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Design and Implementation of Web-Based Product Order and Delivery Management Information System at Dheafin Bakery

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ABSTRACT

This study aims to design and implement a web-based order and delivery management information system for Dheafin Bakery, a small and medium enterprise. The system was developed as a solution to operational problems that have been carried out manually, such as order recording, customer and product data management, and the delivery process. A software engineering approach was used in the development of this system, with the Waterfall method which includes the stages of needs analysis, design, implementation, testing, and maintenance. The system was built using the PHP programming language and MySQL database, and was designed responsively so that it can be accessed through various devices. The implementation results show that the system is able to integrate the ordering and delivery process automatically and in real-time, reduce recording errors, speed up the workflow, and increase efficiency and customer satisfaction. The system also provides easy-to-use customer, product, and order tracking management features. Thus, this information system has succeeded in significantly improving Dheafin Bakery's operational performance and has the potential to become a model for similar applications for other small and medium enterprises.

INTRODUCTION

The advancement of information technology today has brought about a major transformation in various sectors of human life, including in the realm of small and medium enterprises (SMEs) (Rosmayati, 2023) . This development is not only limited to the adoption of computer technology, but also extends to the implementation of integrated information systems, capable of accelerating work processes, reducing errors, and increasing operational efficiency and effectiveness (Simarmata & Situmorang, 2023) . One example of the use (Prayoga et al., 2025) of information technology in the business world is to develop a management information system that is specifically designed to support business needs, (Abdul Kadir, 2018) starting from the production process, ordering, stock management, to product distribution to customers. In this context, SMEs such as Dheafin Bakery which are engaged in the production and distribution of ready-to-eat food require a system that is able to answer operational challenges in a comprehensive and integrated manner.

Dheafin Bakery is a bakery and cake business that continues to grow along with the increasing market demand for practical and quality food products. However, behind this growth, there are still a number of obstacles in the management of daily business processes (Sifwah et al., 2024) . Currently, most of the order and delivery management processes are still carried out manually, starting from recording customer orders in books or worksheets, managing product stock data, to the process of recording and tracking delivery of goods to customers. Reliance on this manual process makes the company vulnerable to various problems (Adolph, 2016) , such as errors in data recording, late delivery due to miscommunication, stock discrepancies due to the absence of an accurate tracking system, and difficulty in producing reports that can be used as a basis for making decisions quickly and accurately.

This condition can certainly have a negative impact on customer satisfaction levels and overall business reputation. In a highly competitive digital era, customers demand fast, precise, and responsive service (Muchsin, 2021) . For this reason, there needs to be a digital transformation through the implementation of a web-based management information system that not only automates key business

processes but also provides real-time and accurate integration between processes. The information system required by Dheafin Bakery must cover all major workflows, from recording orders by officers and customers online, centralized management of product and customer data, to recording and tracking the delivery process that can be monitored by all related parties.

Several previous studies have proven the effectiveness of implementing information systems in supporting SME business activities. For example, designing a web-based inventory management system for bakeries that can monitor raw material stock efficiently (Jati & Permatasari, 2024) , and (No et al., 2024) who developed an online food product ordering application to facilitate the customer transaction process. However, (Sakti et al., 2023) most of these systems still have limitations, because they only focus on one aspect of the entire business process, such as ordering or inventory. In fact, in practice, an integrated system between ordering and delivery is very much needed (Dwi R et al., 2018) , especially for businesses like Dheafin Bakery that have special needs in the production and distribution flow. The absence of a system that truly integrates the entire process in one comprehensive interface is a gap that needs to be filled through this research.

Based on these problems, this study proposes the design and implementation of a web-based order and delivery management information system specifically developed for Dheafin Bakery. This system is designed by considering the real needs in the field and the work structure carried out by the company. The main functions of this system include direct order recording by both officers and customers through an online platform, centralized product and customer data management, monitoring order status over time, and recording the delivery process equipped with real-time tracking of goods status. One of the advantages of this system is the direct integration between the ordering and delivery modules, so that information can flow automatically and synchronously between sections, without the need for re-input or manual document exchange.

The designed system is also equipped with a user-friendly interface, is responsive so that it can be accessed through various devices such as computers, tablets, and smartphones. The software engineering approach used in the development of this system also allows for a detailed user needs analysis process, optimal database design, and system testing to ensure functionality and data security.

This study offers added value in the development of information systems for SMEs, especially because the system developed is not generic, but is specifically tailored to the business needs of Dheafin Bakery. This is important considering that each SME has unique operational characteristics and cannot be solved with a one-size-fits-all digital solution. (Fauzi et al., 2025) . With the presence of an integrated management information system, it is hoped that Dheafin Bakery can increase work efficiency, reduce human error, speed up the decision-making process, and improve overall customer service. In addition, the results of this study can also be used as a reference or model for developing similar systems in other SMEs that have similar problems in their operational processes.

METHOD

This research is included in the type of applied research, which aims to apply and develop information system technology to solve real problems in the business environment. This research also uses a software engineering approach to design and build a web-based product order and delivery management information system.

System Development Methods

The system development method used in this study is the Waterfall method (Hidayati, 2019) , which consists of sequential and systematic stages in building software. The Waterfall model was chosen because it is suitable for system development with defined needs.
clearly from the beginning. The stages in the Waterfall method applied in this study are as follows:

1. **Needs Analysis**

   This stage aims to identify user needs and the system to be built. Data is collected through:

a. Interview with the owner and staff of Dheafin Bakery to learn about the business process related to orders and delivery.
b. Observation of manual order recording and product delivery activities.
c. Documentation study of existing order notes, delivery notes, and administrative systems.
The result of this stage is a list of functional and non-functional system requirements.

2. System Design

This stage aims to design the structure and appearance of the system based on the results of the analysis. The design is carried out using:

a. UML (Unified Modeling Language): Use case diagrams, activity diagrams, and class diagrams.
b. ERD (Entity Relationship Diagram) to design database structure.
c. User interface design using page mockups such as login, dashboard, customer management, orders, products, and shipping.

3. Implementation

The implementation stage is the process of coding the system based on the design results. The system is developed using:

a. Programming language: PHP
b. Database: MySQL
c. Supporting frameworks/technologies: HTML, CSS, JavaScript, and Bootstrap for interface display.
This system is implemented in the form of a web that can be accessed via a browser.

4. System Testing

This stage aims to test the system that has been built to suit the needs. Testing is carried out using the following methods:

a. Black Box Testing, which is testing the functionality of the system without seeing the program code directly. Testing is carried out on each feature such as order management, customers, products, and shipping.
b. User Acceptance Test (UAT), which is testing by users (owner/staff of Dheafin Bakery) to evaluate whether the system has met their needs.

5. System Maintenance

This phase includes bug fixes, adjustments, and further development based on user feedback. Although not the main focus of this research, this phase is planned for the continued use of the system.

RESULTS AND DISCUSSION

This form is the entry point to ensure only authorized users can log in, and is the foundation for the application's security system. Users enter their username and password via a form that sends the data to the server. On the backend, this combination is verified usually by comparing a hash (bcrypt/Argon2) with a stored salt to ensure only authorized users can log in.

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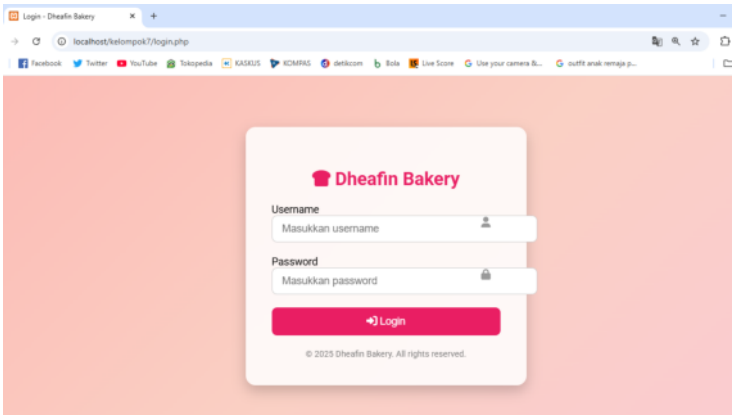

Figure 1. Login Menu

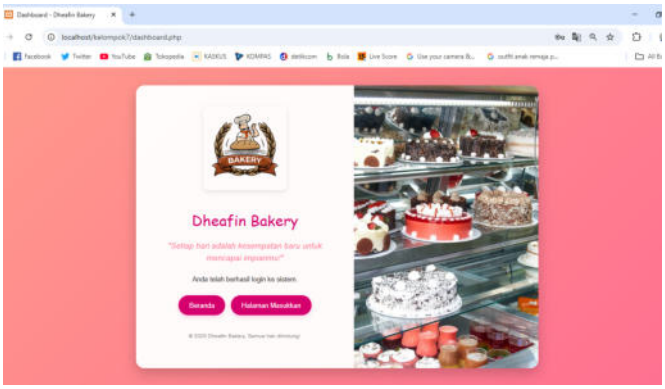

Figure 2. Dashboard Menu

This page is a landing page after login that serves as the user's initial wall in the application, providing confirmation of successful login, summary of status & motivation, direct access to the main part of the application, clear separation of login activity and daily usage.

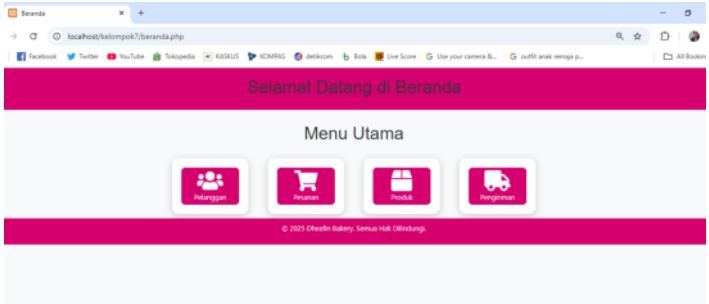

Figure 3. Home Menu

This homepage is kept minimal, with only one focus, namely the main modules such as Customers, Orders, Products, and Shipping. This follows the principle of effective landing pages: "remove navigation and other distractions" to focus the user's attention on one goal. The title "Welcome to Home" provides reassurance that the user has successfully logged in and is now in the center of the application.

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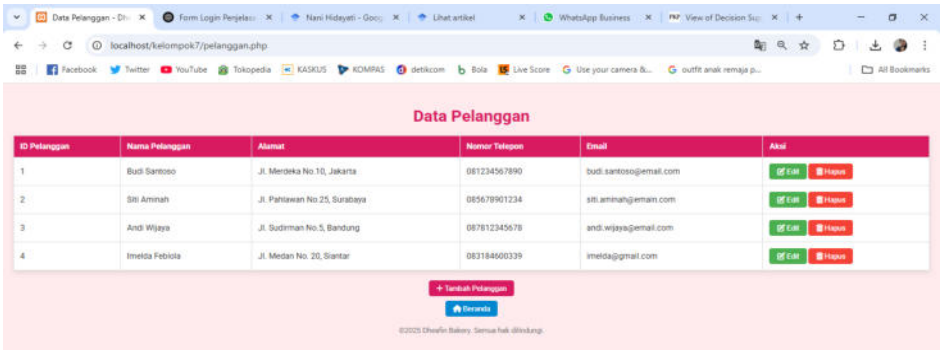

Figure 4. Customer Data Menu

Customer Data page in Dheafin Bakery serves as an intuitive and effective **customer management panel (simple CRM)**. Basic CRM features in the application, providing a structured view of customer information, quick ability to add, edit, and delete data, easy navigation back to the dashboard. With tables and action buttons, users can manage customer data directly and efficiently, without having to switch pages repeatedly.

The customer data display presents key information such as: Name, Address, Phone number and Email

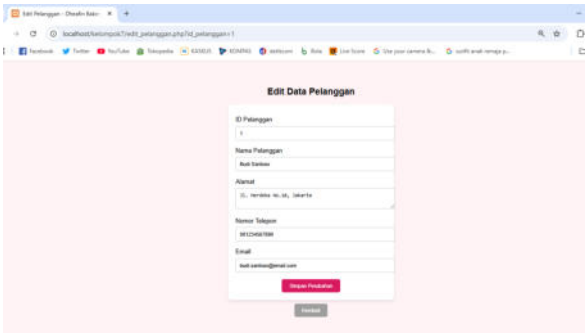

Figure 5. Edit Customer Data

This page acts as a customer data update form that facilitates efficient modification of important information, supported by a clear, structured, and easy-to-use form design (high accessibility), integrated into a simple CRM application workflow ideal for practical and consistent customer data management. The customer data editing form displays a form with complete data (ID, name, address, phone number, email) of the selected customer, allowing users to easily update information before submitting changes.

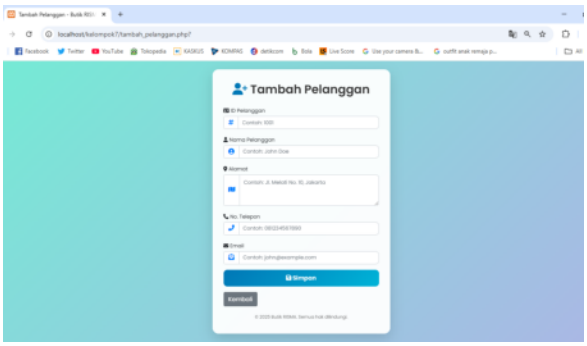

Figure 6. Add Customer

This page allows users to add new customers to the system an important part of CRUD (Create-Read-Update-Delete) application. The Add Customer page functions as:

1. Interface for adding new customer data to the system.
2. User-friendly forms with clear labels, appropriate input, and placeholders for guidance.
3. aw data validation
4. al to maintain data quality.
5. Facilitates quick navigation with save & back buttons.
6. Continuously complete the CRUD system.

With this page, users can add new customers directly and efficiently, keeping the workflow smooth and structured.

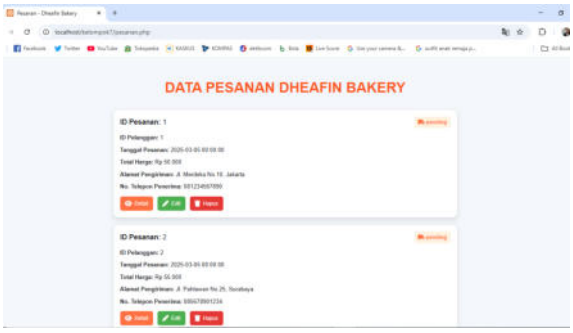

Figure 7. Order Menu

Its main function is to display and manage order data for Dheafin Bakery. A simple order management system that makes it easy for Dheafin Bakery staff to view, track the status, and manipulate data for each incoming order. In more detail, its functions include:

1. Displaying order list: Each order is displayed with Order ID, Customer ID, Order Date, Total Price, Shipping Address, and Recipient Phone Number.
2. Displaying order status: There is a “pending” indicator for each order, showing its current status.
3. Manage orders: There are “Details”, “Edit”, and “Delete” buttons for each order, allowing users to view more details, change order information, or delete the order.

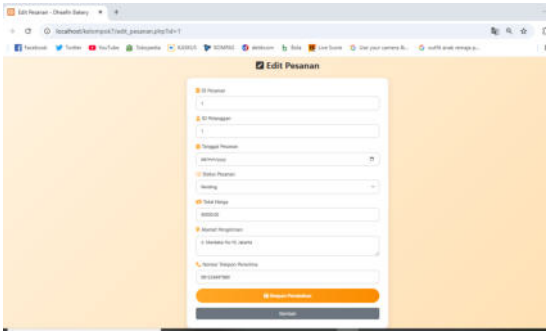

Figure 8. Edit Order

Its main function is to change or update data from an existing order. Its functions include:

1. Displaying existing order data: All columns (Order ID, Customer ID, Order Date, Order Status, Total Price, Shipping Address, Recipient Phone Number) are already filled with the previously selected order information.
2. Allows data editing: Users can change the values in each column (except Order ID and Customer ID which don't seem to be editable).

3. Save changes: The "Save Changes" button is used to save all modifications that have been made to the order data.
4. Cancel editing: The "Back" button is used to cancel the editing process and return to the previous page without saving changes .

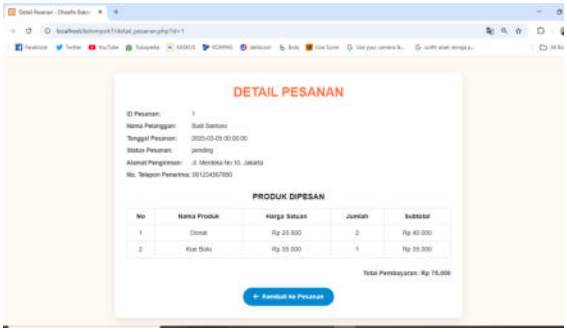

Figure 9. Order Details

This page functions as a display of complete and structured information about an order that has been made by a customer. The information displayed includes order identity, customer data, and details of the products ordered, so that it can be used by admins and officers as a final check before further processes, such as packaging or shipping.

This page is not only a means of tracking the status and contents of orders, but also an important control tool to minimize recording errors and ensure that orders sent are in accordance with customer requests. With a neat appearance and complete data, this page is an important part of the Dheafin Bakery administration system workflow.

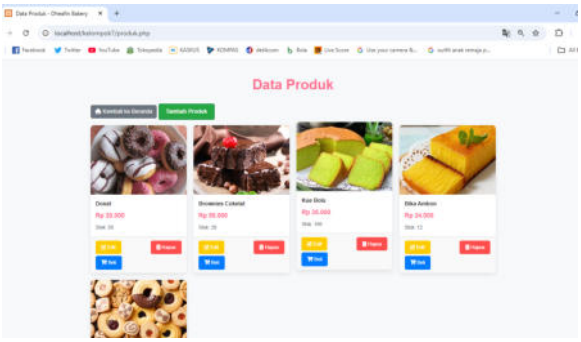

Figure 10. Product Menu

The Product Data page is a vital component in the Dheafin Bakery system. It not only serves as a product list, but also as a primary tool in managing sales catalogs, maintaining smooth transactions, and helping to ensure proper customer service. With the support of edit, delete, and add product features, this page gives admins full control in organizing products according to business needs.

This view serves as a product management center in the Dheafin Bakery information system. Through this page, admins or officers can view, organize, and update information on all products available for sale. This page is an important part of maintaining the completeness, accuracy, and up-to-dateness of product data, so that store operations can run smoothly and professionally.

By displaying current stock data and valid prices, this page helps prevent errors in ordering and shipping transactions. Up-to-date product information will ensure that customers get the right information, and support accurate sales report recording. The product data displayed on this page is a reference when customers place orders and when the shipping team picks up the products to be shipped. Therefore, the completeness and accuracy of the data on this page are very important.

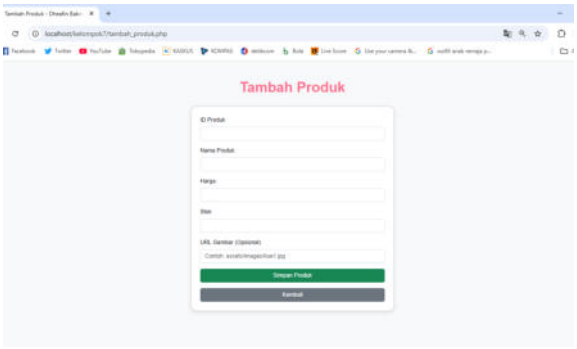

Figure 11. Add Product

This page serves as an official input form to add new product data into the Dheafin Bakery system. The goal is to make it easier for admins or officers to update the list of products sold accurately and efficiently.

This form provides a number of fields that allow users to fill in important information about the product. The first column is **the Product ID**, which is a unique identification number that distinguishes each product in the system. Next, there is the **Product Name column**, which is used to fill in the full name of the product to be added. Then, users can fill in **the Product Price**, which is the selling value per unit that will be used in each transaction. There is also a **Stock column,** which shows the amount of goods available in the warehouse or storage area. Finally, there is an **Image URL column** (optional) which functions to display images of the product, so that the information displayed in the product list becomes more visual and attractive.

The product add form display is an important part of Dheafin Bakery's product management system. This page is designed to provide ease, accuracy, and speed in updating product inventory. With the support of complete data input features and functional action buttons, the product adding process becomes more controlled and efficient, ensuring that the information available is always up-to-date in the system.

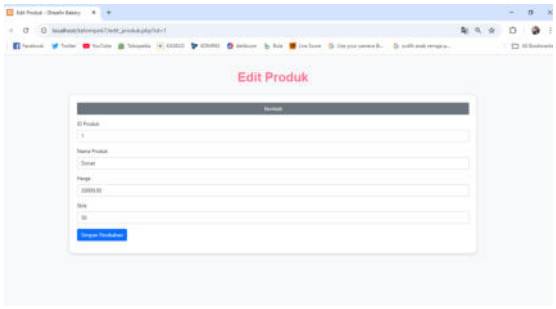

Figure 12. Edit Product

This view serves as a form to change or update product data that has been stored in the Dheafin Bakery system. When the user opens this page, the system will automatically display complete data from the selected product, such as Product ID, Product Name, Price, and Stock.

This form makes it easy for users to edit existing information. Users can update the values in the Product Name, Price, and Stock columns as needed. After the changes are made, users can press the "Save Changes" button to save the latest data into the database, so that product information is always accurate and up-to-date. However, if users decide not to make changes, a "Back" button is available that allows them to cancel the editing process and return to the previous page without saving any modifications. With this display, product management becomes more flexible, fast, and organized in the Dheafin Bakery system.

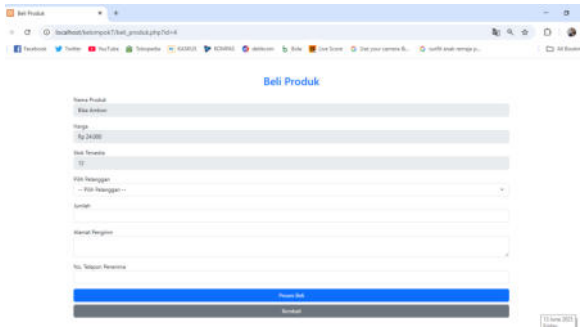

Figure 13. Buy Products

This form acts as the main bridge between the product and the customer in the purchasing process, ensuring that all order data is recorded completely, accurately, and ready to be followed up in the shipping process. This display is a crucial part of the Dheafin Bakery transaction system. This display functions as a transaction form for purchasing or ordering products by customers in the Dheafin Bakery system. This page is designed to help admins or officers record customer orders completely and accurately, from product selection to shipping data.

At the beginning, the system will display details of the product to be purchased, such as product name, unit price, and available stock, so that users can ensure the availability of goods before processing the order. Furthermore, there is a feature to select customers who make purchases, by presenting a list of customers who have registered in the system. This makes it easier to record so that each order is recorded in the name of the correct customer. This form also provides a column to fill in the number of product units to be purchased, where the amount entered will be used to calculate the total price and update stock automatically after the transaction is successful. For shipping needs, users are asked to fill in the shipping address and recipient's telephone number. This information is very important so that the delivery process can be carried out properly and without error. After all data is filled in correctly, the "Process Purchase" button can be clicked to complete the transaction. The system will record all information into the database as part of the customer's order history. If the user wants to cancel the transaction before it is processed, there is a "Back" button that allows you to exit this page without saving any data.

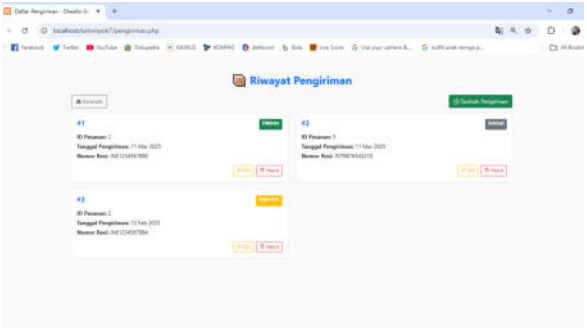

Figure 14. Shipping Menu

This delivery history page serves as a control center to monitor and manage the entire distribution process of Dheafin Bakery products to customers. With informative and interactive display features, users can ensure that each delivery is well recorded, its status is updated, and data remains efficiently organized in the system.

This view functions as a product delivery history management and monitoring page, which allows admins or officers to view, update, and manage all related data. delivery process in the Dheafin Bakery system. This page is designed with a card-based design, making it easy for users to understand each delivery entry quickly and visually.

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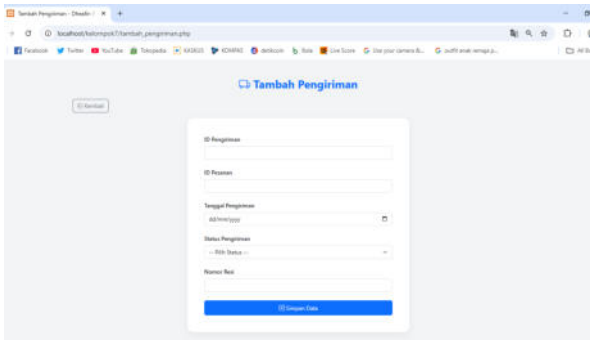

Figure 15. Add Shipping

This add shipment form is an important component in the Dheafin Bakery system workflow. Its function is to ensure that every shipment process can be recorded accurately, making it easier to track, manage logistics, and report shipments to customers. With a simple yet informative appearance, this page helps maintain efficiency and transparency in managing product distribution.

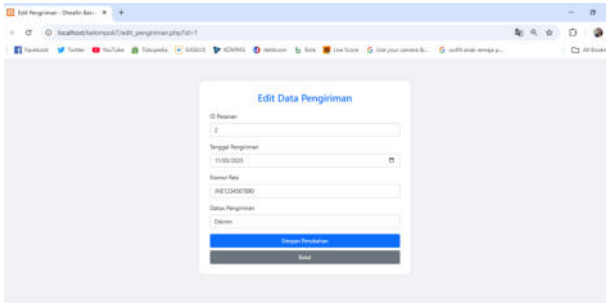

Figure 16. Edit Shipping Data

This shipping edit form plays an important role in keeping product shipping data in the Dheafin Bakery system up to date, accurate, and reliable. Through a simple yet informative display, users can easily access and update recorded shipping information, without having to re-enter all data from the beginning. The editing features provided are flexible, allowing changes to shipping dates, statuses, and receipt numbers according to operational needs. With this system, the process of monitoring and tracking product distribution becomes more orderly and efficient.

In addition, this intuitively designed display also supports officers or admins to work faster and with minimal errors, so that the quality of the company's logistics management is maintained. In other words, this page is a crucial component in supporting the sustainability of the distribution system and professional customer service at Dheafin Bakery.

CONCLUSION

Based on the design and implementation results, the web-based product order and delivery management information system developed for Dheafin Bakery has succeeded in addressing the business's operational needs, particularly in improving the accuracy, efficiency, and structure of recording, managing, and monitoring product sales and distribution. The system integrates key features such as user authentication, dashboard interface, customer data management, product catalog settings, order processing, and shipment tracking. These modules are interconnected to ensure a seamless flow of information, reducing data redundancy and operational errors. The use of CRUD (Create, Read, Update, Delete) functionality across modules enhances flexibility and supports real-time data updates. Furthermore, the implementation of detailed order and shipping records enables administrators to verify transactions before fulfillment, thereby minimizing mistakes and improving customer satisfaction. The system interface is designed to be user-

friendly, facilitating ease of use even for users with limited technical background. Overall, the system demonstrates positive potential to improve the operational workflow of a medium-scale MSME like Dheafin Bakery. Although formal testing metrics and user acceptance data are limited in this phase, the structured design and logical workflow suggest that the system can serve as a strong foundation for future enhancements, such as integration with financial reporting modules, automation, or mobile access. This project also aligns with broader efforts to support digital transformation in local SMEs.

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