



Implementation of Web-Based Sales and Stock Management Information System at Fika Shop Bali

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ABSTRACT

Fika Shop Bali faces challenges such as manual recording of transactions, inaccuracies in financial reports, and inconsistent stock data. This research aims to design and develop a web-based information system to automate the management of sales, inventory, and financial data. Using the waterfall method, this research includes analysis, design, implementation, and testing stages. The system effectively records transactions, generates real-time financial reports, and monitors reseller debt settlement automatically. This improves operational efficiency and supports strategic decision-making.

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1. Introduction

The rapid development of information technology in recent decades has brought major changes to various aspects of life, including the business world. Information systems play an important role in improving efficiency, productivity, and service quality, as well as speeding up data processing, enabling better system integration, and facilitating fast and accurate decision making. In a business context, information systems help record transactions efficiently and prepare more structured financial reports.

Fika Shop Bali, a Trading Business (UD) founded by Fika Ardiani in 2015, faces various challenges in managing its operations. Currently, they still rely on a manual system in operational management, with financial reports only made at the end of the month, so the owner must be physically present to check the report as real-time data is not available. Sales transactions and stock management still use physical receipts and paper books, which are prone to loss or damage. Recording data of owed resellers is also done manually using books, which often leads to errors in monitoring payment status or amount owed. Lack of real-time data access, errors in recording transactions, and discrepancies in stock data are some of the main obstacles faced by Fika Shop. Lost or damaged receipts are also an obstacle in the financial reconciliation process. In addition, the recording of reseller debts often leads to errors in data updates, such as recording the wrong amount of debt or not knowing the payment status accurately. If the 3-day deadline passes, the item price will automatically change to the normal price. The absence of integrated reports such as incoming goods, outgoing goods, transactions, profit and loss, and cash flow reports makes it difficult for owners to analyze business performance and make strategic decisions quickly.

To overcome these problems, it is necessary to develop a website-based information system to manage sales, stock items, and financial data automatically. This system is designed using the waterfall method which is carried out in a structured and gradual manner. This system allows the creation of reports such as reports on incoming goods, outgoing goods, transactions, profit and loss, and cash flow automatically and in real-time. With complete and accurate reports, owners can analyze business performance, determine whether the business is profitable or loss-making, and make strategic decisions faster. The system will also help monitor the duration of reseller debt repayment automatically, thus preventing errors in price adjustments. The flexibility of access through various devices such as computers, tablets, or smartphones also allows store owners to monitor and manage the business anytime and anywhere.

This research aims to design and build a website-based information system to manage sales and stock of goods at Fika Shop Bali. This research only focuses on developing information systems for managing sales and stock of goods at Fika Shop Bali, does not involve integration with other systems at Fika Shop Bali, and does not manage salaries, receipts, and taxes. The reports generated are in the form of profit and loss, transactions, receivables, stock in, and stock out which can be printed into PDF and Excel.

2. Method

Research methodology and system design for a website-based information system for sales and inventory management at Fika Shop Bali. This research was conducted from May 2024 onwards at Fika Shop, which is located at Jl. Gunung Bromo Raya No. 24, Monang Maning, Kec. West Denpasar, Denpasar Regency, Bali.

Data Collection Technique

This study employed both primary and secondary data collection methods to obtain a comprehensive understanding of the information system requirements at Fika Shop Bali. Primary data were gathered through interviews and direct observation. An in-depth interview was conducted with the shop owner, Fika Ardiani, who identified several critical issues in the current financial recording system. Among the main problems were the owner's dependency on being physically present to monitor financial reports, as the existing system did not support real-time report generation. Financial statements were only compiled at the end of each month, and the manual process of recording transactions on paper or in ledgers was time-consuming, error-prone, and frequently led to the loss of important data. This manual system also delayed access to information and slowed down end-of-month reporting, particularly during periods of increased sales. Complementing the interview, a field observation was conducted on March 25, 2024, at Fika Shop Bali to study the workflow of purchase and sales transactions, as well as stock management practices. The observations revealed inconsistencies in manual transaction entries, including discrepancies in item quantities and pricing on receipts, which affected the accuracy of financial records. Inaccurate sales records also led to unreliable inventory data, thereby

complicating warehouse management and impacting product availability and operational efficiency.

Secondary data were collected through documentation and literature review. The documentation process involved gathering images and files that illustrated the current workflow and manual financial reporting practices. These data were essential in designing the proposed information system. Additionally, a literature review was conducted to support the theoretical foundation of the study. It included resources from books and online references relevant to financial management and system design in business contexts. The theoretical framework was built upon concepts from information systems, data collection methodologies, system design theory, programming languages, black-box testing, and prior research studies. The integration of both primary and secondary data ensured that the system design aligned with actual operational needs and provided practical solutions to the issues identified.

System Analysis and Design

Ongoing System Analysis:

An analysis of the current system at Fika Shop Bali was conducted to determine the workflow and problems that occur. Based on interviews and observations, it was found that the current transaction process involves customers viewing goods, cashiers recording transaction data, making receipts, and the accounting department making transaction reports which are then recorded in the ledger. For stock management, suppliers send goods, the warehouse section creates an incoming goods note, which is then processed into a report and recorded in the ledger.

Analysis of the Proposed System:

Based on the analysis, a new system is proposed to be developed at Fika Shop Bali. In the new transaction process, the customer sees the goods, the cashier inputs the transaction data, the system generates a transaction receipt, and the accounting/admin creates a transaction report which is then archived. For stock management, suppliers send goods, the warehouse section inputs incoming goods data, the system generates an incoming goods receipt, and accounting/admin creates an incoming goods report which is then archived.

System Overview:

This information system is a web-based platform for recording sales reports and stock management. System users include the admin (business leader or owner and accountant), warehouse staff, and cashier. The system supports Fika Shop Bali in recording sales, purchases, and monitoring stock items, with access that requires login first.

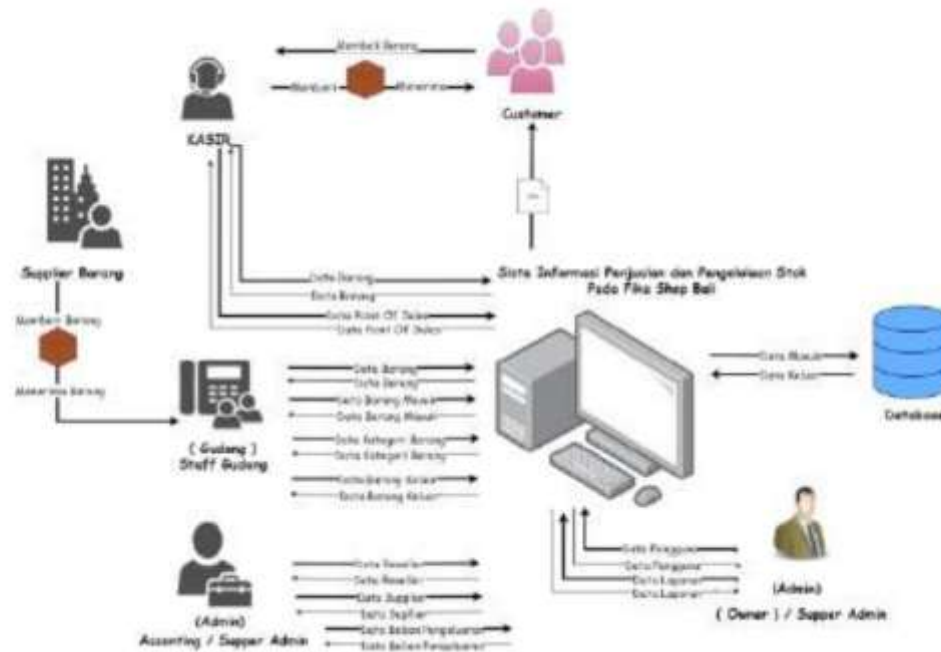


Figure 1. Overview of the system to be created

Functional Requirements:

The functional requirements of the system include services that are available as per the user's needs. This system must be able to:

- Perform login privileges for each user (cashier, admin, warehouse staff).
- Manage Item Data: Admin and warehouse staff can add, change, search, and delete item data. Cashiers can only view item data.
- Perform the sales process (point of sales): Cashiers and admins can add, change, search, and delete sales data. The system can display the outstanding status.
- Manage product category data: Admins and warehouse staff can add, change, search, and delete product category data.
- Manage product return data: Admins and warehouse staff can add, change, search, and delete product return data.
- Manage incoming goods/products data: Admins and warehouse staff can add, change, search, and delete incoming goods data.
- View and display outgoing goods management data.
- Manage supplier data: Admin can add, change, search, and delete supplier data.
- Manage expense data: Admins can add, change, search, and delete expense data.
- Manage reseller data: Admin can add, change, search, and delete reseller data.
- Process reports and provide features for admins to print and convert transaction reports, profit and loss, receivables, and incoming and outgoing goods into excel files according to the selected time period.

Non-Functional Needs:

Non-functional system requirements include software and hardware.

- Software: Operating system: Windows 10. Programming languages: HTML, CSS, Native PHP, Bootstrap, JavaScript. Database: MySQL. Applications: Visual Studio Code, Laragon, Web Browser (Microsoft Edge).
- Hardware: Laptop with 4 GB RAM and Note Printer.
- Compatibility: Cross-browser compatibility (works on various major browsers) and Device Compatibility (responsive on various devices such as desktop, laptop, tablet, smartphone).

System Design

The system design phase in this research incorporates both Data Flow Diagram (DFD) and user interface planning. Key system actors identified include the cashier, warehouse staff, and admin (comprising accounting personnel and the store owner). The system accommodates various events such as user login, user data management, sales transactions, supplier management, item data handling, incoming and return item recording, viewing of outgoing items, and management of product categories, expense tracking, reseller information, and comprehensive reporting. The DFD model is structured in three levels. At the context diagram (DFD Level 0), the system outlines the interaction of three main actors and one passive actor—customers—providing a general overview of the system's operational scope. In DFD Level 1, the system is decomposed into specific modules, totaling nine processes such as point-of-sale management, inventory operations, supplier and reseller management, and reporting. Further detailing in DFD Level 2 explains sub-processes such as login authentication for three user roles (admin, cashier, warehouse), user data control, transactional input with role-based permissions, and category and supplier data management. Specific roles are also designated for handling incoming and returned goods, with varying access rights between admin and warehouse staff.

Database Design

In the database design, a Conceptual Data Model (CDM) is created consisting of nine primary tables covering sales, inventory, expenses, user accounts, and supplier-reseller networks. The Physical Data Model (PDM) refines these relationships and includes detailed table structures, field types, and key constraints. The user interface consists of several functional pages. The login page verifies credentials and redirects to the dashboard upon success. The dashboard presents operational summaries such as item counts, transaction volume, inventory history, stock graphs, and expenses. The Point of Sales page allows authorized users to process transactions by entering essential purchase details, which are automatically computed to generate final pricing and discounts. History and management pages exist for various modules including products, users, suppliers, resellers, incoming and outgoing goods, expenses, and reports. Each page contains standard CRUD functions (Create, Read, Update, Delete) supported by search capabilities and structured layouts.

User Interface

- a. Login page: The user has to fill in "username" and "password". If the data is valid, it redirects to the dashboard, otherwise, it displays an error message.
- b. Dashboard Page: Provides a comprehensive overview of store operations, displaying the total number of items, number and value of transactions, history of incoming and outgoing items, graph of item movement, and expenses.
- c. History Point of Sales (Transaction) page: Manage transaction data with "Search", "Edit", "Add", and "Delete" buttons. Displays total transactions, those that have not been paid off, and those that have been paid off. Allows users to view the complete transaction history.
- d. Transaction Page (Point of Sales): Cashiers and admins can add transaction data by filling in the date, bill type, buyer name, reseller name, product, amount, payment method, and payment amount. The system automatically calculates the total price and discount.
- e. Product Data Page: Manage product data with "Search", "Edit", "Add", and "Delete" buttons. Displays a complete list of products (name, code, category, reseller price, retail price, stock).
- f. Add Product Data page: Admins can add new product data by filling in the name, category, unit, brand, retail selling price, stock, reseller selling price, and description.
- g. Incoming Goods History page: Manage incoming goods data with "Search", "Edit", "Add", and "Delete" buttons. Displays the history of all incoming goods (name, code, quantity, date, supplier).
- h. Add Incoming Goods page: Admins can add incoming goods data by filling in the product category, vendor, date, quantity, and capital price. Retail and reseller prices are automatically filled in.
- i. Outgoing Goods Data History page: Users can view and search outgoing goods data only.
- j. Supplier History page: Manage supplier data with "Search", "Edit", "Add", and "Delete" buttons. Displays a list of suppliers with contact information, address, and delivery history.
- k. Product Category History Page: Manage product category data with "Search", "Edit", "Add", and "Delete" buttons. Displays a list of category changes and the total amount of data.
- l. User Data History Page: Manage user data with "Search", "Edit", "Add", and "Delete" buttons. Displays the total amount of user data.
- m. Add User Data page: Admins can add new user data by filling in full name, email address, nickname, password, and access rights.
- n. Reseller Data History page: Manage reseller data with "Search", "Edit", "Add", and "Delete" buttons. Displays the total number of reseller data. Explains the benefits and conditions of resellers (minimum 3 dozen/36 pcs, sold within 3 days, if not sold, the normal price is charged).
- o. Add Reseller Data page: Admin can add new reseller data by filling in full name, mobile number, ID number, and address.

- p. Expense Data Page: Allows the management of expense data. There are "Search", "Edit", "Add", and "Delete" buttons. Displays the total amount of expenses and the expense chart for the income statement.
- q. Add Expense / Expense Data page: Admin can add expense data by filling in the expense category, pay date, pay amount, and description.
- r. Reports Page: Provides Profit and Loss, Receivables, Transactions, Out of Stock, and In Stock outputs, with filter features.

Test Scenario

In terms of system testing, a black-box testing method is employed to ensure each functional component performs as intended. The scenarios tested include login functionality, dashboard rendering, POS transactions, goods and item category history, returns, stock movement data, user and supplier records, expense management, reseller information, and the generation of comprehensive reports. This structured testing approach helps validate the overall reliability and usability of the system before deployment.

Usability Testing

The usability aspect will be tested with a questionnaire to Fika Shop workers. The questionnaire contains 14 questions that represent 5 test indicators (Understandability, Learnability, Operability, Error, Attractiveness). A 5-choice Likert scale (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree) with a weight of 5 to 1 will be used.

Calculation of the percentage of usability aspects using the formula:

- For odd questions: $SUS\ Score\ of\ Odd\ Questions = Q\ odd - 1$.
- For even questions: $Even\ Question\ SUS\ Score = 5 - Even\ Question\ SUS\ Score$.
- Total SUS score: $SUS = 2.5 \times [\Sigma(\text{odd } Q\ Score - 1) + (5 - \text{even } Q\ Score) \times n]$.
- SUS average score: $Average = \frac{\text{Number of Respondents Sum Score}}{n}$.

The test results will be used to assess system user satisfaction, by determining the grade (A-F) and adjective rating as well as the level of user acceptance (Net Promoter Score: Acceptable, Marginal, Not Acceptable).

3. Results and Discussion

System Implementation and User Interface

This system is implemented to manage sales and stock data directly. This web-based system is implemented on the login page, main dashboard, user data, item data, member data, supplier data, POS transactions, transaction history, incoming goods data, return goods, expenses, and reports (profit and loss, transactions, receivables, incoming and outgoing goods).

The main user interface (UI) implementation includes:

- a. Login Page: Allows users to enter their username and password to access the system. Upon successful login, users will be directed to the home page according to their access rights, namely administrator, cashier, or warehouse.

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- b. Admin Home Page: Accessible to administrators and allows users to view incoming and outgoing goods data, item data, total transactions, total expenses, as well as incoming and outgoing goods charts. This page is also equipped with a date filter to make it easier to search for data according to a certain period.
 - c. Cashier Home Page: After logging in with cashier access rights, cashiers can access POS for sales transactions and item data to view stock items.
 - d. Warehouse Staff Home Page: After logging in with warehouse access rights, warehouse staff can manage incoming goods, outgoing goods, and return goods, as well as monitor stock items.
 - e. Point of Sales (POS) Transaction Page: Accessible to cashiers and administrators. This page allows them to perform sales transactions by selecting items, specifying quantities, and viewing the total price. Users can choose the payment type (transfer or cash), as well as choose a discount if any. Once the transaction is completed, the cashier or administrator can choose to print the receipt, and the stock is automatically updated.
 - f. Point of Sales History page: Allows cashiers and administrators to check the transaction list that includes transaction number, date, buyer's name, total price, and payment status. The system also shows the remaining time for reseller payments, with a deadline of 3 days. If it exceeds the deadline, the system automatically changes the billing type to retail. Users can perform CRUD (create, read, update, and delete) operations through the available icons. When a transaction is deleted, the stock will be updated and return to the original amount.
 - g. Item Data History Page: Allows admins and warehouse staff to manage item data with CRUD (create, read, update, delete) features. Users can add, change, or delete item data that includes item code, name, quantity, and retail and reseller prices. Each deletion will affect all related data and update the item stock. There is also an item import button to speed up the process of filling in item data using Excel.
 - h. Item Category History Page: Allows Admins and Warehouse Staff to add, view, edit, and delete item categories through the CRUD feature.
 - i. Goods Return History page: Allows admins and warehouse staff to record return items with the CRUD feature. Each return automatically updates the stock in the item data.
 - j. Incoming and Outgoing Goods Data History page: Allows Admins and Warehouse Staff to monitor stock history. Incoming Goods Data can be managed with the CRUD button, while Outgoing Goods Data only displays the number of outgoing goods according to the POS transaction and cannot be changed.
 - k. User Data History Page: Allows Admin to manage user data through CRUD (Create, Read, Update, Delete) buttons. Admins can also assign access rights according to user roles (Administrator, Cashier, Warehouse).
 - l. Supplier Data History page: Allows Admins to manage supplier information. On this page, Admins can use CRUD buttons to add, view, edit, or delete supplier data.
 - m. Expense Data History page: Allows Admin to manage expense history with CRUD (Create, Read, Update, Delete) feature.
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- n. Reseller or Member Data History page: Allows Admins to manage the history of registered reseller data. In this page, Admin can view, add, edit, or delete reseller information using CRUD feature.
- o. Reports Page: Allows the admin to view and manage financial reports and transactions. On this page, admins can access various types of reports, such as profit and loss reports, accounts receivable reports, transaction reports, and incoming and outgoing goods reports. Each report can be exported to Excel or PDF format.

System Testing

This system test uses the black box testing method, which aims to check whether the system has functioned as expected. This test is carried out to observe the execution of the system through test data and check the results produced by the system based on the tested functions.

In addition, system testing also uses usability testing. Usability testing is a process to evaluate the interface or user experience (UX) of a website or software so that it is easy to use by users.

Usability testing questionnaires were distributed to 8 people who work at Fika Shop Bali, including the owner, to measure their level of satisfaction with the use of the system. The data collected was then analyzed using the System Usability Scale (SUS) method to determine the Grade Scale and Net Promoter Score (NPS).

Based on the SUS calculation results, the average SUS value is 78.4375.

- The Acceptability Ranges of the respondents showed an "Acceptable" category.
- The Grade Scale range of respondents to the system is in the "B" category.
- The range of Adjective Ratings of respondents on the system falls into the "Excellent" category.

From these results, it is concluded that the Web-based Sales and Stock Management Information System at Fika Shop Bali has a good level of feasibility for use. This system is considered feasible to support the operational needs of Fika Shop Bali and provide convenience in sales management and stock management.

4. Conclusion

The implementation of a website-based sales and stock management information system at Fika Shop Bali has been successfully carried out, with a design that includes data collection, making diagrams such as Event List, Data Flow Diagram (DFD), System Flow Diagram (SFD), and Conceptual Data Model (CDM), as well as developing user interfaces using PHP and MySQL to ensure the system runs optimally. The system provides various important features, including user data management, item data, sales and purchase transactions, profit and loss reports, stock items, as well as supplier and member data management, all of which are designed to support the operational management of Fika Shop Bali effectively and efficiently. Black Box Testing results show that all features function properly and as needed, proving that this system can improve the efficiency of stock and sales management. For further development, it is recommended to perform

regular system maintenance to ensure optimal performance and relevance to user needs, including software updates, performance optimization, and bug fixes. The addition of a scanning tool feature will increase efficiency by making it easier to input item data, sales transactions, and stock management through scanning barcodes or QR codes. In addition, the integration of routine book closing features (daily, weekly, and monthly) will help record transactions and stock accurately, analyze sales trends, prepare financial reports, and analyze business, so that the management of Fika Shop Bali's business becomes more neat, efficient, and transparent.

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