

DEVELOPMENT OF A WEB-BASED FASHION PRODUCT AND CUSTOM DESIGN ORDERING SYSTEM AT BELLYBEE BOUTIQUE

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Abstract

The rapid development of **information technology** has significantly impacted **service** and **transaction systems** in various industries, including **fashion**. **Bellybee**, a boutique specializing in **Muslim fashion** and **custom design services**, still conducts its **ordering** and **product management** processes manually. This manual approach has led to frequent issues such as **service delays**, **data entry errors**, and **inefficient transaction management**. To address these challenges, this project developed a **web-based ordering system** to streamline both **regular product purchases** and **custom design services**. The system enables customers to browse **digital catalogs** by category, manage **shopping carts**, and submit **personalized design requests**. On the administrative side, it offers features for **product management**, **order tracking**, **role-based dashboards**, **financial reporting**, and a **live chat-based ticketing system**. The development method follows the **waterfall model**, consisting of **requirement analysis**, **system design**, **implementation**, and **testing stages**. The final system integrates all **order processes** into a single **responsive platform** accessible via desktop or mobile, aimed at enhancing **operational efficiency** and **service quality**. This research provides a practical solution for **MSMEs** to digitally transform their **business operations** and strengthen **competitiveness** in the **digital market**.

Keywords: Web-Based Ordering System, Fashion, Custom Design, Laravel, E-Commerce, Bellybee

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1. INTRODUCTION

The rapid development of information technology has profoundly influenced various sectors, including trade and services. One significant application of information technology is the use of web-based information systems that accelerate and simplify business processes, from customer service to product management and transactions. In today's digital era, businesses are expected to adapt and utilize digital platforms as essential tools for their operations.

Bellybee is a Micro, Small, and Medium Enterprise (MSME) operating in the fashion sector, specializing in Muslim women's clothing and custom design services. As customer demand continues to grow, the boutique faces operational challenges, especially with its current manual

systems for order processing and product management. Customers still place orders through messaging applications, which often results in data recording errors, service delays, and inefficient transaction handling. In addition, the absence of a real-time product catalog and integrated admin dashboard limits the business's ability to deliver effective customer service.

To address these issues, this research proposes the development of a web-based ordering system that integrates all business processes from product catalog management and shopping cart features to custom design order processing and administrative dashboards. The system is designed to enable customers to easily browse products, place orders, and communicate custom design needs, while providing admins with real-time access to order data, inventory updates, and financial reports.

The system is developed using the Waterfall model, which consists of five main stages: requirement analysis, system design, implementation, testing, and evaluation. Laravel, a PHP-based web application framework, is used to implement the system, supported by MySQL as the database. This structured approach is intended to ensure the delivery of a scalable, maintainable, and user-friendly platform that enhances the efficiency and professionalism of Bellybee's services.

Several previous studies have shown that web-based systems, particularly those built using Laravel, are effective in improving transaction efficiency and customer data management in MSMEs. However, many MSMEs still struggle with digital transformation due to limited resources and technical know-how [1]. This paper aims to fill this gap by presenting a practical case of system development tailored to the specific needs of an MSME.

The novelty of this research lies in its integration of custom design order processing, a local storage-based customer interaction system without login requirements, and a modular dashboard tailored to different operational roles. With this, the system not only addresses current bottlenecks but also offers a model that can be replicated in similar MSME environments.

2. METHOD

This study employed a **software engineering approach** using the **Waterfall development model**, which is characterized by a linear and sequential structure. This model was selected because it provides a systematic and structured method for building software, particularly suitable for small to medium-scale systems such as the one developed for Bellybee Boutique. The Waterfall model consists of five stages: **requirement analysis, system design, implementation, testing, and evaluation** [2].

This approach has also been proven effective in previous research on document management systems for marketplace orders, where a similar sequential development flow improved data classification and minimized errors in business procedures [3].

2.1. Requirement Analysis

In the initial phase, data was collected through direct observation and interviews with the owner and staff of Bellybee. The aim was to identify problems in the current manual ordering process and to define the functional and non-functional requirements of the system. Key issues identified included lack of real-time product visibility, inefficient custom order handling, and absence of a unified dashboard for admin roles.

2.2. System Design

Based on the requirements, the system architecture was designed, including **database schema**, **user interface mockups**, and **data flow diagrams**. The system uses a **modular structure** with separate components for catalog browsing, shopping cart, custom design orders, and admin dashboards. The design also incorporated role-based access control for different admin functions (Product, Finance, Operation).

2.3. Implementation

The system was developed using Laravel 10, a PHP framework that supports MVC (Model-View-Controller) architecture, paired with MySQL as the relational database.

Similar to previous studies in inventory and transaction management systems, the use of the Waterfall model provided a clear, structured path to achieve implementation goals and reduce errors in manual stock processing [4].

Key modules implemented include:

- Product catalog and cart management (frontend)
- Checkout and custom design submission
- Admin dashboard for product and transaction management
- Live chat ticketing system with status tracking
- Notification system for order status updates

The frontend was designed to be responsive and compatible with both desktop and mobile browsers. Customers can use the system without login through **LocalStorage**, while admin users must authenticate based on role.

2.4. Testing

After implementation, **black-box testing** was carried out to verify system functionality against the defined requirements. The system was tested internally by the development team and evaluated by the Bellybee staff through scenario-based use cases. Errors and usability feedback were recorded and used to refine the system.

2.5. Evaluation and Documentation

The final phase included system evaluation to assess performance, reliability, and user experience. A summary of strengths and areas for improvement was documented, along with complete technical documentation for future system updates or expansion.

This structured development methodology ensures that the resulting web-based ordering system meets user needs effectively and provides a scalable foundation for digital transformation at Bellybee Boutique.

3. RESULTS AND DISCUSSIONS

This section presents the results of the system development process and discusses the implementation of key features, interface design, and the system's impact on operational efficiency at Bellybee Boutique. The discussion is supported by system diagrams and user interface displays that demonstrate the functionality of the implemented features .[5]

3.1. System Overview

The developed system is a web-based ordering platform that consists of two main user interfaces: one for customers and another for admin roles. The customer-facing system does not require user login and utilizes browser-based LocalStorage to maintain cart data and session identity. Meanwhile, the admin dashboard is divided into role-based access for product, finance, and operational management.

Key modules implemented include:

- Digital product catalog with real-time stock status
- Shopping cart and checkout system
- Custom design ordering form with file upload and description
- Role-based admin dashboard
- Ticketing system for live chat complaint handling
- Order status tracking and notification system

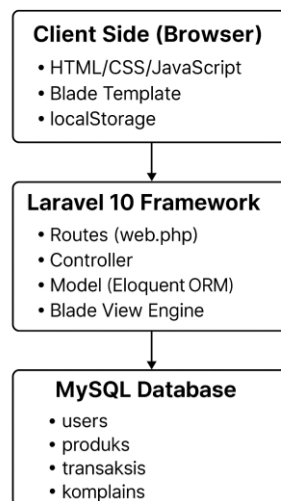


Figure 1 System Architecture of the Web-Based Ordering Platform

3.2. Functional Testing Results

The system was tested using black-box testing to verify all main functions operate according to the specified requirements. Test cases included:

- Adding products to cart and placing orders
- Uploading custom design requests
- Admin login and managing product data
- Responding to tickets from customers
- Viewing and exporting transaction reports

All test cases were successfully passed. The system was also reviewed by Bellybee's internal team, and feedback indicated significant improvement in the speed and accuracy of order processing.

No	Module Name	Test Case Description	Expected Result	Test Result	Status
1	Product Catalog	Display product list with filtering by category	Products appear based on selected filter	Successful	Pass
2	Shopping Cart	Add product to cart and view item details	Product added to cart	Successful	Pass
3	Checkout	Submit order with customer info and quantity	Order stored and confirmation shown	Successful	Pass
4	Custom Design Submission	Upload custom design file with description	File uploaded, order pending confirmation	Successful	Pass
5	Admin Login	Login using valid credentials	Redirected to dashboard	Successful	Pass
6	Product Management (Admin)	Add, edit, delete product	Product updated in system	Successful	Pass
7	Ticketing System	Submit customer complaint via live chat	Ticket created with status "Open"	Successful	Pass
8	Order Status Tracking	View status of submitted order	Status updated in user interface	Successful	Pass
9	Financial Report Export	Export transaction data to Excel or PDF	File downloaded successfully	Successful	Pass

Table 1 Functional Testing Results of Each Module

3.3. Discussion

The implementation of this system has addressed several operational issues previously faced by Bellybee. Manual processes were replaced with automated digital workflows, reducing errors in transaction recording and improving customer service. This result is consistent with prior implementations of Laravel-based inventory and ordering systems, where structured workflows improved transaction accuracy and simplified user interactions [6]. The integration of role-based admin dashboards allows better division of tasks and accountability within the team.

The use of Laravel with the MVC structure has been shown to support efficient development of web-based transaction systems, as demonstrated in prior studies on e-commerce platforms [7].

One of the most notable innovations is the use of **LocalStorage** to allow customers to interact with the system without logging in, offering convenience while minimizing friction. In addition, the **ticketing system** helps ensure all customer complaints are tracked and resolved effectively[8].

Similar to prior research on CRM systems in the construction sector, implementing a responsive, user-centric system with structured development methodology such as Waterfall can significantly improve customer satisfaction and service quality [9].

The system also serves as a **scalable model** that can be expanded in the future with features such as payment gateway integration, order tracking via shipping APIs, and loyalty programs for customers.

4. CONCLUSION

This research successfully developed a web-based ordering system for fashion products and custom design services tailored to the operational needs of Bellybee Boutique. The system integrates multiple modules, including a product catalog, shopping cart, custom design submission, role-based admin dashboards, live chat ticketing, and order tracking. Its development followed the waterfall model, ensuring that each phase from requirement analysis to testing was executed systematically and effectively [10].

The implementation of the system has addressed several major pain points previously experienced by Bellybee, such as inefficient manual data entry, lack of real-time order monitoring, and limited communication flow for custom orders. With the new platform, customers can easily browse and purchase products, submit design requests, and receive order updates without the need to log in. Meanwhile, the admin side benefits from centralized data management, role-specific functionality, and enhanced monitoring of transactions and customer service.

The system provides a scalable digital solution that improves both **transaction efficiency** and **service quality**, making it a practical model for digital transformation among MSMEs in the fashion sector. It also demonstrates how Laravel and modern web technologies can be leveraged to support small businesses in overcoming operational challenges through accessible and maintainable software.

Future improvements may include the integration of payment gateways, real-time shipment tracking, customer login features, and advanced analytics to further enhance the functionality and business value of the system.

4.1. System Design and Diagrams

System design serves as the foundation for developing a structured and functional application. This section presents several key diagrams used during the planning and development phase of the web-based ordering system at Bellybee Boutique. These include the use case diagram, activity diagrams, sequence diagrams, and the entity-relationship diagram, each of which outlines how users interact with the system and how the system handles various processes.

4.1.1 Use Case Diagram

The use case diagram in *Figure 4* illustrates the interactions between the primary actor *the Customer* and the features of the system. The diagram captures the main functionalities offered by the platform, including:

- Browsing products by category
- Viewing product details
- Placing regular orders or custom design orders
- Uploading design files
- Filling in personal data and selecting size/quantity
- Choosing payment methods and completing transactions
- Tracking order and delivery status
- Confirming orders

The system is designed to support both regular product purchases and custom design requests, providing flexibility for different customer needs. By simplifying the process into a series of logical actions, the diagram ensures that each interaction point is clearly defined and can be translated into development requirements.

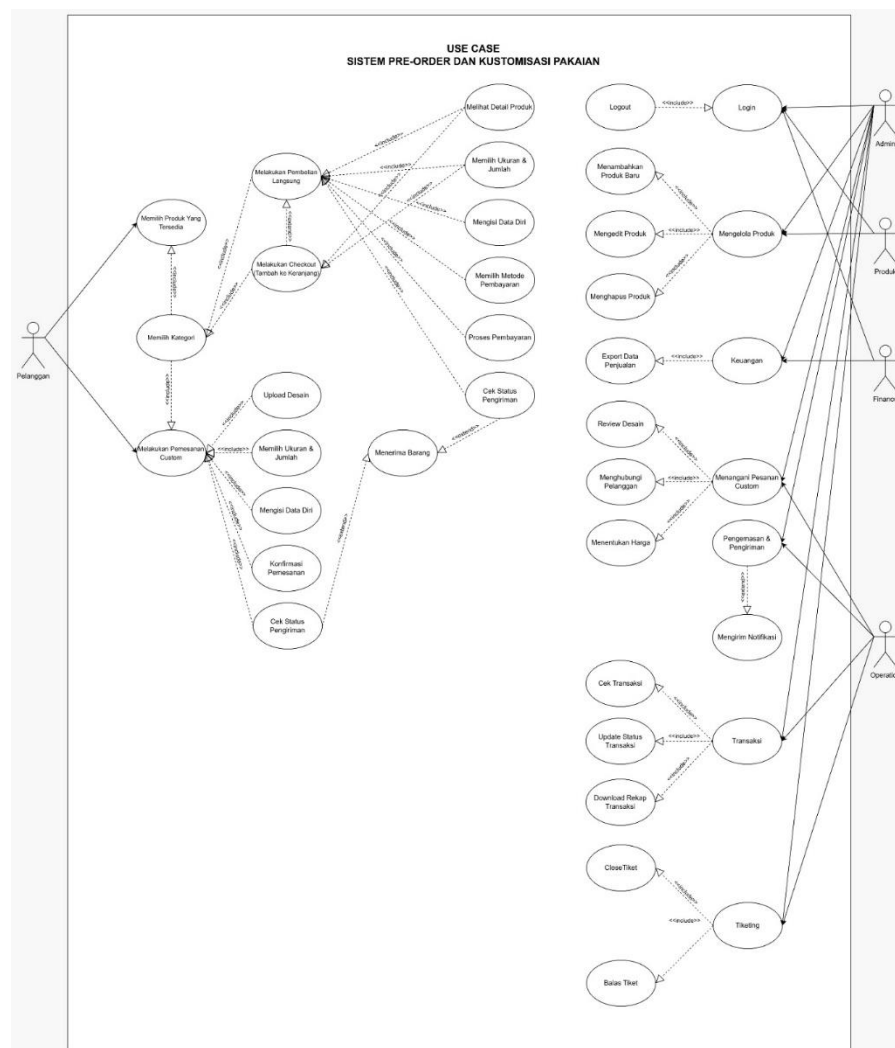


Figure 2 Overall Use Case Diagram of the Bellybee Boutique System

4.1.2 Activity Diagram

The activity diagram presented in Figure 5 illustrates the detailed workflow between customers and admin users in the process of placing both regular and custom orders through the Bellybee Boutique web-based system. The diagram is organized into two swimlanes: Customer and Admin, representing the division of responsibilities and sequential steps taken by each user role.

On the customer side, the activity begins with selecting the type of order — regular product or custom design. The regular order flow involves browsing products, selecting categories, choosing product details (size and quantity), inputting personal information, selecting payment methods, and completing the purchase. For custom orders, customers upload their designs, provide sizing information, and confirm their requests.

The admin side manages custom order review, pricing, and payment verification. If the customer confirms the order, the admin proceeds to order processing, which includes production, packaging, and shipping. Notifications are then sent to customers, who can track the status and confirm receipt of their orders.

This structured process allows seamless interaction and minimizes the inefficiencies previously encountered in manual handling.

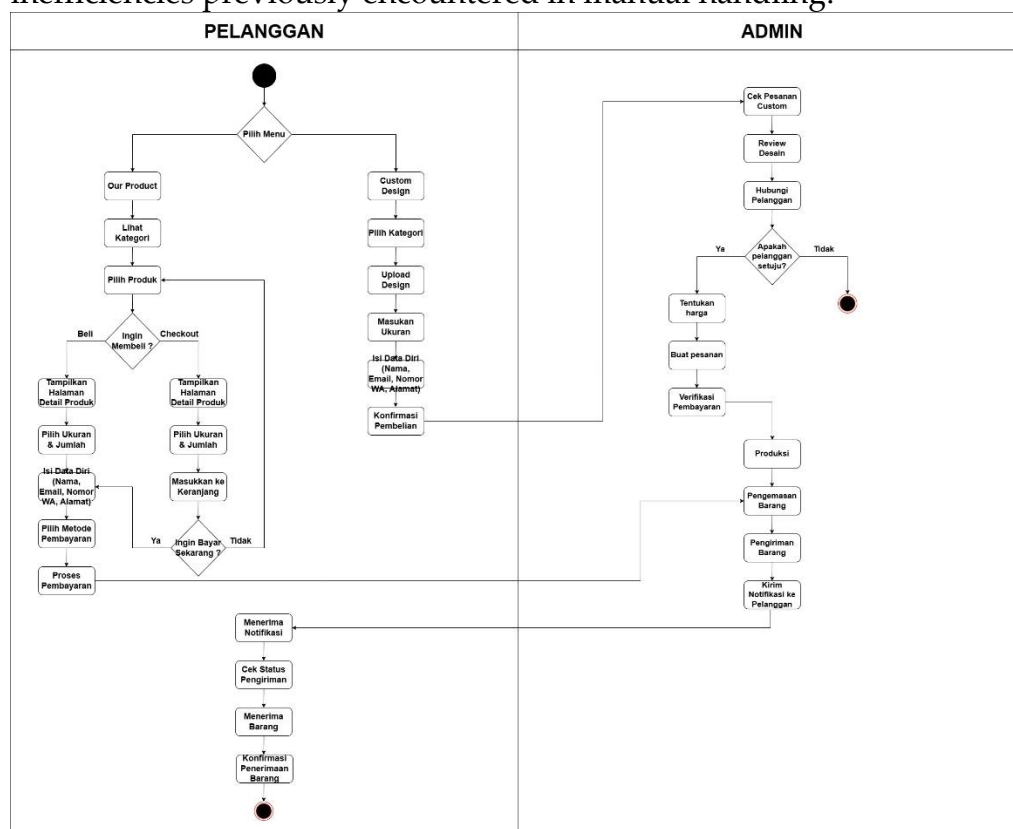


Figure 3 Activity Diagram for Customer and Admin Workflow in the Web-Based Ordering System

4.1.3 Sequence Diagram

Figure 4 illustrates the Sequence Diagram of the web-based ordering process at Bellybee Boutique, covering both regular product purchases and custom design submissions. The diagram is divided into three lifelines representing the Customer,

System, and Operation, highlighting the flow of messages between these actors during the interaction process.

The sequence begins with the customer choosing a menu option between regular products and custom design.

For **regular purchases**, the user navigates through product categories, selects an item, fills in size and quantity, completes personal and payment information, and then makes the payment using a virtual account (VA). The system validates the payment, updates the order status, and notifies the admin (Operation) to process the order. Once the shipping number is inputted, the system sends an email with the shipping status and tracking code to the customer.

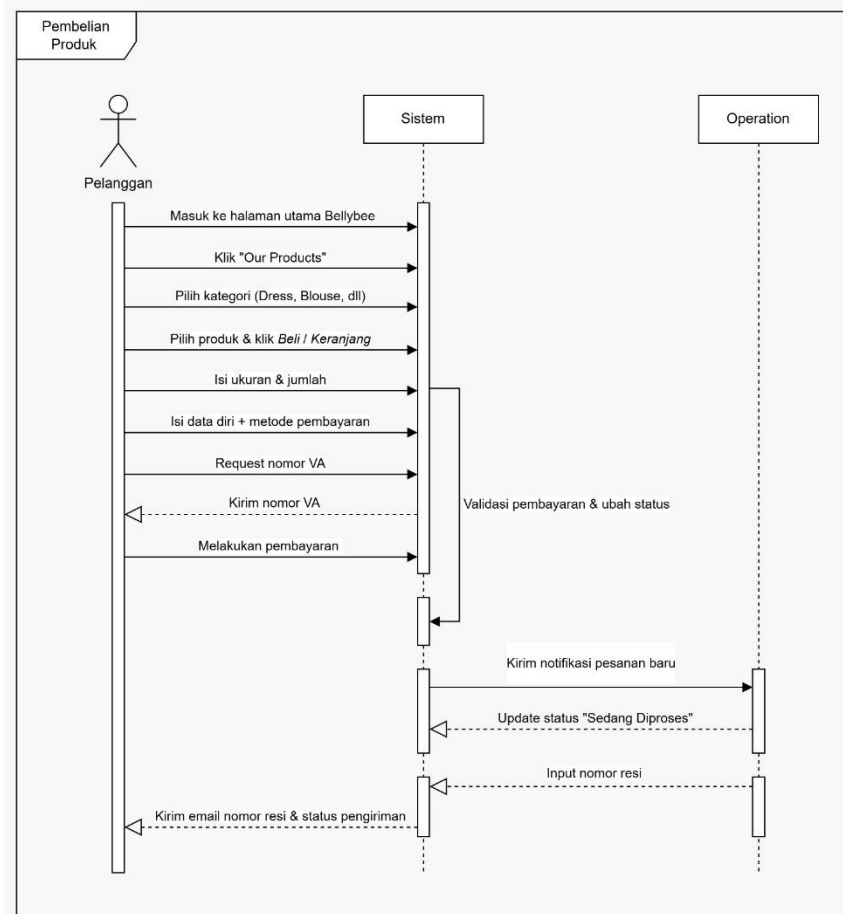


Figure 4 Sequence Diagram of Regular Design Ordering Process

For **custom design orders**, the user opens the custom order page, enters personal data, selects the clothing category, fills out size measurements according to the selected category, and uploads the design file. The system forwards this request to the Operation team. An operator then contacts the customer via WhatsApp or email to negotiate the price. Once the price is agreed upon, the system sends a notification indicating that the price has been determined.

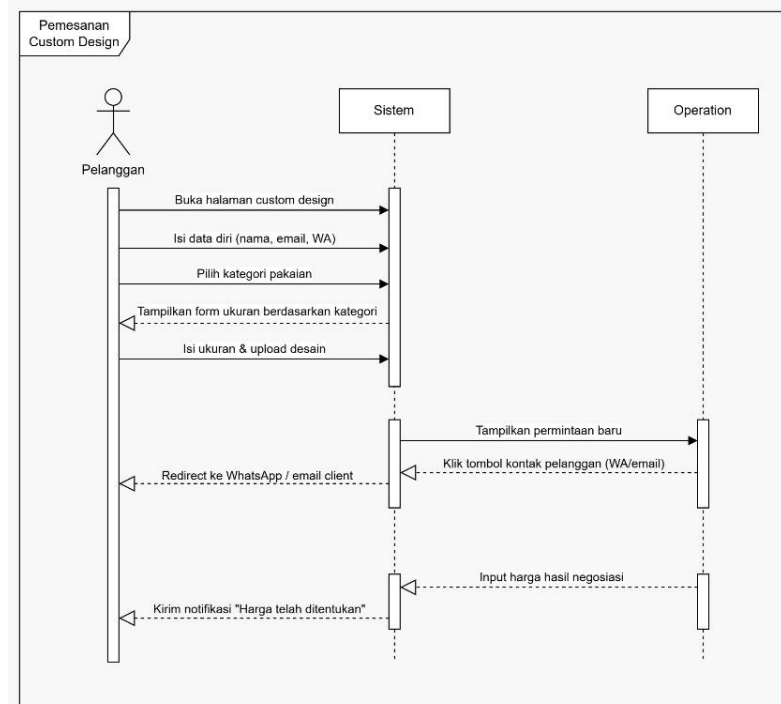


Figure 5 Sequence Diagram of Custom Design Ordering Process

This sequence diagram provides a detailed representation of each interaction and decision point throughout the ordering and fulfillment process, ensuring system transparency and efficient communication between users and operators.

4.1.4 Class Diagram

The class diagram represents the object-oriented design structure of the Bellybee Boutique Ordering System. It illustrates the relationships among various entities such as users, products, transactions, complaints, and custom designs.

The system is composed of several main components:

- **User System:** Includes user accounts with defined roles (admin, operation, product, finance) and a chat feature to manage communication.
- **Product & Cart:** Products are stored in the produk class, while shopping activities are represented by keranjangs and cart_items, linking products to customers before checkout.
- **Transactions:** The transaksis and transaksi_items classes record order data, including customer details, items purchased, payment methods, and delivery tracking.
- **Complaints:** Complaints are managed through komplain and komplain_messages, enabling users to submit and track service issues.
- **Authentication & Tokens:** Handled by personal_access_tokens and password_reset_tokens, providing secure access and password reset functionality.

- Custom Design Orders: The custom_designs class handles customer-submitted designs with file uploads and measurement details.
- Supporting Tables: Such as migrations and failed_jobs to manage database migrations and system error logging.

This class structure ensures that all core functionalities of the system are modular, maintainable, and clearly mapped to the business logic of the Bellybee application.

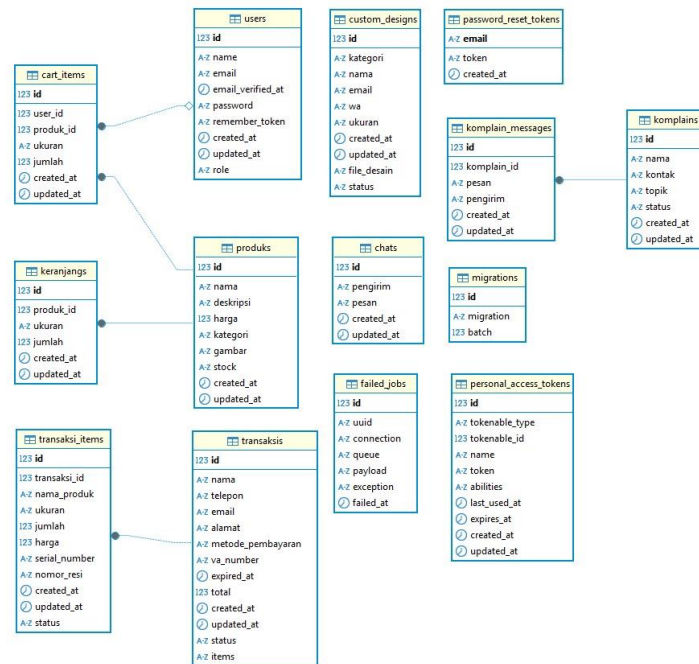


Figure 6 Class Diagram of Bellybee Boutique Ordering System

4.1.5 User Interface Design

The user interface design of the Bellybee system adopts a user-friendly and responsive approach to ensure optimal user experience across devices. The interface is developed using Laravel's Blade templating engine and structured in a way that allows both customers and administrators to navigate the platform seamlessly.

The customer-facing interface is designed to facilitate product browsing, order placement, and custom design requests. Key interface components include product category filters, cart management, checkout forms, and shipping tracking inputs. These elements aim to streamline the shopping process while maintaining clarity and aesthetic consistency.

On the administrative side, the interface provides features for managing transactions, product inventory, registered users, complaint tickets, and sales reports. The dashboard includes visual summaries of product counts, transaction statistics, and sales data, assisting administrators in monitoring system performance effectively.

The following figures illustrate the layout of both user and admin interfaces in the form of low-fidelity wireframes:

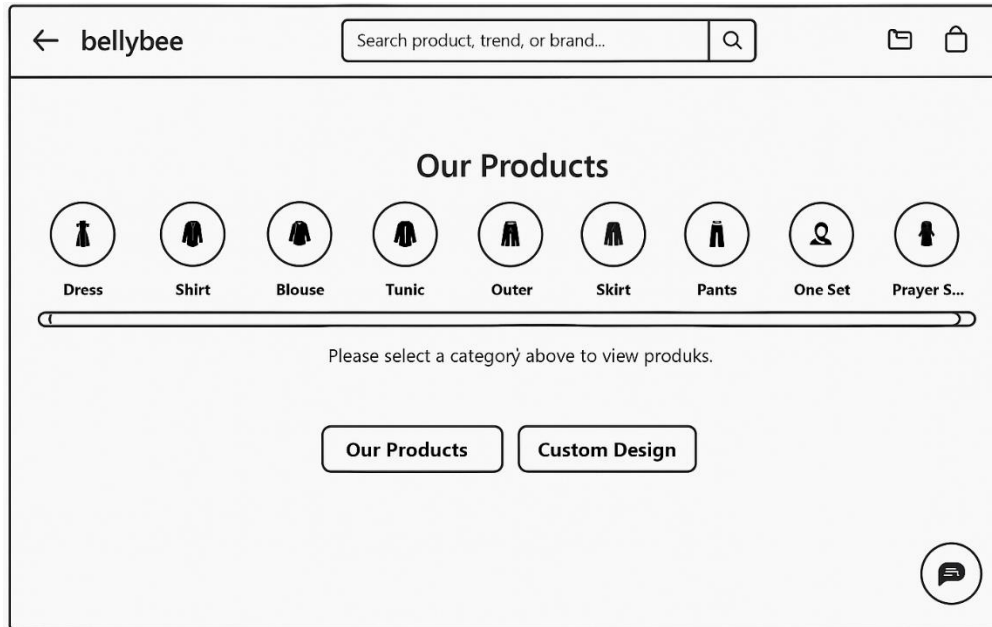


Figure 7 Customer Interface Wireframe

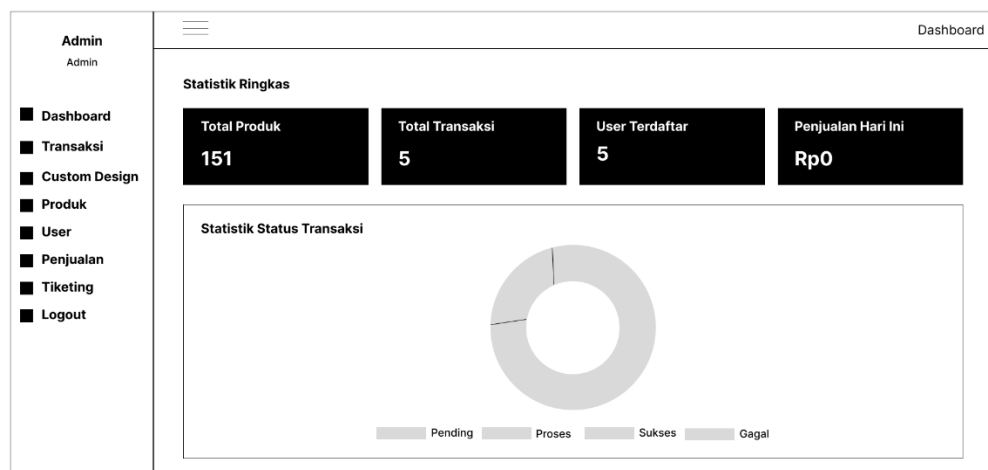


Figure 8 Admin Interface Wireframe

4.1.6 User Interface Implementation

The user interface was developed using Laravel Blade templates and styled for responsiveness. The homepage displays product categories, popular items, and allows users to add items to the cart directly.

The checkout page enables users to review their cart, input customer data, and submit orders. For custom designs, users can upload image files, describe their request, and receive admin confirmation.

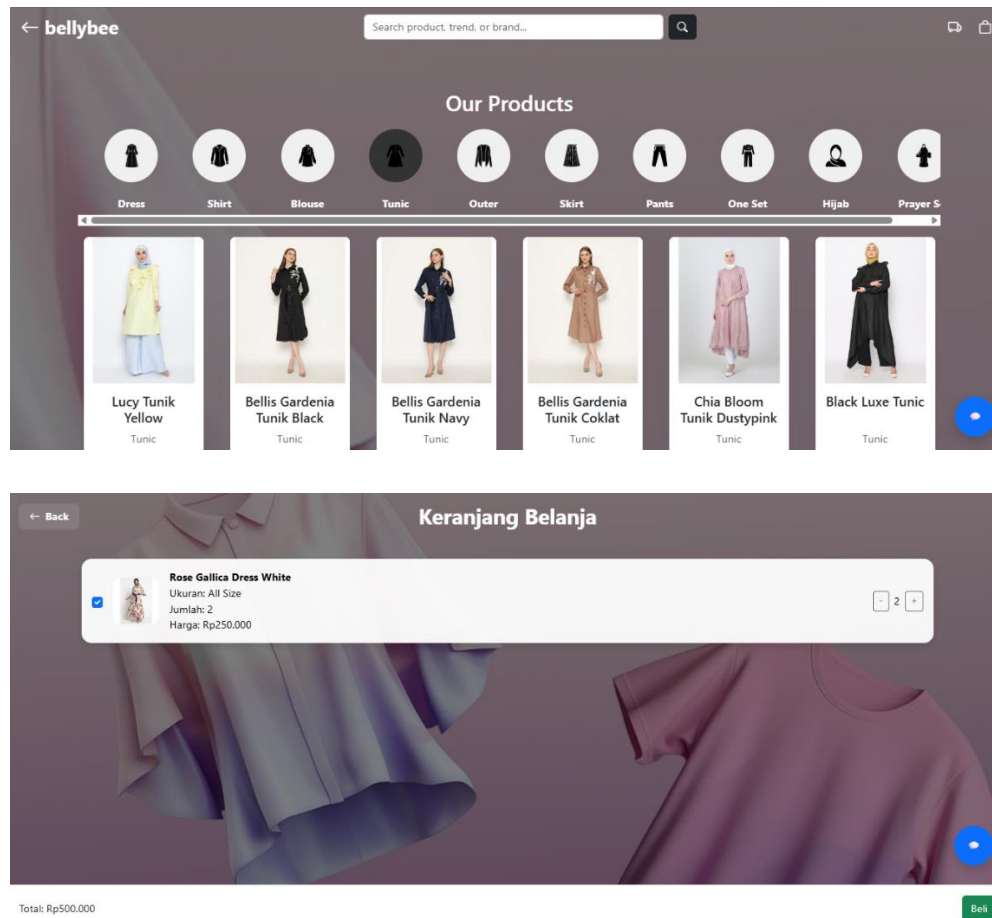
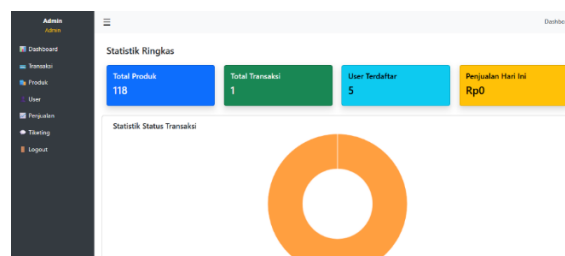


Figure 9 Customer Interface for Catalog and Checkout

The admin dashboard contains different modules for:

- Product management (add/edit/delete)
- Transaction monitoring
- Ticket (chat) management
- Financial report export (Excel/PDF)
- Custom order review and price confirmation



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CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Yafi Mahadika : Backend Development, Database Integration, Writing – Data Analysis

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Jodi Setiawan : Frontend Development, Testing, Writing – Original Draft

Wasis Haryono : Supervision, Validation, Writing – Review & Editing

DECLARATION OF COMPETING INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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