Information System Design in Warehouse Inventory Control

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A B S T R A C T S

Inventory management is a crucial aspect for the smooth operation of businesses, as the availability of stock significantly impacts the company's operations. Supporting successful inventory management involves utilizing an information system that assists the company in monitoring inventory in real time and presenting accurate and up-to-date information. The purpose of conducting this research is to comprehend the concept of inventory control and its interrelation with an information system. The stage of this research is to carry out a research framework starting from planning, designing until the system can be used by users. In addition, the results of a literature review that was conducted using data from earlier studies by other researchers were used. The role of information systems in inventory control is of paramount importance, as it can enhance effectiveness and efficiency by providing real-time data about warehouse stock, thereby reducing the risk of errors that could result in losses for the company. Therefore, the development of an inventory control information system is anticipated to alleviate issues related to inventory management within the company.

A R T I C L E   I N F O

1. INTRODUCTION

A warehouse is one of a company's most valuable assets. A sufficient supply of goods guarantees efficient business operations and excellent customer service. On the other hand, stock shortages can hamper the production process and negatively impact customer satisfaction. Inventory management is so important to corporate success (I Rizkya, K Syahputri, RM Sari & OC Syardhi, 2020; Ramakrishna Yanamandra, 2019) . Due to the significance of inventory management, supporting tools are required to make it easier to control inventory, one of which is through the use of technology. The use of technology is a means to increase efficiency in any good human activity that leads humans to carry out valuable actions (Ramdhani, 2022). Designing corporate control information technology can make it easier for businesses to manage their storage activities. The inventory information system has been designed to be database-based which will make it easier for users to do their work, such as making it easier to process inventory data and create the required reports because this system is designed with an attractive and easy-to-use interface (Nurainun, 2020).

Furthermore, information systems can assist businesses in analyzing the obtained inventory data. Companies may use information systems to estimate market demand, allowing them to predict when demand will rise or drop, and when it is best to deliver goods. This enables businesses to more effectively and efficiently manage their inventories. As a result of the impact of information systems on inventory control, businesses require an information system capable of managing company inventory; thus, in this study, researchers built an information system capable of regulating company inventory management.

2. METHODS

2.1. Research Stage

The research framework used is based on the existing framework of thought, the research framework used can be seen in Figure 1.
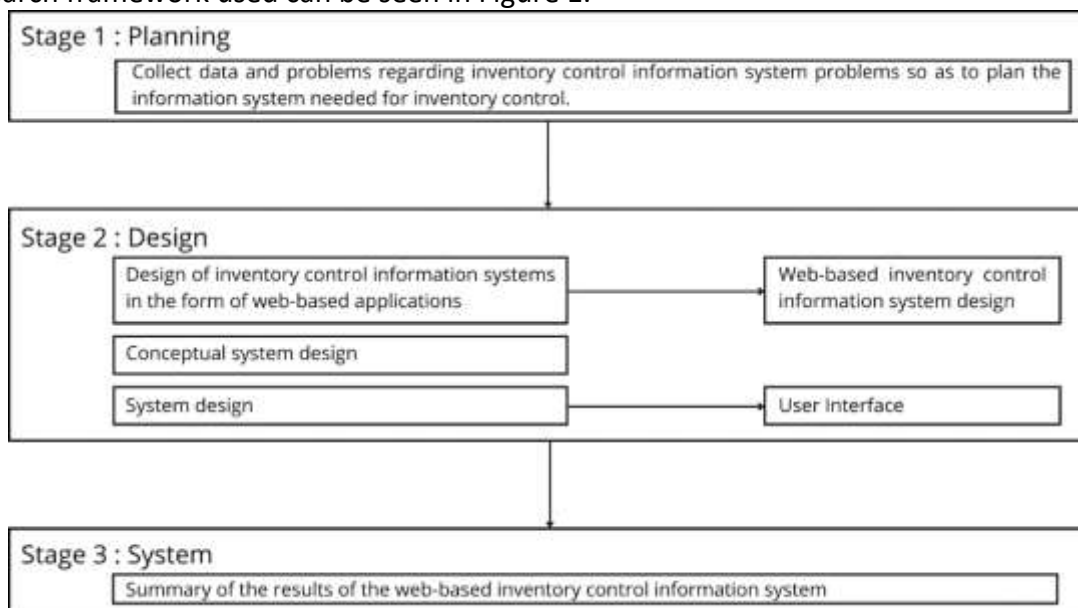

Figure 1. Research Stage

2.2 Literature Review

This scientific paper was written using the literature review approach as its primary research strategy. The study works that have already been studied by other researchers are identified, evaluated, and synthesised using this procedure. Journals, publications, and scientific papers that have been published during the previous five to ten years are the author's primary sources.

3. RESULTS AND DISCUSSION
3.1. Analysis of Inventory Control Problems

Analysis was carried out to determine general problems that are often found in inventory control.

Table 1. Case Analysis of Inventory Control Problems

Case	Analysis	Reference
In processing the inventory of the Maranatha Electrik store, you will encounter several obstacles, namely the wrong amount of inventory data, no archiving of entry and exit documents in the warehouse, and incorrect final inventory records. The guard must count and count and report the delay due to the warehouse Re-recording, there is often excess inventory, inventory is not corrected, items purchased and used, the information is not very relevant and accurate, the communication between the store owner and the warehouse clerk is not smooth.	• constraints on the amount of inventory data due to the absence of document archiving • recalculating and recording for report generation due to inaccurate information.	(Swasono & Prastowo, 2021)
UD SRC A3 is a minimarket engaged in the sale of food and staples. The problem that is often faced is that the management of inventory is carried out manually so that it is vulnerable to shortages of inventory materials, inaccuracies between incoming and outgoing inventory data, and the possibility of data manipulation and making reports to the owner takes a long time, because the making of reports is still manual. Especially in processing transaction data and recording inventory	• Recording incoming and outgoing goods is done manually so it is vulnerable to inaccurate inventory. • Allows for report manipulation, and takes time to create reports because it is still done manually.	(Pratama & Rusliyawati, 2023)

Case	Analysis	Reference
of goods that still use paper stock forms. With this manual data processing process, data accumulation often occurs, so that the final information about the stock / availability of goods produced sometimes does not match the physical stock in the warehouse. If at any time the owner needs inventory data and reports on data in and out of goods, it cannot be provided quickly, because it needs to be calculated manually one by one.		
At CV. X for information written in the raw material warehouse uses a whiteboard as a place to store information data on the arrival and release of materials which will later be recapitulated through paper documents by the warehouse department. This can affect production activities because the purchasing department must ask the warehouse for the availability of goods. In addition, the amount of inventory stock cannot change automatically so that the warehouse department must calculate the availability of stock items regularly so that the data can be updated and there are differences in the information provided to the purchasing and production departments.	If there is an outgoing item, the inventory data is not automatically reduced so that you have to calculate the availability of stock items regularly.	(Ramdhani & Supena, 2022)
Kedai Garasi Pamekasan still uses a manual system. Records used to record all transactions related to material inventory such as purchase records, usage records, and inventory recapitulation records. The problem that occurs is that consumers often feel disappointed because when placing a food order it turns out to be sold out, even though the consumer has already waited a long time, this is due to a lack	Lack of information related to purchase records, usage records, and inventory recapitulation records.	(Djaja, Fathorrahman, & Suryansyah, 2020)

Case	Analysis	Reference
of information from the kitchen and the raw material warehouse section with the cashier who receives the order.		
UD. Mekaryo Utomo based on the current business process, the sales department has problems in knowing the number of goods in the warehouse, the absence of this information often results in the sale of goods that are not in accordance with the availability of stock in the warehouse, this disrupts service to customers. In the reporting process that occurs currently, it takes a long time because it has to search and re-record data from transaction documents for the issuance and receipt of goods to make monthly reports.	• Constraints in knowing information on the number of goods available • The reporting process takes time because you have to search and re-record data	(Suhariyant, 2015)

According to the problems that have been examined, an information system is typically required in the digital age to help control inventory in order to record, make recapitulations, and make reports. As a result, the researcher created a straightforward inventory control information system that can aid in the effective management of inventory.

3.2. Information Systems Design

3.2.1. Use Case Diagram

Use cases or use case diagrams are modeling for activities in the system to be created (Andri Pratama, Rusliyawati, 2023). This helps identify system functions and the actors involved in those functions.
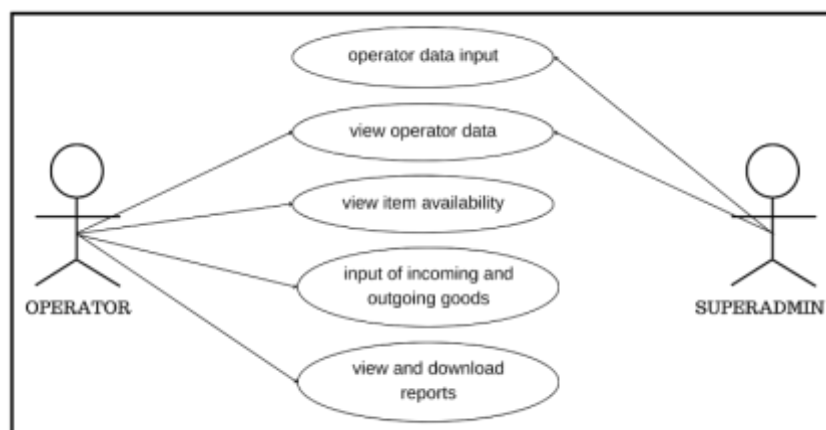

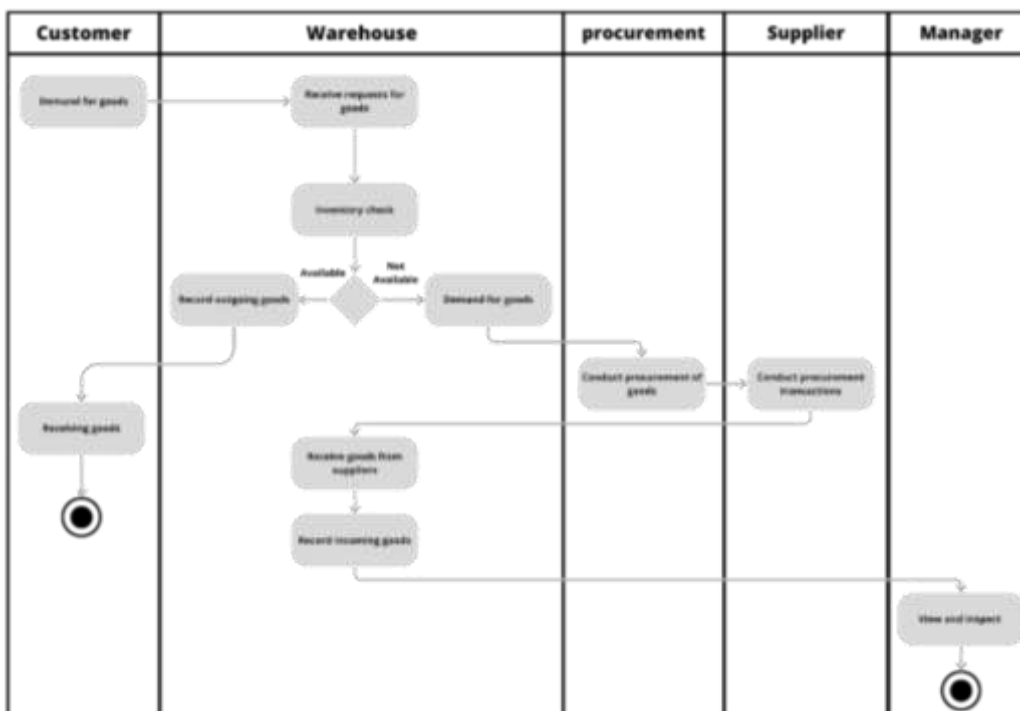**Figure 2. Use Case Diagram**

The Operator and Superadmin are only two of the actors in the system. Operators are performed by working personnel, and Superadmin are portrayed by supervisors or department chiefs.

Table 2. Use Case Diagram Description

No	Actor	Description
1	Operator	• Have access to add and remove goods movement • Have access to see item availability • Have access to download reports
2	Superadmin	• Has access to edit, add and delete user data • Have access to see the availability of goods

3.2.2. Diagram Activity

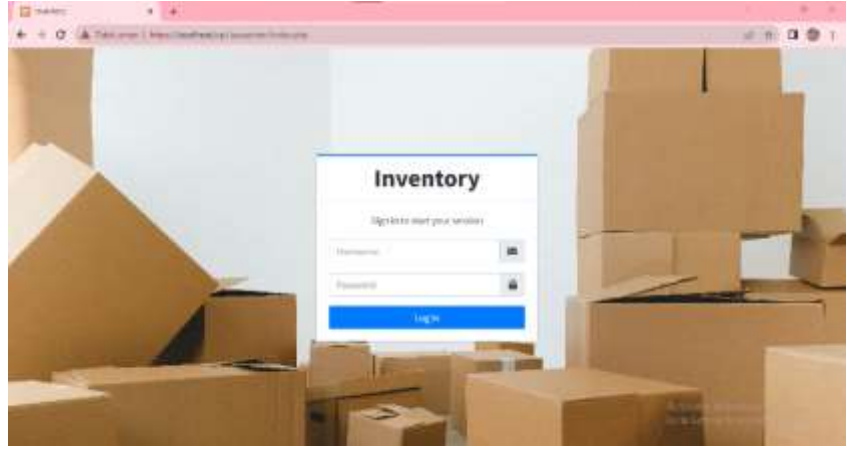Activity diagram is a graphical representation of the functional flow of how a system works. It is usually used to visualize the steps and decisions involved in completing a task.
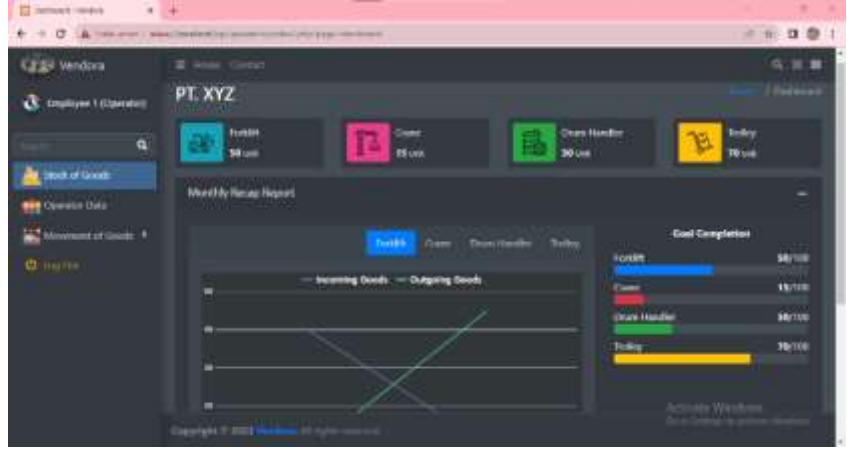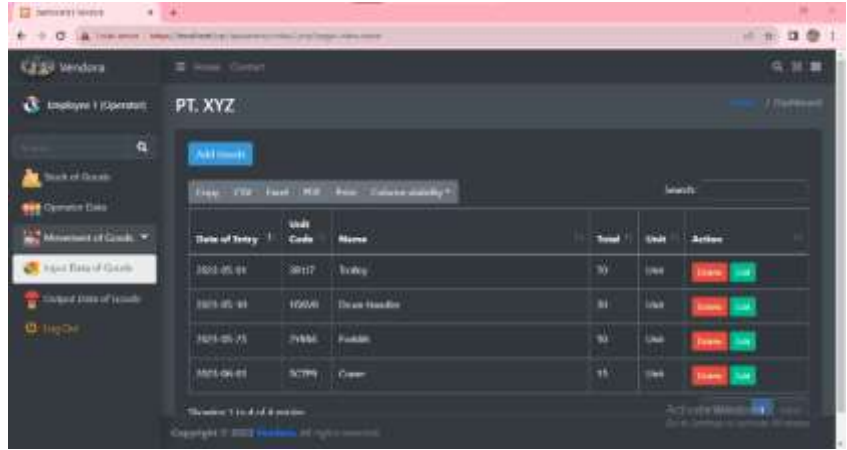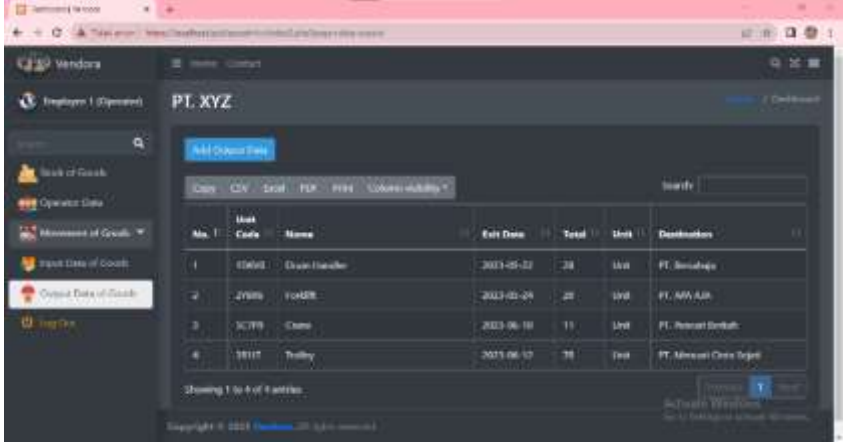
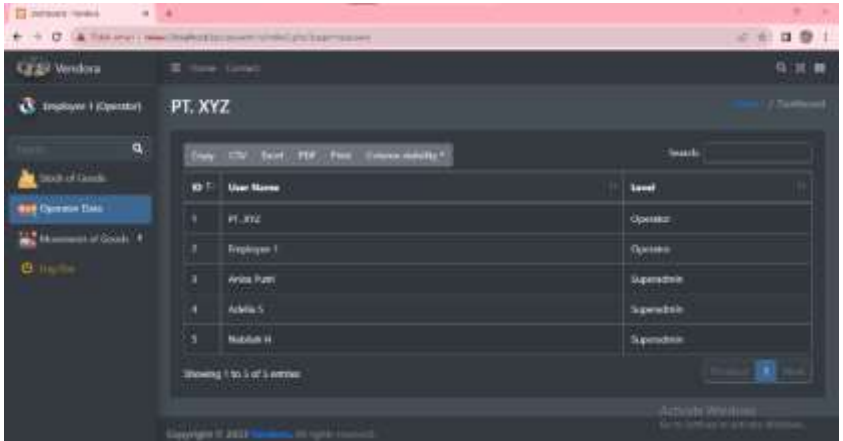

Figure 3. Activity Diagram

Beginning with the request for arriving items, inventory control actions. In order to register the exiting products, the warehouse department first determines whether the items are available. If not, the warehouse department notifies the procurement department to purchase the goods. The available products will be listed and documented if the goods have arrived.

3.2.3. Information Systems Design

The program's conceptual system design uses several software tools, including XAMPP v3.3.0, MySQL, MariaDB, Unified Modelling Language (UML), Hypertext Preprocessor (PHP). Furthermore, the user interface design can be seen in the table 3

Table 3. User Interface Design

User Interface	Description
	Login To be able to access the users need a registered username and password, the username and password can only be accessed by the superadmin as shown in the picture
	Dashboard Displays the amount of stock held as well as the movement of incoming and outgoing goods.
	Movement of Goods For goods input and output data, the users can download data in CSV, Excel, PDF and other formats to make it easier to make reports. 1. **Goods Input Data** When goods arrive they will be input, then the amount of input will automatically add

User Interface	Description
	up to the previous inventory. 2. **Goods Output Data** When there are outgoing goods that will be input, then the amount of outgoing goods input will automatically reduce the amount of existing inventory.
	User Data On this page can only be accessed by superadmin. Superadmin can see which operator or superadmin can access this system.

4. CONCLUSION

This paper covers the design of information systems in the context of inventory control in great detail. The study's findings indicate that the development of an effective information system is of critical importance in today's corporate environment. This system's architecture can increase operational efficiency by allowing for precise stock monitoring, the selection of the correct supplier, and improved inventory planning. This lowers the possibility of expensive overstock and understock disturbing operations. Furthermore, an efficient information system aids in the improvement of customer service. Organizations can respond to consumer requests more quickly and optimize the delivery process with the correct inventory data. This immediately leads to client happiness and keeps the company connection strong.

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