

Design of a Web-Based Inventory Management System for Toko Fajar Mandiri Tani In Karangmulya, Suradadi

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Abstract

This study addresses the problem of mismatched stock records and actual inventory levels in the warehouse of Toko Fajar Mandiri Tani, which often disrupts operations and customer service. To solve this, the study used data collection methods such as direct observations, interviews with staff, and literature review to build a strong foundation for the system design.

The analysis of the current manual system identified its strengths and weaknesses, which became the basis for developing a new solution. The result is a web-based inventory management system that helps record, monitor, and report stock levels in real-time.

The system implementation showed significant benefits, including improved accuracy in inventory data, reduced risks of overstocking or understocking, and better stock order recommendations. Additionally, the automated inventory reporting feature supports faster and more informed decision-making. This system not only records stock but also streamlines the overall operational management of the store. The findings of this study offer a practical technological solution to help small and medium-sized businesses manage their inventory effectively.

Keywords: Analysis, Inventory, System, Information System, Inventory Management System

1. Introduction

The trade sector plays a significant role in supporting Indonesia's economy by facilitating the exchange of goods and services. This sector accommodates a wide range of business scales, from small to large enterprises, making it accessible to individuals with diverse financial capabilities. Despite its benefits, trade businesses often face challenges in managing inventory effectively, particularly in operations involving a wide variety of fast-moving goods [1].

Manual inventory management often leads to discrepancies between recorded and actual stock levels. These issues stem from factors such as data entry errors, damaged goods, theft, or mismatches in recorded and actual stock movements. For instance, Toko Fajar Mandiri Tani, a business specializing in selling fertilizers and pesticides in Karangmulya village, experienced a discrepancy where the recorded stock showed 70 bags of goods, but a physical count revealed only 65 bags. Such inconsistencies can disrupt operational efficiency and customer satisfaction, highlighting the need for an effective inventory control system [2].

An internal inventory control system is essential for protecting a business's assets and ensuring data accuracy. This includes implementing security measures to prevent errors and conducting periodic stock checks to reconcile records with actual inventory. While many businesses conduct physical inventory counts annually, others prefer more frequent checks, such as monthly, weekly, or even daily [3].

To address these challenges, this study proposes designing a web-based inventory management system for Toko Fajar Mandiri Tani. This system aims to reduce the risks of overstocking or understocking, improve stock monitoring, and support better planning to meet customer needs. By integrating real-time stock tracking and reporting features, the system provides a practical solution for enhancing operational efficiency and minimizing inventory discrepancies [4].

This research focuses on analyzing and designing a web-based inventory management system, encompassing functions such as recording incoming and outgoing goods, generating stock reports, and monitoring the availability of fertilizers and pesticides in the store. The ultimate goal is to provide a reliable tool for Toko Fajar Mandiri Tani to optimize its inventory management processes [5].

2. Research Methodology

This study aims to analyze the inventory management system at Toko Fajar Mandiri Tani and design a web-based information system to improve stock management efficiency. The methodology used to achieve these objectives consists of several stages, namely data collection, analysis of the existing system, and the design of the proposed new system. Data collection in this research was carried out using three main methods: observation, interviews, and literature review. **Observation** was conducted by directly observing activities at Toko Fajar Mandiri Tani. The researcher observed the buying and selling processes, product arrangement, and interactions between staff and customers [6]. This observation provided a clear picture of how the current inventory system operates manually, with records still being

made in notebooks, leading to potential data errors. Next, **interviews** were conducted with relevant parties involved in inventory management, including administrative staff, service staff, and store managers. These interviews aimed to explore in-depth issues such as discrepancies between stock data in the ledger and physical stock in the warehouse, as well as other operational challenges faced by the store. Additionally, a **literature review** was used to enrich the research. The researcher gathered and studied relevant literature, including books and journals on inventory management information systems, previous research reports related to stock management in stores or similar industries, and government regulations related to inventory management policies [7].

To analyze the existing system and design the new information system, the researcher used two main methods: system analysis and system design. In the **analysis method**, the researcher followed four main stages. The first stage is the **survey of the existing system**. In this stage, the researcher conducted in-depth observation of the inventory recording system at Toko Fajar Mandiri Tani. The current system is manual, and errors often occur in data entry, both in stock records and financial reports. The researcher also identified that the workflow involving CV. Sumber Pangan, administrative staff, service staff, and store managers often leads to inaccuracies in data. The second stage is **analysis of the survey findings**, which involves a thorough analysis of the data collected from observations and interviews. The collected data is analyzed to identify problems and weaknesses in the current system. The researcher identified key issues such as data discrepancies between ledger records and physical stock in the warehouse[8]. The third stage is the **identification of information needs**, where the researcher identifies the need for a more accurate and efficient information system. These needs include regular data input for stock movements (both daily and monthly) to ensure the inventory system operates more accurately and efficiently. The final stage is **identifying system requirements**, which involves determining the specifications and features that the proposed web-based inventory management system must have in order to be implemented[9]. Following the analysis stage, the researcher proceeds with the **system design method** using the **Unified Modeling Language (UML)** approach[10]. This UML method is used to design the new system by depicting workflows and procedures in diagram form. The first stage of this design is the creation of a **Use Case Diagram**, which illustrates the interaction between system users and the system itself. The researcher then creates an **Activity Diagram** to show the sequence of activities in the proposed system and a **Sequence Diagram** to depict the interaction between objects within the system. Finally, the researcher creates a **Class Diagram** to illustrate the data structure within the system, including entities such as products, transactions, and users, as well as their relationships. The results of the analysis and system design are expected to provide the foundation for developing the web-based inventory information system, which can improve efficiency and accuracy in inventory management at Toko Fajar Mandiri Tani.

3. Result and Discussion

This study analyzes the system currently used at Toko Fajar Mandiri Tani, particularly the inventory management process, which is still carried out manually. Based on the analysis, several issues were identified in the existing system, including data input processes, report recording, and information distribution.

Output Analysis shows that the inventory card report, which is a summary of the inventory, is still recorded manually in a notebook. This leads to discrepancies between the manual records and the actual stock quantity in the warehouse. The manual recording process requires the use of a pen, which increases the likelihood of errors in data entry. These stock reports are submitted to the management and administrative staff at the end of each month, but due to the manual process, their accuracy depends on individual diligence.

Input Analysis indicates that the monthly reports used for recording incoming and outgoing goods are also submitted manually by the sales staff. These reports are received late, which results in inefficiencies in monitoring inventory and decision-making related to stock levels. The delays worsen the timeliness of stock monitoring and affect decision-making regarding inventory.

In the **Process Analysis**, it was found that several parties are involved in the inventory management, including the management, sales staff, administrative staff, farmers, and the distributor (CV. Sumber Pangan). The data recording process starts with the distributor updating the stock inventory, followed by the recording of purchases and sales by the administrative and sales staff. The identified flow of information shows several steps that require time and accuracy, such as stock calculations and report printing, which are then reported to the management. However, this process is vulnerable to errors and needs improvement for greater efficiency.

The **Flow of Document (Fig 1)** below illustrates the document flow in the data recording and reporting process at Toko Fajar Mandiri Tani. This figure depicts how information flows from the distributor to the management, with various stages involving the administrative staff, sales staff, and farmers.

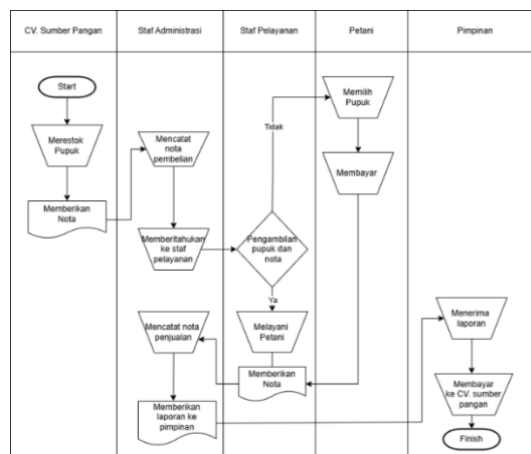


Fig. 1: Flow of Document

Identification of Needs also emphasizes the necessity for a web-based information system to simplify inventory management and the recording of goods coming in and out. The current manual processes not only affect data accuracy but also increase the time required for

data processing. Therefore, it is proposed that the store adopts a web-based system that is more efficient and can provide real-time information. This system would help reduce human errors in data entry and simplify the management of inventory with more accurate automated calculations.

The hardware requirements for this system include devices such as computers or laptops with a minimum specification of an i3 processor, 4GB RAM, and at least 500GB of hard disk space. Additionally, the software required to build this system includes Visual Studio, Xampp, PHP, and MySQL. These will support the development and implementation of a web-based information system capable of managing inventory data more effectively.

Additionally, the **Identification of Brainware Needs** highlights the importance of training the administrators who will operate the system. Given that data recording was previously done manually, administrators need to understand how to operate the new system to fully utilize its features. This training will ensure that all staff can operate the system efficiently and produce accurate and timely reports.

Based on these findings, it can be concluded that the implementation of a web-based information system at Toko Fajar Mandiri Tani will provide many benefits, particularly in improving the efficiency and accuracy of inventory recording. This system is expected to address the issues present in the manual system, reduce errors in stock calculations, and provide faster and more accurate information to the management and relevant staff.

3.1. Usecase Diagram

The use case diagram plays a crucial role in this research as it illustrates the interactions between two primary actors, namely the farmer and the admin, with the system to be developed. This diagram helps identify the functional requirements of the system, such as stock recording, tracking purchases and sales, and real-time transaction monitoring. By visually representing these processes, the use case diagram facilitates understanding of how the system should operate, clarifies workflows, and ensures that the developed system meets the operational needs of Toko Fajar Mandiri Tani. The importance of the use case diagram lies in its ability to provide a clear picture of how users, in this case, the farmer and the admin, interact with the system. By defining each actor and the processes involved, the diagram lays a strong foundation for developing a targeted system. For example, stock recording and other transactions, which are integral to the operational activities at Toko Fajar Mandiri Tani, can be clearly mapped out in this diagram, ensuring that each element functions optimally.

Additionally, the use case diagram serves as an effective communication tool between developers and stakeholders, such as the managers of Toko Fajar Mandiri Tani and the farmers. With this diagram, developers and stakeholders can communicate more easily and in a structured way, ensuring that the system design aligns with the end users' needs. A clear understanding of the existing workflow will help developers design user-friendly interfaces and minimize potential errors during development. During the system development phase, this use case diagram acts as a guide for developers to understand the essential features that the system must include. For instance, the system must be able to record stock levels at the store, track purchases made by farmers, and monitor sales carried out by the admin. This is extremely helpful in ensuring that system development is carried out with a clear focus and in line with the identified requirements.

Moreover, the use case diagram can be used to analyze and identify potential issues or shortcomings in the current process. By visualizing how interactions between the farmer, the admin, and the system take place, the diagram can highlight areas that need improvement or optimization. For example, if a step in the process is too complex or inefficient, developers can design a more straightforward and effective solution. Overall, the use case diagram is an essential tool in designing the information system at Toko Fajar Mandiri Tani. This diagram not only helps map out workflows and functional requirements but also ensures that the system developed meets the expectations of stakeholders and fulfills the operational goals of the store. By using the use case diagram effectively, the system development process can be more directed and result in a more satisfying outcome for all parties involved.

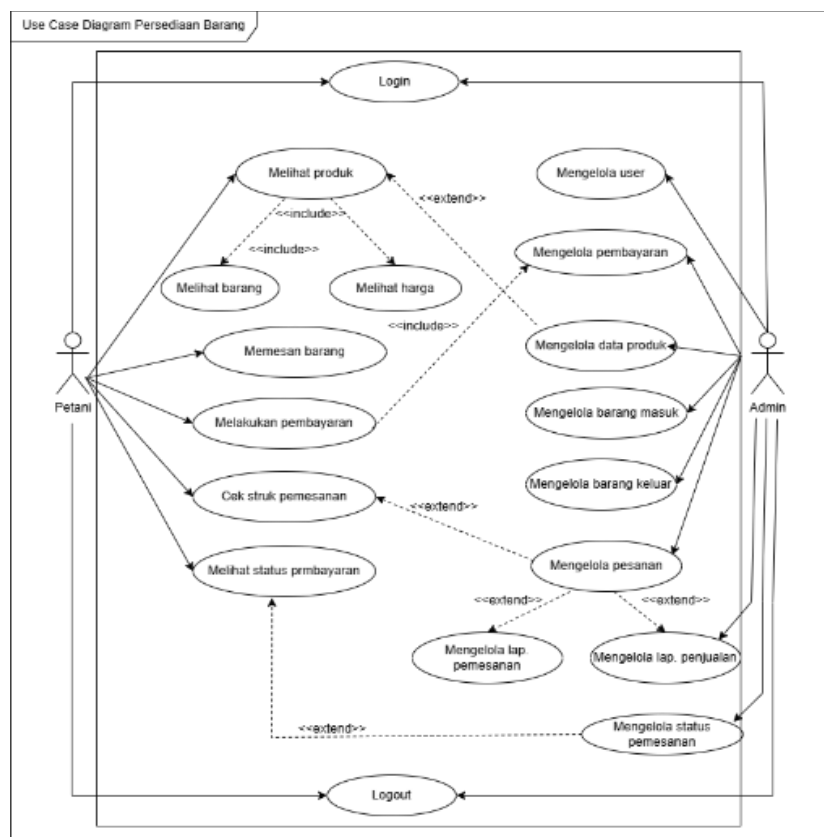


Fig. 2: Usecase Diagram of Toko Fajar Mandiri

3.2. Class Diagram

The class diagram plays a crucial role in this research as it illustrates the structure of the system to be developed, showing the existing classes, their attributes, and the relationships between these classes. In the context of the stock and sales record system at Toko Fajar Mandiri Tani, the class diagram is used to design a structured data model, such as classes for stock items, sales transactions, purchase records, and inventory management. With the class diagram, developers can better understand how data will be stored, accessed, and linked between entities within the system. This is essential to ensure that each part of the system functions properly and aligns with the operational needs of the store. Through the class diagram, developers can also design a more efficient and operationally effective system. For example, the class diagram can illustrate how sales transactions are linked to stock item data, as well as how information about purchases and stock levels can be integrated within a single system. This allows developers to ensure that all data related to transactions is processed correctly and promptly, ultimately enhancing the operational efficiency at Toko Fajar Mandiri Tani. Additionally, the class diagram helps in mapping the relationships between the various classes within the system. For instance, the sales transaction class may be linked to the stock item class to update the stock level after a sale. By visualizing these relationships, developers can easily identify if any part of the system needs adjustment or optimization and ensure that the flow of data between classes runs smoothly without any obstructions. This also makes it easier to maintain the system in the future, as each component of the system is clearly mapped out.

The class diagram also plays an essential role in designing a flexible and scalable system. For example, if Toko Fajar Mandiri Tani wants to add new features, such as a discount system or a customer loyalty program, the class diagram can be used to design new classes that integrate with the existing ones. By designing a modular and well-structured system, developers can ensure that the system built can easily grow and adapt to the store’s evolving needs. Moreover, the class diagram facilitates communication between the development team and stakeholders, such as store managers or business owners, to ensure that all necessary features are properly accommodated in the system. This diagram provides a clear overview of how the various elements in the system interact, making discussions and gathering feedback from stakeholders easier before implementation begins. Thus, the class diagram is not only a tool for system design but also an effective medium for communication between developers and users. Overall, the class diagram plays a very significant role in the development of the stock and sales record system at Toko Fajar Mandiri Tani. By using the class diagram, developers can design a well-structured, efficient, and easily upgradable system. Additionally, the class diagram ensures that the developed system can meet the operational needs of the store, support existing business processes, and facilitate the store’s growth and development in the future.

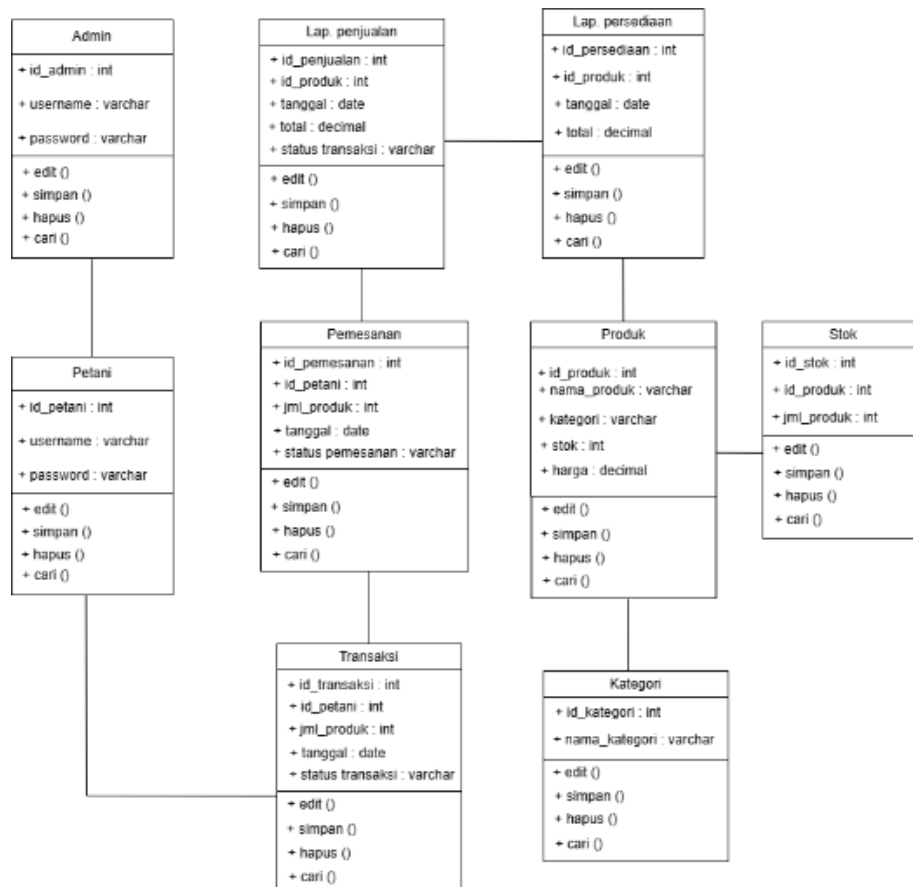


Fig. 3: Class Diagram of Toko Fajar Mandiri

4. Conclusion

Based on the analysis and design of the inventory management information system at Toko Fajar Mandiri Tani, it can be concluded that the inventory management process at the store is still not optimal. One of the main factors is the absence of a digital information system to support the process of recording and managing stock items more efficiently. Currently, stock records are still done manually, which leads to several issues in terms of accuracy and timely information. This has become a major obstacle for better management, as the manual process is prone to human error and delays in report delivery.

The manual recording process involves administrative staff filling out forms provided by CV. Sumber Pangan using a pen. Although these forms are used to record the in-and-out movement of goods, this method often results in discrepancies between the records and the actual stock in the warehouse. Additionally, the manual recording process takes longer and involves complex verification steps, which disrupts the workflow and causes delays in decision-making. Monthly reports are also frequently delayed in reaching the store, leading to inaccuracies in stock management and a lack of transparency in financial and operational reports.

Therefore, a web-based information system is needed to automate the entire process of recording and managing stock items at Toko Fajar Mandiri Tani. With an integrated system, the process of recording stock movements can be done in real-time, minimizing errors that arise from the manual process. This system would also make it easier to monitor stock levels and generate more accurate and timely reports, thereby improving operational efficiency. The implementation of a structured information system is expected to increase productivity and facilitate data-driven decision-making with accurate and reliable information.

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