Design and Build a Web-Based Digital Thrifting Product Marketing System at Muhhasecond

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Abstract

The thrifting industry or the sale of used products that are suitable for use is growing in Indonesia, especially among the younger generation. However, most thrifting business actors still use manual marketing through social media, so market reach is limited, transaction recording is less systematic, and product data management is inefficient. This research aims to design and build a web-based thrift product marketing system on Muhhasecond as a solution to improve the effectiveness of promotions and sales processes. The developed system provides a structured product catalog, ordering features, and automatic management of sales data and reports for admins. The research method uses the Waterfall model, including needs analysis, design, implementation, testing, and maintenance. The expected result is a web-based application that is able to expand marketing reach, increase operational efficiency, and support the competitiveness of Muhhasecond's thrifting business in the face of digital developments.

Keywords: Thrifting; web-based system; digital marketing; Muhhasecond and Waterfall model.

I. INTRODUCTION

The phenomenon of thrifting or the sale of second-hand goods is increasingly in demand, especially among millennials. In addition to more affordable prices, thrifting is also an alternative fashion trend as well as a solution in reducing clothing waste (fast fashion). However, the thrifting sales system that still relies on bazaars or social media such as Instagram is considered not optimal. This raises various problems, including limited marketing reach, prone to fraud, excessive consumption due to low prices, to manual revenue recording so that it is prone to errors.(Laela Laela & Yudhistira Arie Wijaya, 2023). The development of information technology has had a significant impact on various sectors, including the fashion industry. One of the trends that is growing rapidly is thrifting, which is the sale of used fashion products that are still feasible.

Thrifting is not only a solution for people who want quality products at affordable prices, but also contributes to the eco-friendly movement through the reduction of textile waste.Muhhasecond is one of the thrifting business actors engaged in the sale of used fashion products. So far, the marketing and sales system is still carried out simply through social media and direct interaction with customers. This poses several obstacles, including: limited marketing reach, difficulties in managing product data, lack of a structured catalog system.Seeing these opportunities and challenges, a web-based digital thrifting product marketing system is needed that can expand market reach, present product information in a structured manner, and simplify the transaction process between sellers and buyers. It is hoped that Muhhasecond will be able to increase marketing efficiency, strengthen competitiveness, and provide a better shopping experience for consumers.

Table 1. GAP Research

Yes	Researcher	Key Features	Weaknesses / Gaps	Compatibility with current research
1	Laela & Yudhistira (2023)	Sales website thrifting, transactions, revenue recording	Not yet focused on structured catalogs, no stock management and automated reports yet	This research adds a structured catalog, stock management, and automated reports
2	Windihastuty et al. (2025)	WordPress e-commerce website for increased sales	Limited features as per plugin, less flexible to thrifting needs (unit items, different conditions)	This research uses a web-based custom system so that features can be made more specific according to Muhhasecond's business
3	Arsando et al. (2024)	Web-based thrifting e-marketing for promotion	Marketing focus, not emphasizing transaction systems and data management	This research combines marketing, product catalogs, transactions, and admin data management in one system

The conclusion of previous research has developed a web-based thrifting sales system, but it still has limitations in poorly structured catalogs, the absence of unit stock management, and the unavailability of automated sales reports. Therefore, there are still research gaps that need to be filled so that the thrifting system can run more optimally.

II. METHODS

Research methods are systematic steps used to collect, analyze, and interpret data to achieve research objectives. In this study, the approach used is Applied Research, which is a type of applied research that focuses on solving real problems through the application of technology. Applied Research was chosen because this research not only produced theoretical concepts, but also produced a web-based thrifting product marketing system that could be directly used by Muhhasecond to improve operational and marketing efficiency. To obtain accurate data in the process of analysis and system design, this study uses the following three data collection techniques:This stage is carried out by collecting references from books, journals, scientific articles, and previous research related to marketing information systems, e-commerce, thrifting, and software development methods. Literature studies are conducted to build a strong theoretical foundation as a reference in system design. Observations were carried out directly on the operational processes at Muhhasecond, including marketing activities through social media, transaction processes between admins and customers, sales recording, and product data management. Through this observation, a clear picture of the business flow that runs and various problems faced in daily operations is obtained. In addition, interviews were also conducted with the owners and admins of Muhhasecond to obtain more in-depth information about the obstacles faced, system needs, and expected features.

This interview also serves to validate the results of observations and help in determining the priority of features to be developed in web-based applications. In the development of this application, the Waterfall method is used, which is one of the software development models that has a systematic and sequential structure, where each stage must be completed first before proceeding to the next stage. This method is analogous to a waterfall flow that flows from top to bottom gradually. The first stage is analysis, which is carried out through literature studies, observations, and interviews to identify and formulate system needs. At this stage, an understanding of business processes at Muhhasecond is carried out and the determination of functional needs such as product catalogs, stock management, sales transactions, and sales reports, as well as non-functional needs such as data security and ease of system access.The next stage is design, which is the process of designing the application architecture, user interface, and database structure. At this stage, various modeling is used such as a Use Case Diagram to describe the function of the system, a Sequence Diagram to show the flow of interaction between components, and a Class Diagram to design the system data structure.

Once the design is complete, the implementation stage is carried out by translating the system design into program code using the PHP programming language with the CodeIgniter framework that implements the Model-View-Controller (MVC) architecture. Data storage uses a MySQL database to store product, transaction, and customer data in a structured and easily manageable manner.The next stage is testing, which is carried out using the Black-box method, which is a test that focuses on the compatibility between input and output without paying attention to the internal structure of the code. Testing is carried out on the main functions of the system such as product management, transaction processes, stock management, and report generation to ensure the system runs according to needs. The last stage is maintenance, which is carried out after the system is used operationally, including fault repair, performance improvement, and feature adjustments according to user needs and feedback to keep the system running optimally. Through this data collection method and Waterfall-based system development method, it is hoped that the thrifting product marketing system at Muhhasecond can increase marketing effectiveness, improve the accuracy of data management, and simplify the transaction process for customers.

III. RESULT AND DISCUSSION
System Planning

In the system design stage, data flow diagrams (DFDs) and entity relationship diagrams (ERDs) are used as modeling approaches. This approach was chosen because both can provide a clear picture of the data flow and inter-entity relationship structure required for Atika's cashier and store inventory management information system.

1. Data Flow Diagram (DFD)

DFD is used to describe how data flows in the system and how the processes interact with each other. In the muhhasecond thrifting ordering system, the main data flow is centered on the sales transaction process, stock management, payment recording, and report creation.1.
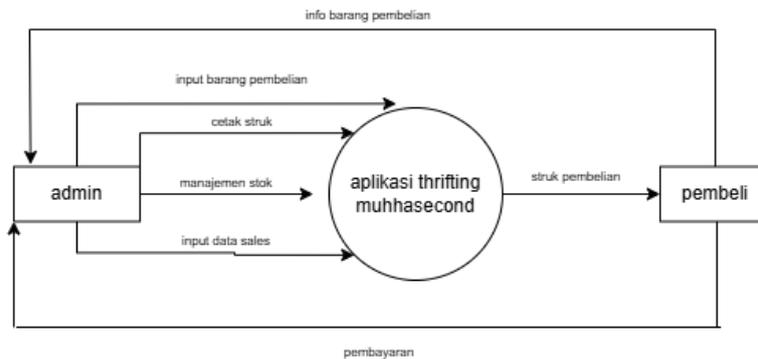
Fig 1. DFD Level 0

The DFD Level 0 (Context Diagram) on the Muhhassecond Thrifting Application system describes the interaction between the system and two external entities, namely the admin and the buyer. Admins manage item data and monitor transactions, while buyers use the system to view catalogs and make purchases. All input from admins and buyers is processed by the system to produce outputs in the form of item information, order status, and transaction data. Because they are overview, DFD Level 0 does not display the details of internal processes, but rather only the flow of data between external entities and the system.
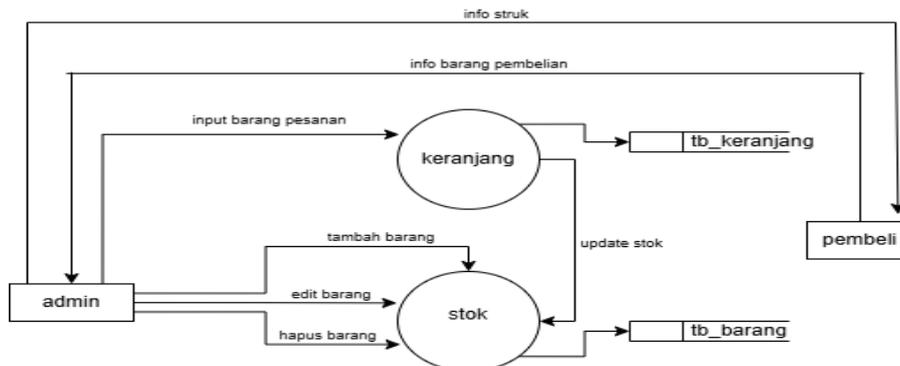

Fig 2. Dfd Level 1

DFD Level 1 in the Muhhassecond Thrifting Application system is a development of a context diagram that displays the main processes in more detail, namely the cart process and the stock process. The cart process manages the buyer's activity in selecting and storing items into the tb_keranjang, while the inventory process manages the inventory of items that are done by the admin and stored in the tb_barang. The flow of data between admins, buyers, system processes, and data stores at this level is shown in more detail than at Level 0, but it is still general without explaining the internal logic of the system in depth.

2. ERD

The ERD of the Muhhassecond Thrifting App describes the relationship between the admin entity, the item, the cart, and the checkout. Admins manage item data, while buyers select items stored in carts and checkouts. This ERD shows the interconnectedness of data on goods, orders, and purchase transactions in the system.
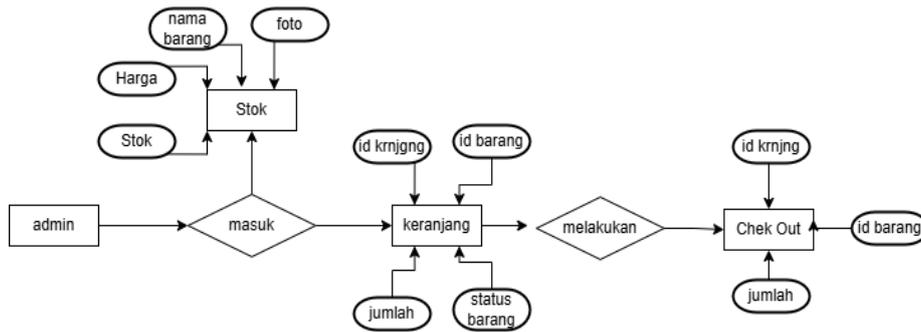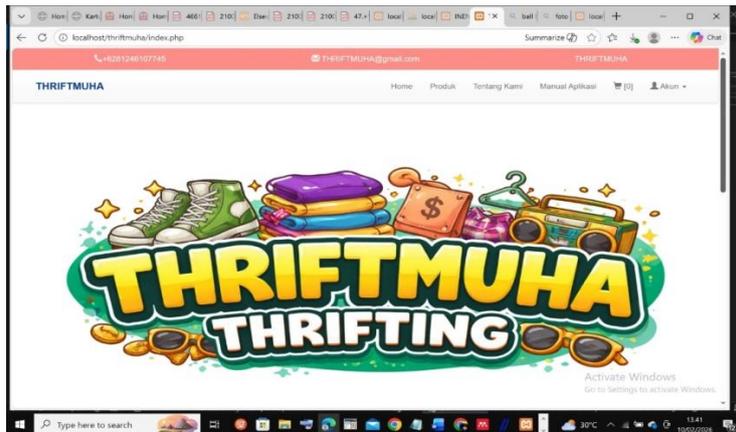
Fig 3. ERD
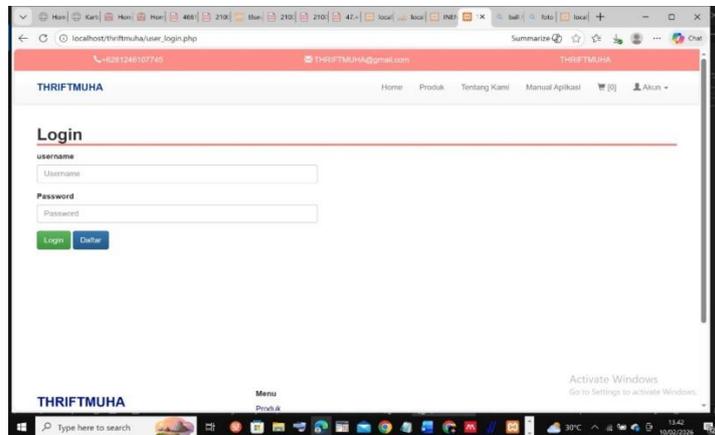
Implementation

Home

Fig 4. Home

Login page

Fig 5. Login Page
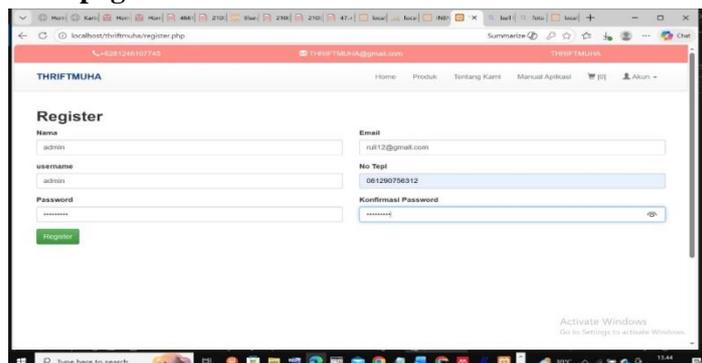
Account registration page

Fig 6. Account registration page
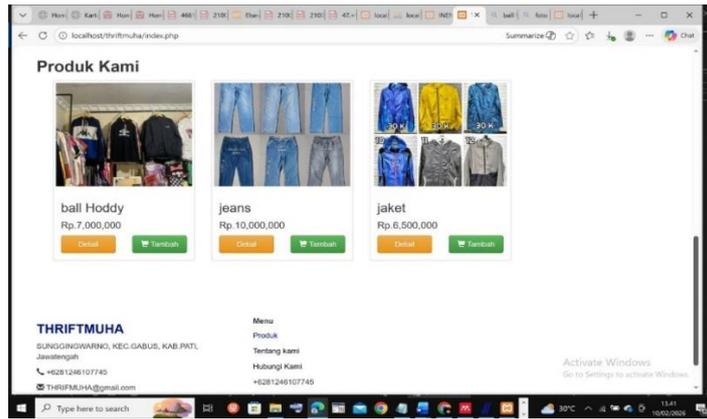
Product Page

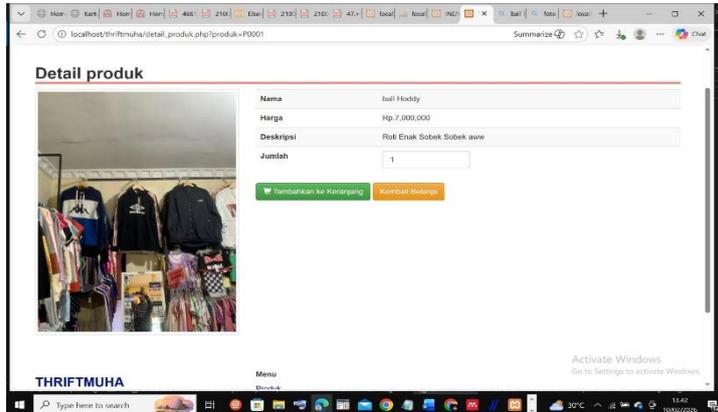**Fig 7.** Product Halam

Product detail page

Figure 8. Product detail page
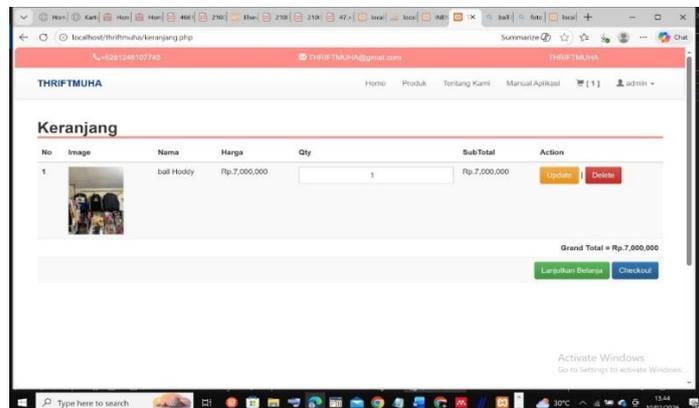
Cart page

Fig 8. Cart page

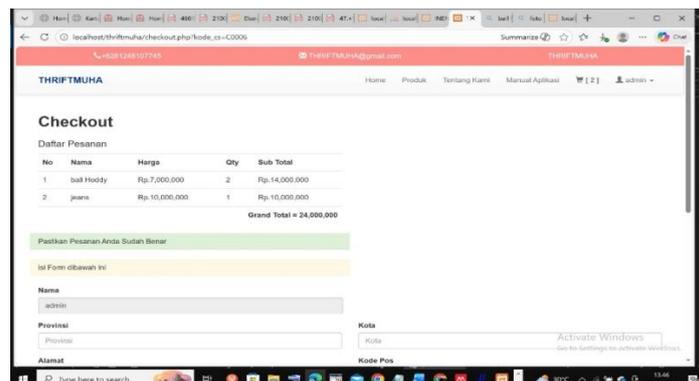**Checkout page**

Fig 9. Checkout page
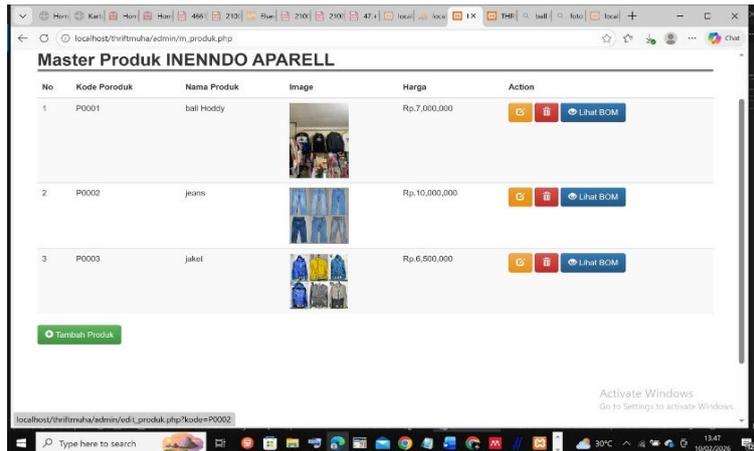
Manage products admin page

Fig 10. Manage products admin page

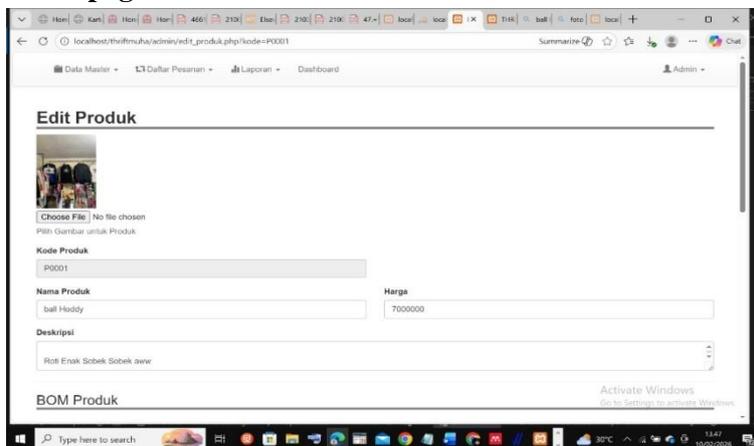**Product edit admin page**

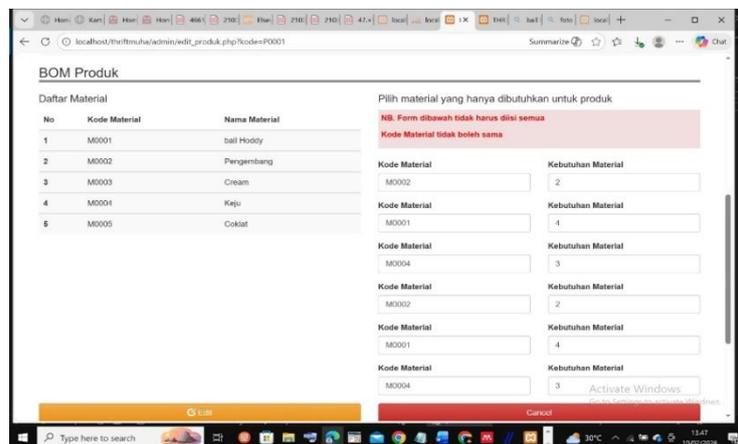**Fig 12.** Product edit admin page

Product bomb

Fig 13. Product BOM admin page

System testing

Syestem testing is a test used to find errors in the application system, such as errors in application functions or menus that do not appear. In other words, Black Box Testing is a testing method that focuses on the functionality of an application system. In this test, random input data is used to check whether the results are acceptable. It is said definitely, meaning that if the data entered is wrong, the system will reject it and the data cannot be stored in the database. However, if the input data is correct, then the data can be received and stored in the information system database. [10].

Table 2. System Testing

Tested Modules	Input/Condition Data	Expected Results	Test Results
Login	Fill in your username and password correctly	The system displays the user's main page	Valid
	Filling in the wrong username or password	The system rejects login and displays an error message	Valid
Account Registration	Fill out the entire registration form correctly	The account was successfully created and stored in the database	Valid
	Blank one of the registration fields	System rejects registration	Valid
Product Page	Access the product catalog page	A complete list of products	Valid
Product Details	Choosing a product	The system displays product details	Valid
Cart	Add products to cart	The product successfully went to the cart	Valid
	Add products without selecting the quantity	System rejects and displays warnings	Valid
Checkout	Checkout with complete data	The checkout process was successful	Valid
	Checkout without complete data	Checkout process failed	Valid
Admin Manage Products	Fill out the add form correctly	Product data is successfully saved	Valid
	Blank the add product form	Product data failed to be saved	Valid
Product Edit Admin	Change product data	Product data is successfully updated	Valid
Admin Delete Product	Delete product data	Product data was successfully deleted	Valid

IV. CONCLUSION

The web-based thrifting application on Muhhassecond has been successfully developed to support digital product, transaction, and marketing management. This system makes it easier for admins to manage data and provides convenience for buyers to place orders. The test results show that all features are running well and validly, so the application is considered suitable for use to increase the efficiency and competitiveness of thrifting businesses.

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