. A simulated payment method was integrated, allowing status updates to “Paid” and “Completed” once a transaction is made. Furthermore, customers have access to their transaction history and can view detailed order information. From the admin side, features such as product and category management, order confirmation, and status monitoring were also successfully developed and implemented.

#### 4.2. Testing Results

To ensure the system functions correctly, black box testing was conducted on all core features. This type of testing focuses on evaluating the system from the user’s perspective without examining the internal code logic. Each test scenario was designed based on real user interactions, such as logging in, viewing menus, ordering, making payments, and managing transactions.

The testing involved twelve features and all scenarios produced the expected results. For instance, when a valid login was attempted, the system redirected the user to their dashboard. If invalid credentials were entered, an appropriate error message was displayed. Menu items were successfully added to the cart, and order data was stored and shown in the transaction history. The admin features, such as confirming payments and managing categories or products, also functioned without error.

Based on the test outcomes, it can be concluded that the system is operationally ready and meets all functional requirements. The successful execution of every test scenario indicates a high level of reliability in the developed application.

#### 4.3. Discussion

The system developed in this study presents a practical solution to the manual food ordering challenges faced by Esthetic Cafe. By digitalizing the ordering process, the application enhances customer service through reduced wait times, improved order accuracy, and convenience in placing and tracking orders. Customers no longer need to rely on staff to make reservations or place orders, as all processes are handled through the system interface.

In addition, the system benefits the business operationally. Admins can manage menu items more effectively, monitor transactions in real time, and reduce errors that commonly occur with manual processes. The Laravel framework, known for its flexibility and built-in security features, also ensures that the system is scalable and can be maintained in the long term.

This research proves that a web-based food ordering system, when properly designed and tested, can significantly contribute to the digital transformation of small to medium-sized food businesses. The implementation not only improves service delivery but also supports data-driven decision-making through reliable transaction records and usage analytics.

### 5. Conclusion

The development of the food ordering application for Esthetic Cafe using the Laravel framework has proven to be effective in enhancing both customer experience and business operations. Through structured implementation based on the MVC architecture, the system successfully integrates key features such as menu browsing, cart management, table selection, ordering, payment simulation, and transaction tracking. The results of black box testing indicate that all functionalities performed as expected, confirming the system’s readiness for real-world use. Furthermore, the application contributes to operational efficiency and service quality by automating manual processes and enabling data-driven decision-making. This study demonstrates that a well-designed web-based application can serve as a strategic digital solution for small to medium-sized culinary businesses undergoing digital transformation.

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