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Application Of the Buffer Stock Method in The Inventory Information System (Study On One Wholesale Company in Bandung)

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Abstract

This study aims to examine the inventory system employed by a wholesaler located in Bandung and offer suggestions to enhance the efficiency and effectiveness of inventory management. The research methodology is a case study incorporating interviews and firsthand observation of the company's inventory system. The results suggest that the company still needs to practice any particular approach for overseeing its inventory, resulting in difficulties in calculating suitable inventory levels and a failure to use technology in inventory management. Hence, the author advises the wholesaler in Bandung to enhance the utilization of technology in managing their inventory and proposes adopting a buffer stock approach for inventory control.

Keywords : *Inventory, Buffer Stock*

INTRODUCTION

Effective inventory management is a vital concern in the manufacturing industry. An ideal inventory management system should function at the optimal economic level while minimizing potential threats to the firm. Inventory control practices will influence the company's performance in satisfying client demand and managing stock. (Qadafi & Wahyudi, 2020)

Effective management of inventory is crucial for maintaining efficient manufacturing and sales operations. (Weiss et al., 2019) The organization must ascertain the most efficient inventory levels to ensure uninterrupted production while minimizing expenses. Effective inventory management is essential for attaining this equilibrium. (Baruffaldi et al., 2019; Hadian et al., 2021)

An inventory system is not just a collection of policies and controls, it's a strategic tool that oversees and monitors inventory levels to ascertain the appropriate stock to maintain, the timing of inventory availability, and the necessary order size. (Sahputra et al., 2022) The objective of this system is not just to guarantee the accessibility of the appropriate resources, but to keep the team focused and goal-oriented, ensuring the right quantities at the right time. Inventory systems and models seek to minimize overall expenses by identifying the most advantageous order point for what items to order, how much to order, and when to place the order. (Damayanti et al., 2023)

The demand level and the lead time for supply orders determine the buffer stock's value. An insufficient supply of goods can bring production to a standstill, underscoring the vital significance of inventory management in a company's operations. On the other hand, having too much inventory can lead to increased expenses for storing and maintaining the items, and also means that the capital tied up in the stored goods could have been used for more productive investments. (Babil, 2023) The company's objective is not simply to decrease or

augment inventory but also to optimize profitability.

Hence, it is imperative for the wholesaler in Bandung to tackle inventory management concerns, which encompass identifying the most advantageous order amount, scheduling of orders, the upper limit of inventory to be stored, and the requisite inventory to prevent shortages or surpluses. Inventory must be managed in order to anticipate unforeseen swings in demand. However, steps should be taken to limit stock levels, as having excessive inventory results in higher costs and wastage.

Systems and Information

System as a network of interconnected procedures that collaborate to carry out activities or accomplish specific objectives. (Corbae & D'Erasmo, 2021; McClintock, 2021)

Information, the valuable output of our work, is the result of data undergoing a transformative process. This process, in which you, as professionals in the field, play a crucial role, turns raw data into meaningful insights. Data, the raw material, is a collection of factual details that describe events and real entities. (Aghdam et al., 2023)

Buffer Stock

Buffer stock, often called safety or reserve stock, is an extra inventory to safeguard against and avoid situations when no stock is available. Buffer stock should be taken into account due to the likelihood of new orders arriving after the scheduled due date, such as delays caused by flooding and the increased demand for manufacturing. Insufficient buffer stock in such circumstances can result in stockout failures and impair both the production process and store services. (Aghdam et al., 2023)

Given the context of the problem described earlier, the researcher intends to investigate the application of a buffer stock approach in implementing an inventory information system at a wholesaler in Bandung.

METHOD

Research methods

The author employed a descriptive research methodology in this study. This strategy generates a comprehensive summary of situations or events, with the primary objective of gathering fundamental data.

Regarding the research conducted to gather data and information, the approach employed for the data-gathering process is as follows:

Observation

The study involves primary research by directly seeing and capturing the required data and information.

Interview

This entails gathering data by conducting face-to-face interviews with authorized individuals, particularly the warehouse manager, to obtain the essential information and data for the research.

Literature review

In addition, utilizing literature about the research objectives might aid in resolving challenges and establishing a solid theoretical basis.

System Development Methods

The prototype method was employed to develop the value processing system in this research. The prototype model bridges the disparity in consumer comprehension of technical elements and elucidates the requirements and specifications of desired

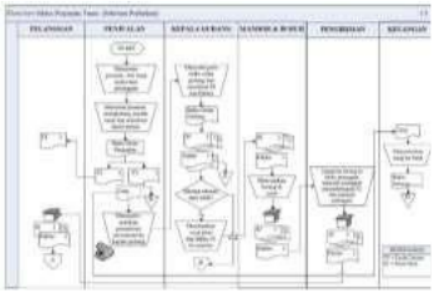
customer needs to software developers. The initial phase of the prototype model involves the collection of requirements. Developers and clients convene to establish the goals and comprehensive extent of the product, ascertain all existing requirements, and delineate areas that require additional clarification. Next comes the process of "rapid design." Rapid design prioritizes the presentation of software elements directly observable by employees or users, such as input methods and output formats—efficient design results in creating a prototype. The employees/users evaluate this prototype to refine the software developer's requirements. Interaction occurs when the prototype is modified to accommodate the requirements of employees while also enabling engineers to gain a clearer understanding of the tasks that need to be accomplished.

RESULT AND DISCUSSION

SYSTEM ANALYSIS AND DESIGN

a) Business Process Analysis

The subsequent sequence outlines the progression of business operations at a particular wholesale enterprise in Bandung, commencing with the data input performed by the administrator.



b) SWOT analysis

Strength

The Admin collects and verifies stock data, incoming goods reports, and exiting goods reports before submitting them to Marketing. This process helps to minimize errors in data recording.

Weakness

The user is responsible for inputting data on goods, while the admin manages outgoing goods using semi-electronic Data Processing (EDP). The admin manually enters data into a number processing application (Microsoft Excel), which results in a time-consuming process for inputting goods data.

Opportunities

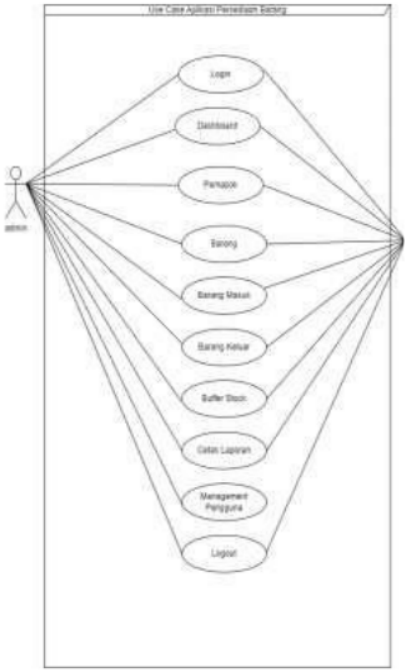
An entirely computerized system for recording goods data will mitigate the risk of users fraudulently entering incoming and outgoing goods data and provide convenience for administrators in managing goods inventory data.

Threat

The user's manual input of item data in a number processing application (Microsoft Excel) poses a danger of data loss and improper computerization.

c) Proposed New System

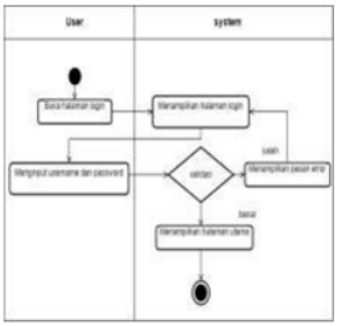
i. Use case diagrams



ii. ScenarioTable

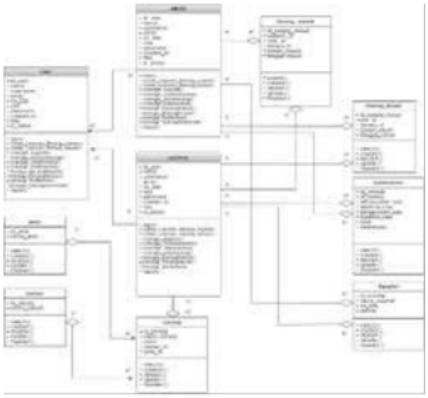
Use case Specification	
Nama *Use Case*	*Login*
Aktor	Admin
Deskripsi	Mengaktifkan aktor untuk masuk dan mengakses layanan sistem.
Skenario Utama	
Pre-Condition	Aktor telah dapat mengakses layanan sistem
Aksi Aktor	Reaksi Sistem
1. Membuka halaman login	2. Menampilkan halaman login
3. Mengisi *username* dan *password*	4. Validasi *username* dan *password* yang diinput aktor
	5. Halaman utama sistem ditampilkan.
Skenario Alternatif	
	5. Menampilkan pemberitahuan *username* dan *password* salah
6. Mengisi *username* dan *password* yang valid	7. Validasi *username* dan *password* yang diinput aktor
	8. Halaman utama sistem ditampilkan
Post-Condition	Aktor dapat Mengakses layanan sistem

iii. Activity diagram



d) System planning

i. Database Design



No	Field	Type	Primary Key
1.	ID_METODE	*VARCHAR*	*
2.	ID_BARANG	*CHAR*	
3.	PENGGUNAAN MAX	*INTEGER*	
4.	LEADTIME_MAX	*INTEGER*	
5.	PENGGUNAAN_RATA	*INTEGER*	
6.	LEADTIME_RATA	*INTEGER*	
7.	HASIL	*INTEGER*	
8.	KETERANGAN	*VARCHAR*	

ii. Interface Design

SYSTEM IMPLEMENTATION

The system implementation step involves describing and preparing an application system to ensure its operational readiness.

Login Page Display

Home Page/Dashboard Display

Buffer Stock Page View

CONCLUSION

The findings derived from this research can be summarized as follows: Firstly, the technology enables the automated recording of commodities data for companies. Furthermore, it assists in identifying the most advantageous reorder spots to guarantee uninterrupted availability of inventories. Furthermore, it aids in maintaining optimal inventory levels in warehouses to avoid both shortages and surpluses. Finally, it produces pertinent reports based on the outputs of the item data collection system.

Moreover, numerous recommendations can provide direction for future research. First and foremost, the program should be flexible and capable of accommodating future technology improvements. Furthermore, it is crucial to prioritize improvements in the visual aesthetics, functionality, and overall security of the system to exceed the performance of earlier versions.

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