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Digital Transformation of Inventory Management: Evaluating the Impact of First In First Out-Based Accurate Point of Sale System Implementation on Warehouse Operations

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ABSTRACT

Every company engaged in manufacturing or distribution requires an effective inventory management system to ensure operational continuity and prevent recording errors. This study aims to evaluate the implementation of a Warehouse Management System based on the Point of Sales (POS) Accurate software using the First In First Out (FIFO) method at PT. Vortex Energy Batam, Giga Energi Teknologi unit. The study employs a mixed-method approach, combining quantitative and qualitative analyses to obtain a comprehensive understanding of the system's effectiveness. Data were collected through observation, interviews, and literature review. The results show that the implementation of the POS Accurate system with the FIFO method significantly improves recording efficiency, reduces human error, and accelerates stock reporting processes. The average input time per transaction decreased from 10–15 minutes to 3–5 minutes, while data accuracy increased through the system's automated validation feature. Furthermore, the system enhances integration between departments and improves data transparency. Overall, the implementation of the POS Accurate FIFO-based system effectively strengthens inventory management performance and supports supply chain efficiency.

Keywords: Warehouse Management System; First In First Out; Point of Sale Accurate; Warehouse Efficiency; Inventory Management

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INTRODUCTION

Every company operating in the manufacturing or distribution sector requires an effective inventory management system to ensure smooth and stable operational processes (Shanmugamani, 2023), supply chain performance highly depends on real time inventory visibility and the accuracy of information used for decision making. Therefore, the warehouse becomes a critical component in ensuring operational continuity and responsiveness in the industry Therefore, warehouse systems play a crucial role as the foundational element of business continuity. The Warehouse Management System (WMS) is one of the technologies widely adopted to support modern warehousing activities. WMS enables companies to manage receiving, storage, and distribution processes in an integrated manner (Faradillah, 2019). Previous studies have shown that WMS implementation can enhance data accuracy, accelerate transaction processes, and minimize recording errors (Putri, 2019; Shanmugamani, 2023).

In addition to system integration, the chosen inventory management method also influences warehouse efficiency. One commonly used method is First In First Out (FIFO), an approach that ensures the first items received are the first items issued. This method plays a critical role in preventing the accumulation of aging inventory, improving stock rotation, and maintaining product quality (Nirmala, 2024). However, various studies indicate that manual warehouse systems often lead to inefficiencies and data inaccuracy. A similar phenomenon occurred at Giga Energi Teknologi prior to the adoption of a digital system. Although the company has begun implementing a Point of Sale (POS) Accurate based Warehouse Management System (WMS) with First In First Out (FIFO) principles, the implementation has only been running for approximately three months, resulting in several challenges, such as discrepancies between system data and physical stock conditions.

This situation causes delays in several transactions because staff members must perform additional manual verification. Previous studies have shown that the application of Warehouse Management Systems (WMS) can improve the accuracy of stock recording and reduce processing time; however, most of these studies only focus on large-scale implementations in fully digital environments (Alamsah et al., 2024; Shanmugamani, 2023). Research on the transitional phase when companies are shifting from manual spreadsheets to digital systems is still very limited, particularly in small to medium-scale distribution companies that rely on batch-based inventory flows. Furthermore, existing research rarely explores how the integration of the FIFO method through a Point-of-Sale application specifically affects operational efficiency and staff adaptation during early implementation.

Therefore, this study addresses this gap by examining the effectiveness of FIFO-based digital recording using POS Accurate during the transition from manual spreadsheets to a WMS-aligned system, focusing not only on performance improvements but also on user adaptation and challenges encountered in daily warehouse operations. These issues indicate that the digital system is still in its adjustment phase, both technically and in terms of human resource adaptation. Therefore, this study was conducted to evaluate the extent to which the implementation of POS, Accurate with a FIFO approach, can enhance warehouse operational efficiency. The study aims to identify challenges during the early stage of system adoption, analyze improvements in efficiency and accuracy after the system is implemented, and formulate development recommendations to support the continuous optimization of system performance.

Recent literature presents various perspectives regarding the effectiveness of digital warehousing systems, highlighting both their advantages and potential limitations. While many studies emphasize significant improvements in accuracy, speed, and

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traceability following WMS implementation, other research demonstrates that early stage digitalization may produce inconsistent results due to staff adaptation, workflow restructuring, and system alignment issues. These diverging findings show that the success of WMS adoption is highly dependent on organizational readiness, technological maturity, and the consistency of warehouse practices, making early-phase evaluation important to understand transitional outcomes.

Despite extensive research on WMS and FIFO, most prior studies have focused on large-scale or long-term implementations where systems have already reached operational stability. Limited attention has been given to warehouses in the initial stages of transitioning from manual to digital processes. This creates a clear research gap in understanding how hybrid digital manual workflows function during early adoption, particularly within small-to-medium warehouse environments. Existing literature has not yet examined the combined use of POS-based systems like POS Accurate with FIFO principles in real-world conditions, where system instability and human resource adaptation are still ongoing.

The novelty of this study lies in its investigation of POS Accurate integrated with FIFO principles during an early-stage digital transformation. Unlike prior studies that analyze mature or fully optimized WMS environments, this research captures real-time challenges such as data discrepancies, manual verification, and input delays that naturally occur during the adjustment phase. The use of a mixed-method approach combining quantitative performance measurements with qualitative insights from warehouse staff also provides a more comprehensive evaluation compared to previous research that typically focuses on a single perspective.

By addressing these gaps, the findings of this study are expected to demonstrate both the operational improvements and the practical challenges arising during system implementation. The anticipated outcomes include identifying areas where the digital system enhances efficiency, recognizing obstacles that hinder performance, and proposing recommendations to support the long-term optimization of POS, Accurate, and FIFO within the company's warehouse operations. These contributions are intended to assist other organizations undergoing similar digital transitions and enrich the academic discourse on early-phase WMS implementation.

LITERATURE REVIEW

Warehouse Management System (WMS)

A Warehouse Management System (WMS) is a computer-based information system designed to manage receiving, storage, placement, and distribution activities in an integrated and traceable manner. (Alamsah et al., 2024) found that WMS implementation significantly improves stock accuracy and enhances warehouse productivity within FMCG logistics operations. Similarly, emphasizes that WMS reduces administrative workload through automated transaction recording and minimizes manual-input–related errors. For both large and medium-sized enterprises, integrated WMS functions as the operational backbone, ensuring that every stock movement remains fully documented and traceable.

Several empirical studies also support the operational impact of WMS. (Ropianto, 2020) demonstrated that WMS improved warehouse productivity in an automotive company in Batam by up to 35% through real-time monitoring of inbound and outbound flows. Likewise, (H. Lee, 2025) showed that WMS supports automated batch tracking and stock reporting, improving transparency and accountability. However, recent studies acknowledge that early-stage WMS adoption can also introduce transitional challenges,

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including staff adaptation, inconsistent data entry, and incomplete system synchronization. This indicates that WMS effectiveness is not uniform across implementations, particularly during initial digital migration phases.

First In First Out (FIFO) Method

The FIFO method ensures that goods stored first are also the first to be dispatched. According to (Nirmala, 2024) FIFO promotes proper stock rotation and prevents aging or obsolete inventory, ultimately improving product quality. (Fadillah, 2024) found that integrating FIFO with a web-based system helps reduce human error and accelerates digital stock reporting. Similarly, (Sihombing et al., 2024) show that FIFO is highly effective in controlling inventory levels in minimarket operations.

FIFO influences not only the physical flow of goods but also the digital flow of information. FIFO-based batch recording enables consistent issuing processes, simplifies auditing, and improves traceability. However, several studies also highlight that FIFO implementation in manual warehouse systems is difficult to maintain due to inconsistent documentation and delayed data entry. This suggests that FIFO works optimally when supported by digital systems capable of automatic batch tracking.

Point Of Sales (POS) Accurate

POS Accurate is a Point of Sales system integrated with accounting and inventory modules. (Kumar, 2023) explain that ERP–POS integration enhances transaction efficiency because data flows automatically into accounting modules. (Li, 2022) emphasize that FIFO embedded within POS systems strengthens batch accuracy and inventory traceability across transactions.

In the warehouse context, (Basuki, 2025) found that POS usage in automotive industry warehouses increased data-input speed by up to three times while reducing documentation errors. This aligns with the needs of companies transitioning from manual systems to more structured digital systems, particularly when accuracy and speed are crucial.

Integration of Warehouse Management System, First In First Out, and Point Of Sales for Warehouse Efficiency

Integrating WMS, FIFO, and POS has been shown to significantly enhance warehouse efficiency. (Shanmugamani, 2023) state that digital system implementation can reduce human-error rates by up to 40% and accelerate stock audits. (Rachmawati, 2024) also note that combining FIFO with WMS improves inventory rotation and optimizes storage-space allocation.

In the context of Giga Energi Teknologi, the integration of POS Accurate, FIFO, and a digital warehouse system supports automated input, batch tracking, and stock reporting. This not only enhances operational speed and accuracy but also increases data transparency, enabling management to make more reliable strategic decisions.

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Conceptual Framework

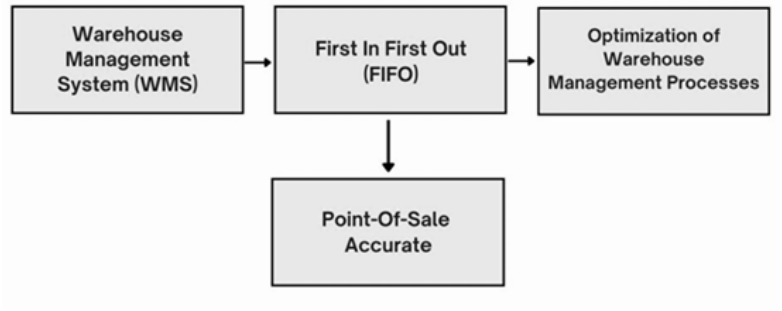

Figure 1. Conceptual Framework
Source: Own Compilation, 2025

This conceptual framework illustrates the relationship among WMS, FIFO, and POS in supporting warehouse efficiency and data accuracy. These three variables interact within an integrated system flow that directly influences the quality of record-keeping and decision-making processes.

Based on the literature review, the relationship among the three core concepts in this study shows that the Warehouse Management System (WMS) enhances efficiency and accuracy in inventory management through integrated recording and real-time monitoring. The FIFO method ensures orderly stock rotation, preventing the buildup of aging goods and facilitating stock audits. Meanwhile, POS Accurate functions as a digital recording system that integrates purchasing, sales, inventory management, and financial reporting automatically, thereby reinforcing the accuracy and consistency of operational data.

Together, these concepts support warehouse efficiency, data accuracy, and information transparency. The integration of WMS, FIFO, and POS Accurate provides a strong foundation for companies transitioning toward digitalized operations and strengthens competitiveness amid the demands of Industry 4.0 (Basuki, 2025; Shanmugamani, 2023)

RESEARCH METHOD

This study employs a mixed-method approach by integrating quantitative and qualitative analyses. The Mixed Method design is considered suitable for organizational system evaluation because it allows numerical performance indicators to be interpreted together with user experience and behavioral responses (Creswell, 2022) This method was selected because the company is in the early phase of system digitalization, requiring insights that are not only numerical but also based on real user experience in the warehouse environment. Quantitative analysis was used to measure operational improvements such as input time, documentation accuracy, and stock flow efficiency, while qualitative analysis through interviews, direct observation, and documentation review supported the interpretation of system usage during the transition process (Slingerland et al., 2021).

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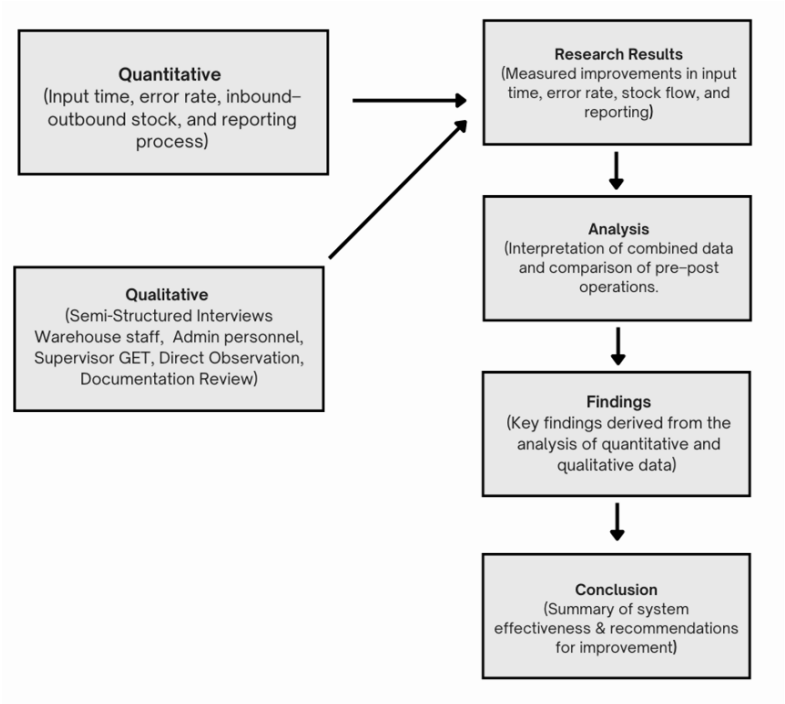

Figure 2. Mixed Method Research Approach
Source: Own Compilation, 2025

As illustrated in Figure 2, the integration process in this Mixed Method design follows a structured flow beginning with Research Results, followed by Analysis, Findings, Discussion, and concluding with Conclusion and Recommendations. Mixed-method structures of this type ensure that both quantitative and qualitative data complement one another rather than being analyzed separately (Creswell, 2022) The research was conducted at PT Vortex Energy Batam, Giga Energi Teknologi unit, from September to November 2025, aligning with the ongoing implementation of POS Accurate, so that changes and challenges could be directly observed throughout the transition period.

Types and Sources of Data

Quantitative data were obtained from measurements of transaction input time before and after system implementation, error rates in recording, stock movement data (inbound and outbound), and the speed of report generation. Meanwhile, qualitative data were collected through interviews with warehouse staff, administrators, and supervisors, direct observation of daily workflows, and documentation of transaction records before and after digitalization. The combination of quantitative and qualitative data is essential to understand both practical performance outcomes and user behavioral adaptation during digital transitions (Nurain et al., 2024).

Data Collection Techniques

Three data collection techniques were applied in this study. Direct observation was conducted to examine inbound, storage, and outbound processes as well as to observe how warehouse personnel operated POS Accurate in daily activities. In-depth interviews were carried out to explore user experiences related to the challenges faced during the transition period and the improvements perceived after the system was implemented. Meanwhile, document analysis was performed to compare the previous manual recording system, which relied on Google Spreadsheet, with the digital records generated by POS Accurate. The triangulation of these techniques strengthens the validity of findings by

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ensuring that information obtained from different sources supports each other (Shanmugamani, 2023).

Data Analysis Techniques

The data analysis techniques were adjusted to the information obtained during the internship. First, descriptive analysis was used to portray work patterns, recording flows, and system usage within daily administrative and warehouse activities. Second, thematic analysis was used to categorize observations and interview results into major themes such as user adaptation, system feature utilization, and work experiences after digitalization, as recommended in recent organizational qualitative research frameworks (Slingerland et al., 2023). The final stage involved triangulation by comparing various sources of information to ensure the consistency and reliability of findings. This approach provides a comprehensive overview of the implementation of FIFO-based POS Accurate at PT Giga Energi Teknologi based on real conditions observed during the internship.

RESEARCH RESULTS

Operational Conditions Before the Implementation of POS Accurate

Before implementing POS Accurate, Giga Energi Teknologi relied on Google Spreadsheet as its primary recording tool. All inbound and outbound stock transactions were entered manually by warehouse staff, making accuracy highly dependent on human precision. This manual approach created several issues, including delays in stock updates, a high potential for input errors, difficulties in tracking item batches, and the need for repeated verification when preparing monthly reports. In addition, the absence of integration between departments caused the stock information displayed in the system to not always reflect the actual physical condition of the warehouse.

Transition and Early Stage of POS Accurate Implementation

During the early stage of implementation, although the digital system helped simplify workflow processes, several manual interventions were still required. This occurred because POS Accurate needed to synchronize previously recorded Spreadsheet data with the physical stock conditions in the warehouse. Warehouse staff were required to re-verify stock quantities, ensure batch accuracy, and correct inconsistent data caused by earlier manual recording practices. This adjustment process took approximately three months and served as a critical step to ensure the accuracy of initial data before full system utilization.

Throughout the transition period, warehouse staff also corrected batch information and entry dates that were not uniform, including ensuring that each item had consistent codes, categories, and units within the digital system. Although this stage required additional time and careful attention, it formed a foundation for stable system operations in the future. As users became more familiar with digital input procedures, the need for manual intervention gradually decreased. These findings indicate that the success of digitalization is not solely determined by the technology itself, but also heavily depends on the readiness and adaptability of users in following new, more structured procedures.

Inbound and Outbound Goods Flow Under the FIFO Mechanism

Inbound goods are recorded through the Purchasing module, where the system automatically increases stock based on the transaction date and stores batch information according to the arrival time. When goods are issued through the Sales Invoice module, the system deducts stock based on the oldest batch without requiring manual intervention

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from the user. This demonstrates that the FIFO feature is functioning automatically in accordance with the fundamental principles of inventory rotation.

Table 1. Incoming and Outgoing Goods Inspection (FIFO Tracking)

Entry Date	Item Code	Warehouse	In	Out	Balance
04-08-2025	TL LED ECOFIT	Center	200	0	200
04-08-2025	TL LED ECOFIT	Center	10	0	210
27-08-2025	TL LED ECOFIT	Center	0	6	204
29-08-2025	TL LED ECOFIT	Center	50	0	254
29-08-2025	TL LED ECOFIT	Center	0	15	239
23-09-2023	TL LED ECOFIT	Center	0	41	198
16-10-2025	TL LED ECOFIT	Center	0	3	195
16-10-2025	TL LED ECOFIT	Center	0	2	193
17-10-2025	TL LED ECOFIT	Center	0	3	190
21-10-2025	TL LED ECOFIT	Center	0	100	90

Source: Own Compilation (2025)

As shown in Table 1, the stock movement reflects how inventory is issued based on the earliest recorded entry, demonstrating the application of the First In First Out (FIFO) method. The changes in stock balance indicate that each outbound transaction deducts quantities from the oldest available batch. This pattern confirms that the system consistently follows FIFO without requiring manual batch selection. Such automation reduces the risk of dead stock, minimizes issuance errors, and ensures that stock rotation occurs in an orderly and traceable manner.

Implementation of the POS Accurate System

The implementation of the FIFO method aims to ensure that the first items received are the first items issued, maintaining balanced stock rotation and preventing the accumulation of aging inventory. Based on field observations, the application of FIFO within POS Accurate is carried out through several key steps:

The Login Page displays the initial access interface of the POS Accurate system. Users are required to enter their credentials before reaching the main dashboard.

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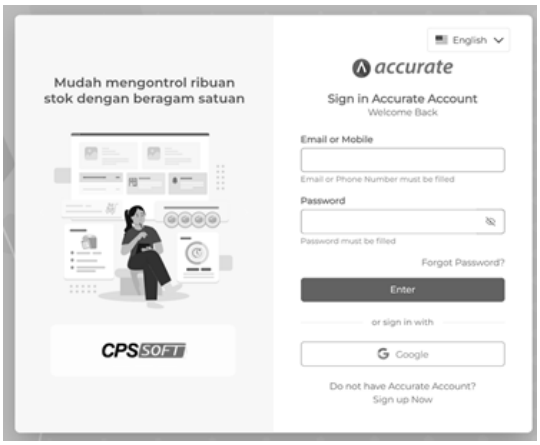

Figure 3. Log In Page
Source: Own Compilation, 2025

The Dashboard Page presents the home interface of POS Accurate used at Giga Energi Teknologi after login. The dashboard includes key menus such as Customers, Suppliers, product name entry, stock information, pricing, and product images.

Figure 4. Dashboard Page
Source: Own Compilation, 2025

The Inbound Goods Data Page is used when items arrive from suppliers. Warehouse staff input data such as item code, product name, quantity, unit price, and entry date through the Purchasing menu. The system automatically increases stock levels and stores batch information based on the recorded date.

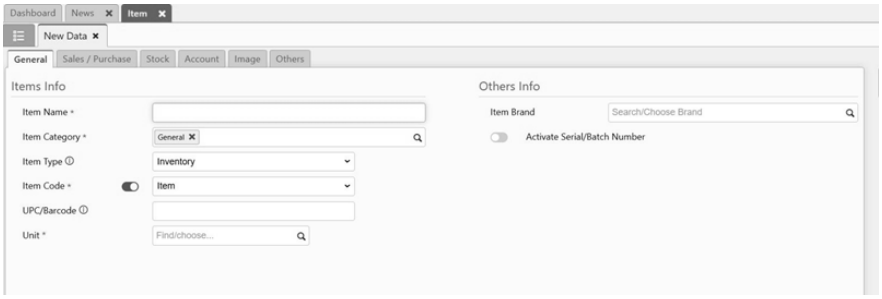

Figure 5. Add inbound Goods Data Page
Source: Own Compilation, 2025

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The Outbound Goods Data Page is used when items are issued to customers. Administrative staff record the transaction through the Sales Invoice menu, and POS Accurate automatically deducts stock from the oldest batch, ensuring compliance with FIFO principles.

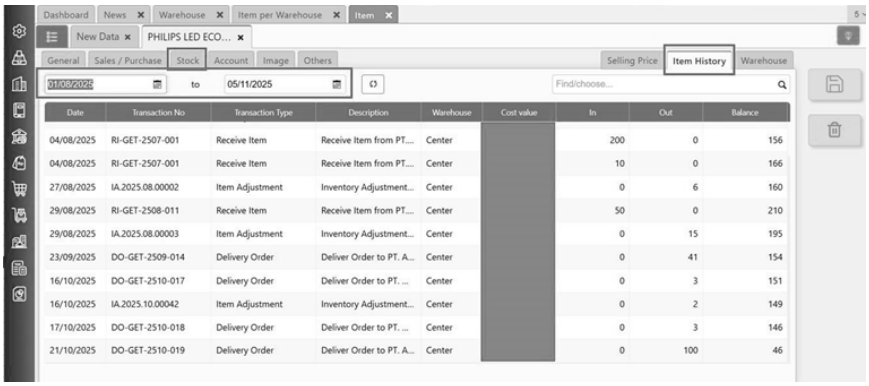

Figure 6. Outbound Goods Data Page
Source: Own Compilation, 2025

Analysis of FIFO Implementation in POS Accurate

The implementation of FIFO within POS Accurate not only regulates the physical rotation of goods but also influences the structure and consistency of data flows. The system automatically selects the oldest batch whenever an outbound transaction occurs, simplifying batch tracing and stock auditing. The Inventory Report feature provides detailed information regarding batch numbers, entry dates, and stock quantities.

Operational Conditions After the implementation of POS Accurate

After the adaptation period was completed, several significant operational improvements became visible. The implementation of POS Accurate accelerated transaction recording because the system automatically calculates and updates stock quantities for each transaction. Recording errors decreased as warehouse staff no longer performed manual calculations that were vulnerable to human error.

In addition, stock reports can now be accessed in real-time, eliminating the need for repeated recaps as required in the previous system. Data flows also became more structured because every transaction is recorded automatically and synchronized across modules, from Purchasing to Sales Invoice. The implementation of the FIFO feature further helped the company monitor batch movement more accurately, ensuring that stock rotation follows standard inventory management principles.

Overall, digitalization through POS Accurate made the workflow more efficient, standardized, and accountable.

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SWOT Analysis of POS Accurate Implementation

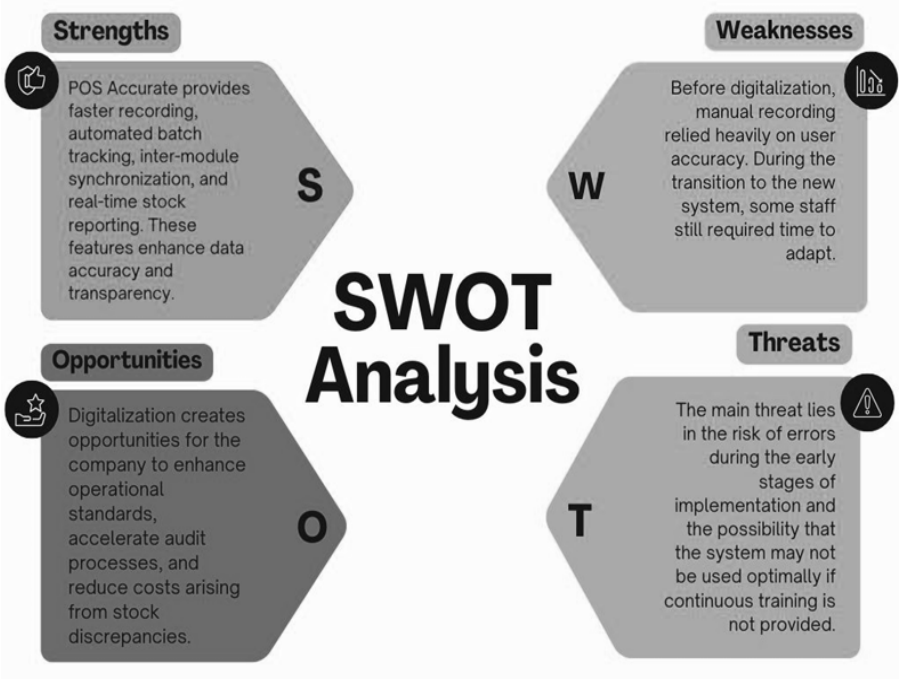

Figure 7. SWOT Analysis
Source: Own Compilation, 2025

As illustrated in Figure 7, the overall analysis demonstrates that the advantages offered by POS Accurate effectively resolve the limitations of the previous manual system while simultaneously creating new opportunities for system enhancement and operational improvement.

Interview Result with Warehouse and Administrative Staff

To strengthen the observational findings, interviews were conducted with warehouse and administrative staff who are directly involved in inventory management activities using POS Accurate. The interviews aimed to understand the transition in workflow and the practical application of FIFO within daily operations.

Based on the interview results, the administrative staff stated that *"POS Accurate helps us manage stock movement in an organized structure. Every incoming and outgoing item must be recorded first, and the system automatically adjusts stock levels and batch positions, so we can easily track where the item comes from and where it goes."* This statement indicates that POS Accurate supports the fundamental principles of a Warehouse Management System (WMS) by regulating stock flow and ensuring traceability.

The discussion also revealed clear differences between the manual Spreadsheet method and the POS system. A warehouse worker mentioned, *"When we used spreadsheets, errors often happened because everything depended on manual entry. Now the system updates the stock automatically and faster. Every department can access the same data, so we do not need to send files back and forth anymore."* This comparison highlights improvements in terms of accuracy, speed, and inter-departmental synchronization after the adoption of POS Accurate.

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In addition, the transition from manual documentation to digital processing significantly affected daily workflows. One warehouse employee explained, *"Previously, when many products arrived at once, it took a long time to input them one by one. We had to recheck the data repeatedly to avoid mistakes. Sometimes errors were only noticed long after. With the new system, it is more controlled and less stressful."* This shows that digitalization reduces workload pressure and minimizes the risk of delayed error detection.

Regarding the technical recording process, the administrative staff described how transactions are entered through the system: *"When products arrive, we input them through the Purchasing menu, and the stock automatically increases in the system. For items going out, we create a Sales Invoice, and the system selects the oldest batch automatically. Pricing also appears based on the preset list, so we no longer calculate manually."* This clarifies how POS Accurate integrates purchasing, sales, and inventory processes with automated pricing and batch control.

Finally, the interview also confirmed the practical application of FIFO in everyday warehouse operations. A warehouse worker emphasized, *"The system always issues the oldest batch first. In the warehouse, we also organize items according to their arrival date. We perform weekly physical checks to ensure the stock in the system matches the items on the shelves."* This demonstrates that FIFO is maintained through both system automation and physical supervision.

Overall, the interview results show that warehouse personnel understand and consistently operate POS Accurate as part of their daily activities. FIFO is maintained through an interaction between automated batch tracking and scheduled physical verification, resulting in improved stock rotation, accuracy, and overall operational efficiency.

Comparisson Between Spreadsheet and POS Accurate Systems

Using spreadsheets to record transactions is often considered practical, but recent studies show that manual documentation increases the risk of data inconsistencies. According to (Ardiansyah, 2023), spreadsheets are highly dependent on user accuracy, making them prone to input errors, duplicate entries, and mismatches during stock audits. (Sari, 2022) also emphasize that manual documentation slows down operational flow because verification must be performed repeatedly to ensure data validity.

In contrast, the use of POS systems is far more efficient and less prone to errors. (Lawal, 2022) explains that POS systems can process transactions within seconds, making data entry significantly faster compared to manual documentation, which requires more time and effort. POS systems are also integrated and automatically update data in real time, making them suitable for operations that demand high speed and accuracy. Furthermore, (Santos, 2023) state that the development of POS technology now connected to digital platforms and artificial intelligence,helps businesses improve efficiency, reduce input errors, and accelerate data processing.

Overall, this comparison demonstrates that transitioning from manual spreadsheets to a POS system provides substantial benefits, particularly in speed, accuracy, and ease of data monitoring. POS systems are not only more practical, but also safer and more stable for daily operational needs. The following table presents a comparison of stock management aspects between the manual Spreadsheet system and the digital POS Accurate system:

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Table 2. Comparison Between Spreadsheets System and POS Accurate

Management Aspect	Spreadsheets	POS Accurate
Error Risk	High probability of input and formula errors because all data depends on manual entry	Low error rate due to automatic validation and system-based transaction processing
Speed	Slow, especially when many items arrive at once and require manual verification	Fast because stock and transaction data are updated automatically
Data Synchronization	Requires repeated file sharing and manual consolidation	Real-time synchronization across departments
Batch Control	No automatic batch control; FIFO requires manual monitoring	FIFO executed automatically through batch tracking in the system
Reporting	Recapitulation requires manual calculation and formatting	Reports generated instantly based on recorded transactions

Source: Processed from (Fadillah, 2024; Kumar, 2023);

The comparison presented in Table 2 refers to previous studies indicating that manual spreadsheet-based documentation has a high risk of input errors and requires repeated double-checking due to the absence of automated validation (Fadillah, 2024). In contrast, POS-based systems offer faster and more accurate data processing because stock and transaction information are updated automatically in real (Kumar, 2023). Furthermore, the automation of batch tracking and FIFO execution in POS systems contributes to more reliable item rotation and minimizes the risk of outdated stock accumulation (Santos, 2023).

Key Findings of the Study

Based on the observations, interviews, and data analysis conducted in this study, the implementation of POS Accurate was found to accelerate transaction recording processes while simultaneously improving data accuracy. The FIFO mechanism operates automatically and consistently, enabling more structured and traceable batch management. Furthermore, real-time access to stock reports increases information transparency and supports timely decision-making.

Although several manual interventions were still required during the initial stages of system adoption, their frequency gradually declined as users became more familiar with the digital workflow. The integration between departments, particularly between Inventory and Accounting, also improved, resulting in more synchronized operational processes. Overall, the findings indicate that the adoption of a FIFO-based digital system positively influences warehouse operational efficiency and enhances the reliability of inventory information.

DISCUSSION

The findings of this study demonstrate that the transition from a manual spreadsheet-based system to POS Accurate has contributed to notable improvements in warehouse operations. The reduction in input time and documentation errors reflects the system's capability to streamline administrative tasks and minimize human error, supporting research that states digital warehouse systems improve accuracy and efficiency in stock

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administration (Fadillah, 2024; Ropianto, 2020) These outcomes are in line with previous studies showing that automated inventory documentation significantly reduces time allocation for verification processes and increases overall operational reliability (Alamsah et al., 2024). The automatic FIFO mechanism observed in POS Accurate ensures consistent batch rotation and reduces the risk of aging inventory. This aligns with studies indicating that FIFO principles function most effectively when supported by automated batch-selection features in digital warehouse systems (Nirmala, 2024; Sihombing et al., 2024). The system's ability to trace item flows through detailed batch information strengthens stock accountability and simplifies audit processes, supporting findings that digitalized tracking enhances warehouse transparency and tracing accuracy (Li, 2022).

Integration between inventory operations and accounting records improved significantly after system adoption. This integration eliminated redundant data entry and ensured that financial records reflected actual stock movements, in line with studies demonstrating that ERP–POS integration supports more reliable business decision-making and financial reporting accuracy (Kumar, 2023; R. I. Lee, 2025). The digital synchronization between departments also mirrors recent findings showing that real-time system connectivity increases teamwork efficiency and reduces cross-departmental delays (Halim, 2024).

Although some manual interventions were required during the early implementation phase, these were primarily due to inconsistencies inherited from previous manual practices. As users became more familiar with the digital workflow, the need for adjustment decreased, confirming that system effectiveness is closely related to user adaptation and organizational readiness during digital transitions (Santos, 2023; Shanmugamani, 2023). The transitional challenges observed in this study reflect previous literature concluding that digital transformation often produces unstable initial outcomes due to the adjustment period before operational routines become fully standardized (Nurain et al., 2024).

Overall, the discussion highlights that POS Accurate, when integrated with FIFO principles, provides substantial benefits for warehouse operations. The system enhances accuracy, efficiency, and transparency while supporting long-term digital transformation efforts within the organization. This conclusion strengthens the perspective that digital warehousing is not only a technological change, but also a strategic enabler for operational sustainability and competitive advantage in industry settings (Basuki, 2025).

CONCLUSIONS

The implementation of a Warehouse Management System based on Accurate's Point-of-Sale platform with the First In First Out (FIFO) principle has resulted in significant improvements in inventory management at Giga Energi Teknologi. The digital system enhanced the efficiency of recording processes, accelerated transaction input times, and reduced the human errors commonly found in the previous manual spreadsheet method. The automatic batch-tracking feature ensured that item issuance followed the correct sequence, enabling consistent application of FIFO and simplifying stock verification and audit activities. System integration across modules, particularly between Inventory and Accounting, also increased stock transparency and improved the accessibility of information needed for operational decision-making. Although several manual adjustments were required during the early phase of implementation, user adaptation improved over time, leading to more stable and structured operational flows. Overall, the system strengthened warehouse performance and enhanced the reliability of inventory data.

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To support long-term optimization, the company is encouraged to provide continuous training for warehouse and administrative personnel, especially regarding batch management, transaction procedures, and data validation. Routine system evaluations are also recommended to ensure that digital records remain aligned with physical stock conditions, thereby minimizing potential discrepancies. In addition, developing a real-time analytical dashboard to monitor key performance indicators such as inventory accuracy, stock rotation speed, and input efficiency may further enhance operational oversight.

Despite these positive results, this study has limitations because observations and data collection were conducted during the early stage of system implementation, meaning the findings may not fully represent long-term digital maturity. Furthermore, the study was limited to a single company and did not compare multiple industries or system variations. Future researchers are encouraged to examine the long-term effects of digital inventory systems across different business sectors, evaluate the relationship between user readiness and digital adoption success, and compare various technological platforms to determine which features most effectively support warehouse performance.

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