Design of a Web-based Production and Sales Management Information System for the Small Business Convection Industry

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Article Info	ABSTRACT
Corresponding Author: Samuel Ramos E-mail: samuel.pakpahan@ubk.ac.id	This research aims to develop a web-based information system to overcome production and sales management problems in the small-scale convection industry. The main problem faced is the lack of efficiency due to manual recording, which causes errors in stock management, ordering, and production. The solution offered is to design an information system with key features such as raw material stock management, customer ordering, production management, and sales reports. The system was developed using the Waterfall method and implemented to optimize production and sales management. The development results show an increase in operational efficiency through real-time stock monitoring, faster order processing, and accurate report generation. System testing ensures that all features function properly and can meet business needs in improving efficiency operationally. **Keywords:** Information Systems, Production Management, Web-Based System, Sales Management

INTRODUCTION

Micro, Small, and Medium Enterprises are central to the Indonesian economy, especially in the garment industry sector. One example is Cipta Busana Konveksi, a garment business located in West Java. This business has grown rapidly and has succeeded in attracting many customers, both local and outside the region. However, along with this growth, Cipta Busana Konveksi faces operational challenges in terms of production and inventory management which still uses conventional methods.

In the digital era, MSMEs such as Cipta Busana Konveksi require an integrated information system to help manage production, sales and inventory more efficiently . This study aims to develop a web-based information system that can help small businesses overcome these operational constraints and improve the efficiency of their sales business (Pradnyani et al., 2024; Riyanti et al., 2024).

The main problem faced by Cipta Busana Konveksi is the lack of efficiency in stock management and ordering. Manual recording causes errors in monitoring raw material inventory, which leads to stockpiling or shortages of raw materials when needed. In addition,

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the ordering and sales process carried out manually results in delays in information to customers, which affects customer satisfaction (Fahri, 2022; Hasyim et al., 2023; Jabid, Abdurrahman, et al., 2023; Jabid, Syahdan, et al., 2023) and operational efficiency(Ramli et al., 2022).

With the increasing need for an efficient system in managing production and inventory, the development of web-based information systems (Alfiansyah et al., 2023; Denih et al., 2022; Ramadhan et al., 2022)becomes very important for MSMEs such as Cipta Busana Konveksi. This information system will help small businesses to increase visibility in the supply chain, simplify order management, and optimize the production process. The urgency of this research lies in the ability to increase the competitiveness of MSMEs through the use of better technology (Hutahaean et al., 2023; PUTRA & GUNAWAN, 2021; Suryadana & Sarasvananda, 2024).

This study aims to design and build a web-based production and sales management information system at Cipta Busana Konveksi using the Waterfall method. This system is expected to overcome existing operational constraints and increase efficiency in inventory management, production, and sales (Aristana et al., 2024; Dewi et al., 2024). By implementing the waterfall method, it can provide convenience in the design process to the implementation of information systems, because it can be done in structured stages (Budiman et al., 2024; Pratiwi et al., 2024; Putri et al., 2024).

Research contribution in developing effective information systems for convection UMKM. The developed system will be an example of how information technology can be applied on a small business scale to improve business efficiency and customer satisfaction. In addition, the results of this study can also be used as a reference for other UMKM who want to apply similar technology.

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METHOD

To develop the proposed web-based information system, the Waterfall system development method is used. The Waterfall method is a systematic and sequential approach to software development. The waterfall model is the simplest SDLC (Software Development Life Cycle) model (Meol et al., 2024; Nurninawati et al., 2023; Rachmad et al., 2023; Sudipa et al., 2023). This model is only suitable for software development with specifications that do not change. which consists of several stages as follows:
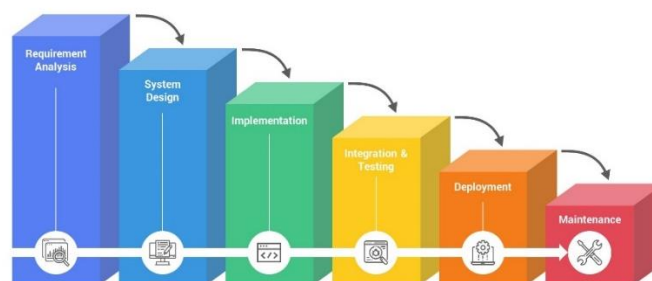

Figure 1. Waterfall Method Phase

Needs Analysis: At this stage, an analysis of the functional and non-functional needs of the system is conducted based on interviews with the owner and employees of Cipta

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Busana Konveksi. The need for features such as stock management, ordering, production, and sales reports are identified.

System Design: After the needs are analyzed, the next stage is to design the system architecture, which includes the design of the user interface (UI), database, and process flow of the information system. This design will be used as a guide in the development stage. Development: At this stage, coding or system development is carried out using the PHP programming language and MySQL as a database. The system will also be built with the Bootstrap framework so that the web display becomes responsive. Testing: After development is complete, the system will be tested to ensure all features are working as required. This testing includes testing the functionality, performance, and security of the system. Implementation: After the system is tested and improved, the system will be implemented in Cipta Busana Konveksi. Employees will be trained to use the system, and the system will begin to be used in daily operations. Maintenance: After implementation, system maintenance is performed to ensure the system is running properly, and repairs are made if errors occur or improvements are needed.

RESULTS AND DISCUSSION

Requirements Analysis and System Design

System requirement analysis is a stage to analyze the needs required in creating a system. Functional requirement analysis contains what processes will be carried out by the production and sales management information system, namely the system can log in and validate for users on the system, namely admin, production, warehouse and owner.

This systemcan search, add and make changes to product data, customers, customer orders, sales, access to this feature is intended for admins.

This systemcan search, add and make changes to raw material and production data, access to this feature is intended for the production section. This system can search, add and make changes to raw material purchasing data, suppliers and stock opname, access to this feature is intended for the warehouse section.

This system can display and print various sales reports, production reports, purchase reports, sales reports.

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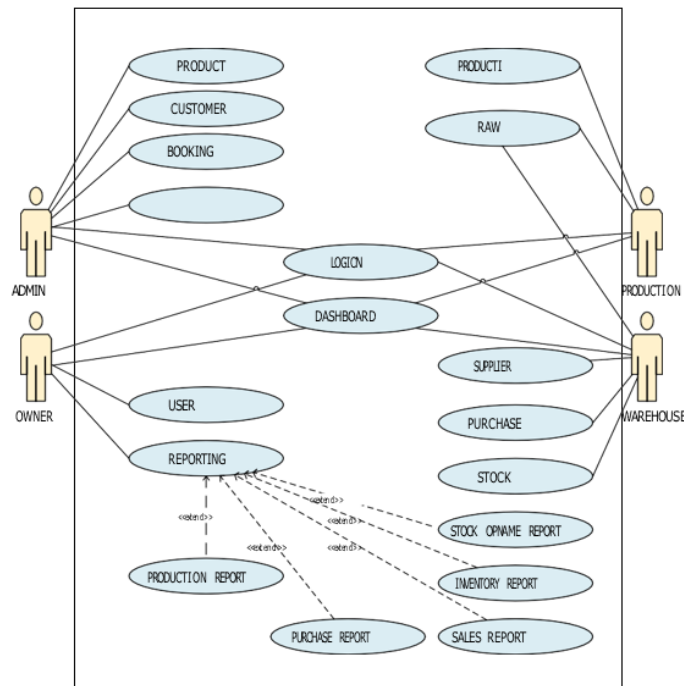
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Figure 2. Usecase Diagram Design

In this use case diagram, there are actors, namely Admin, Owner, Production, and Warehouse. Admin is an actor who can manage product data, customer data, customer orders, sales and can access the Dashboard on the system. Owner is an actor who can manage user data, reports and can access the Dashboard on the system. Production is an actor who can manage raw material data, supplier data, manage stock taking data and raw material purchases and can access the Dashboard on the system. Warehouse is an actor who can manage raw materials and production data and can access the Dashboard on the system.

System Implementation
Product Dataview Implementation

Implementation of product dataview is a display used to view overall product data that has been stored in the system. On this page, a table containing product data is displayed with product data search functionality and a button that will direct the user to the add product page, for each row in the table, if clicked will direct the user to the edit/detail product data page. This page can be accessed by the admin.
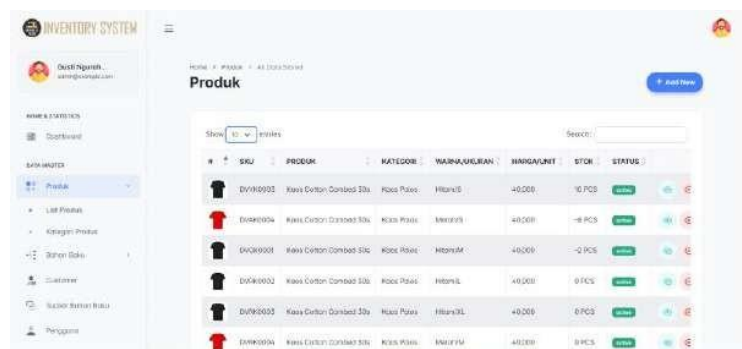

Figure 3. Product Dataview

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Implementation of Change Production Data

Implementation of changing production data is a display used by each user to perform the process of changing production data. On this page, details of production data will be displayed. On this page, if the user wants to make changes to production data, the user must update the number of productions that have completed progress and press the "Update All" button.
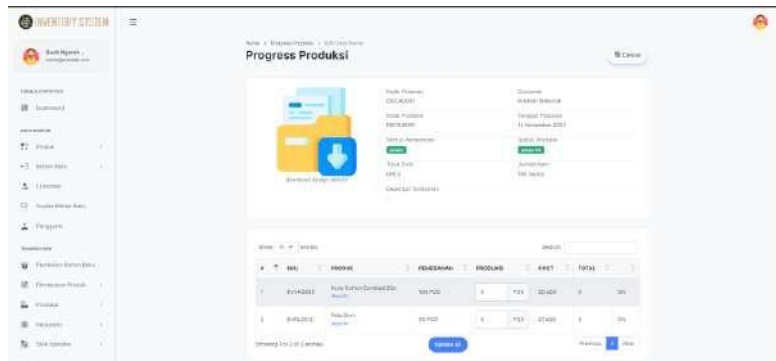

Figure 4. Change Production Data

Customer Order Dataview Implementation

The implementation of customer order dataview is a display used to view overall customer order data that has been stored in the system. On this page, a table is displayed containing customer order data with order data search functionality and a button that will direct the user to the add customer order page, for each row in the table, if clicked will direct the user to the edit/detail customer order data page. This page can be accessed by the admin.
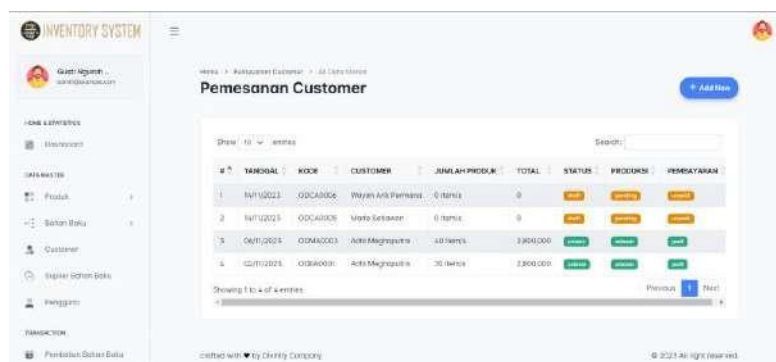

Figure 5. Customer Order Page

Sales Report Implementation

The implementation of the sales report is a display used by system users to view sales reports. The report will present information about product sales every month. Users can download the report in .pdf format by pressing the "download" button in the upper right corner of the page. This page can be accessed by the owner.
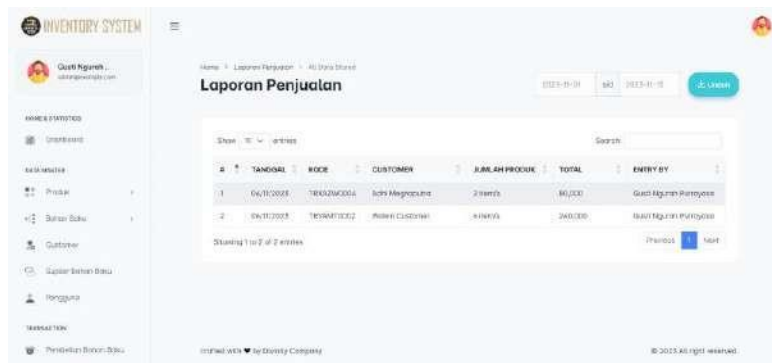
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Figure 6. Report Pages

BlackBox Testing

Blackbox Testing is a testing method that focuses on system functionality without regard to the internal structure or program code. This test evaluates whether the system functions according to predetermined requirements, by providing input and checking the output without seeing how the system processes the input internally.

Table 1. Blackbox Testing Scenario

System Features	DDescriptions	Testing Scenarios	Results
Login	Verify the login process with various user roles	Users can login according to their access rights	Valid and appropriate
Product Data Management	Ensure users can add, change and delete product data	Product data can be managed correctly	Valid and appropriate
Raw Material Stock Management	Verify raw material stock management including stock additions and reductions	Raw material stocks are accurately recorded	Valid and appropriate
Ordering Process	Ensure orders from customers can be recorded and processed correctly	Customer orders can be logged and tracked for status	Valid and appropriate
Report Management	Test whether the sales report can be generated correctly and downloaded in PDF format	Reports are generated according to existing data	Valid and appropriate

Based on the table above, it can be explained that from testing the login features, Product Data Management, Raw Material Stock Management, Order Process and Report Management, testing is carried out through the access rights of each user, and the result is that each test scenario is valid and the system features are running according to the user requirements analysis.

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CONCLUSION

This research successfully developed a web-based information system for production and sales management in a small business in the garment sector. This system solves various problems related to stock management, order recording, and production tracking. The main features that were successfully built include raw material stock management, customer orders, production management, and sales and production report generation. Research implication is the system allows for more accurate recording, real-time stock monitoring, and order information that can be accessed quickly and easily. System development was carried out using the Waterfall method, and testing showed that the system functioned as expected, with increased operational efficiency in assisting management for the business.

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