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Design and Development of a Donut Sales Website as an Online Sales Medium

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ABSTRACT

This study aims to design and develop a web-based donut sales system to address limitations in conventional sales, particularly in product information delivery, transaction recording, and sales administration. The system was developed using the Waterfall method, comprising requirements analysis, system design, implementation, testing, and maintenance planning. System design used UML models to describe user interactions and system processes, while PHP and MySQL were used for implementation and data management. The resulting application provides user registration and login, product browsing and searching, shopping-cart and wishlist functions, online ordering, and administrative features for managing products, categories, customer accounts, orders, and sales information. The main website features were checked independently by the developer to obtain an initial overview of their functionality. However, further systematic testing and evaluation involving actual users are needed to assess the system's usability, reliability, and potential impact on sales administration. The article describes the system workflow and the interfaces available to administrators and customers. The developed platform is intended to make product information easier to access and to provide a more structured way to record and manage orders than a fully manual process. The administrative features also bring product and order information together in one application, supporting more consistent monitoring of sales activities. The study demonstrates the implementation of a web-based sales application for a donut business; however, further evaluation involving actual users and quantitative performance measures would be needed to establish its effect on sales efficiency and customer satisfaction.

INTRODUCTION

Advancements in information technology have driven significant changes across various business activities, including sales processes and data management. Within the culinary sector, the implementation of web-based information systems and e-commerce platforms provides opportunities for businesses to manage product information, transactions, customer data, inventory, and sales activities more systematically. E-commerce websites can facilitate online purchasing processes while improving customer access to product information and supporting business development (Majeed et al., 2023; Mindara et al., 2025; Nadhifah et al., 2025). The development of website-based sales systems has also been applied in various business sectors to provide more accessible purchasing facilities and improve the management of online sales activities (Putra et al., 2025; Yusro & Masturoh, 2025). Therefore, implementing a web-based sales system represents a potential solution for businesses seeking to improve operational efficiency and expand their market reach.

Donut businesses are part of the culinary sector that requires systematic management of product varieties, prices, inventory, transactions, and promotional information. In conventional sales operations, the management of these activities may become less efficient when product records, customer orders, and transaction information are handled separately or manually. Such practices can increase the time required to record transactions, monitor product availability, retrieve sales information, and prepare sales reports. The development of website-based e-commerce systems can help businesses organize product information and sales processes within an integrated digital platform (Kafita et al., 2025; Burhan et al., 2025). Previous research on website-based sales systems has demonstrated the relevance of structured e-commerce development for businesses that need to manage product information and transactions more effectively (Andriani & Nurfaizah, 2025; Putra et al., 2025). Consequently, a web-based sales system can provide a practical approach to supporting the operational needs of donut businesses.

Digital technology is also relevant to the marketing and promotional activities of culinary businesses. E-commerce platforms enable businesses to present product information online, while digital marketing strategies can help increase product visibility and reach potential customers. Majeed et al. (2023) discussed the development of e-commerce in conjunction with business model planning and search engine optimization to support sales growth. Similarly, Burhan et al, (2025) examined the use of e-commerce to enhance digital marketing and increase sales at AKZ Cake & Donut. Research focusing on digital marketing strategies for Anjali Donut also highlights the relevance of marketing planning to the development of donut businesses. Furthermore, social media marketing has been examined in

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relation to consumer trust, brand reputation, and purchase intention in the fast-food industry (Sadom et al., 2024). These studies indicate that integrating product information and online ordering facilities into a website can complement digital promotional activities and provide customers with a convenient way to explore available products.

The challenges associated with conventional sales processes affect not only business owners but also customers. Customers may need to visit a physical store to obtain information about product varieties, prices, and availability, which can limit convenience when purchasing products. A web-based sales system can address these limitations by providing accessible product information and facilitating online ordering. Research on consumers' attitudes and purchase intentions toward food ordering through online platforms highlights the importance of understanding consumer responses to digital purchasing channels. In addition, Chiu et al. (2024) investigated consumers' intentions to use online food delivery services, while Sadeli et al. (2023) examined consumer purchasing behavior in short food supply chains using social commerce in Indonesia. These studies provide a relevant basis for considering customer accessibility and purchasing behavior in the development of digital sales services. Accordingly, a donut sales website can be designed to help customers view product details, compare prices, check available products, and submit orders through an online platform.

The implementation of a web-based sales system also supports more structured data management. Product details, customer information, transaction records, inventory data, and sales reports can be managed through a centralized database, enabling business owners to access relevant information more efficiently. Previous research has applied website-based e-commerce development to different business contexts, including food-product sales, accessories, and other retail businesses (Kafita et al., 2025; Andriani & Nurfaizah, 2025; Putra et al., 2025). Furthermore, Mindara et al. (2025) examined the design and development of an e-commerce website using the Waterfall method and the Laravel framework. Yusro and Masturoh (2025) also discussed website-based e-commerce information system development using the Waterfall method. These studies demonstrate the continued relevance of systematic development methodologies in producing website-based sales systems. For a donut business, an integrated database can support the organization of product records and transactions, as well as facilitate the preparation of sales reports.

From an operational perspective, the integration of online sales functions with organized business data can help owners monitor sales activities and evaluate business performance. Research on the scope of e-commerce use, innovation capability, and performance among food-sector micro, small, and medium enterprises in Indonesia highlights the relevance of digital commerce to business development. Research on online food-product sales systems also provides evidence of the importance of digital platforms in supporting product accessibility and commercial activities (Kafita et al., 2025; Burhan et al., 2025). In addition, research on e-commerce adoption in the food retail sector emphasizes the importance of assessing technological readiness when implementing digital sales channels. The integration of product information, customer orders, transaction records, and sales reports can therefore provide a foundation for more systematic business administration. In the context of donut sales, these functions can help business owners monitor product availability and sales activities while providing customers with more accessible purchasing services.

The development of a web-based sales system requires an appropriate software engineering approach to ensure that the system is designed according to business requirements. The Waterfall method provides a sequential development process that can be applied through stages such as requirements analysis, system design, implementation, testing, and maintenance. Its application in website-based e-commerce development has been discussed by Mindara et al. (2025), Nadhifah et al. (2025), and Yusro and Masturoh (2025). Similarly, Ramadhan et al. (2025) examined the development of a website-based e-commerce platform using the Waterfall method. These studies provide relevant methodological references for developing a sales website with clearly defined requirements and development stages. In the proposed donut sales system, the development process is directed toward implementing product management, customer information management, transaction processing, inventory management, and sales reporting. PHP is used as the programming language, while MySQL is used to manage the system's database.

Beyond operational management, digital sales platforms may contribute to the development of wholesale and retail opportunities. A website can serve as a centralized channel through which businesses introduce their products, communicate prices, and receive customer orders. Research on e-commerce and digital marketing in the food sector indicates that digital channels can be incorporated into business strategies to support product promotion and sales activities (Majeed et al., 2023; Burhan et al., 2025). Studies concerning online food ordering and consumer purchasing behavior also demonstrate the importance of digital channels in facilitating interactions between businesses and customers (Chiu et al., 2024; Sadeli et al., 2023). In addition, research on e-commerce adoption among food-sector enterprises in Indonesia provides a relevant context for considering the role of digital commerce in business performance. These findings support the development of a donut sales website that combines product presentation and online ordering with administrative functions.

Based on these considerations, a web-based donut sales system is needed to integrate product information, customer data, transactions, inventory, and sales reports into a single platform. The proposed system is developed using PHP and MySQL to support structured data management and online sales activities. The system is intended to help business owners manage products and transactions more systematically while enabling customers to access product

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information, including varieties, prices, and availability, and place orders online. This development is consistent with previous research on website-based e-commerce systems for food products and other business sectors (Kafita et al., 2025; Mindara et al., 2025; Putra et al., 2025).

Based on the background described above, this study aims to design and develop a web-based donut sales website using PHP and MySQL. Specifically, the study seeks to develop a system that manages product data, customer information, transactions, inventory, and sales reports digitally and systematically. The website is also intended to facilitate customer access to product information and online ordering. By integrating these functions, the proposed system is expected to improve the organization of sales and administrative activities while supporting customer convenience and the development of digital sales channels. The research is expected to contribute to the implementation of web-based information systems in the culinary sector, particularly in the management of donut sales.

LITERATURE REVIEW

Recent studies have examined website-based sales systems as a way to organize product information, transactions, and sales administration. Megananda et al. (2023) describe the development of a product-sales website using the Waterfall methodology. Majeed et al. (2023) examine e-commerce design and search-engine optimization in a food-store context, report on a bakery sales project. Taken together, these studies provide relevant examples of digital sales processes and website-based product presentation. Nevertheless, the scope and implementation details differ across businesses, so system features should be selected according to the operational requirements of the target business.

Building on these studies, the present research focuses on a donut sales website that combines customer-facing product browsing and ordering with administrative management of products, categories, accounts, orders, and sales information. The contribution described here is the implementation of these functions in one PHP–MySQL application and the documentation of its interfaces and workflows. The article does not claim a measured increase in sales; instead, it presents the system design and functional implementation as a foundation for subsequent user evaluation.

METHODS

This study employs the Waterfall method to develop a web-based donut sales system. The development process consists of sequential stages: requirements analysis, system design, implementation, testing, and maintenance planning. Each stage is carried out systematically to ensure that the developed system meets the identified business requirements.

The requirements analysis stage identifies the existing sales processes, problems encountered in sales management, and user requirements. The system design stage translates these requirements into a structured system model, including process flows, database structures using an Entity-Relationship Diagram (ERD), Unified Modeling Language (UML) diagrams, and user interface designs. The implementation stage involves developing the system using PHP as the programming language and MySQL as the database management system. The testing stage involved independent functional checking by the developer to verify that the main website features operated as intended. The checks focused on the functions implemented in the system, including user authentication, product management, shopping cart, ordering, and order status. The observations were used to identify potential functional issues and areas requiring further improvement. However, the evaluation was limited to developer-performed checks and did not involve formal testing with representative users or a comprehensive set of documented test cases.

The research activities comprise a literature review, requirements analysis, system design, implementation, testing, evaluation, and report preparation. Each activity is conducted in an organized sequence, beginning with the identification of system requirements and continuing through the development and evaluation of the application. The system design stage is particularly important because it provides a clear representation of the system's structure, functionality, data relationships, and interactions between users and the application before implementation.

To support the system development process, UML is used to visualize the proposed system's functionality and interactions. The diagrams provide a structured overview of how users interact with the application and how the system performs its main processes. The following section presents the UML models used to describe the design of the web-based donut sales system.

UML System Design

UML modeling is used to illustrate the workflow and structure of the web-based sales system being developed. UML helps explain how users interact with the system and how the system operates internally.

Flowchart Diagram

The following flowchart illustrates the workflow of the Donutela online sales website, including the activities performed by administrators and users, from account registration and login to product management, order placement, and order status monitoring.

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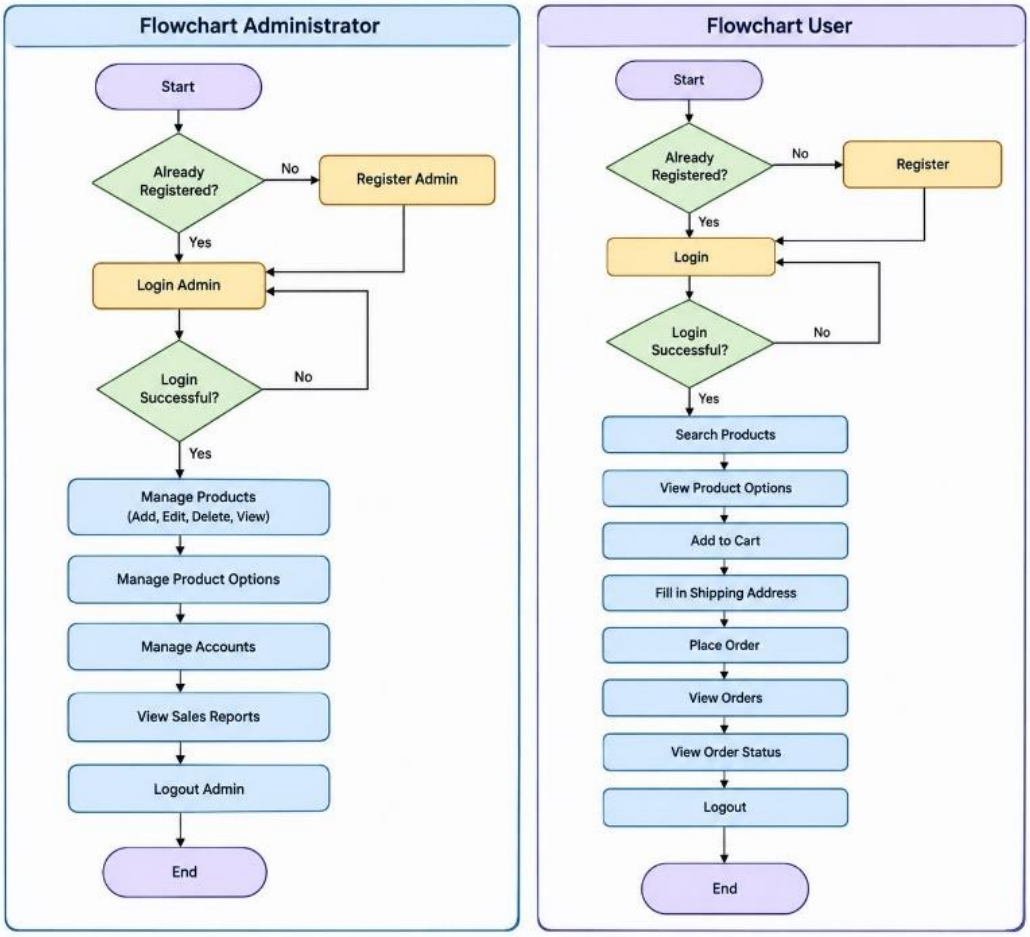


Figure 1. Flowchart Diagram

Use Case Diagram

The admin is responsible for managing all system data and activities. The use cases that can be performed by the admin are as follows:

1. Administrator Use Case Diagram
   a. Register
      Administrators can create an account to ccess the system.
   b. Login
      The administrator must log in to access the system securely.
   c. Manage Products
      Administrators can add, edit, delete, and manage product data.
   d. Add Product
      Administrators can add new products with their details.
   e. Edit Product
      Administrators can update existing product information.
   f. Delete Product
      Administrators can remove products from the system.
   g. View Product List
      Administrators can view all products registered in the system.
   h. Manage Product Options
      Administrators can manage available product variations.
   i. Manage Accounts
      Administrators can manage registered user accounts.
   j. View Sales Reports
      Administrators can view reports to evaluate sales performance.
   k. Logout
      Administrators can log out after completing their activities.

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2. Customer Use Case Diagram
    1. Register
       Users can create a new account to use the system's ordering features.
    2. Login
       Registered users can log in to their accounts.
    3. View products
       Users can view a list of products along with details such as prices and product descriptions.
    4. Search Products
       Users can search for products they want to purchase.
    5. Add products to cart
       Users can select products and add them to the shopping cart.
    6. Place an order
       Users can proceed to checkout and submit their order to the system.
    7. Fill in Shipping Address
       Users can enter their delivery address.
    8. View order status
       Users can view the status of their orders, such as "processing" or "completed."
    9. Logout
       Users can log out after shopping.

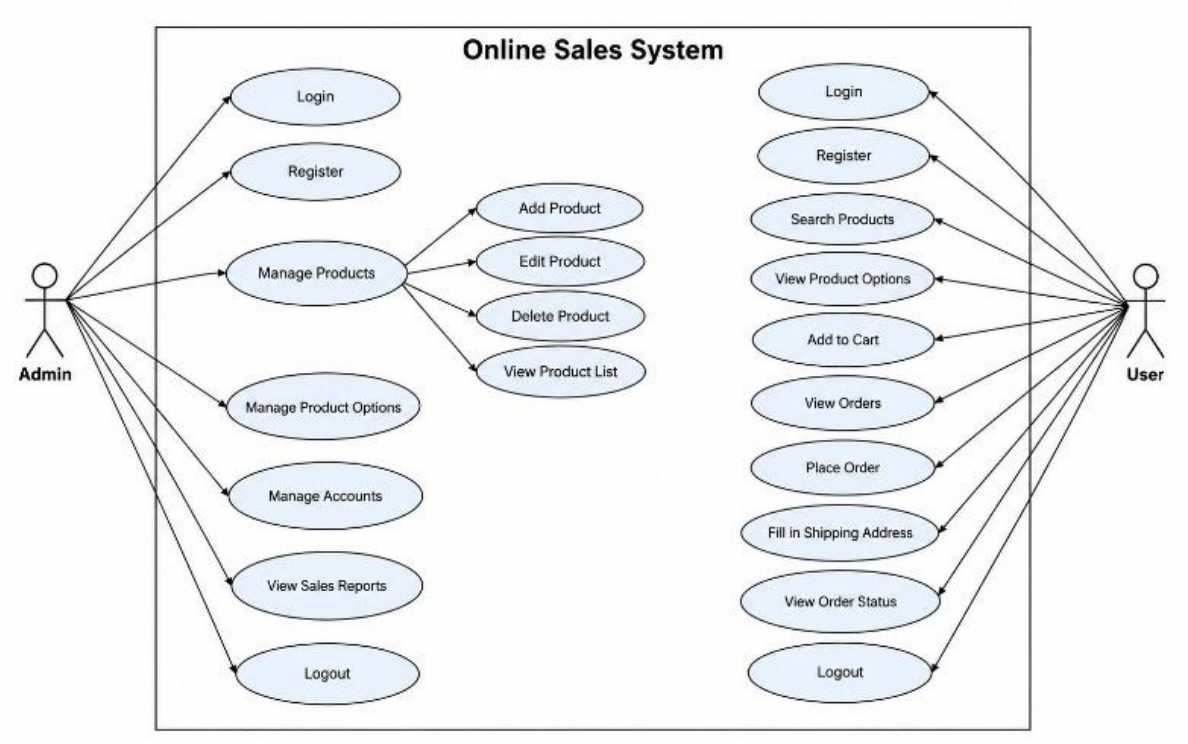


Figure 2. Use Case Diagram

Figure 2 illustrates the main interactions between the administrator and customer. The administrator manages products, categories, orders, and sales reports, while customers register or log in, browse products, add items to the cart, place orders, and check order status.

Class Diagram

A class diagram is used to illustrate the data structure and relationships between classes within the web-based donut sales system. This diagram displays the attributes and key functions of each interconnected class in the system.

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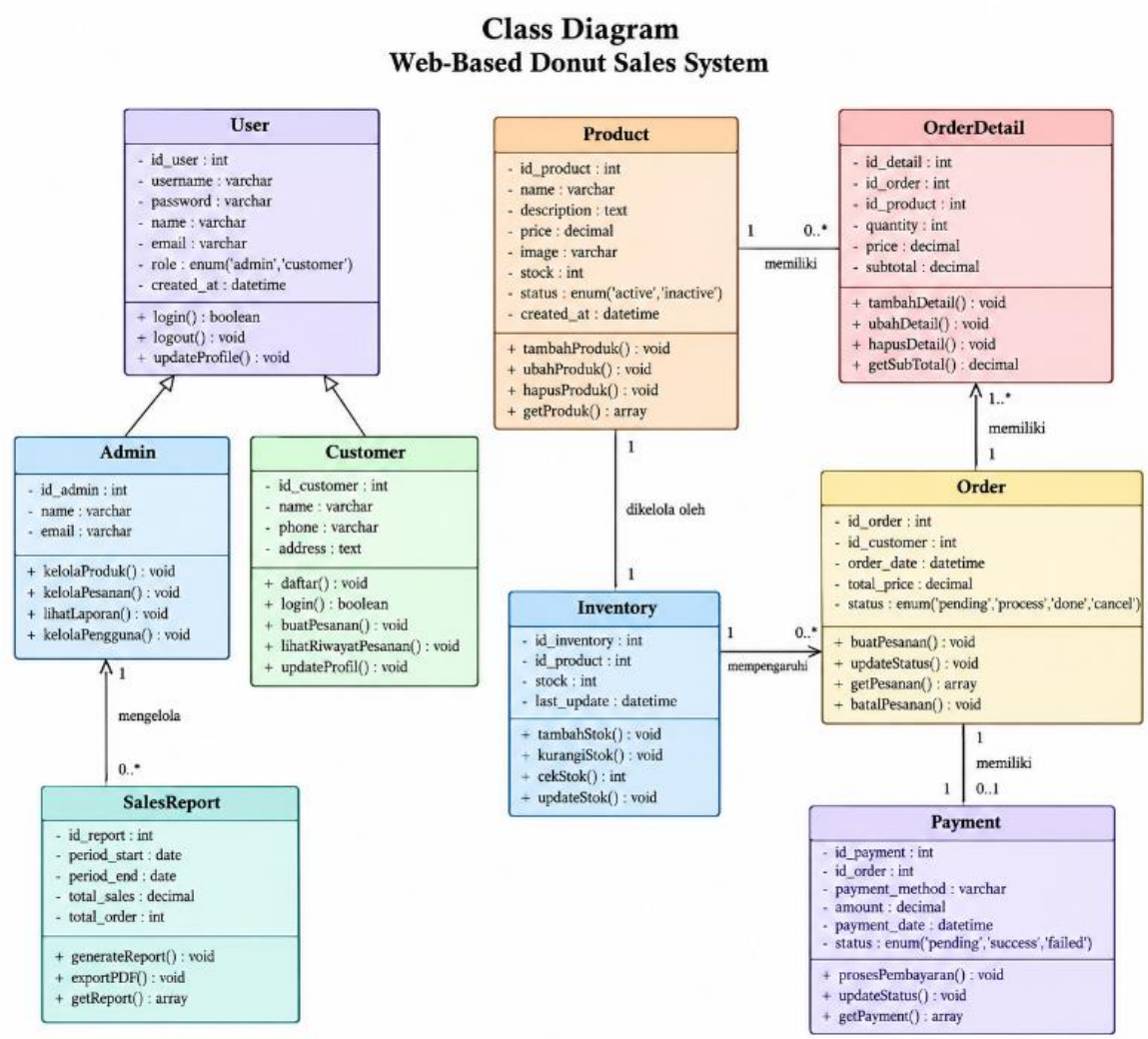


Figure 3. Class Diagram

Activity Diagram

An Activity Diagram is used to illustrate the workflow of the web-based donut sales system, showing the sequence of activities performed by users and the system. The process begins when a user accesses the website and logs in or registers an account. Customers can view product information, select donuts, place orders, and proceed with payment. The system processes the orders, records transaction details, and updates the order status. Meanwhile, the admin can manage product data, monitor orders, update inventory, manage user information, and generate sales reports. These activities correspond to the functions described in the Use Case Diagram, the process flow presented in the Flowchart, and the data relationships represented in the Class Diagram, including the User, Product, Order, OrderDetail, Inventory, Payment, and SalesReport classes. Therefore, the Activity Diagram provides a clear representation of the operational workflow and the interactions between users and the system.

RESULTS

This research was conducted according to the stages outlined in the research schedule. It began by identifying issues within the sales process specifically, the reliance on manual methods—which hindered the optimal management of product data, transactions, and reports. To address these challenges, a web-based sales system was developed to facilitate data and transaction management.

User Interface

Interface design involves creating the visual interface that serves as the link between the user and the web-based sales system. The design aims to ensure the system is easy to use, visually appealing, and understandable for all users, including both administrators and general users.

The design process prioritizes ease of navigation, information clarity, and consistency in layout and color. Each page is designed to align with its specific function and user requirements.

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1. Administrator Login page

The admin login page is used by administrators to access the web-based donut sales system. Administrators are required to enter their registered username or email address and password. The system verifies the entered credentials before granting access to the admin dashboard. This feature helps restrict access to administrative functions, including product management, order processing, and sales data management.

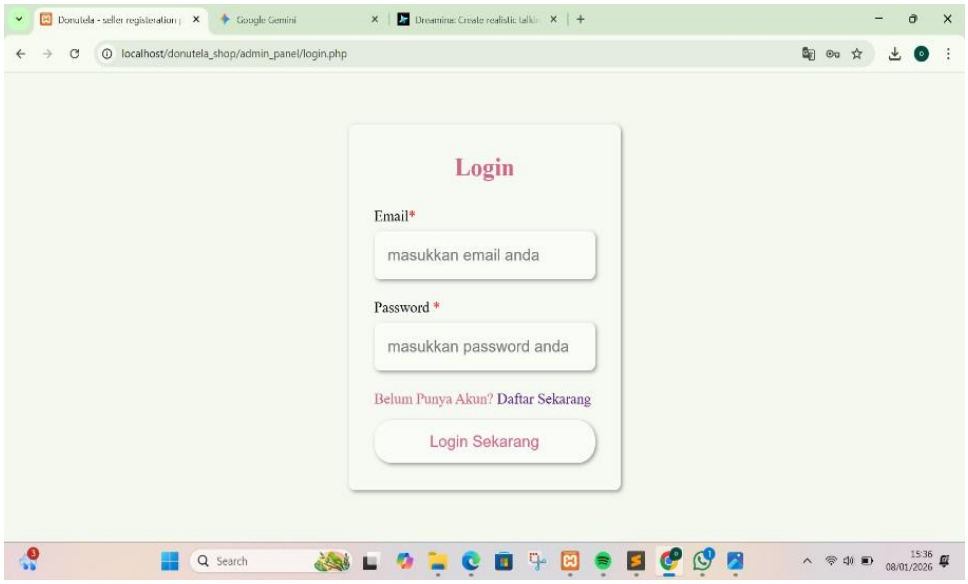


Figure 4. Administrator login page

2. Administrator Register Page

The admin registration page allows administrators to create an account to access the web-based donut sales system. The registration form provides fields for entering the required account information, such as username, email address, and password. The submitted information is stored in the system database to create an administrator account. Once registration is completed successfully, the administrator can log in to access the admin dashboard and manage the system's operational activities.

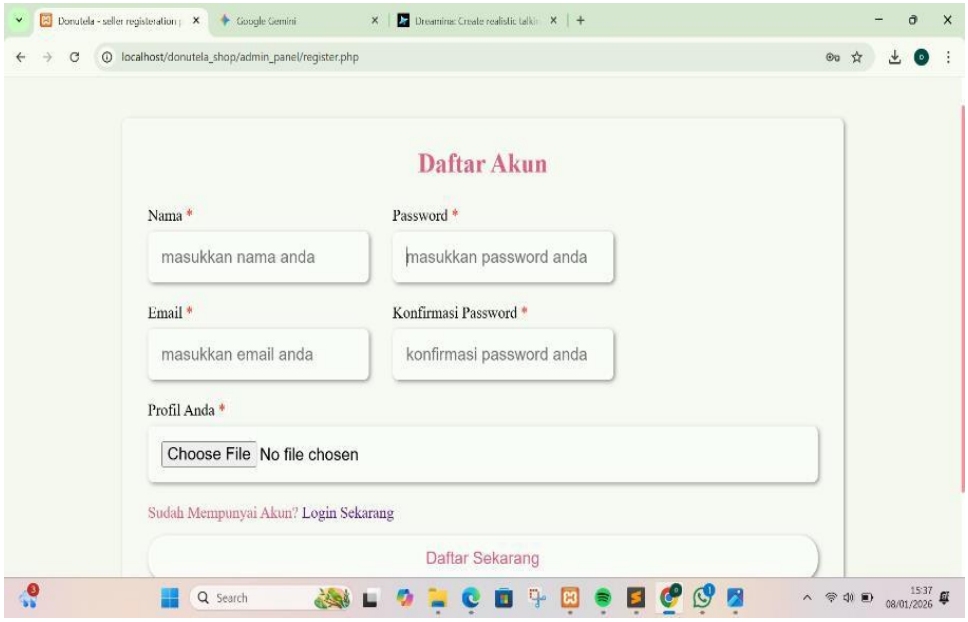


Figure 5. Administrator Registration Page

3. Administrator Home Page

The admin dashboard is the primary page displayed after an administrator successfully logs into the system. It serves as a central hub for managing the web-based sales system and provides an overview of the system's status.

The dashboard displays summary information, such as the number of products, order counts, and the status of orders currently being processed. This information enables the administrator to monitor sales activity quickly and

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efficiently. Additionally, the dashboard features a navigation menu that facilitates easy access to key functions, including the management of product data, categories, orders, and sales reports. The page layout is designed to be simple and structured, ensuring the administrator can easily understand and use the system.

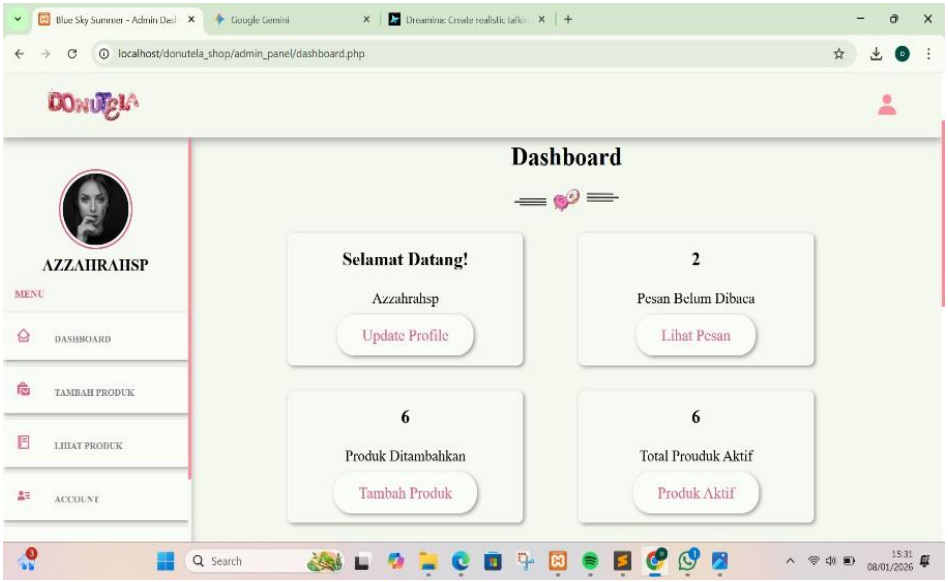


Figure 6. Administrator home page

4. Add product page

The "Add Product" page is used by the administrator to add new product data to the web-based sales system. This page features an input form that the administrator must complete, including fields for the product name, price, stock, description, and product image.

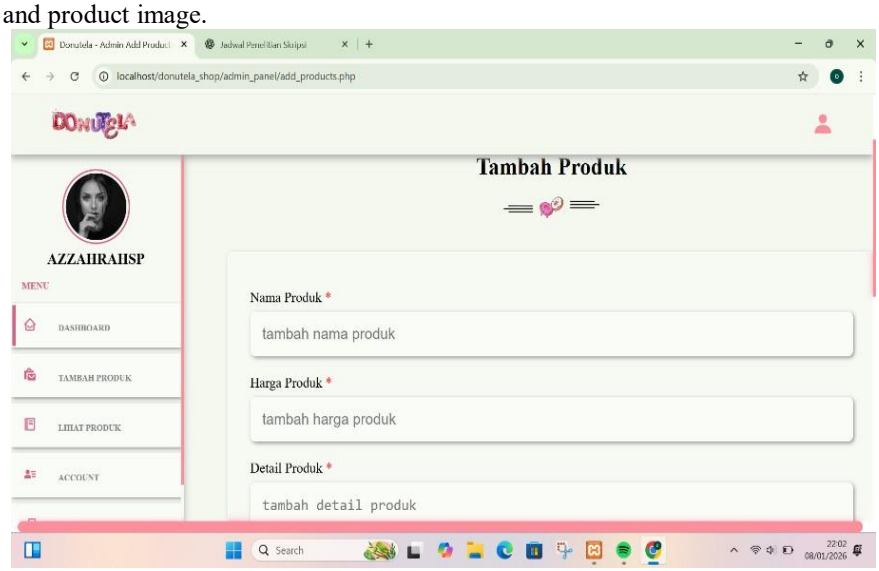


Figure 7. Add Product page

5. Product View Page

The product view page allows administrators to view all product data stored within the web-based sales system. This page displays a list of products in a table format, showing details such as product name, category, price, stock level, and status. In addition to displaying product data, the page features action buttons—such as options to edit or delete products—enabling administrators to manage data easily. The page layout is structured to ensure administrators can quickly locate and manage specific products.

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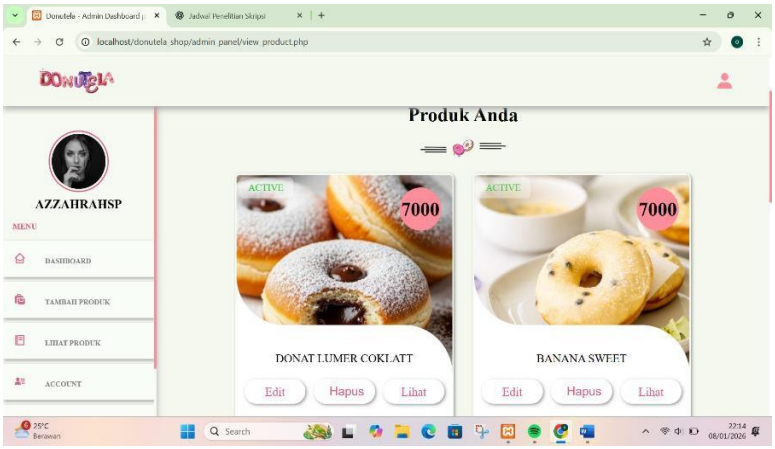


Figure 8. View Product Page

6. Account Page

The account page is used by administrators to view and manage the list of user accounts registered in the web-based sales system. User account data such as user ID, username, and email—is displayed on this page in a table format.

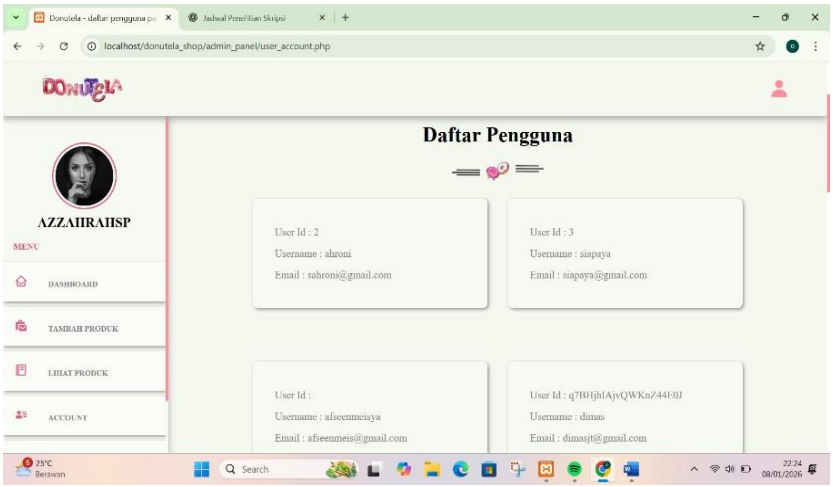


Figure 9. Account page

7. Logout Icon

The logout icon serves as a button to exit the web-based sales system. It is accessible to both administrators and users after a successful login. Clicking the logout icon terminates the user's session and redirects them back to the login page.

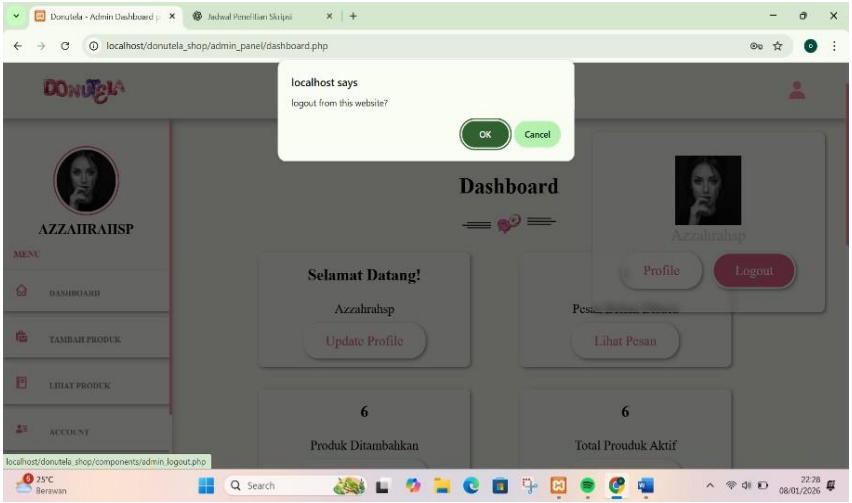


Figure 10. Administrator Logout Icon

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8. User Login Page

The user login page is used by users to access the web-based sales system. On this page, users are required to enter their previously registered email or username and password.

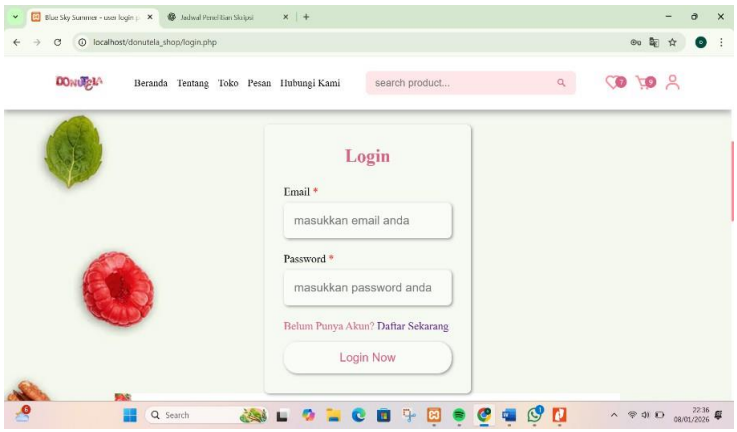


Figure 11. User Login Page

9. User registration page

The user registration page is used by prospective users to create a new account on the web-based sales system. On this page, users enter the required information, such as their name, email, username, and password.

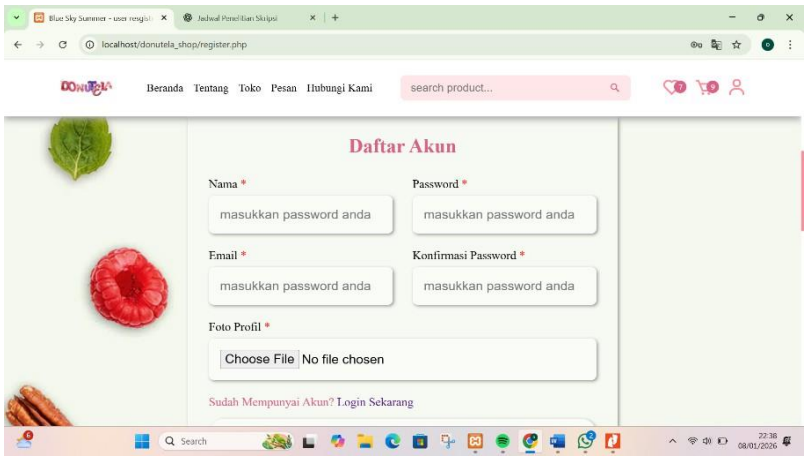


Figure 12. User registration page

10. User Home Page

The user homepage is the main page displayed after a user successfully logs into the system. On this page, users can view a list of available products along with brief information, such as store details, the product menu, and orders.

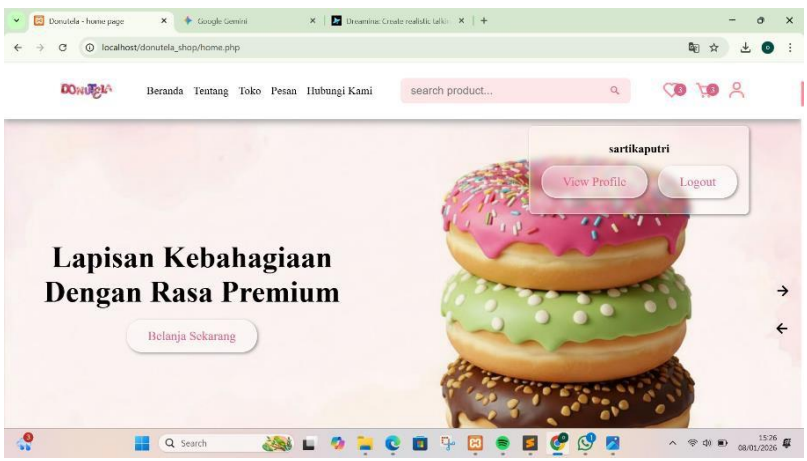


Figure 13. User home page

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11. Store page

The shop page provides a brief overview of the donut shop, which operates via a web-based sales system. It outlines the shop's profile and product offerings, and explains that the shop was established to make the ordering process convenient for customers.

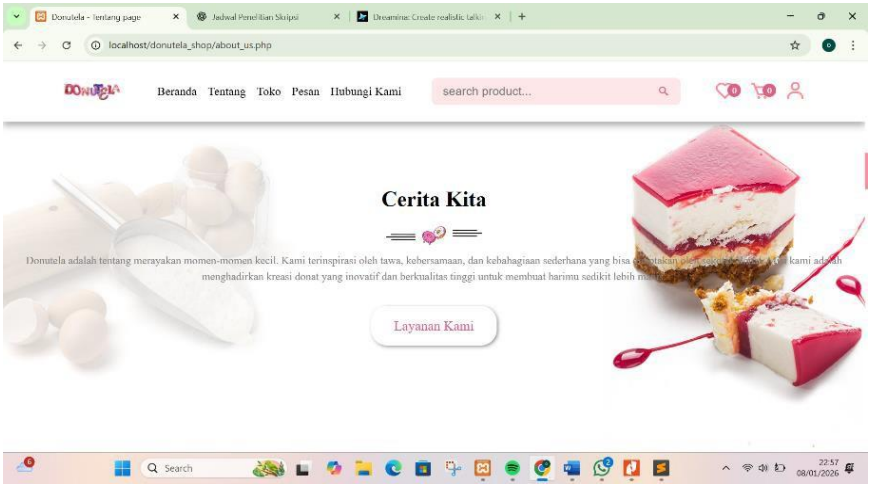


Figure 14. About the Store Page

12. Shop Page

The shop page displays all available doughnut products that users can purchase. On this page, users can view a list of products along with brief information such as product names, prices, and images.

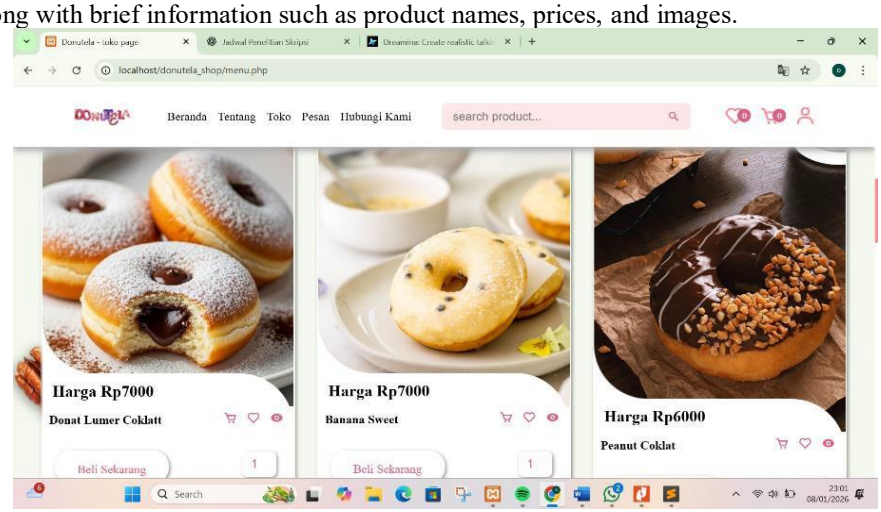


Figure 15. Shop Page

13. Order Page

The order page is used by users to place product orders. On this page, users can view the details of their selected orders and proceed with the ordering process through to completion.

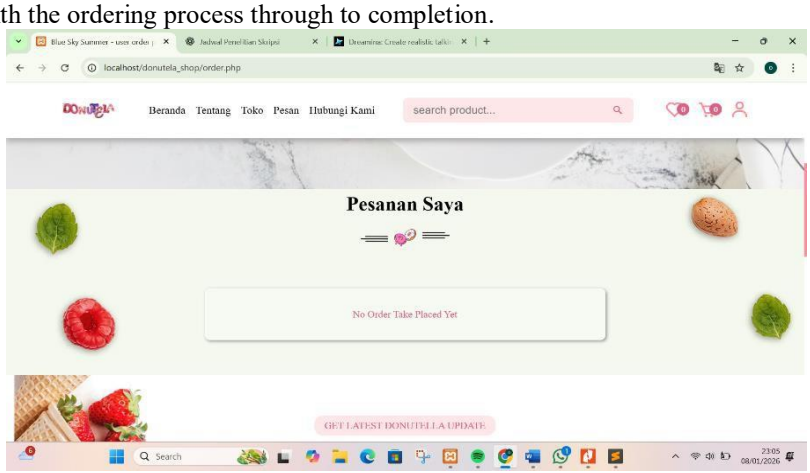


Figure 16. Order Page

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14. Contact Us page

The "Contact Us" page makes it easy for users to get in touch with the store. It provides contact details such as the address, phone number, or email—as well as a message form that users can use to send inquiries or suggestions.

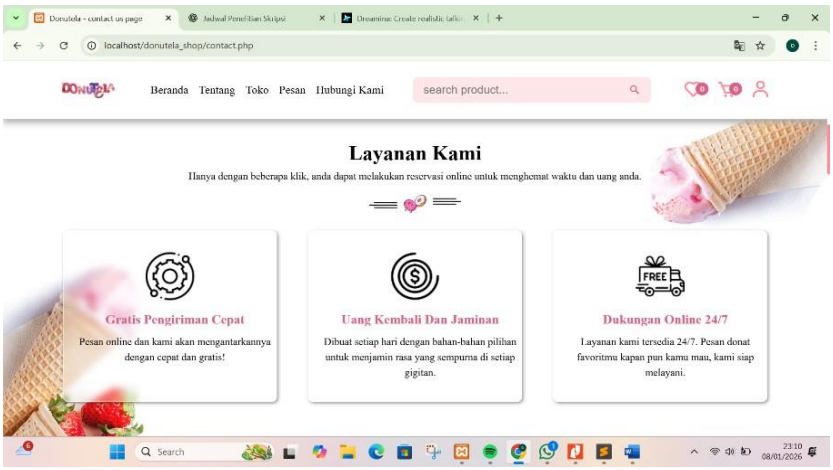


Figure 17. Contact Us page

15. Product search page

The product search page helps users quickly find products based on specific keywords. On this page, users can enter the name of the product they wish to find, and the system will display the relevant search results.

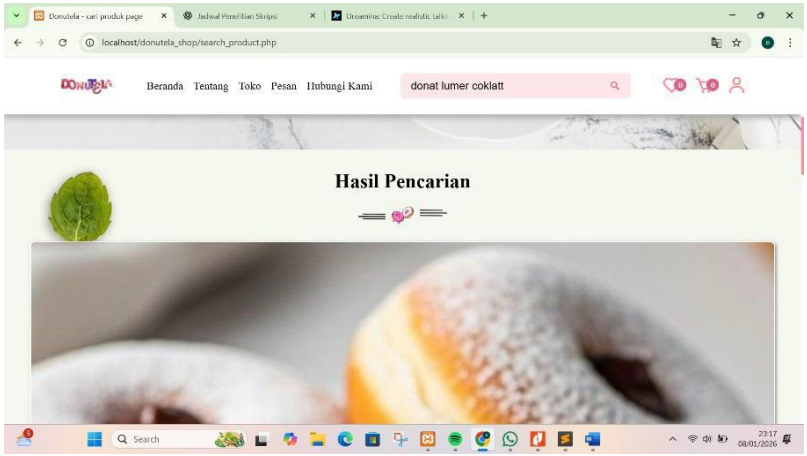


Figure 18. Product search page

16. Icon wishlist

The wishlist icon allows users to save products they are interested in so they can view them again later. With this feature, users can mark their favorite products without having to make an immediate purchase.

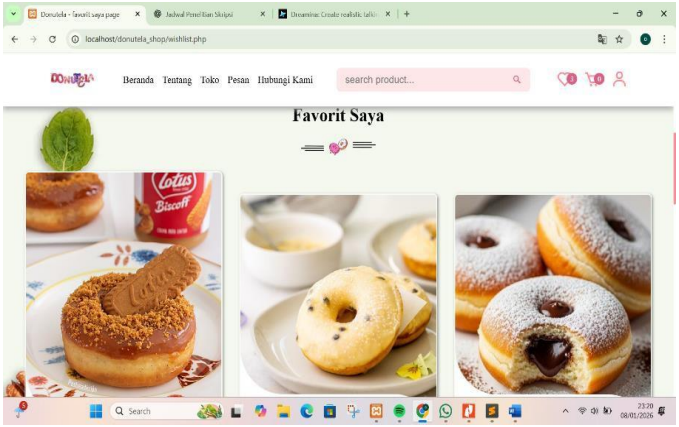


Figure 19. Wishlist page

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17. Shopping Cart Icon

The cart icon is used to hold products intended for purchase. Users can add, remove, or review selected products before proceeding to the checkout process. Both icons are designed to make online shopping easier for users.

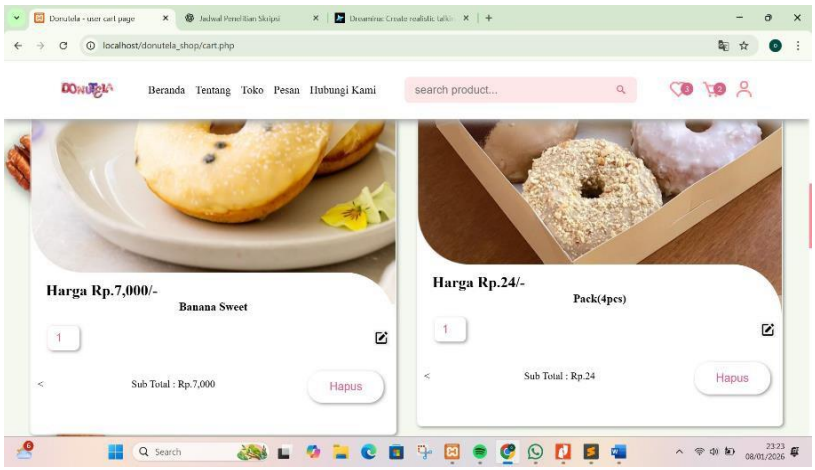


Figure 20. Cart page

18. User Logout Page

The user logout page is used to terminate the user session in the web-based sales system. After the user clicks the logout button or icon, the system logs the user out of their account and redirects them to the login page.

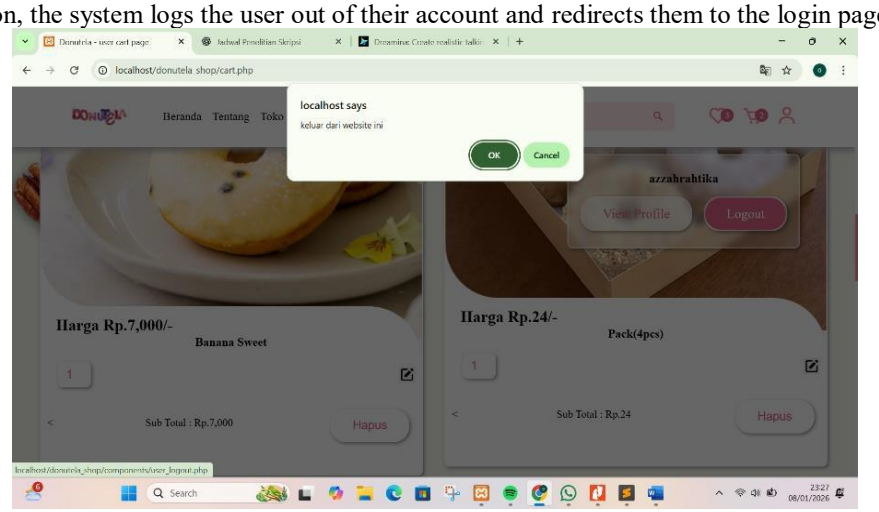


Figure 21. User logout page

After all Donutela website interfaces were implemented, functional checks were performed on several main features to obtain an initial overview of the system's functionality. The checks covered login, product management, product search, shopping cart, ordering, and order status. Each feature was examined based on its intended function. The testing scenarios and results are presented in the following table.

Table 1. Functional Testing Scenarios and Results

Feature	Test Scenario	Expected Result	Actual Result
Login	Enter valid credentials	User successfully log in	The user was successfully redirected to the dashboard
Product Management	Add a new product	Product is saved and displayed	The product was successfully saved and displayed in the product list.
Product Search	Search by Product name	Matching products are displayed	The system displayed products matching the search keyword.
Shopping Cart	Add a product to cart	Product appears in the cart	The selected product appeared in the shopping cart.
Ordering	Submit an order	Order is recorded in system	The order was successfully recorded in the system.
Order Status	View Order status	The current order status is displayed	The system displayed the current order status.

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Based on the examination results presented in the table above, the testing was conducted to determine whether the main features of the Donutela website operated according to their intended functions. The examination covered login, product management, product search, shopping cart, ordering, and order status. The results provided an initial overview of the website's functionality. However, the examination was conducted independently by the developer and did not include formal testing with comprehensive documented test scenarios or direct evaluations involving users.

DISCUSSION

The Donutela website integrates product management, customer accounts, and ordering functions into a single web-based platform. These features are intended to support more organized sales administration and provide customers with easier access to product information. However, the current evaluation was limited to functional checks performed by the developer. Therefore, the findings do not establish measurable improvements in sales efficiency or customer satisfaction. Further research should involve systematic functional testing and evaluations with actual users to assess the website's usability and effectiveness.

CONCLUSION

Based on the development process described in this study, a web-based donut sales system was developed to facilitate online product browsing and ordering. The system provides customers with access to product information and ordering functions, while allowing administrators to manage product data, orders, and user accounts in a structured manner.

The main features of the Donutela website were checked independently by the developer to obtain an initial overview of their functionality. Further systematic testing using documented test cases and evaluations involving actual users is needed to assess the website's usability, reliability, and potential contribution to sales administration.

However, minor bugs may still occur under certain conditions. Further testing with documented test cases and actual users is needed to evaluate usability and determine whether the system improves efficiency compared with the previous manual process. Future development may also include courier information, a messaging feature, and enhanced access control.

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