

Innovative Accounting Solution: A Web-Based Approach for Apotek Saka Sasmitra Using the Waterfall Method

**Evaditus Kresna Yuvisan¹, Albertus Dwiyoga Widianoro², Agnes Advensia
Christmastuti³**

^{1,2}Department of Information Systems, Computer Science Faculty, Soegijapranata Catholic University

³Department of Accounting, Soegijapranata Catholic University

Jl. Pawiyatan Luhur IV No.1, Bendan Duwur, Kota Semarang, Jawa Tengah 50234

¹evkresna2001@gmail.com

²yoga@unika.ac.id

³a_advensia@unika.ac.id

Abstract— Klinik Saka Sasmitra a healthcare facility that provides medical services, including general practitioners, dentists, and a pharmacy. The pharmacy in this clinic dispenses medications with or without a doctor's prescription. The research focuses on the pharmacy because the process of recording transactions, purchases, and medication inventory is done manually using paper and Microsoft Excel, resulting in inventory management challenges. The clinic conducts numerous transactions per day but lacks an appropriate accounting system and financial reporting. To address this issue, this research proposes the development of an accounting system using the Waterfall method. This method sequences the stages of analysis, design, implementation, testing, improvement, and maintenance to reduce errors. The web-based development will integrate the sales, purchase, and inventory systems and provide financial reports accessible through a web browser. The aim of this design is to provide convenience for both company management and consumers. The research will result in a web-based system for sales, purchase, inventory, and company dashboards.

Keywords— accounting information system, web-based, sales, purchase, inventory, waterfall

I. INTRODUCTION

Klinik Saka Sasmitra is a healthcare facility located in Semarang, Indonesia, providing medical services, including general and dental care, alongside operating a pharmacy that dispenses both prescription and over-the-counter medications. The primary focus of this research centers around the pharmacy within Klinik Saka Sasmitra.

Apotek Saka Sasmitra relies on manual record-keeping using physical ledgers and Microsoft Excel to document sales transactions, purchases, and inventory data. This manual recording process has led to challenges in accurately tracking and managing pharmaceutical inventory. Often, the pharmacy staff faces difficulties in inventory management, primarily due to the absence of standardized inventory recording procedures. Presently, during inventory checks, they can only ascertain if certain items are running low or have been depleted.

To address these challenges, this research proposes the development of a web-based accounting information system. The chosen development model for this accounting system is the Waterfall method, which involves a systematic and sequential approach, encompassing stages such as analysis, design, implementation, testing, and maintenance. This approach is selected for its ability to minimize errors and ensure the systematic development of a well-structured website.

The web-based system is expected to provide a comprehensive solution, connecting sales, purchases, and inventory management, while also offering financial reporting capabilities, including balance sheets and income statements accessible through web browsers. Ultimately, this design aims to provide an infrastructure that enhances convenience for both company management and consumers. This research will result in an integrated web-based system encompassing sales, purchases, inventory, and a company dashboard.

II. LITERATURE REVIEW

Accounting Information System is a comprehensive framework that collects, records, stores, and processes data to generate information for decision-makers. This system encompasses individuals, procedures and instructions, data, software, IT infrastructure, internal controls, and security measures [1]. Accounting information system is designed to gather, record, store, process, and generate financial information for both internal and external stakeholders [2].

Purchasing is a crucial support activity within an organization or company that involves acquiring goods (raw materials or supplementary materials) required for operational activities, whether for internal use or resale. An Accounting Purchase System is employed by companies to manage the procurement of goods necessary for their core business operations [3]. It consists of several interconnected procedures, including purchase request, quotation request, purchase order, goods receipt, accounts payable recording, and purchase distribution [4].

Inventory plays a vital role in the smooth operation of an organization or company. It includes assets available for sale in normal business operations, assets in the production process for subsequent sale, or raw materials and supplies used in production or service delivery [5]. Inventory management involves planning, procurement, control, and management of

goods within an organization. This process encompasses various stages, including inventory planning, procurement, goods receipt, and stock management.

Sales activities involve the selling of goods or services to generate profits, ensuring the continued smooth operation of an organization or company. Effective sales management is crucial for organizational success, as it represents the primary source of revenue. Sales include the exchange of goods or services between sellers and buyers at mutually agreed-upon prices. The sales process encompasses stages such as sales preparation, marketing, sales execution, and after-sales service [6][7].

Internal control systems comprise organizational structures, methods, and measures coordinated to safeguard assets, ensure accounting data accuracy and reliability, enhance efficiency, and promote compliance with management policies. A robust internal control system is essential for sound financial management and decision-making within an organization [8].

Laravel is an open-source PHP framework that provides essential modules to optimize PHP performance in web development, ranging from simple to complex websites. Laravel is chosen by web developers due to its perceived speed, security, and simplicity. It offers a dynamic programming language, making it a preferred choice for web application development [9].

A **database** is a structured collection of information or data stored in a computer or server. Databases are used to efficiently store, manage, and manipulate large volumes of data, ensuring it is accessible when needed. Data within a database is organized into tables, consisting of columns and rows, where each column represents a data type (e.g., name or address), and each row represents an entity or object [10].

PHP My Admin is an open-source web application used for managing MySQL databases and can handle multiple databases simultaneously. PHP My Admin simplifies database-related tasks, such as

creating databases, tables, data entry, querying, and more, through a user-friendly web interface. It has gained popularity in website development, particularly for websites requiring database access [11].

The FIFO (First-In-First-Out) cost method is an inventory valuation approach where the first items added to the inventory are the first to be sold or used. In this method, the cost of the earliest inventory acquired is allocated to goods sold first, while the cost of the most recent inventory is assigned to ending inventory [12]. FIFO assumes that the oldest inventory is sold before newer inventory.

The Waterfall method is a linear and sequential software development process model where each phase depends on the completion of the previous one. It comprises a series of distinct stages, including analysis, design, implementation, testing, and maintenance, in a fixed order. While providing structure and clarity, the Waterfall method is less flexible and may struggle to adapt to changing user needs (adaptability) [13].

III. METHOD

The data collection methods employed in this research include observation, interviews, and documentation [14]. Observation involves direct on-site examination of the accounting information system, particularly in the areas of sales, purchasing, and inventory. Interviews consist of conversations with relevant individuals to gather information about operational activities, challenges, expectations, and system usability. Documentation entails recording and collecting data from various documents and records related to the accounting information system, specifically focusing on sales, purchasing, and inventory processes.

The development model for this accounting system utilizes the Waterfall method for designing accounting information systems for sales, purchases, and inventory. The researcher has chosen

this method due to its sequential approach, encompassing analysis, design, implementation, testing, and maintenance stages, which helps minimize errors and ensures the systematic development of a well-structured website [15].

IV. RESULT AND DISCUSSION

A. System Requirement Analysis

The first step for this research is an analysis of system requirements. Data collected through documentation, interviews and observations with the Apotek Saka Sasmitra will be collected and analyzed further so as to obtain complete information regarding the specifications and needs of the Apotek Saka Sasmitra. System analysis extracts as much information as possible from the user so that a website-based accounting system can be created that can meet feature needs and carry out commands desired by the user.

B. System Design

Use case diagram are used to determine user access right on the sistem [16]. Use Case Diagram for the accounting information system designed for Apotek Saka Sasmitra, as depicted in Figure 1, serves as a comprehensive representation of the system's intended functionality and the actors involved interactions, setting a solid foundation for the forthcoming development and implementation phases of the accounting information system for Apotek Saka Sasmitra.



Figure 1 Use Case Diagram

Entity Relationship Diagram for the accounting information system designed for Apotek Saka Sasmitra, as depicted in Figure 10. Entity Relationship Diagram is an indispensable component of the system design process, elucidating the core entities and their associations within the accounting information system tailored for Saka Sasmitra Pharmacy.

C. System Implementation

The design of the application that has been created and will be continued with the creation of the application. Here is a view of the system that has been created:

1. Login Page

The login page, which has been previously crafted, is depicted in Figure 2. This login page required user to provide their email and password within these fields for completion.

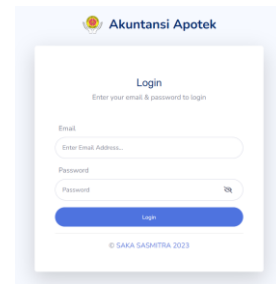


Figure 2 Login Page

2. Master Product Menu Page

The master product menu page, which has been previously crafted, is depicted in Figure 3, serves as the platform for managing the inventory of products or medicines available at Apotek Saka Sasmitra.

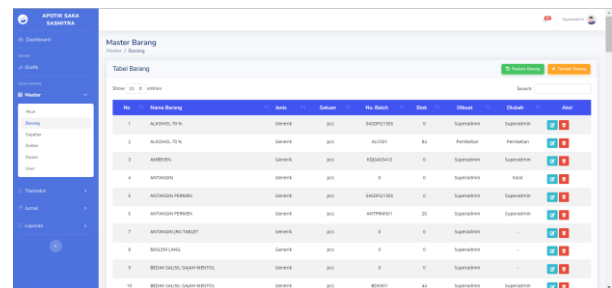


Figure 3 Master Product Menu Page

3. Sales Transaction Menu

The Sales Transaction Menu, which has been previously crafted, is depicted in Figure 4, allows users to input various sales-related information, including product details, payment method selection, with a dedicated save button for recording the transaction.

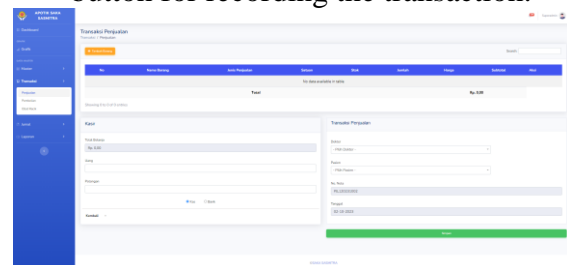


Figure 4 Sales Transaction Menu

4. Purchase Transaction Menu

The Purchase Transaction Menu, which has been previously crafted, is depicted in Figure 5, offers users the capability to input purchase information, including product details,

payment method selection, with a dedicated save button for recording the transaction.

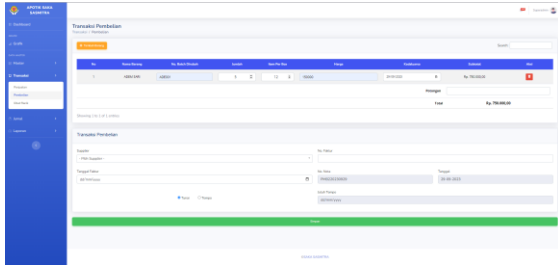


Figure 5 Purchase Transaction Menu

5. Compound Medicine Transaction Menu

The Compound Medicine Transaction Menu, which has been previously crafted, is depicted in Figure 6, enables users to input information regarding compounded drugs, including product specifics, payment method selection, with a dedicated save button for recording the transaction.

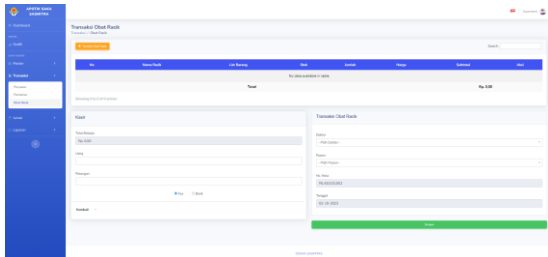


Figure 6 Compound Medicine Transaction Menu

6. General Ledger

The General Ledger page which has been previously crafted, is depicted in Figure 7, allowing users to select the journal period and review general journal entries corresponding to their transactions.

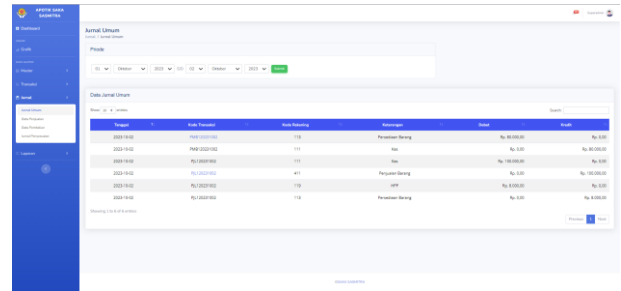


Figure 7 General Ledger

7. Profit/Loss Report

The Profit/Loss Report, which has been previously crafted, is depicted in Figure 8, to present users with profit and loss statements, along with the ability to select specific reporting periods.

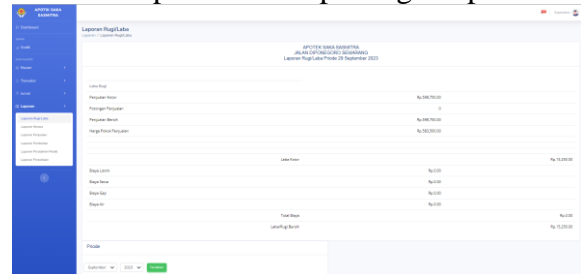


Figure 8 Profit/Loss Report

8. Balance Sheet Report

The Balance Sheet Report page which has been previously crafted, is depicted in Figure 9, users to access balance sheet reports and select the desired reporting periods.

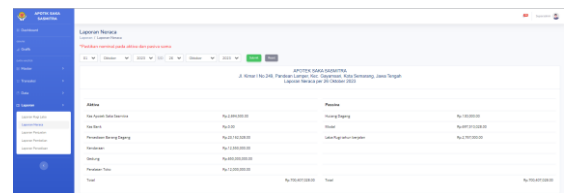
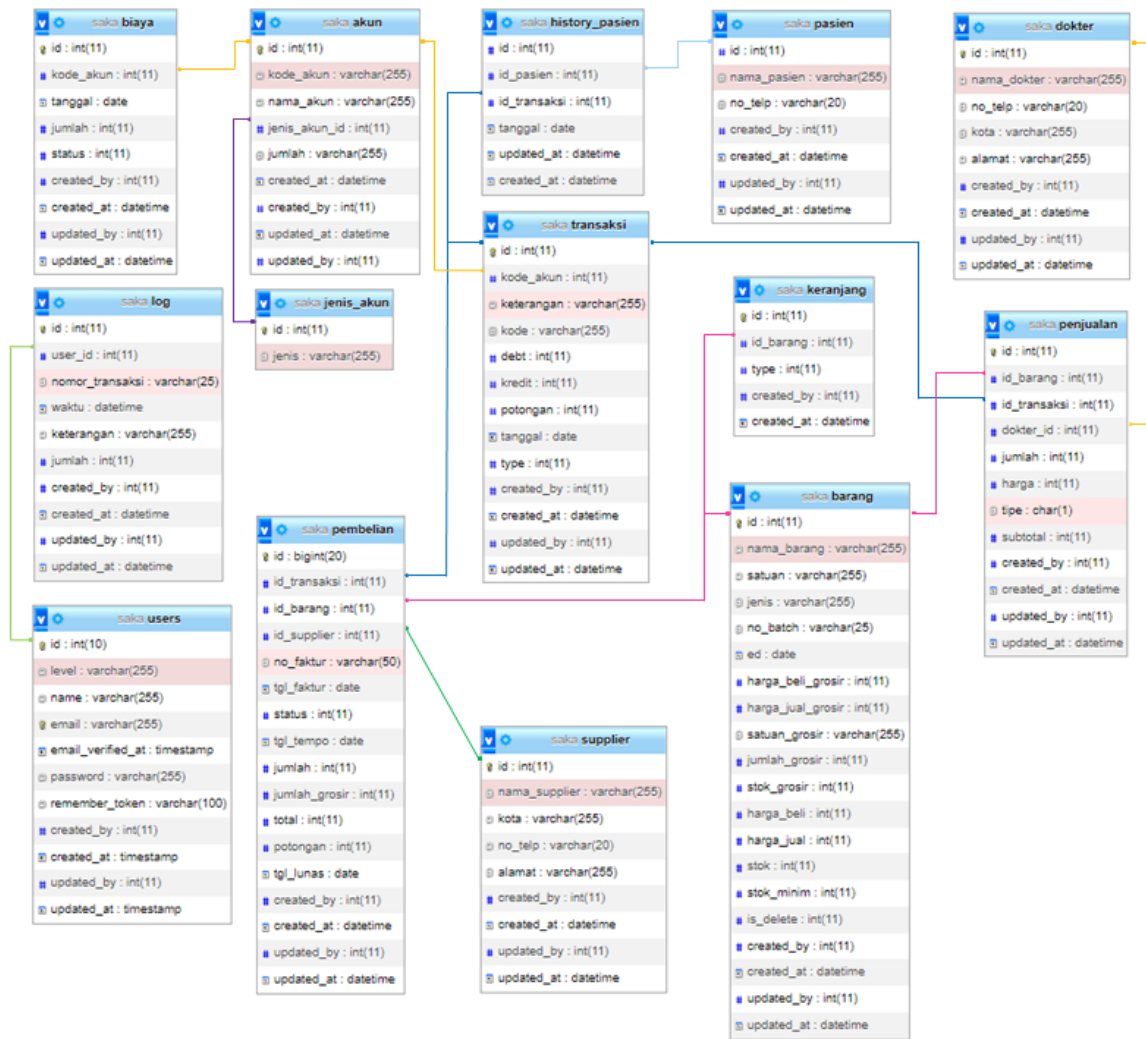


Figure 9 Balance Sheet Report



D. System Testing

System testing aims to ensure that the system that has been made runs well. In this study, system testing will be carried out in two stages, namely, technical system testing and interviews with users.

The results of technical system testing have run well, this is done to evaluate the system technically and ensure that the system that will be used by users can run properly in accordance with the functions and commands that have been designed. This technical system testing is carried out based on access and features.

The results of the system testing interview have gone well, it is done to find out the shortcomings or errors that occur when the user uses or gives commands to the system and ensures that the user can use the system properly in accordance with the functions

and commands that have been designed based on access and features.

E. System Repair and Maintenance

In this phase, improvements to address issues and challenges identified in the system will be carried out, and system maintenance will be performed. This includes system development to rectify any errors that may arise, improve unit system implementations, and enhance or adjust the system according to the needs of Apotek Saka Sasmitra. System maintenance will be conducted at regular intervals, approximately every three months or as soon as system errors are detected, depending on which occurs first. The system will continue to evolve to remain aligned with the requirements of Apotek Saka Sasmitra.

V. CONCLUSION

Based on the findings presented above, the following conclusions can be drawn:

1. The design and implementation of the sales and purchase system at Apotek Saka Sasmitra, achieved through interviews, observations, document studies from the pharmacy, system design, and the results of system development, have provided a clear system workflow. It encompasses the entire process from inputting purchases and sales to generating purchase and sales invoices.
2. The design and implementation of the inventory recording system at Apotek Saka Sasmitra, accomplished through interviews, observations, document studies from the pharmacy, system design, and the results of system development, have integrated inventory recording with the purchasing and sales systems. This integration ensures automatic updates to the inventory as transactions occur.
3. The implementation of a computerized accounting system for Apotek Saka Sasmitra, involving data entry for purchases, inventory, and sales, using the FIFO method in its recording, has resulted in seamless integration with the provided system reports, including profit and loss statements, balance sheets, and inventory reports. Additionally, this system allows for the execution of all commands for adding, editing, deleting, and viewing data in each module.

REFERENCE

- [1] Romney, M. B., & Steinbart, P. J. (2018). *Accounting Information Systems*. Pearson.
- [2] Hall, J. A. (2019). *Accounting Information Systems*. Cengage Learning.
- [3] Mulyadi. (2016). *Sistem Akuntansi* (T. E. S. Empat (ed.); 4th ed.). Salemba Empat.
- [4] Monczka, R. M., Handfield, R. B., Giunipero, L. C., & Patterson, J. L. (2015). *Purchasing and Supply Chain Management*. Cengage Learning.