

Mobile Web-Based Cassava Inventory Management System: A Case Study at CV Panca Yoga, Purbalingga

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Abstract: A web and mobile-based inventory management system is developed with the aim of streamlining the process of checking incoming goods, outgoing goods, stock inventory, and report generation for business owners and employees. CV Panca Yoga, operating in the cassava trading industry since 2012 and located on Jalan Raya Kejobong, Krenceng, Purbalingga, Central Java, serves as a case study. The existing inventory data recording processes at CV Panca Yoga are considered inefficient and ineffective, as they rely on manual procedures for recording incoming and outgoing goods, managing stock inventory, and generating reports. To address these issues, we have designed a web and mobile-based inventory management application that facilitates the input of data related to incoming and outgoing goods, stock inventory, and report generation. This digitized system not only enhances speed and efficiency but also reduces the potential for errors.

Keywords: Inventory; Information System; Stock; Web; Mobile.

1. Introduction

The rapid advancement of information systems has underscored the importance of accurate information dissemination in today's business landscape. Various applications have emerged, allowing companies to efficiently manage their inventory, which is an important component in generating profits through the sale of goods. Despite progress, some businesses still rely on traditional bookkeeping methods, as exemplified by CV. Panca Yoga is located in Purbalingga, Central Java, Indonesia. CV. The absence of a web and mobile-based inventory management system at Panca Yoga has created challenges in managing inventory information, primarily stemming from inherent errors and inefficiencies associated with manual bookkeeping processes.

In today's dynamic business environment, efficient inventory management has become the key to success. Timely and accurate processing and utilization of inventory data has a significant impact on a company's profitability and competitive position. This essay delves into the field of web-based and mobile inventory management systems, with a particular focus on their development and implementation to meet the evolving needs of the modern enterprise. An example of a case study in this context is CV. Panca Yoga, a company that has been active in the cassava trading industry since 2012, is based in Purbalingga, Central Java. Similar to many other businesses, CV. Panca Yoga grapples with the challenges posed by manual inventory management processes, thereby highlighting the urgent need for digital solutions.

Efficient inventory management is at the core of business operations, ensuring timely availability of the right products while minimizing storage costs and risks associated with out-of-stock or overstock situations. In contrast, traditional inventory management systems, which rely on manual bookkeeping methods, grapple with intrinsic limitations, including human error, time-consuming procedures, and difficulty in maintaining real-time accuracy [1][2]. To overcome these challenges, web-based and mobile inventory management systems have emerged as a viable solution and offer a ton of benefits. This system simplifies tracking of incoming and outgoing goods, simplifies stock inventory management, and produces precise financial reports. By leveraging digital technology, these systems increase efficiency and accuracy,

empowering businesses to make informed decisions and improving their overall performance [3]. The development and implementation of web-based and mobile inventory systems includes several stages, including system design and software development. Different development methodologies, such as the Waterfall model, can be used to design effective systems. Insights gained from related literature highlight that successful implementation of such systems produces positive results in inventory management, which ultimately results in increased profitability and reduced operational inefficiencies [4]. Nonetheless, it is important to contextualize these concepts in real-world scenarios. CV case study. Panca Yoga is a sharp illustration of the challenges faced by companies that do not have a web-based and mobile inventory management system. The absence of a system like this requires manual bookkeeping, making companies vulnerable to errors and inefficiencies. Through strategic development and implementation of customized systems, CV. Panca Yoga can simplify its inventory management process, making it more efficient and precise. This, in turn, will benefit employees by simplifying inventory tracking, item verification, and financial reporting, thereby increasing overall operational efficiency.

Realizing the challenges faced by CV. Panca Yoga, this research begins the development of a web and mobile based inventory management information system which is equipped with important features related to inventory. This system aims to simplify inventory tracking, item verification and financial reporting for employees. By addressing these challenges, this research seeks to provide a CV. Panca Yoga and similar businesses with digital solutions to improve their inventory management practices, thereby increasing overall efficiency and reducing errors in recording and reporting.

2. Research Method

The system's design plays a pivotal role in determining the transformation of data into a novel and efficacious system. The data employed in this research is of a quantitative nature, characterized by its measurability and direct quantification, typically manifesting as information or explanations expressed in numerical or numeric form. In the context of this study, the requisite quantitative data comprises information pertaining to the inventory stock at CV. Panca Yoga, as well as data concerning the company's record-keeping practices. The inception of this system and the subsequent transition from data to a novel system represent a pivotal aspect of this research. The quantitative data utilized herein is instrumental in understanding the dynamics of inventory stock at CV. Panca Yoga and evaluating the efficacy of their existing record-keeping processes. The acquisition and analysis of quantitative data necessitate rigorous methodology and techniques to ensure accuracy and reliability. The following subsections outline the research design, data collection methods, and data analysis techniques employed in this study.

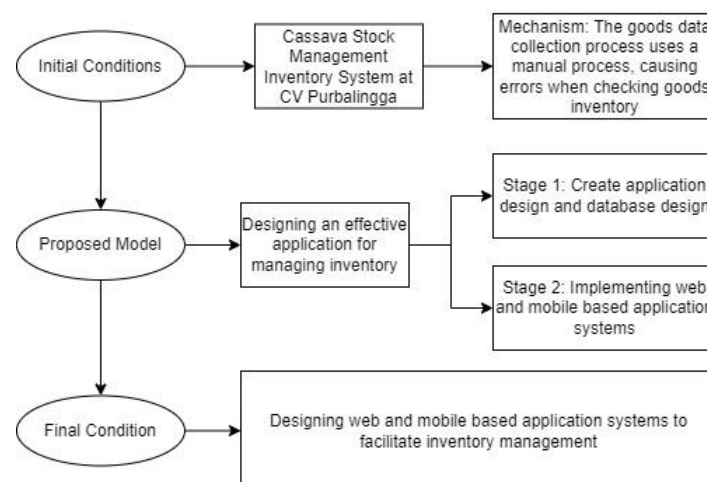


Figure 1. Research Framework

The research design encompasses the plan and strategy for conducting the study. In this research, a descriptive research design is employed to provide a comprehensive and systematic examination of the quantitative data related to inventory stock and record-keeping at CV. Panca Yoga. Descriptive research is well-suited for presenting an accurate portrayal of the current situation within the organization. Data collection is a critical phase in quantitative research. In this study, data related to inventory stock is collected through direct observation and surveys conducted at CV. Panca Yoga. The researchers will physically assess the stock, recording quantities, types of items, and other relevant inventory-related information. Additionally, structured questionnaires may be administered to gather input from relevant personnel regarding their inventory management practices and record-keeping methods. The quantitative data collected during the research process will undergo rigorous analysis to derive meaningful insights. Descriptive statistical methods will be employed to summarize and present the data in a structured and comprehensible manner. This will include the calculation of measures such as means, standard deviations, and frequencies to provide a quantitative overview of the inventory stock.

and record-keeping practices at CV. Panca Yoga. Furthermore, inferential statistical techniques, such as regression analysis or hypothesis testing, may be employed if the research objectives necessitate the exploration of relationships or hypotheses related to the data. The utilization of quantitative data, coupled with robust research methodologies, ensures the reliability and validity of the findings, ultimately contributing to a comprehensive understanding of the inventory management challenges and record-keeping practices at CV. Panca Yoga.

3. Result and Discussion

3.1 Results

The web application was tested for displaying, deleting, and adding data on the web page. This involved the login page, subsequent pages after login, the product data page, employee data, and the purchase data forum.



Figure 2. Employee Data Display

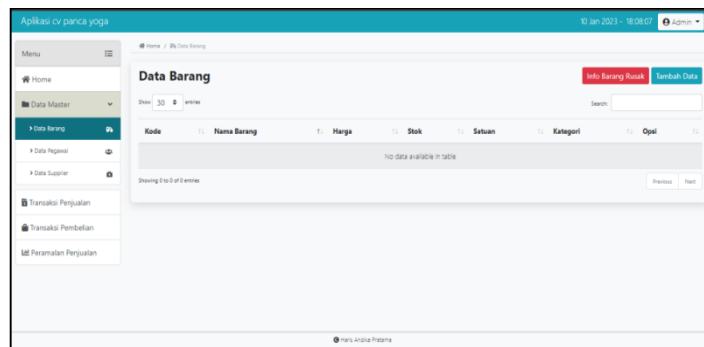


Figure 3. Purchase Entry Form Display

Figure 3. Employee Data Display

Figure 4. Display of Purchase Entry Form

3.1.1. Testing

After implementing the application in Visual Studio Code and XAMPP, the next step involved testing the application's functions and features according to the intended objectives. The results are summarized in Table 1:

Table 1. Results Table

No.	Feature Name	Expected Outcome	Actual Outcome	Status
1	Login	Successful login leading to the dashboard	Successful login leading to the dashboard	Success
2	Product Data Page	Successful entry of products and listing in the product table	Successful entry of products and listing in the product table	Success
3	Employee Data Page	Displaying employee data and positions in the company	Displaying employee data and positions in the company	Success
4	Supplier Data Page	Displaying supplier data for incoming goods	Displaying supplier data for incoming goods	Success
5	Sales Transaction Form	Successful display and input of transaction data	Unsuccessful in displaying and inputting transaction data	Failure
6	Purchase Entry Form	Successful display of purchase transaction data	Successful display of purchase transaction data	Success

3.1.2. Data Flow Diagram (DFD)

Figure 5 This is the Level 0 diagram, also known as the context diagram. It illustrates how the system interacts with external entities. In this section, a general overview is provided along with the flow of data directed towards the system. To access information about incoming and outgoing products, the admin inputs data into the application system. Similarly, the company owner can check inventory stock by providing their data to the system application, allowing them to review stock levels.

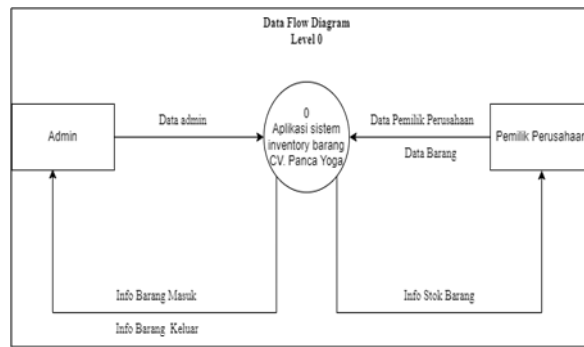


Figure 5. Data Flow Diagram Level 0

3.1.3. Activity Diagram

- 1) Activity Diagram for Admin Data Figure 6 This activity diagram depicts the admin data process, starting with the login process by entering a username and password. If the input is incorrect, an error message is displayed. If the input is correct, the user gains access to the main page, where they can choose the admin menu. The system then displays two options: logout and profile. If the user wishes to view admin data, they select the profile menu, which displays admin data. This section also includes an edit data feature. If the user selects edit data, they are directed to the employee data, where they can make edits. After editing and clicking save, the admin data will display the updated information.

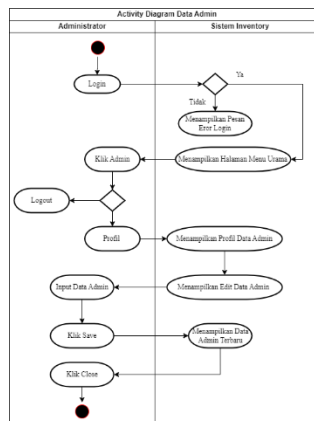


Figure 6. Admin Activity Diagram

- 2) Activity Diagram for Supplier Data Figure 7, This activity diagram outlines the supplier data process, which begins with the login process by entering a username and password. If the input is incorrect, an error message is displayed. If the input is correct, the user gains access to the main page, where they can select the data master menu and then choose data supplier. The system displays the supplier form page. To add supplier data, the user selects the add data menu on the data supplier page. The system then displays the form for adding supplier data. After entering the data and clicking save, the data supplier page will display the newly added supplier information.

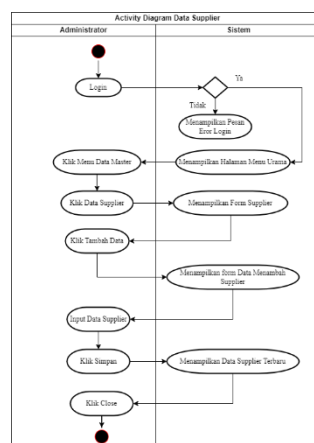


Figure 7. Supplier Data Activity Diagram

3.1.4. Use Case Diagram

Figure 8 The use case diagram illustrates the actions that the system will perform and who will interact with the system. Based on the proposed system solution, the use case diagram is created based on the identified actors and use cases.

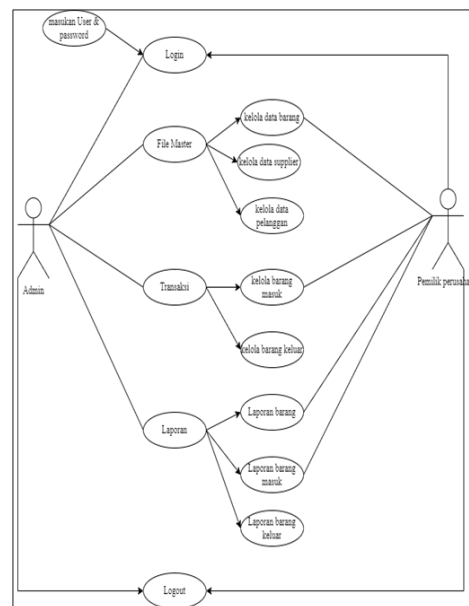


Figure 8. Use Case Diagram

3.2. Discussion

The testing confirmed the successful implementation of the login feature. Users can log in with their credentials, and upon successful authentication, they are directed to the dashboard. This achievement is pivotal, as it ensures secure access to the system and lays the foundation for subsequent interactions. The system demonstrated its competence in managing product data. Users were able to input product information, and the data was accurately reflected in the product table. This capability is central to inventory management, as it streamlines the process of adding and tracking products. One of the critical aspects of an inventory management system is the ability to showcase employee data. The system excelled in displaying employee information and their respective positions within the company. This functionality is essential for ensuring transparency and accountability within the organization. The system effectively managed supplier data for incoming goods. It allowed users to access and review information related to suppliers, facilitating smoother procurement processes. This feature is vital for maintaining a robust supply chain. An area of concern emerged in the testing of the sales transaction form. The system encountered difficulties in displaying and inputting transaction data. This represents a critical issue, as sales transactions are at the core of business operations. Addressing this challenge is imperative to ensure the system's overall functionality and utility. On a positive note, the system excelled in displaying purchase transaction data and allowed users to input this information seamlessly. This is a significant achievement, as it streamlines the record-keeping process for purchases, enhancing accuracy and efficiency. The testing phase demonstrated several successes in the system's functionality, including login authentication, product data management, employee data display, and supplier data management. However, the issue encountered with the sales transaction form underscores the importance of resolving this issue promptly to ensure the system's effectiveness in facilitating sales processes. Addressing this concern will be a priority in further development and refinement of the web-based inventory management system.

4. Related Work

The research landscape in the field of inventory management has seen a variety of important studies conducted by different researchers. These investigations have contributed significantly to the development and improvement of inventory management systems. Kartiko Ardi Widodod and Suryo Adi Wibowo (2022), their research aims to simplify inventory management for employees through a web-based application developed using the waterfall method, ensuring controlled management of incoming and outgoing goods [1]. Nindian Puspa Dewi and Ridho Abdi Fadlillah (2021) explored the Design of a Web and Android Based Inventory Management System, which leads to the transformation of a manual inventory system into a computerized one [2]. Gede Pratama Pinatih and Deny Hidayatullah (2022) contributed to Designing an Inventory System Using a Website-Based Waterfall Model, offering a solution for switching from manual data processing to a computer-based system [3]. Rizky Azhar Pribachtiar and Agus Prasetyo Utomo (2021) conducted research, resulting in a structured system that can manage and display product data and produce stock, incoming reports and exit [4]. Novita Setianti and Wika Purbasari (2022) developed a Web-Based Inventory Application for Cv. Adicita

Prayoga, simplifies data processing and inventory management [5]. Listiyani and Subhiyakto (2021) contributed to Designing a Warehouse Inventory System Using the Waterfall Method (Case Study at CV. Aqualux Duspha Abadi Kudus, Central Java), outlining a systematic approach to developing useful warehouse management applications [6]. Gede Pratama Pinatih and Deny Hidayatullah (2022) explained Inventory System Design Using a Website-Based Waterfall Model, emphasizing the importance of reducing errors in data processing to produce an accurate and efficient Inventory Management System on CV. Goddess Laksmi [7]. Yanuarsyah, Muhaqin, & Napianto (2021) contributed to Information Architecture in Inventory Management Systems (Case Study: Upt Puskesmas Rawat Inap Pardasuka Pringsewu), creating an architecture that makes sorting, filtering, searching for data easier, and displays, increasing the ease of data utilization [8]. Made Setiawati, M. S., I Nyoman Yudi Anggara Wijaya, Wijaya, & Ni Made Estiyanti (2021) focuses on Designing a Web-Based Sales, Purchasing and Inventory Information System (Case Study: Resto Jinggo Tutu), produces an application that helps in processing sales data, purchasing management, expense tracking, and kitchen stock [9]. Larasati, Huda, & Ashari (2022) started Development of an Android-Based Inventory Stock Control Application, facilitating stock management at Fast and Loud Industries through an Android-based system [10].

Ardiyanto, D. (2022) created a Website Based Inventory Accessory Application using Unified Modeling Language (UML) and prototype development, as well as testing using black boxes and ISO standards [11]. Wijaya & Lomban (2022) proposed a Web-Based Inventory System Using the Waterfall Method, with the aim of minimizing the gap between actual inventory and database records, thereby reducing errors in stock tracking [12]. Surono & Yulia (2023) designed a Drug Inventory System at the BS Farma Central Pharmacy which has improved drug management and supervision [13]. Oktafiani, Matondang, & Wirawan (2022) implemented a Web-Based Warehouse Inventory Management Information System at Bariklie Collection thereby increasing efficiency and accuracy in managing inventory data thereby producing more precise reports [14]. Aliefatan (2023) proposed Inventory System Design for Bansun Sports Shoes Stores, simplifying access to information regarding available and out of stock items, thereby benefiting employees and stakeholders [15]. These studies collectively provide valuable insight into the field of inventory management and serve as a foundation for further research and system development in this area.

This research explores aspects of inventory management in various contexts, with a primary focus on information system development. There are several similarities and differences that can be identified in this research. The similarity between these studies is the use of a similar system development method, namely the Waterfall method, in several studies that have been mentioned. This shows that this method has significant relevance in the development of inventory management information systems. In addition, this research aims to automate and modernize the inventory system, which was initially carried out manually, ensuring accuracy and efficiency in managing inventory data. However, the main difference lies in the model and environment in which the research is conducted. Some studies lead to web application development, while others focus on Android-based systems. Some also focus on specific businesses, such as restaurants or shoe stores, while others are more general. In addition, this research covers a variety of aspects, from product inventory management to employee data management, and even drug inventory management. Although there are differences in context and scope of research, all this research contributes to the development of information technology in inventory management. They provide valuable insight into how to automate processes, improve accuracy, reduce errors, and increase efficiency in inventory management. It is a collaborative effort that enriches the field of inventory management and provides solutions for various industries and businesses.

5. Conclusion

The conclusion of this research is that the Mobile Web Based Cassava Inventory System Application (Case Study CV. Panca Yoga, Purbalingga) has a positive impact in making things easier for company owners and employees. This application facilitates monitoring of incoming goods, outgoing goods, stock of goods, and bookkeeping reports. The research results show that using this application provides benefits in increasing efficiency and accuracy in inventory management. With this application, company owners can easily monitor inventory without the need to carry out more complicated manual processes. This helps in making more informed decisions regarding inventory and the purchasing process. In addition, employees can also access information more quickly and accurately, increasing productivity and efficiency in their daily tasks. The Mobile Web Based Cassava Inventory System Application has proven to be a valuable tool in increasing efficiency and transparency in inventory management at CV. Five Yogas. Thus, the use of this kind of information technology has the potential to have a positive impact in various industries and businesses.

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