

ENHANCING STORAGE AND RETRIEVAL SYSTEM IN THE CONSIGNED GOODS WAREHOUSE: A KAIZEN-BASED SOP DEVELOPMENT AND IMPLEMENTATION

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ABSTRACT

The consigned goods warehouse frequently encounters challenges, including the accumulation of stored items and faults in retrieving consigned goods. These problems stem from using simple forms with inadequate information and the absence of a Standard Operating Procedure (SOP) to regulate consigned goods in the warehouse. This research aims to develop and implement an SOP for storing and retrieving consigned goods to address these issues. The research process began with observations and needs analysis, followed by the development and implementation of the SOP, and concluded with an impact analysis comparing conditions before and after the implementation of Kaizen. The findings reveal that the consigned goods warehouse system has become more organized and standardized. Improvements in item information include adding details such as intended usage, usage timelines, item photographs, and Purchase Requisition (PR) documents or Statement Letters (BA). These enhancements have improved traceability and rectified faults in retrieving consigned goods. The accumulation of items was addressed through a storage time limit and reminders from warehouse personnel to users when it was time to use the items.

Keywords: Consigned Goods; Kaizen; SOP; Traceability; Warehouse

ABSTRAK

Gudang barang titipan sering menghadapi permasalahan yaitu penumpukan barang di gudang dan kesalahan dalam pengambilan barang titipan. Permasalahan ini disebabkan penggunaan formulir sederhana dengan informasi yang kurang memadai serta belum ada prosedur SOP yang mengatur mengenai barang titipan di gudang. Penelitian ini bertujuan untuk mengembangkan dan mengimplementasikan SOP terkait dengan penitipan barang titipan dan pengambilan barang titipan untuk mengatasi permasalahan tersebut. Proses penelitian diawali dengan melakukan observasi dan analisis kebutuhan, dilanjutkan dengan pengembangan dan implementasi SOP serta analisis dampak yang membandingkan kondisi sebelum dan setelah implementasi Kaizen. Hasil penelitian menunjukkan bahwa sistem gudang barang titipan menjadi lebih terorganisir dan terstandarisasi. Perbaikan pada informasi barang mencakup penambahan detail seperti kegunaan barang, waktu penggunaan, foto barang, serta lampiran dokumen Purchase Requisition (PR) atau Berita Acara (BA). Perbaikan ini meningkatkan ketertelusuran barang dan menghilangkan kesalahan dalam pengambilan barang titipan. Penumpukan barang dapat dihindari dengan pembatasan waktu penyimpanan barang titipan serta reminder dari personel gudang kepada user jika tiba saat penggunaan barang.

Kata Kunci: Barang Titipan; Kaizen; SOP; Ketertelusuran; Gudang

INTRODUCTION

Warehouses serve as storage facilities for various needs and often face multiple challenges. One common issue is inaccurate record-keeping, which can result in overstocking or shortages (Marziali et al., 2021; Aji & Nindiani, 2022; Paul & Lestari, 2015). Other issues include damage to goods in the warehouse (Echeverria-Garcia & Espinoza-Alarcon, 2023; Rizkya et al., 2020), as well as problems related to material identification, item arrangement, and warehouse cleanliness (Miranda, 2019; Wani & Shinde, 2021). Another problem faced in warehouse management is operational inefficiency in the order picking process (Attari et al., 2021), workflow (Žunić et al., 2018), and travel distance (Yener & Yazgan, 2019).

Some studies in warehouse adopt the principles of continuous improvement or Kaizen. Martins et al. (2020) elaborated continuous improvement in the warehouse management system, focusing on enhancing operational efficiency, optimizing layout, reducing waste, and fostering a culture of continuous improvement. Continuous improvement activities in the warehouse were also carried out by cleaning obsolete materials from the shelves and redesigning the warehouse layout to improve efficiency of operational flow (Ferreira et al., 2019). Based on Pauluk & Oláh (2017), Kaizen can be successfully applied in warehouse management, which is based on simple and cost-effective solutions with four basic principles: shortening (closer movement or leaving unnecessary step), connection (perform action simultaneously), reorganization (changing the operations or arrangement order), and simplification (simplified complicated things).

A consumer goods company in Jakarta operates two types of warehouses: an inventory warehouse and a consigned goods warehouse. The inventory warehouse stores routine items, while the consigned goods warehouse holds non-routine items. Categories of consigned items include project materials awaiting installation, leftover project materials post-installation, non-inventory items before and after installation, reusable used items (including assets and non-assets), critical spare parts, and exclusive items such as IT device spare parts, promotional goods, commercial items, and more. Management employs an SAP information system to manage inventory goods, while consigned goods are tracked using a straightforward Microsoft Excel database. As a result, consigned goods rely on manual oversight and do not benefit from the real-time tracking available for inventory items.

Various issues arise in the consigned goods warehouse, particularly regarding the accumulation of a large number of items and the difficulties faced by warehouse personnel in locating specific items and their designated storage locations when users request them. These challenges stem from the fact that item retrieval is based solely on a form filled out during the consigned goods storing process. However, the information provided on this form is highly limited, as it only includes the item name and quantity, making it difficult to accurately track and trace item details. Consequently, poor traceability of item information leads to delays in items retrieval, inefficiencies in warehouse operations, and increased time spent searching for specific goods.

A common issue is the incorrect retrieval of items, often due to users forgetting details during confirmation with warehouse staff. Furthermore, inconsistencies among personnel responsible for storage and retrieval operations can lead to errors, leading to repeated trips to the warehouse. This wastes time and significantly prolongs the retrieval process. Finding the required items can be particularly time-consuming, especially for those stored for long durations, sometimes over a year. The presence of different personnel during storing and retrieval further complicates the identification of consigned goods. The activities involved in retrieving consigned items include receiving and checking documents, locating and releasing consigned goods, obtaining Section Head approval, assigning document sequence identifiers, recording transactions on the computer, and providing receipt copies to users. A comparison between the standard time for consigned goods retrieval activities and actual practice is shown in Figure 1.

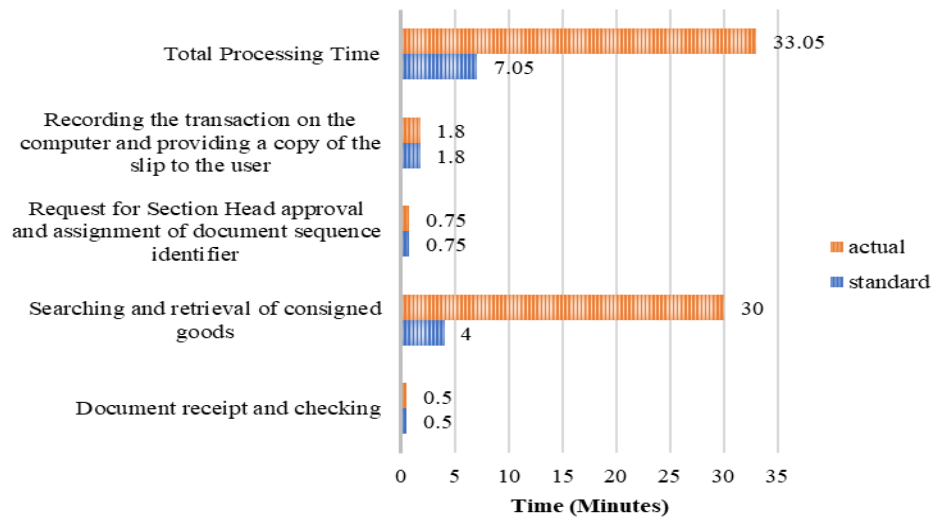


Figure 1. Comparison of standard and actual time in consigned goods retrieval activities

Based on Figure 1, the standard time allocation for consigned goods retrieval activities is 7.05 minutes, but it can take up to 33.05 minutes. This increase in time occurs during the search and retrieval of consigned goods, often due to repeated trips to the warehouse caused by faults in the items provided during retrieval, leading to a time increase of up to 650%.

The consumer goods company does not have a clearly defined Standard Operating Procedure (SOP) for consigned goods. As a result, no significant measures have been taken to address the accumulation of consigned goods in the warehouse. Warehouse staff cannot remind users to retrieve their items because there is no available information on the intended use, timing of use, or retrieval of consigned goods. However, having an SOP is essential. According to Hollmann et al. (2020), an SOP is a document designed to ensure that workers carry out processes consistently and by best practice standards.

Therefore, this study aims to analyze the consigned goods system in the warehouse and implement continuous improvements by developing an SOP. The research question to be addressed is how the consigned goods receiving and retrieval system can be improved to resolve recurring issues.

RESEARCH METHOD

A system for managing consigned goods must be developed to address recurring issues, particularly faults in item retrieval, which can lead to time wastage. The research flow (Figure 1) begins with field observations, followed by a needs analysis, and develops an SOP governing the warehouse's receipt and retrieval of consigned goods. The conditions are analyzed before and after the improvements to determine the resulting impact. The conceptual framework is presented in Figure 2.

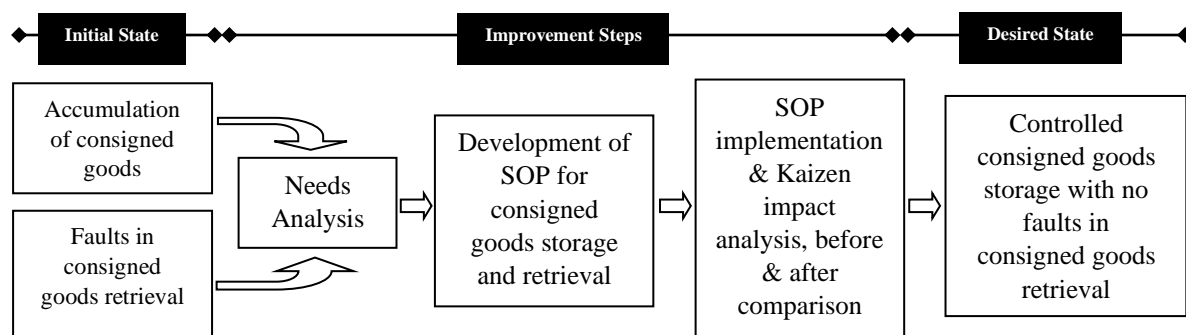


Figure 2. Conceptual framework

The initial condition involved the accumulation of goods in the warehouse and faults in consigned goods retrieval. A needs analysis was conducted to address these issues and create an SOP for storing and retrieving consigned goods. The SOP was implemented, and the conditions before and after its implementation were analyzed to assess the impact of the Kaizen activities. The desired final condition is controlled storage of consigned goods with no faults in their retrieval.

An SOP is crucial for establishing a well-managed system in the consigned goods warehouse. Therefore, developing and implementing an SOP is essential to resolving these issues. According to Schmidt & Pierce (2016), an SOP is a documented procedural practice that specifies who, why, what, where, when, and how a task is performed. SOPs can describe the administrative and technical operational functions of an organization. An effective SOP ensures consistency in implementing processes or procedures (even during personnel changes) and enhances efficiency by reducing employee workload. According to Lubis et al. (2020), an SOP is a quality standard for performing instructions, tasks, and activities essential to the organization.

RESULTS AND DISCUSSIONS

Consigned goods stored in the warehouse often create challenges for this Consumer Goods company. A common issue is the lengthy search time required when retrieving consigned goods, caused by a significant accumulation of these goods and inadequate record-keeping practices. Users often store consigned goods for more than a year, resulting in the accumulation of items in the warehouse. Furthermore, the consigned goods form contains incomplete data, lacking information about when the items will be used or their intended purpose. The form typically only includes the item name and quantity.

Initially, the storing process required users to fill out a form containing only the item name and quantity, without any detailed information about the items or supporting documentation. The goods consigned to the warehouse are owned by the user, typically ordered items stored in the warehouse if not immediately needed, to be retrieved later. The main issue is that the storage and retrieval system still relies on a basic form, often leading to retrieval faults due to the lack of detailed item specifications.

A needs analysis was conducted to address the issues faced in the consigned goods warehouse, as shown in Table 1.

Table 1. Needs analysis for consigned goods warehouse

No	Party	Needs
1	Consigned Goods Warehouse	Clear identification of consigned goods, easy-to-find consigned goods, accurate knowledge of the quantities, understanding of the intended use of consigned goods, availability of photographs for easier item identification, a proper storage system to prevent long-term accumulation, and the ability to remind users to retrieve items when they are due for use
2	User	No faults occur during item retrieval, items are retrieved from the warehouse promptly, and users are reminded when it is time for the retrieval process.

Consigned goods stored in the warehouse often create challenges for this Consumer Goods company. One major issue is the lengthy search time during retrieval, caused by a significant accumulation of consigned goods and incomplete or inaccurate consignment records. Users frequently store items for over a year, leading to overcrowding in the warehouse. Furthermore, the existing consignment form provides limited information, listing only the item name and quantity without details on the intended use or the timeframe for retrieval.

In the current process, users complete a form that only includes the name and quantity of the items without additional details or supporting documents. Items consigned to the

warehouse are typically ordered goods owned by the user, stored when not immediately needed, and retrieved later. However, the lack of detailed specifications in the basic form often results in faults during retrieval.

The warehouse department seeks to improve item search processes to address these issues. Available information must include the correct item name, be consistent with the name listed in the Purchase Request (PR), ensure proper name standardization, and facilitate easier tracking of goods. Additionally, incorporating item photographs is necessary to simplify identification during retrieval, mainly when different personnel handle storage and retrieval. Photographs will significantly aid quick recognition during searches.

The warehouse also aims to prevent prolonged storage of consigned goods due to users failing to retrieve them. Warehouse staff cannot remind users to collect their items because there is no information on the intended use or timeline. Including details such as when and for what purpose the items will be used would enable warehouse personnel to remind users, thereby reducing long-term accumulation.

On the other hand, users want to avoid faults during retrieval to prevent wasted time caused by repeated trips to the warehouse. Users also appreciate being reminded when it is time to collect their consigned items.

Kaizen, a Japanese term for continuous improvement in standardized work processes (Rossini et al., 2019), is implemented to address these challenges. According to Abdulmouti (2015), Kaizen is a philosophy or practice focusing on ongoing improvements in manufacturing, engineering, or business management processes.

In this warehouse, Kaizen is applied by developing and implementing an SOP for the receipt and retrieval of consigned goods, which had not existed previously. According to Akhyar (2012), SOP is a process document that provides a detailed description of how operators should carry out specific tasks. Its primary purpose is to ensure that all workers perform their duties in a consistent manner, as required to achieve the desired outcomes of the process. Based on the needs analysis, the SOP is designed and illustrated in Figure 3 for the receipt process and Figure 4 for the retrieval process.

The consignment receipt process begins with identifying the items to be stored and organizing them. Photographs of the items are taken and attached to the consignment documents. The Material Deposit Slip (MDS) or consignment form is filled out by the user and must be accompanied by a copy of the PR document. If the PR is available (complete documentation), approval is granted by the Department Head. If the PR is incomplete, the user must create statement letters indicating the absence of the PR, which must be approved by both the Department Head and the VP. Following approval, the MDS is signed by the Department Head, and the items and documents are taken to the consignment goods counter.

Warehouse personnel check the consistency of the items and documents. If they match, the consigned items are accepted. Identification tags and stamps are added, and approval is given by the Section Head. Users then log their consignment in a logbook. Once approved by the Section Head, warehouse staff input the transaction into the receipt system. If inconsistencies are found, the process restarts with the user re-identifying the items.

Previously, there was no procedure specifying a maximum storage period for consigned goods, leading to uncontrolled storage. The new SOP includes a procedure limiting storage to six months, requiring Department Head approval at the time of consignment. If the storage period exceeds six months, the user must submit a new statement letters (BA) approved by the VP. This encourages timely use of the items and prevents prolonged accumulation in the warehouse. Additionally, this time limit allows the user's supervisor to monitor purchased goods and ensure they are necessary and utilized within six months, preventing idle company assets. Improvements to the consignment process have resulted in

better-controlled storage. Information is now more standardized, complete, and easier to monitor.

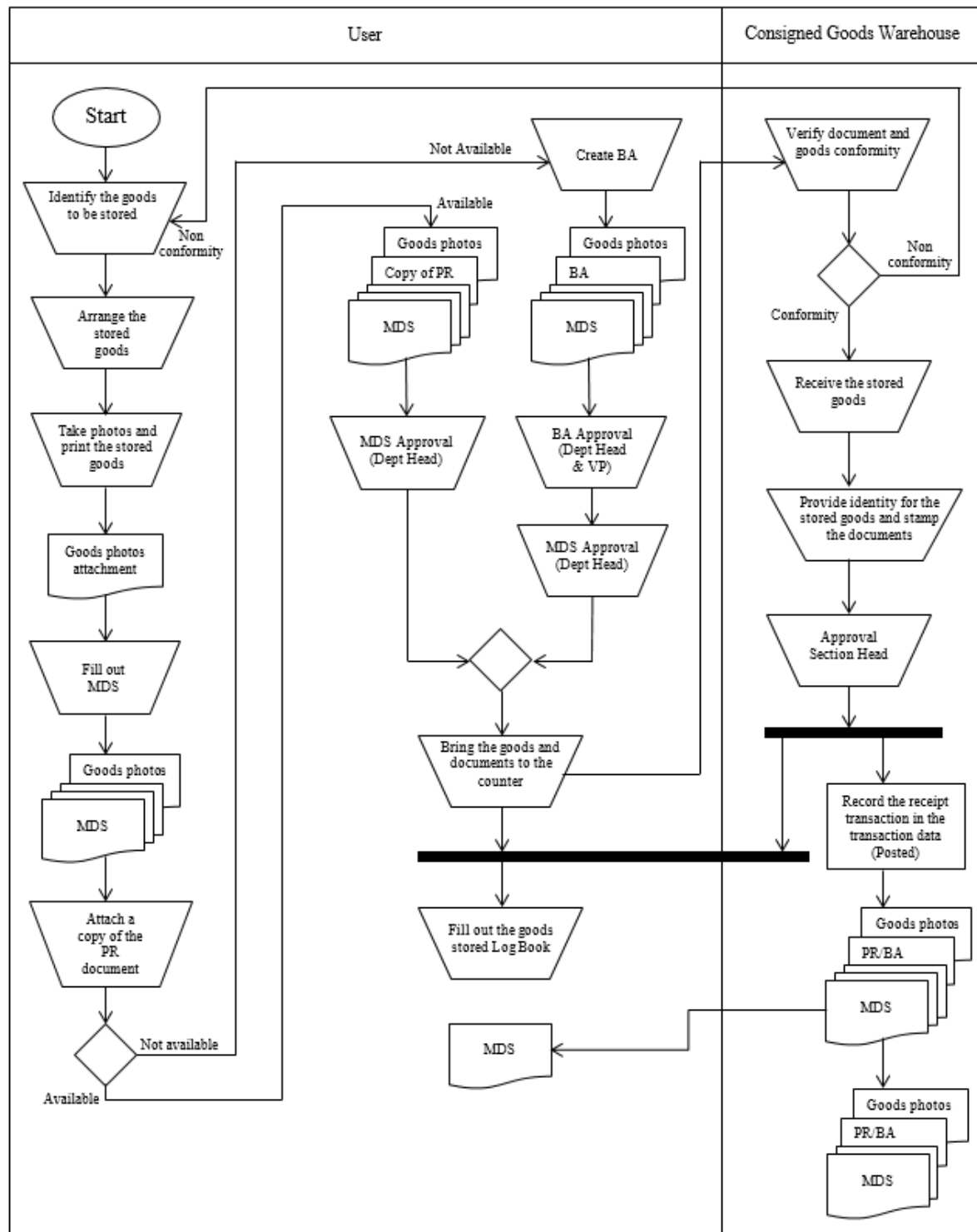


Figure 3. SOP of goods storage in the consigned goods warehouse

In Figure 4, the SOP for retrieving consigned goods begins with identifying the items to be retrieved. The user fills out the Material Withdrawal Slip (MWS) or material withdrawal form, which is then approved by the Department Head. The user brings the document to the consignment goods counter, where warehouse personnel check the document for accuracy. If the documents match, warehouse

personnel locate and retrieve the consigned goods, with the retrieval approved by the Section Head. The user receives the consigned goods and logs the retrieval in the logbook. Finally, warehouse personnel input the issue transaction into the MWS transaction data.

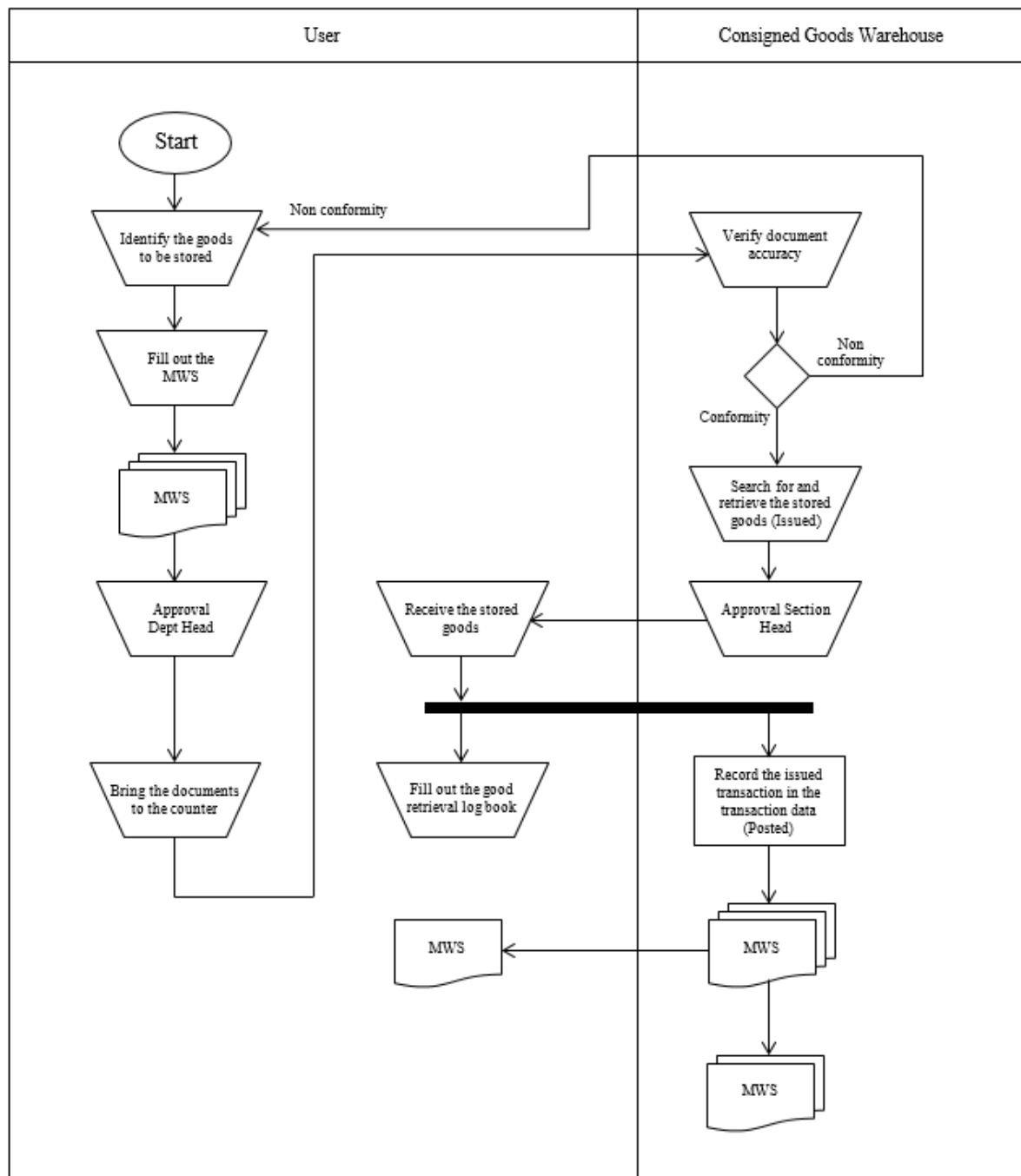


Figure 4. SOP of goods retrieval in the consigned goods warehouse

The implementation of this SOP has provided various benefits to the company. Issues such as the accumulation of goods for years and faults in retrieving consigned items no longer occur. The SOP has enhanced the quality of warehouse services for internal customers, prevented time wastage during item searches or retrieval faults, and established a storage time limit. This encourages users to be more prudent in purchasing only necessary items, thereby avoiding prolonged storage of unused company assets.

With the development and implementation of the SOP as a guideline for operational procedures in the consigned goods warehouse, several positive impacts have been achieved, including a better and more controlled database for warehouse personnel, such as:

1. Understanding the planned use or installation of consigned goods enables personnel to remind users when to install or utilize the items.
2. Knowing the purpose of consigned goods makes understanding the nature of the items easier and facilitates better placement within the warehouse.
3. Including item photographs to simplify identification during retrieval, ensuring the match between the item name and the actual item while improving the traceability of item information.
4. Setting a storage time limit for consigned goods, preventing item accumulation, and encouraging better user purchasing decisions ultimately result in more controlled management of company assets.

A comparison of the conditions before and after the Kaizen implementation in the consigned goods warehouse is presented in Table 2.

Table 2. Comparison of storage and retrieval system in the consigned goods warehouse before and after Kaizen implementation

Critical Points	Before Kaizen Implementation	After Kaizen Implementation
Consigned goods information	Item names (non-standard), quantities listed, no attachment document	Standardized item names, quantities, function, and installation time listed, item photographs, attachment of PR or BA
Period of consigned goods storing	Not limited	Limited to a maximum of six months
Consigned goods storing	Accumulation of items occurred, and warehouse personnel could not remind users	Storage is more controlled, and warehouse personnel can remind users when it is time for installation
Consigned goods retrieval	Frequent item faults	No item faults occur

With the development and implementation of the SOP for consignment goods in the warehouse, the traceability system for consignment goods has significantly improved.

CONCLUSIONS

The development of the SOP for consignment goods in the warehouse, which encompasses both storage and retrieval processes, was meticulously carried out while taking into account the specific needs and expectations of relevant stakeholders, including warehouse personnel and users who consign goods. With the implementation of the SOP, information regarding consignment goods is now far more comprehensive, as it is accompanied by photographs and attached PR (Purchase Requisition) documents, significantly enhancing traceability and simplifying the identification process. The implementation of the SOP for consignment goods has brought about notable improvements to the storage and retrieval systems within the warehouse, effectively reducing item accumulation by enforcing a six-month storage limit. The structured approach has also enabled warehouse personnel to proactively remind users about their stored goods, ensuring that consigned items are retrieved in a timely manner based on the available usage information. Additionally, by applying Kaizen principles to the consignment goods warehouse, the overall system has become more standardized, systematically controlled, and highly traceable.

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