



Design and Development of a Web-Based Sales Information System for DuabelasShop Bengkulu

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Abstract

DuabelasShop Bengkulu is a retail business engaged in selling various daily consumer products in Bengkulu City. In its operational activities, the store still relies on a manual sales recording system using notebooks and simple worksheets, which frequently causes difficulties in monitoring stock availability in real time, discrepancies between physical inventory and recorded data, delays in generating sales reports, and a high risk of data loss due to human error. This study aims to design and develop a web-based sales information system capable of supporting accurate and real-time sales data recording at DuabelasShop Bengkulu. The system was developed using the Agile method, which emphasizes collaboration, flexibility, and incremental product delivery through short development cycles (iterations), consisting of the Plan, Design, Launch, Develop, Test, Deploy, and Review stages. The system was built using the PHP programming language and a MySQL database, and was tested using the Black Box Testing method. The results show that the developed system is able to facilitate online product sales, allowing the business to reach a wider customer base without being limited by location or time, while also improving the efficiency of managing product data, transactions, and sales reports. All 19 Black Box Testing scenarios on the system's main functions were declared successful, indicating that the system is feasible for use at DuabelasShop Bengkulu.

Keywords: Agile, E-Commerce, MySQL, PHP, R&D

1. INTRODUCTION

The increasingly tight competition in the business world encourages business actors to utilize information technology as a means of improving competitiveness and service quality. One form of technology application that is widely used today is web-based information systems, which are considered capable of supporting more efficient data management, accelerating operational processes, and expanding service access for customers.

DuabelasShop Bengkulu is a retail business engaged in selling various daily consumer products in Bengkulu City. In its operational activities, DuabelasShop Bengkulu still relies on a manual sales recording system using notebooks and simple worksheets. This condition often creates various problems, such as difficulties in monitoring stock availability in real time, discrepancies between physical inventory and recorded data, delays in generating sales reports, and a high risk of data loss caused by human error.

An information system is a set of interrelated components that collect, process, store, and distribute information to support decision-making and control within an organization [1]. The appropriate implementation of an information system can improve productivity, data accuracy, and service speed in a business [2]. Previous research on a retail store in Palembang City showed that the implementation of a web-based sales information system was able to increase stock management efficiency by up to 70% and significantly accelerate the sales reporting process [3]. Similar findings were also reported in studies on web-based stock management systems for retail businesses [10] and sales information systems for trading MSMEs [12], both of which confirm that the digitalization of sales processes can improve operational efficiency and accuracy.

Based on the description above, the research problem of this study is how to design, build, and test a web-based sales information system that meets the operational needs of DuabelasShop Bengkulu. This study aims to: (1) design and build a web-based sales information system for DuabelasShop Bengkulu; (2) produce a

system capable of supporting accurate and real-time sales data recording; and (3) test the feasibility of the module built using the PHP programming language and a MySQL database, with the object of research limited to DuabelasShop Bengkulu.

2. MATERIALS AND METHOD

The subject of this study is the sales information system at DuabelasShop Bengkulu, a retail business located in Bengkulu City that still carries out its sales recording process manually. System users consist of two roles: the administrator, who is responsible for managing product data, user data, and monitoring reports, and the cashier/customer, who processes daily sales transactions using the developed system. The research was conducted at DuabelasShop Bengkulu for approximately ten months, covering the stages of literature review, requirements analysis, system design, implementation, testing, and report writing.

This study uses a Research and Development (R&D) approach, which aims to produce a software product that can be tested and evaluated for feasibility through a systematic process starting from requirements analysis, design, implementation, to product testing [4]. The Black Box Testing results were analyzed descriptively to measure the level of functionality and feasibility of the developed system.

2.1 System Development Method

The system was developed using the Agile method, a software development approach that emphasizes collaboration, flexibility, and incremental product delivery through short development cycles called iterations. Each iteration produces a part of the system that can be directly tested and evaluated by users, so that feedback can be obtained quickly and applied to the next iteration. The Agile workflow used in this study is shown in Figure 1.



Figure 1. Stages of the Agile Method

The system development method used consists of seven stages that run repeatedly and continuously, namely: (1) Plan, planning the system requirements through identification of manual recording problems, determination of system objectives, and data collection through observation and interviews with the store owner; (2) Design, designing the database (product and transaction tables), user interface design, and system flow using DFD, and ERD ; (3) Launch, building an initial prototype demonstrated to the store owner to obtain feedback; (4) Develop, full development of the system covering sales input, and sales reporting features; (5) Test, testing the system using the Black Box Testing method to ensure all features run properly; (6) Deploy, real implementation of the system so that it can be used by cashiers and the store owner; and (7) Review, evaluation of the system's suitability to user needs and identification of shortcomings for improvement in the next cycle.

Data collection was carried out using three techniques: direct observation of the ongoing sales recording process at DuabelasShop Bengkulu, interviews with the store owner and staff to explore feature requirements, and a literature study of books, journals, and previous research relevant to sales information systems, PHP, MySQL, the Agile method, and system testing.

2.2 Database Design

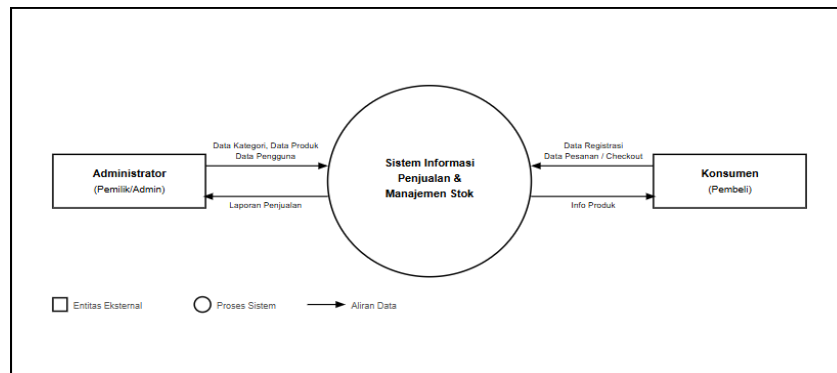


Figure 2. Context Diagram

A context diagram of the Sales Information System that illustrates the relationships between the system and the external entities involved. The diagram shows three main entities: Administrator, Cashier, and Owner/Manager. The Administrator manages system data such as product data, categories, and user data which is then processed by the system. The Cashier interacts with the system to conduct sales transactions and receives a sales receipt as output. Meanwhile, the Owner or Manager receives information in the form of sales reports from the system to aid in monitoring and decision-making. This context diagram shows the overall data flow between users and the system without displaying the system's internal processes in detail.

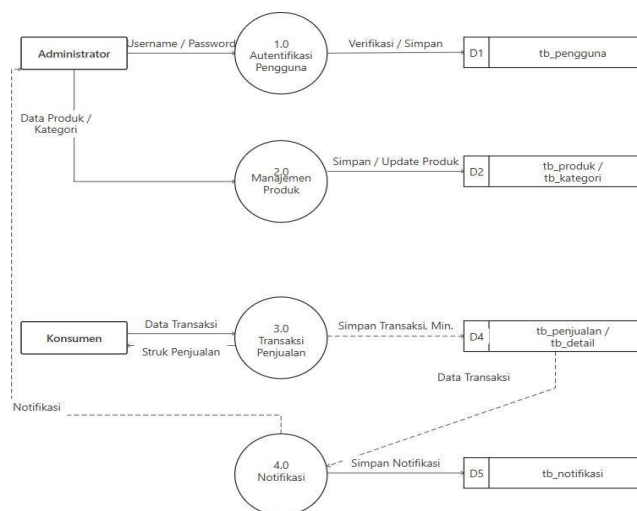


Figure 3. Level 0 DFD

Level 0 DFD for the sales information system, which illustrates the main process flow within the system. The diagram includes several external entities—namely, the Admin, Cashier, and Owner/Manager—who interact with the system. The Admin performs user authentication (1.0) by entering a username and password, which are then verified and stored in the `tb_pengguna` database table (D1). Furthermore, the admin also manages product data (2.0), such as adding, modifying, or updating product and category data. The cashier processes sales transactions (3.0), which store transaction data in the `tb_sales/tb_detail` (D4) tables and generate sales receipts. This diagram illustrates how data flows from users to the system and how data is stored and processed in the database.

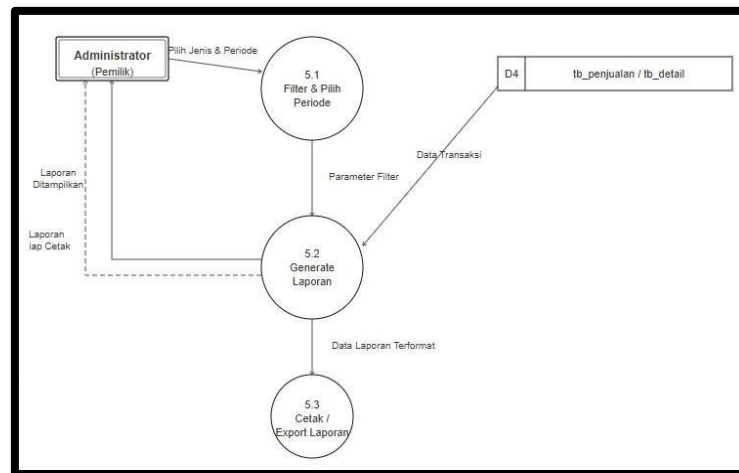


Figure 4. Level 1 DFD for Reports

Level 1 DFD: A report that illustrates the report generation process in the sales information system. In this diagram, the Administrator or Owner can select the report type and time period through the Filter & Select Period process (5.1). The selected filter parameters are then used in the Generate Report process (5.2) to retrieve and process data from the *tb_penjualan/tb_detail* (D4) database tables, which contain sales transaction data. After the data is processed, the system generates a formatted report that can be displayed to the user. Next, in the Print/Export Report process (5.3), the generated report can be printed or exported to produce a sales report.

The database structure of the system was designed using an Entity Relationship Diagram (ERD), which illustrates the main entities along with their attributes and relationships. The main entities in this system include User, Product, Category, Sales Transaction, and Transaction Detail, as shown in Figure 2. The database design was subsequently implemented into several main tables, namely the admin, user, category, product, sales, sales detail, and notification tables, using MySQL as the database management system.

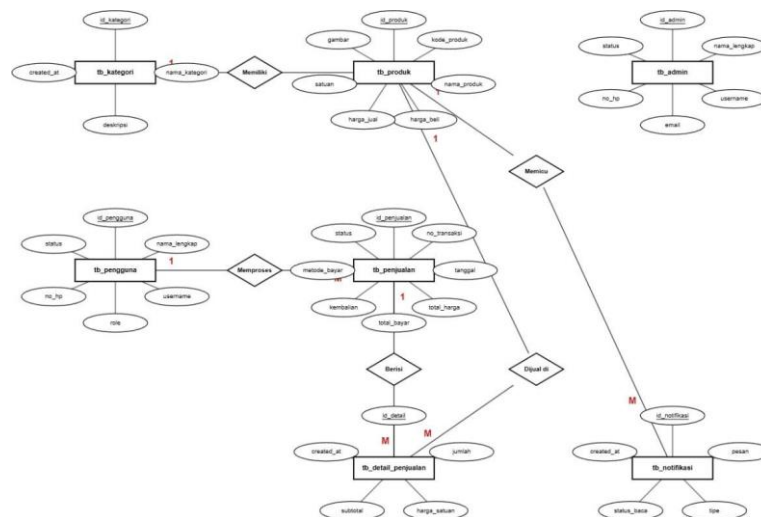


Figure 5. Entity Relationship Diagram (ERD) of the System

2.3 Testing Method

System testing was carried out using the Black Box Testing method, which focuses on the system's functionality without considering the internal structure of the program code. Testing was conducted by providing specific inputs to the system and then comparing the resulting outputs with the expected results based on predefined real usage flows (use cases).

3. RESULTS AND DISCUSSION

The web-based sales information system for DuabelasShop Bengkulu was developed to facilitate online product sales, enabling the business to reach a wider customer base without being limited by location or time, while also improving the efficiency of managing product data, transactions, and sales reports. The system was designed with two main sides: the admin side and the user (customer) side. On the admin side, the system provides features to manage product and category data, as well as monitor and manage incoming orders. On the user side, the system allows customers to view the product catalog, perform searches, add products to the cart, and complete the checkout process online.

3.1 System Interface

The home page (Figure 3) displays the main navigation menu consisting of Home, Store Info, Products/Catalog, and Contact, equipped with a search field and Login and Register buttons. Below the navigation bar, a promotional banner for the latest products is displayed, along with a featured products section showcasing several selected items so that visitors can immediately view the store's best collection. On the customer side, the system also provides a store information page, a product catalog with filtering features by name, category, and price range, a product detail page, a shopping cart, a checkout page, and options for shipping and payment methods (bank transfer, QRIS, or cash on delivery).

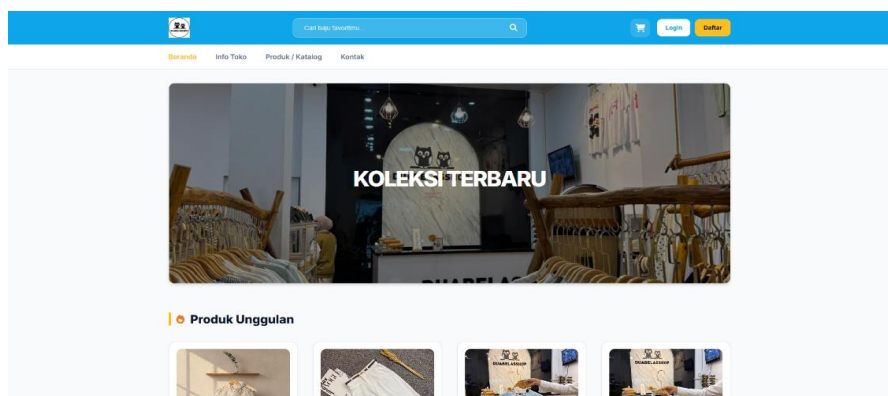


Figure 3. Home Page of the System

On the admin side, the system provides a dashboard page (Figure 4) that displays a summary of important data such as the total number of products, registered customers, incoming orders, and total revenue in the form of statistic cards. Through the navigation panel, the admin can access menus for managing products, categories, orders, customers, and sales reports. The product management feature allows the admin to add, edit, and delete product data, while the order management feature allows the admin to update order status from confirmation to completion. The sales report feature presents a recap of transactions based on a selected date range, which can be printed or exported for business evaluation purposes

Product List or catalog page of the DuabelasShop application which can be accessed through the Product/Catalog menu. On the left side there is a Product Filter panel that allows visitors to filter products by name, category, minimum price, and maximum price, equipped with Apply Filter and Reset buttons. The main area displays information that the system displays 3 products, with the Newest sorting option in the upper right corner. The three products displayed are Polkadot Blouse priced at Rp 135,000 in the Shirt category, Belt Culottes priced at Rp 129,000 in the Pants category, and Blouse priced at Rp 155,000 in the Shirt category. Each product card is equipped with an item photo, a colored category label, product name, red price, and two action buttons, namely Order and Details.

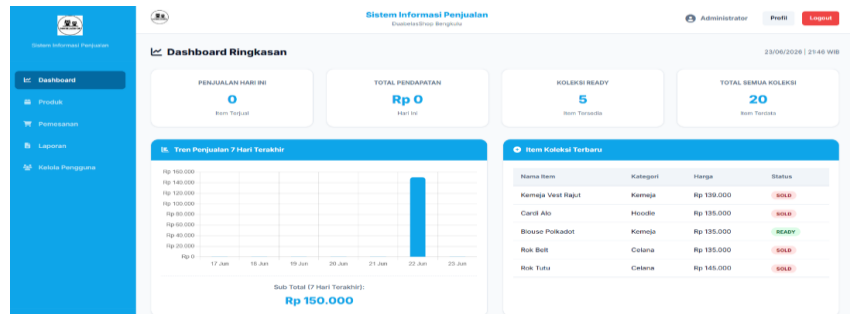


Figure 4. Admin Dashboard Page

3.2 Black Box Testing

System testing was carried out by the admin using the Alpha testing method with a Black Box approach, which is functional testing of the system without regard to the internal logic structure of the software. Testing was conducted on 19 scenarios covering registration, authentication, product and category management, shopping cart and checkout processes, order status updates, and sales report generation. The test results are presented in Table 1.

Table 1. Black Box Testing Results for the DuabelasShop Sales Information System

No	Test Scenario	Input	Expected Output	Result
1	Customer account registration	Filling in all registration data correctly	System saves data and the account is successfully created	Passed
2	Registration with empty data	Not filling in the registration form	System displays a validation message	Passed
3	User login	Correct email and password	System enters the user dashboard	Passed
4	Login with wrong password	Incorrect password	System displays a login failure message	Passed
5	Product search	Entering a product name	System displays the searched product	Passed
6	Viewing product detail	Clicking the product detail button	System displays complete product information	Passed
7	Adding a product to the cart	Clicking the add-to-cart button	Product is added to the shopping cart	Passed
8	Changing product quantity	Changing the order quantity	Total price is updated automatically	Passed
9	Removing a product from the cart	Clicking the remove button	Product is removed from the cart	Passed
10	Order checkout	Filling in shipping data	System saves the order	Passed
11	Viewing order history	Opening the History menu	System displays transaction data	Passed
12	Editing user profile	Changing profile data	Profile data is successfully updated	Passed
13	Adding a product (admin)	Filling in product data	Product is successfully saved	Passed
14	Editing product data	Editing product data	Product data is successfully updated	Passed
15	Deleting a product	Clicking the delete button	Product is successfully deleted	Passed
16	Adding a category	Filling in a category name	Category is successfully added	Passed

No	Test Scenario	Input	Expected Output	Result
17	Updating order status	Changing transaction status	Order status is successfully updated	Passed
18	Viewing sales report	Selecting a date range	System displays the sales report	Passed
19	Admin logout	Clicking the logout button	System exits the admin dashboard	Passed

Based on the test results in Table 1, all 19 test scenarios showed a “Passed” result, meaning that every system function—from user registration and authentication, product and category management, shopping cart and checkout processes, order status updates, to sales report generation—operated in accordance with the expected output. These results are consistent with previous studies indicating that Black Box Testing is effective in verifying the conformity of web-based sales information system functions with user requirements [9], [11]. Therefore, the web-based sales information system built for DuabelasShop Bengkulu is declared feasible for supporting a more accurate, real-time, and organized sales recording process compared to the previously used manual recording system.

4. CONCLUSION

Based on the design, implementation, and testing that have been carried out, it can be concluded that the web-based sales information system for DuabelasShop Bengkulu was successfully designed and built using the PHP programming language and a MySQL database with the Agile development method. The system provides two types of access rights: the admin, who can manage product, category, order, customer, and sales report data, and the customer, who can register, log in, view the product catalog, add products to the shopping cart, complete checkout, and view order history. The shopping cart, checkout, and sales report features available in the system facilitate the transaction process and help the admin monitor revenue over specific periods. The Black Box Testing results for 19 main system function scenarios show that all functions run well according to the requirements and specifications that were designed, so the system is declared feasible for supporting the sales process at DuabelasShop Bengkulu

5. ACKNOWLEDGMENTS

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