

Implementation of a Web-Based Financial Management System in the AER Konveksi Embroidery Business

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Abstract: Manual financial management in Micro, Small, and Medium Enterprises (MSMEs) can lead to recording errors, delays in financial reporting, and difficulties in obtaining accurate and integrated financial information. These challenges are also encountered by AER Konveksi, an embroidery and garment business that still relies on manual financial record-keeping. This study aims to develop and implement a web-based financial management system to support the integrated management of customer data, orders, payments, income, expenses, and financial reports at AER Konveksi. The system was developed using the Waterfall method, which consists of requirements analysis, system design, implementation, testing, and maintenance. The system was implemented using PHP, HTML, CSS, JavaScript, Bootstrap, and MySQL, with XAMPP used as the local server environment. System functionality was evaluated using the Black Box Testing method. The results show that the developed system can integrate customer management, order processing, payment recording, receivables management, cash inflows and expenses, account management, Work Order (SPK) generation, transaction receipt printing, and financial reporting within a single web-based platform. Testing of 17 functional scenarios showed that all scenarios produced outputs consistent with the expected results, resulting in a 100% functional test success rate. The system therefore provides an integrated platform that can support more structured financial and operational management at AER Konveksi. However, further evaluation is required to assess non-functional aspects, such as usability, security, and system performance.

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Introduction

The development of information technology in the digital era has had a significant impact on various business sectors, including Micro, Small, and Medium Enterprises (MSMEs). The use of information technology is no longer merely a communication medium but has also become a primary tool in supporting operational processes, data management, and business decision-making. Digitizing business processes can improve the effectiveness, efficiency, and accuracy of data management, thereby helping businesses increase their competitiveness. The implementation of web-based information systems allows for integrated data storage, easy access, and accelerates information processing (Akhmad & Purnomo, 2021).

Financial management is a crucial aspect of business sustainability. Good financial management allows business owners to accurately assess their financial condition by recording income, expenses, receivables, and payables, as well as preparing financial reports. However, many MSMEs still record transactions manually, making them vulnerable to errors, data loss, delays in reporting, and difficulties in obtaining accurate financial information for decision-making. The use of web-based information systems has been shown to improve the quality of transaction recording and expedite the preparation of financial reports (Sholeha et al., 2025).

The embroidery and garment manufacturing business is a MSME sector with quite complex transaction activities, involving the management of customer data, orders, raw material purchases, payments, operational expenses, customer receivables, and financial reporting. If all processes are still carried out manually, the risk of recording errors, data duplication, and delays in reporting will increase, which can impact the quality of decision-making by business owners (Apriyandi, 2025).

AER Konveksi is a business engaged in embroidery and convection services that serves various orders for embroidered clothing, uniforms, and other convection needs, located at Jl. Ketintang Baru XIII No. 6, Ketintang, Gayungan District, Surabaya City. Based on the results of observations and interviews, the financial management process at AER Konveksi is still carried out manually using a book of records, so that the process of searching for transaction data, recapitulating payments, recording expenses, and preparing financial reports takes a relatively long time. This manual recording process also increases the risk of calculation errors, data loss, and discrepancies between transaction data and actual financial conditions, as found in various studies on financial management of MSMEs that still use manual systems (Budiman et al., 2026). Another problem found is the unavailability of a system capable of integrating all financial data in one database, so that customer data, order transactions, payments, receivables, expenses, and financial reports are still stored separately and make it difficult for business owners to monitor financial conditions comprehensively.

Based on a review of previous research, most similar studies have focused solely on developing financial information systems for MSMEs in general, retail stores, and educational institutions (Ayem et al., 2024). Research specifically developing financial management systems for embroidery and garment manufacturing businesses with integrated features—including customer data management, order transactions, payments, expenses, receivables, and financial reporting—is still relatively limited (Maulidiawati et al., 2025). Thus, there remains a research gap that opens up opportunities to develop systems that better suit the operational needs of embroidery and garment manufacturing businesses, particularly in the AER Konveksi. The novelty of this research lies in the full integration of embroidery business processes—from customer orders, payment validation, printing Work Orders (SPK), to cash recording and financial reporting—in a single web-based system that directly involves two user roles (admin and customer).

Based on the description, the formulation of the research problem is: (1) how is the current financial management process at AER Konveksi; (2) how to design and build a web-based Embroidery Business Financial Management System that suits the operational needs of AER Konveksi; and (3) how are the results of testing the system to ensure the system functions

according to user needs. The research is limited to the process of managing income, expenses, payments, receivables, and preparing financial reports used by the admin/business owner, as well as functional testing of the system. The purpose of this research is to analyze the current financial management process, design and build a system that suits the needs, and test the system to ensure all functions run according to user needs so as to increase the effectiveness of financial management at AER Konveksi.

Literature review

Information Systems. An information system is a system consisting of a set of interrelated components—humans, hardware, software, databases, procedures, and communication networks—that work in an integrated manner to collect, process, store, and present information to support operational activities, coordination, and decision-making within an organization (Aryani et al., 2023; Effendi et al., 2023). The quality of an information system is influenced by the quality of the system, the quality of the information, and the quality of the services provided to users (Sari et al., 2023).

Financial Management System. A financial management system is a system used to manage all of an organization's financial activities in an integrated manner, from recording transactions, managing income and expenses, controlling cash flow, managing receivables and payables, to preparing financial reports as a basis for decision-making. The implementation of an information technology-based financial management system enables automated data processing, thereby increasing the speed, accuracy, and precision of financial information and minimizing manual recording errors (Pratiwi, 2023). Research shows that implementing a web-based accounting information system can help MSMEs manage financial transactions more effectively and produce more accurate reports (Amalia, 2023; Prasakti, 2023).

Website. A website is a collection of interconnected web pages accessed via the internet using a web browser. It serves as a centralized data storage, processing, and presentation platform, allowing for fast, accurate, and real-time access to information (Juliantono et al., 2022). Developing a website-based system offers advantages over desktop applications, including eliminating the need for installation on each user's device, easier maintenance, and enabling centralized system updates (Nurnilawati et al., 2022).

Unified Modeling Language (UML). UML is a visual modeling language used as a standard in the analysis, design, and documentation of object-based software systems, including Use Case Diagrams to describe actor interactions with the system, Activity Diagrams to model business process flows, Sequence Diagrams to describe the sequence of communication between objects, and Class Diagrams for class structures and their relationships (Anardani et al., 2023). The use of UML helps reduce errors in the development stage because system requirements have been visualized before implementation (Wayahdi & Ruziq, 2023).

PHP and MySQL. Hypertext Preprocessor (PHP) is a server-side scripting programming language used to build dynamic web applications, working on the server side to process user requests, manage application logic, and communicate with databases. MySQL is an open-source Relational Database Management System (RDBMS) that supports Structured Query Language (SQL) for efficient data addition, modification, deletion, and search operations, and is easily integrated with PHP (Latifurrahman et al., 2023; Mukhlis & Santoso, 2023). Database design using Entity Relationship Diagrams (ERD) and Physical Data Models (PDM) has been proven to produce more organized database structures (Mukhlis & Santoso, 2023).

HTML, CSS, JavaScript and Bootstrap. HTML is used to create the basic structure of a web page, CSS to manage the appearance and layout, and JavaScript to add interactive functions on the client side, such as form validation and display updates without reloading the page (Sisephaputra et al., 2023; Runturambi et al., 2024; Adhimah et al., 2023). Bootstrap as a front-end framework provides ready-to-use components (navigation, buttons, forms, tables, grid systems) that support responsive design on various screen sizes, thus speeding up the interface development process (Sari & Zakaria, 2023).

XAMPP and Visual Studio Code. XAMPP is a software package consisting of Apache as

a web server, MySQL as a database management system, and PHP as a server-side programming language, which makes it easy for developers to build and test web applications locally (Sinlae et al., 2024). Visual Studio Code is used as an Integrated Development Environment (IDE) that provides syntax highlighting, IntelliSense, debugging, and Git integration features, proven to have good levels of learnability, efficiency, and memorability (Hidayah & Rofiqoh, 2024).

Research Methods

This research was conducted at AER Konveksi, an MSME in the field of embroidery and convection services located at Jl. Ketintang Baru XIII No. 6, Ketintang, Gayungan District, Surabaya City, East Java. The object of the research is the financial management system at AER Konveksi, including recording customer data, embroidery order transactions, payments, receivables, income, expenses, and preparation of financial reports. The system development method used is Waterfall, consisting of the stages of needs analysis, system design, implementation, testing, and maintenance.

Data collection technique.Data was collected through three techniques: (1) Observation, conducted by directly observing the business processes and financial management activities at AER Konveksi to identify problems in the current system; (2) Interviews, conducted with the owner of AER Konveksi to obtain information regarding operational constraints, user needs, and expectations for the system to be built; and (3) Literature Study, conducted by studying books, scientific journals, and academic references related to information systems, financial management systems, and the development technology used.

Needs Analysis.System requirements are divided into functional and non-functional requirements. The main functional requirements are presented in Table 1.

Table 1. System Functional Requirements

No	Functional Requirements	Description
1	Login	User authentication based on username and password
2	Dashboard	Displays a summary of activities and financial data
3	Manage User Data	Admin can add, change, delete and view user data
4	Manage Customer Data	Admin manages customer data who order embroidery services
5	Manage Categories & Products	Admin manages category data and embroidery products/services
6	Manage Order Transactions	The system records order transactions and their details.
7	Manage Payments	The system records payments and settlement status.
8	Manage Receivables	System for recording and managing customer receivables
9	Manage Income & Expenses	The system records all income and operational expense transactions.
10	Logout	Securely terminate user sessions

Non-functional requirements include hardware (Intel Core i7-1065G7 processor, 8 GB RAM, 512 GB storage) and software (Windows 11 Pro 64-bit as the operating system; XAMPP as the web server; PHP as the programming language; MySQL as the database; Visual Studio Code as the code editor; Google Chrome as the browser; Bootstrap, HTML, CSS, and JavaScript as interface technologies).

System Design.The design is carried out using the UML approach and database modeling. The system workflow is depicted through a flowchart involving two actors, namely the customer and the admin: the customer registers/logs in, creates an order, uploads proof of payment, waits for admin validation, until receiving confirmation of the order completion; the admin validates the payment, issues a Work Order (SPK), validates the payment, and updates the order status. The Use Case Diagram depicts two main actors (Admin and Customer) with their respective access rights—Admin manages customer data, orders, payments, receivables, income, expenses, accounts, and prints SPKs, transaction receipts, and financial reports; the Customer registers, logs in, orders, pays, and prints transaction receipts. The system behavior is then modeled through Activity Diagrams, Sequence Diagrams, and Class Diagrams.

The database design is carried out using the Conceptual Data Model (CDM) and Physical Data Model (PDM), which consist of eight main entities: Users, Customers, Orders, Order Items, Invoices, Payments, Accounts, and Expenses. Relationships between entities are formed through foreign keys: Customers are related one-to-many to Orders; Orders are related one-to-many to Order Items and one-to-one to Invoices; Invoices are related one-to-many to Payments; while Payments and Expenses are both related to Accounts because every income and expense transaction is recorded based on the account used (Petty Cash or Bank).

The interface design includes 19 functional pages, including Landing Page, Customer Registration and Login, Customer and Admin Dashboard, Product Catalog, Create Order, Upload Proof of Payment, Bill and Pay, Manage Order, Print Proof of Transaction, Print SPK, Cash In and its recapitulation, Expenses and its recapitulation, Manage Customers, and Manage Accounts.

Testing Scenario. System testing was conducted using the Black Box Testing method, which is testing that focuses on the input and output of each function without paying attention to the program code structure. The test scenario covers 17 main features of the system, including registration, login, product catalog, ordering, billing and payment, uploading proof of payment, customer/catalog/order management, recording cash inflows and outflows, account management, and printing documents (invoices, transaction receipts, SPK, cash inflow recapitulation, and expenditure recapitulation).

Results and Discussion

This research was conducted through several systematic stages, as shown in Figure 1. The first stage was problem identification through observation of the order and financial management processes at AER Konveksi. The identification results showed that recording customers, orders, payments, cash inflows, and expenses was still done manually, which risked recording errors, data loss, and delays in preparing financial reports.

The next stage is data collection through observation, interviews, and literature review. The data obtained is then used to analyze user needs and determine the functions that must be available in the system. After the system requirements are determined, the research continues with the design of the interface, business processes, and database structure. The design results are then implemented into a web-based application. The completed system is then tested using the Black Box Testing method to ensure each function produces output that meets user needs. The final stage is analyzing the test results and drawing conclusions based on the system implementation results.

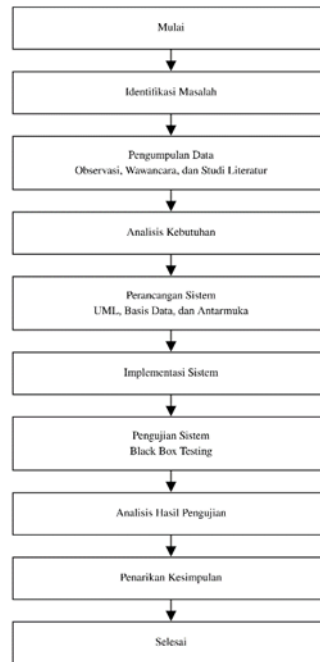


Figure 1. Research Flowchart

The flowchart in Figure 1 is a research flowchart, not a system flowchart. The diagram depicts all stages of the research, from problem identification to conclusion drawing. Systematically organizing the research stages helps ensure that the system developed aligns with the problems and operational needs of AER Konveksi.

1. System Implementation

The Web-Based Embroidery Business Financial Management System at AER Konveksi was implemented based on the results of the needs analysis and design that had been carried out. The software and technology used in the development process consisted of XAMPP as a local server, Visual Studio Code as a code editing application, and HTML, CSS, and JavaScript to build the structure, design, and interaction of the system interface. The use of these tools supports the application development and testing process in a local environment before the system is used by users.

The system has two types of users: customers and administrators. Each user has different features and access rights. Customers can access features related to ordering and payments, while administrators are responsible for managing operational data and financial transactions. This allocation of access rights ensures that each user can only perform functions within their authority.

2. Customer Feature Implementation

The customer feature is designed to make it easier for customers to obtain product information, place orders, monitor order status, and complete payments without having to visit or contact AER Konveksi in person for each transaction stage. Before accessing the system, customers register by entering their full name, telephone number, address, username, and password. Customers who already have an account can log in using their registered account details.

After a successful login, customers are directed to the Customer Dashboard, as shown in Figure 2. The Customer Dashboard serves as the main page and navigation center for customers. This page provides access to the product catalog, order creation, order list, billing and payments, and customer profile. The information displayed on the dashboard

helps customers understand available features and access each transaction stage through a single main page.

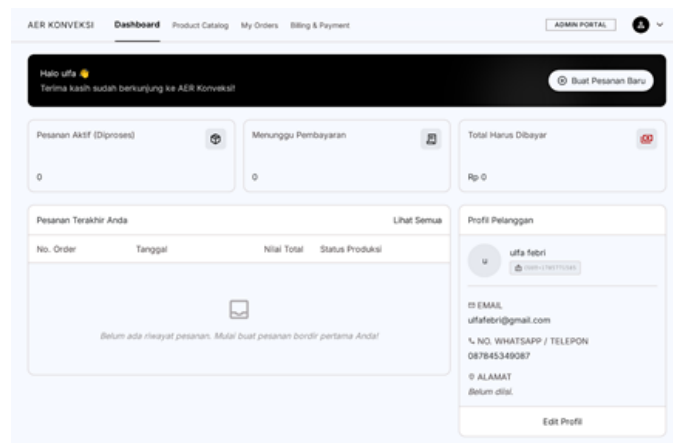


Figure 2. Customer Dashboard View

The Customer Dashboard is designed with a simple navigation menu to allow users to easily navigate from one page to another. Customers can browse products through the catalog before placing an order. The product data in the catalog includes images, product names, descriptions, and prices, providing customers with the necessary information before deciding which embroidery product or service to order.

The Product Order page is shown in Figure 3. This page allows customers to enter order data, such as the selected product, quantity, size, unit price, and additional information. The system calculates a subtotal based on the order quantity and unit price, reducing the risk of miscalculation. Once the form is completed, customers can save the order, and the data will be forwarded to the admin for review and processing.

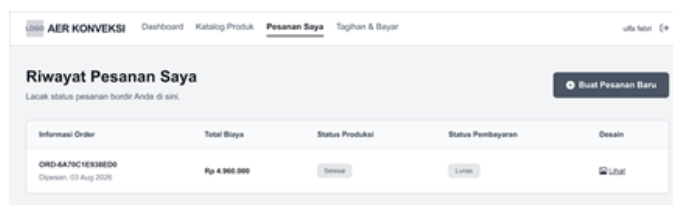


Figure 3. Product Order Page Display

The ordering feature makes order recording more structured because all information is stored in the system. Customers can also monitor the progress of their orders through the My Orders menu. Order statuses are displayed in several stages, such as Awaiting Confirmation, Processing, Completed, and Picked Up. This information helps customers track their orders' progress without having to contact AER Konveksi repeatedly.

Once the order is confirmed and the invoice is issued, the customer can access the Bill Payment page, as shown in Figure 4. This page displays the invoice number, order reference, total amount, remaining balance, and payment status. Payment statuses are categorized as Unpaid, Partially Paid, or Paid in Full, depending on the payment the customer has made.



Figure 4. Bill Payment Page View

On this page, customers can upload proof of payment if the bill has not been paid in full. The submitted proof of payment will be saved and forwarded to the administrator for verification. Once the administrator approves the proof of payment, the bill status will be updated according to the amount paid. Once the payment has been made in full, customers can print the proof of transaction as a payment document. This feature makes it easier for customers to confirm their balance and monitor their remaining balance more regularly.

3. Admin Feature Implementation

Admins have access rights to manage all operational and financial data in the system. After logging in, they are directed to the Admin Dashboard, as shown in Figure 5. The Admin Dashboard serves as the system management center and displays a summary of the number of customers, number of orders, total income, and total expenses. This information helps admins monitor business activities from a single page.

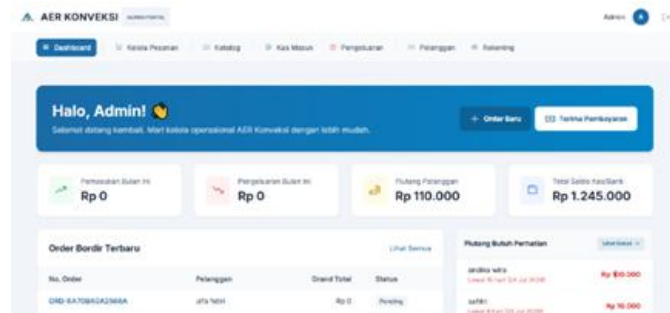


Figure 5. Admin Dashboard View

The Admin Dashboard provides menus for managing customers, orders, product catalogs, cash inflows, expenses, accounts, and reports. Admins can add, view, modify, and delete data as needed. Entered data is stored in an integrated manner, making searching, updating, and summarizing information easier than manual record-keeping.

One of the admin's key features is the Manage Orders page, shown in Figure 6. This page displays the order number, customer name, order date, product, payment amount, order status, and possible actions. Admins can view order details, update the processing status, verify payments, and print a Work Order (SPK).

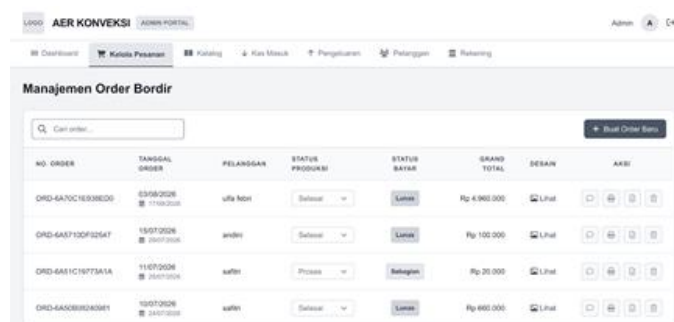


Figure 6. Manage Orders Page View

Order status updates from the admin will be displayed in the customer's account, ensuring both users have the same information regarding the order's progress. This feature helps reduce information discrepancies between customers and management. Furthermore, confirmed order data can be used to generate SPKs as guidelines for production.

The SPK document contains the SPK number, issue date, customer details, order number, product name, quantity, size, color, and additional information. The information in the SPK is derived from stored order data, eliminating the need for manual re-entry. The production department uses this document as a reference when processing orders according to customer specifications.

The Print Order Order (SPK) feature helps link the ordering process to the production process. Organizing order data into a working document reduces the risk of errors in reading quantities, sizes, colors, and additional information. The SPK can also be used as a control document to ensure orders are processed according to agreed-upon information.

In addition to printing the SPK, the admin can print a proof of transaction after the customer's payment has been successfully verified. The Print Proof of Transaction display is shown in Figure 8. The document contains AER Konveksi's identity, transaction number and date, customer data, order reference, payment details, total payment, and payment status.

AER KONVEKSI
Jl. Ketintang Baru XIII No.6, Ketintang, Kec. Gayungan, Surabaya, Jawa Timur 60231.
Kritik & Saran: 081333907352
Email: info@aerkonveksi.com

BUKTI TRANSAKSI
No. Order: ORD-6A70C1E938ED0
No. Invoice: INV-6A70C203944AE
Tanggal: 03 August 2026
Jatuh Tempo: 17 August 2026

DITUJUKAN KEPADA:
ulfa febr
Kode Pelanggan: CUS7-1785775385
T: 087845349087
E: ulfafebr@gmail.com

STATUS TRANSAKSI:
Status Pembayaran: **LUNAS**
Status Produksi: **Selesai**

* Harap simpan bukti transaksi ini sebagai bukti pemesanan yang sah.

RINCIAN PESANAN:

No	Nama Item / Detail Bordir	Qty	Harga Satuan	Total
1	Sweater	35 pcs	Rp 141.000	Rp 4.935.000
	Ukuran XXL	5 pcs	Rp 5.000	Rp 25.000
			Subtotal:	Rp 4.960.000
			TOTAL:	Rp 4.960.000
			SISA:	Rp 0

Figure 7. Printed Transaction Receipt Display

Transaction receipts can be used as administrative records for AER Konveksi and provided to customers as proof of payment. The data in the document is obtained directly from transactions stored in the system, reducing copying errors and ensuring consistency between payment data and printed documents.

Admins also gain access to cash inflow, expense, and account management features. Cash inflow is used to record funds received from customer payments, while expenses are used to record business operational costs. Each transaction includes the date, amount, account, and description. The system can generate a summary of cash inflow and expense based on recorded data. The account feature is used to manage the sources and destinations of funds, such as cash on hand or bank accounts. The integration of these three features helps admins monitor cash flow and prepare more structured financial reports.

4. System Test Results

Testing was conducted using the Black Box Testing method, which focuses on the consistency between input and output data for each function. The testing covered 17 features: customer registration, login, product catalog, ordering, billing and payment, uploading proof of payment, customer management, catalog management, order

management, cash inflow, expenses, accounts, invoice printing, transaction receipt printing, SPK printing, cash inflow summary printing, and expense summary printing.

Test results showed that all features produced output in accordance with the expected results. Registration data was successfully saved, authentication could direct users to the dashboard, orders could be recorded, proof of payment could be uploaded, and order and payment statuses could be updated. Data management functions on the admin side were also able to be run, while billing documents, transaction receipts, SPKs, and financial recaps could be displayed in a print-ready format. Thus, 17 of the 17 test scenarios were declared valid or achieved a 100% success rate.

Discussion

These findings confirm previous research findings that web-based financial management information systems can improve data management efficiency and produce more accurate reports than manual systems (Sholeha et al., 2025; Pratiwi, 2023). Unlike previous studies that generally developed financial systems for MSMEs in general or the trade sector (Ayem et al., 2024), the system in this study specifically integrates the unique business flows of embroidery and garment manufacturing businesses—from customer orders, payment proof validation, SPK issuance as the basis for the production process, to cash recording and financial reporting in a single system that directly involves two user roles (self-service for customers and full control for administrators). This integration is consistent with the findings of Maulidiawati et al. (2025) in a similar case study, which showed that a web-based financial management system in a garment manufacturing business can accelerate the financial reporting process.

The success of all test scenarios (17/17 valid) also indicates that the UML-based design approach (Use Case, Activity, Sequence, and Class Diagram) combined with CDM/PDM/ERD database modeling is effective in minimizing errors during the implementation phase, in line with the statement that visualizing system requirements before implementation can reduce development errors (Anardani et al., 2023; Wayahdi & Ruziq, 2023). The practical implication of these results is that AER Konveksi now has a centralized database that integrates customer, transaction, and financial data, thereby minimizing the risk of data duplication and accelerating the process of monitoring the business's financial condition—a need previously unmet by manual recording. The theoretical implications of this study strengthen the literature that the Waterfall method remains relevant for use in the development of MSME-scale information systems with functional requirements that have been clearly defined since the analysis stage.

Conclusion and Recommendation

Based on the results of the analysis, design, implementation and testing that have been carried out, the following conclusions can be drawn:

1. This research successfully designed and built a Web-Based Embroidery Business Financial Management System at AER Konveksi which integrates the management of customer data, orders, payments, income, expenses, cash accounts, and the preparation of financial reports in one computerized system.
2. The system built helps admins manage financial transactions more effectively and efficiently compared to manual recording, because all data is stored in an integrated database, making it easier to search for data, reducing the risk of data loss, and increasing recording accuracy.
3. The system features—order management, payment recording, income and expenses, SPK printing, transaction proof printing, and financial report presentation—have been proven to support AER Konveksi's operational activities in a more integrated manner.

4. The results of Black Box Testing on 17 functional scenarios show that all functions run validly (100%) according to the designed requirements, so that the system is declared suitable for use to support financial management at AER Konveksi.

The limitations of this research are that the testing conducted is still limited to functional testing (black box) and does not include in-depth non-functional testing such as performance, security, or system usability. Further development is recommended to: (1) add automatic notification features regarding order and payment status; (2) provide financial analytics graphs and dashboards so that business owners can monitor income, expenses, and profits more informatively; (3) add automatic database backup and restore features to improve data security; (4) develop the system into a mobile-based application or Progressive Web Application (PWA); and (5) integrate digital payments (payment gateway) and raw material inventory management so that business processes can be managed more completely.

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