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Prosper P. Mmari and Dr. Mwita Sospeter

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Adoption of Inventory Information Systems and Warehouse Performance: Empirical Evidence from the Medical Stores Department, Tanzania

[1]Prosper P. Mmari
Tanzania Institute of Accountancy, Department of Procurement & Supply chain Management.

[2]Dr. Mwita Sospeter
Senior Lecturer, Tanzania Institute of Accountancy

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Abstract

Purpose: This study examined the influence of inventory information systems on warehouse performance at the Medical Stores Department (MSD), Tanzania. Specifically, the study assessed user efficiency, error reduction, and system integration as key dimensions of inventory information systems affecting warehouse operations.

Methodology: The study employed a quantitative approach and descriptive research design. The target population consisted of 100 employees from the Procurement Management Unit and warehouse departments at MSD Headquarters and Mabibo Zonal Office. A sample of 80 respondents was selected using stratified and simple random sampling. Data were collected through structured questionnaires using a five-point Likert scale and analysed using IBM SPSS Version 28. Multiple regression analysis was applied to determine the effect of inventory information systems on warehouse performance.

Findings: The findings revealed that inventory information systems had a positive and statistically significant effect on warehouse performance ($\beta = .360$, $t = 3.326$, $p = .001$). Effective system utilization improved transaction speed and accuracy, reduced manual recording errors, strengthened stock accuracy, and enhanced information flow between procurement and warehouse functions. System integration also supported real-time stock tracking and inventory monitoring.

Unique Contribution to Theory, Practice and Policy: The study recommends strengthening user capacity, improving automated inventory controls, and enhancing integration between EPICOR-10, eLMIS, procurement, warehousing, inventory control, and distribution functions. These measures are expected to improve inventory visibility, reduce stock discrepancies, strengthen coordination, and enhance warehouse performance at MSD.

Keywords: *Inventory Information Systems, Warehouse Performance, User Efficiency, Error Reduction, System Integration*

JEL Codes: *M15, M11, L23, I18*

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INTRODUCTION

The warehousing activity is very important in maintaining the availability, accuracy and timely delivery of goods through the supply chains with special consideration to the public health systems where effective management of their inventory is critical in-service delivery. The growing complexity of supply chain activities has prompted organizations to embrace Inventory Information Systems (IIS) to improve upon the performance of the warehouse by enhancing the accuracy, coordination and efficiency of the operations within the warehouse. Modern inventory information systems allow tracking inventory in real-time, minimize manual errors, and support decision-making, which enhances warehouse operations and the overall supply chain performance (Masudin et al., 2021; Kumar et al., 2023). These technological innovations have become widely accepted as key solutions to enhance productivity and reliability of a warehouse in the logistics systems of both the private and the public sector.

The use of digital warehouse technologies has been cited as one of the significant factors to enhance inventory management and operational efficiencies. Research has demonstrated that warehouse management systems improve the visibility of inventory and minimize operational inefficiencies through automating processes including recording stock, order processing, and inventory reconciliation (**(Yusof et al., 2025**; Mohammed et al., 2025). In the same manner, Buba et al. (2019) reported that the efficiency of operations and performance bottlenecks are increased in integrated warehouse information systems because of accuracy and coordination of data. The results indicate the growing significance of the shift to digital inventory systems to enhance the performance of the warehouses in different organizational contexts.

The emergence of information systems has played an even bigger role in healthcare supply chains because of the necessity of delivering pharmaceuticals and medical supplies in a timely manner. Hailu and colleagues (2023) discovered that information and communication technology integration brought a substantial enhancement to the operation excellence in pharmaceutical supply chains by improving the availability of data, coordinating, and inventory accuracy. Similarly, Boche et al. (2026) determined that the use of integrated pharmaceutical information systems enhanced the operations in the warehouse by making the data more synchronized and responsive to the supply chain. These articles highlight the need to embrace strong inventory information systems in medical warehouses, where an effective storage and distribution have direct impacts on service delivery outcomes.

Although these international advances in the use of information system in managing and controlling inventories have been made, developing nations still face problems of low visibility of their inventories, poor coordination of their warehouses and poor management of their stocks since only a part of the modern information systems is adopted. In Africa, the recent research has shown that efficient inventory management practices and warehouses play a crucial role in enhancing the efficiency and performance of warehouses and supply chains (Amirrudin et al., 2023; Genevieve and Akumuntu, 2024).

The Medical Stores Department (MSD) is the hub in the management of pharmaceutical storage and distribution in Tanzania and the application of digital inventory platforms like EPICOR-10 and the electronic Logistics Management Information System (eLMIS) have been implemented to enhance the visibility and reporting of inventory. Despite advances in the use of inventory

information systems, the existence of digital technologies does not necessarily translate into improved warehouse performance when such systems are not fully installed, integrated, and effectively utilized across operational functions. At the Medical Stores Department (MSD), digital inventory platforms such as EPICOR-10 and the electronic Logistics Management Information System (eLMIS) have been introduced to improve inventory visibility, reporting, stock control, and coordination. However, these systems are not yet fully installed across all relevant operational areas and remain insufficiently integrated with procurement, warehousing, inventory control, and distribution functions. Consequently, some processes continue to operate in silos, limiting real-time data synchronization, information sharing, and coordinated decision-making. This situation presents an implementation paradox**,** whereby advanced digital systems exist, but their expected operational benefits are constrained by incomplete implementation, limited system integration, variations in user efficiency, and continued operational errors. This concern is particularly important because MSD continues to experience warehouse-performance challenges, with approximately 38% of health facilities reportedly experiencing shortages of essential pharmaceutical products, including antibiotics and vaccines (Mathias et al., 2024; Mwakyeja & Kimario, 2024). In addition, nearly 15% of pharmaceutical products are reported to end up as wastage annually, indicating persistent weaknesses in inventory monitoring and control. Therefore, the central problem is not simply the absence or adoption of inventory information systems, but the extent to which the existing systems are fully implemented, integrated, and effectively utilized to improve warehouse performance. This study consequently examines the influence of user efficiency, error reduction, and system integration on warehouse performance at MSD. Thus, this research aims to examine how inventory information systems affect the performance of warehouses at the Medical Stores Department in Tanzania by conducting tests in accordance with the objective and hypothesized relationships.

Null Hypothesis (H_0)

H_0: Inventory information systems do not have a statistically significant impact on the performance of the warehouse at the Medical Stores Department (MSD).

Alternative Hypothesis (H_1)

H_1: The information systems of inventory have a statistically significant impact on the performance of the warehouse in the Medical Stores Department (MSD).

Theoretical Framework

This study is attached in Systems Theory, introduced by Ludwig von Bertalanffy (1968), which views an organization as a system composed of interrelated and interdependent components that work together to achieve common objectives. The central argument of the theory is that organizational performance does not depend solely on the effectiveness of individual components, but also on how effectively those components interact and exchange information. Within warehouse and supply chain operations, information systems, employees, operational processes, and performance outcomes can therefore be understood as interconnected components of one system. This perspective is particularly relevant to the Medical Stores Department (MSD), where inventory information systems connect procurement, warehousing, inventory control, and distribution activities.

In this study, Systems Theory is applied through an input–process–output–feedback framework. Inputs include MSD's inventory information infrastructure, particularly EPICOR-10 and eLMIS, system integration, and employees' ability to use the systems efficiently. User training supports this capability, although user efficiency is the measured variable. System integration enables information flow across procurement, warehousing, inventory control, and distribution. Accordingly, the study examines user efficiency, error reduction, and system integration as key dimensions influencing warehouse performance within MSD operations. The process component represents operational activities that transform system inputs into warehouse performance outcomes. These activities include inventory data entry, stock recording and updating, order processing and reconciliation, error reduction, and real-time stock tracking. Efficient users support accurate and timely information handling, while automated processes minimize errors and discrepancies. System integration enables information flow across functional units. At MSD, effective system utilization improved transaction speed and accuracy, reduced manual recording errors, strengthened information flow, and supported real-time inventory monitoring. The output component is represented by warehouse performance. Effective transformation of system inputs through warehouse processes is expected to produce improved stock accuracy, greater operational efficiency, reduced stock discrepancies, lower stock-out and expiry risks, improved order fulfilment, and timely delivery of medicines and medical supplies. These outcomes reflect the broader performance objective of MSD's warehouse system. In the study, inventory information systems were found to have a statistically significant positive effect on warehouse performance ($\beta = .360$, $t = 3.326$, $p = .001$), indicating that improvements in the utilization of inventory information systems are associated with better warehouse operations. Finally, the feedback component completes the systems cycle by providing information for continuous improvement. Inventory audits, stock-level monitoring, exception reports, re-order alerts, performance reports, and stock discrepancy identification show whether warehouse operations achieve intended results. This feedback supports correction of inventory records, improvement of user practices, stronger system integration, stock adjustments, and better procurement and distribution decisions. Consistent with Systems Theory, performance information enables the system to continuously refine its inputs and operational processes.

Table 1: Operationalization of Systems Theory in the Study

Systems Theory Component	Application at MSD	Link to Study Variables	Expected Warehouse Performance
Inputs	IIS infrastructure and features; EPICOR-10; eLMIS; system integration; user capability supported by training	User efficiency and system integration	Accurate and timely inventory information
Processes	Data entry; stock recording and updating; order processing; inventory reconciliation; real-time stock tracking; automated transaction processing	User efficiency and error reduction	Fewer recording errors, faster transactions and improved stock accuracy
Outputs	Warehouse efficiency; stock availability; order fulfilment; timely supply; inventory accuracy	Warehouse performance	Reduced stock-outs, lower expiry/wastage risk, shorter order-fulfilment lead time and improved service delivery
Feedback	Inventory audits; stock-level monitoring; discrepancy reports; re-order alerts; warehouse performance reports	Supports continuous improvement of all study variables	Corrective action, improved system utilization and better inventory decisions

To complement Systems Theory, this study adopts the DeLone and McLean Information Systems Success Model to explain how the quality and use of inventory information systems contribute to warehouse performance at the Medical Stores Department (MSD). While Systems Theory explains the interdependence among technological, human, operational, and feedback components, the DeLone and McLean model focuses on how system quality, information quality, system use, and organizational benefits are connected. In the context of MSD, system quality is reflected in the functionality and integration of EPICOR-10 and eLMIS across procurement, warehousing, inventory control, and distribution activities. Effective integration enables timely data synchronization, information sharing, and coordinated decision-making. System use is reflected through user efficiency, particularly employees' ability to enter, retrieve, update, and process inventory information accurately and promptly. Information quality is reflected through error reduction, since fewer recording mistakes, stock discrepancies, and transaction inaccuracies improve the reliability of inventory records. These dimensions are expected to generate organizational benefits through improved warehouse performance, including better inventory visibility, stock accuracy, order fulfilment, operational efficiency, and timely supply of medicines. The model therefore complements Systems Theory by explaining why the mere presence of digital platforms does not automatically result in improved warehouse outcomes. Their performance

benefits depend on the extent to which systems are integrated, information is reliable, and users apply the technologies efficiently in daily operations. This theoretical perspective is consistent with the study variables of user efficiency, error reduction, and system integration, which are examined as key dimensions through which inventory information systems influence warehouse performance at MSD. Consequently, the model provides a technology-focused explanation of how effective implementation converts digital system capabilities into measurable operational improvements within MSD's overall pharmaceutical warehouse environment.

Empirical Review

Warehouse Performance and User Efficiency of Inventory Information Systems

User efficiency refers to the ability of warehouse personnel to use inventory information systems accurately, quickly, and independently when performing inventory-related tasks (Tong, 2023; Harfi, 2025). In this study, user efficiency is operationalized through system speed, data retrieval time, ease of navigation, and user error self-correction. These indicators capture the extent to which employees can complete inventory transactions promptly, retrieve required stock information, navigate EPICOR-10 and eLMIS functions, and identify and correct transaction errors efficiently. User efficiency can be defined as the capacity of a warehouse personnel to efficiently use inventory systems to capture, retrieve and control stock information without much delays and errors. Most recent studies have indicated that adoption of digital inventory information systems can enhance the performance of its users by making the operational procedures easier and the workflow more efficient. Indicatively, Faisal et al. (2024) established that the introduction of a web-based inventory information system was associated with a significant enhancement of efficiency and user satisfaction with operations in warehouse settings due to the decrease in manual operations and the availability of inventory information. Likewise, Rahwani et al. (2023) discovered that adoption of inventory applications in accounting information systems not only increased employee productivity but also the rate of inventory transactions. Vaičiūtė and Katinienė (2025) illustrated that the enhancement of warehouse information systems led to the increased usability of the system and the effectiveness of the staff in the process of managing the inventory records. Similarly, Apriyanti and Bernanda (2023) determined that operational delays were minimized, and the efficiency of the goods data collection process was improved using automated inventory systems. These results show that effective implementation of information systems in inventory facilitates quicker data input, increased inventory precision, and better warehouse efficiency. The majority of these investigations were however done in the environment of private sector warehouses and there was little empirical data on whether the user efficiency of inventory information systems had any impact on the performance of a warehouse in a public pharmaceutical supply chain like the Medical Stores Department (MSD).

Reduction of Errors by Use of Inventory Information Systems and Warehouses Performance

Error reduction discusses the ability of inventory information systems to prevent, identify, and correct inaccuracies that occur during pharmaceutical receiving, storage, picking, issuing, and inventory reconciliation (Poornima et al., 2024). In pharmaceutical warehouses, manual processes may result in incorrect product codes, quantities, batch numbers, expiry dates, and stock balances. Inventory information systems reduce these errors through automated data capture, validation, and real-time stock updating (Wynn, 2021). For example, barcode scanning during receiving allows

medicines to be electronically identified and recorded instead of relying on manual ledger entry, thereby reducing transcription and product-identification errors. Similar verification during picking and issuing helps ensure that the correct medicine, batch, and quantity are selected.

The other important advantage of the implementation of inventory information systems within the operations of a warehouse is the reduction of errors. Mistakes in inventory books tend to cause stock variances, delays and inefficiency in the warehouse. The accuracy of the inventory information systems is enhanced by automating the data entry, justifying the stock transactions and the real time monitoring of the inventory level. According to Giorgi and Lily (2020), inventory identification systems also significantly decreased errors in the recording of the data and increased the accuracy of stock in the warehouse setting. In the same way, Destro et al. (2023) discovered that the presence of inventory records errors had a negative impact on the distribution center performance, and the use of better information systems minimized stock discrepancies and operational efficiency enhancement. Sudarmi and Sunaryo (2024) found that enterprise resource planning systems allowed improving inventory accuracy and reducing operational errors through the integration of warehouse operations into central systems. Similar conclusions were made by Dewy et al. (2025)**,** who discovered that smart warehouse systems, which relied on artificial intelligence, minimized manual error and enhanced reliability of data in inventory operations. Linuwih and Handayati (2025) highlighted that the better accuracy of inventory was, the greater the performance of the warehouse was, as losses were minimized when stock discrepancies were involved. The findings indicate that reduction in errors by utilizing information systems provided by inventory is a major contributor to increased efficiency and reliability in the warehouses. Nevertheless, regardless of these results, the majority of investigations have centered on the manufacturing and business warehouse setting as opposed to the general pharmaceutical warehouses.

Warehouse Performance and System Integration of Inventory Information Systems

System integration is a feature of inventory information systems that allows the linking of warehouse operations to the procurement, distribution, and reporting systems so that there is a smooth flow of information. The integrated systems improve coordination of supply chain functions and thus create better performance of the warehouses. According to Masudin et al. (2021), the adoption of information technology in warehouse operations lead to coordination and minimize operational inefficiencies due to increased inventory tracking and reporting systems. Likewise, Gari (2024) established that the use of information technology enhanced the performance of warehouses in terms of enhancing communication and integration between processes in the warehouse. Moreover, Sudarmi and Sunaryo (2024) also emphasized that the use of enterprise resource planning systems enhanced the operational performance as the combination of inventory, procurement, and distribution activities was integrated into one system. Yoraani et al. (2025) established that web-based inventory systems increased the coordination in the warehouse and the efficiency of operations with the help of the integrated information sharing. Harfi (2025) also determined that poor system integration had adverse impacts on warehouse performance as delays occurred during the data synchronization and reporting. These results imply that the successful integration of systems increases the coordination of operations and leads to better performance of the warehouse. Nevertheless, a lot of the literature has been devoted to the

overall logistics systems, and there is still a lack of empirical data on the inclusion of inventory information systems in the work of a public health warehouse.

Research Gap

The reviewed literature reveals contextual, methodological, and conceptual gaps in research on inventory information systems and warehouse performance. Contextually, most studies focus on manufacturing, retail, commercial, and general warehouse settings rather than public pharmaceutical supply chains. Research by Faisal et al. (2024), Rahwani et al. (2023), Vaičiūtė and Katinienė (2025), and Apriyanti and Bernanda (2023) emphasizes user productivity, usability, transaction processing, and operational efficiency, while error-reduction studies largely examine distribution, enterprise, and smart warehouses (Destro et al., 2023; Sudarmi & Sunaryo, 2024; Dewy et al., 2025). Such settings do not reflect pharmaceutical requirements for continuous medicine availability, stock accuracy, expiry control, and timely fulfilment. Methodologically, prior studies mainly assess user efficiency, transaction speed, usability, data accuracy, stock discrepancies, and delays (Faisal et al., 2024; Rahwani et al., 2023; Apriyanti & Bernanda, 2023; Destro et al., 2023), with limited use of objective indicators such as inventory record accuracy, order fill rate, stock-out rate, expiry wastage, and fulfilment lead time. Conceptually, although system integration improves information flow and coordination (Masudin et al., 2021; Gari, 2024; Sudarmi & Sunaryo, 2024; Yoraeni et al., 2025), evidence on interoperability between enterprise and logistics platforms remains limited. Harfi (2025) further links poor integration to synchronization and reporting delays. This study therefore examines user efficiency, error reduction, and system integration in relation to warehouse performance at MSD.

METHODOLOGY

The research philosophy was based on the positivist philosophy of research which emphasizes objective measurement of variables and application of statistical methods in establishment of relationship between the variables under study through measurable variables thus reducing researcher bias and increasing validity of results. The research design used was descriptive research design that entails describing relationships between variables in a systematic manner but does not interfere with the study environment. The choice of descriptive design was due to its ability to enable researchers to quantify (Morton, 2025; Mahat et al., 2024). The research also employed a quantitative research method, which entails gathering of numerical data and using statistical analysis to test the relationship between variables. This was the chosen method, as quantitative methods can be more objective, generalize the findings, and offer credible evidence when studying organizational performance (Creswell and Creswell, 2021). The methodology used was based on the administration of structured questionnaires to obtain measurable answers to the questions posed to the employees involved in the operations of inventory and warehouses, which allows providing a statistical analysis of the impact that inventory information systems have on the performance of the warehouse (Braun & Clarke, 2021). The research site was the Medical Stores Department (MSD) Headquarters in Keko Mwanga and the MSD Zonal Office in Mabibo, Dar es Salaem, which were chosen due to their central position in the procurement, storage, and distribution of medical supplies, and thus suited the study on inventory and warehouse performance within the context of the Tanzanian public health supply chain (Bulula et al., 2020; Mwakyeja & Kimario, 2024)

Population and Sample Size

The sample of this research was a group of 100 employees in the Procurement Management Unit (PMU) and the Warehouse departments of the Medical Stores Department (MSD) in Dar es Salaem, both the MSD Headquarters and the MSD Zonal Office in Mabibo. A sample of 80 employees was calculated out of this population by using a formula known as the Yamane (1967) formula that is commonly used to take representative samples of finite populations. To guarantee a good representation of the departments and enhance the validity of the study results, the sample was comprised of personnel working at PMU and Warehouse units (Creswell and Creswell, 2021). Multi-stage sampling process was used to select the respondents to maximize representativeness and reduce sampling bias. First, stratified random sampling was utilized, according to which the population was divided into specific strata (according to job roles). This stratification helped in making sure that all of the relevant categories of employees were well represented in the study. Subsequently, the simple random sampling was used in each stratum to provide all the individuals the equal opportunity of being selected, thus facilitating consistent statistical analysis and generalization of the results (Etikan & Bala, 2017).

Procedures and Instruments

Informed consent was sought and the management of MSD was consulted before the data was collected so that all participants can participate voluntarily. Participation was not paid financially and anonymity and confidentiality were assured. The structured questionnaire was used to gather data, the questionnaire was created considering the relevant literature and was dependent on the objective of the study. Study variables measured in the questionnaire were in statements with a five-point Likert scale with 1 (Strongly Disagree) to 5 (Strongly Agree) (Rezigalla, 2020). The self-administered questionnaire was distributed to be filled in five working days. They are physically collected by the researcher and make them complete and enhance response rates. To determine the reliability and clarity of the questionnaire, a pilot study was carried out with 15 participants with characteristics akin to the study population to determine the efficacy of the questionnaire prior to full-scale data collection. The results of the pilot study were used to revise ambiguous questions and increase the validity of the instrument, thus making the overall quality and accuracy of the gathered data better (Van Teijlingen and Hundley, 2020).

Data Analysis Procedures

To test the hypothesis based on the inventory information systems and warehouse performance, inferential statistics were analyzed by using the IBM SPSS version 28. The regression analysis was used to determine the impact of indicators of inventory information systems such as the efficiency of the users, reduction of error, and integration of the system on the performance of the warehouse. The analysis established the statistical significance and predictive value of inventory information systems to performance results.

RESULTS

Effect of Inventory Information Systems on Warehouse Operations

To identify the effect of inventory information systems on the performance of the warehouse at the Medical Stores Department (MSD), multiple regression analysis was used to establish the relationship between the two. Regression coefficients show direction and magnitude of

relationship whereas the significance values show whether the relationship observed is statistically significant. The outcomes of the second objective are in Table 4.1. Predictors of the warehouse performance were user efficiency, error reduction, and system integration to explore the effects of inventory information systems on the operations of the warehouse at the Medical Stores Department (MSD). The findings all in all show that there is a statistically significant relationship between inventory information systems and the performance of the warehouse. They found out that inventory information systems had a positive impact on warehouse performance (=.360, =3.326, =.001) (see Table 4.8). This implies that the better the application of inventory information systems, the greater the operational efficiency in warehouse operations. Notably, it emerged that good utilization of inventory information systems enhanced the performance of the warehouse in terms of user efficiency whereby employees could execute inventory transactions faster and more accurately. Consequently, the immediate data entry and utilization of systems enhanced quicker decision-making and better coordination of operations in the warehouses. Moreover, the results indicate that the reduction in errors by automated systems reduced the number of mistakes in manual recording, and this aid in enhancing stock accuracy and minimizing operational inefficiencies. System integration was also found to enhance the performance of the warehouse, through the smooth flow of inventory information between the procurement and warehouse departments. Electronic Logistics Management Information Systems (eLMIS) were integrated platforms, which contributed to the real-time tracking of stocks and enhanced monitoring of inventory levels. This paper shows how effective inventory information systems can optimize warehouse operations through visibility of data, reduced delays and efficient stock management processes.

Table 1: Multiple Regression Coefficients for Inventory Information Systems

	Unstandardized Coefficients		Standardized Coefficients		
Model	**(B)**	**Std. Error**	**(Beta)**	**t**	**Sig.**
(Constant)	0.353	0.202	—	1.751	0.084
Inventory Information Systems	0.383	0.115	0.360	3.326	0.001

Discussion

The results of this research have found out that inventory information systems positively affect the performance of the warehouse in the Medical Stores Department (MSD) statistically significantly (=.360, t = 3.326, p =.001). This implies that operational efficiency of warehouse operations is increased with better adoption and use of inventory information systems. The constructive correlation in this research confirms previous empirical research results that inventory information system enhances the productivity rate in warehouses by increasing the speed and accuracy of inventory activities. Indicatively, Faisal et al. (2024) discovered that the adoption of web-based inventory systems greatly enhanced user efficiency through faster processing of transactions and better treatment of data. Equally, Vaičiūtė and Katinienė (2025) found that a better warehouse information system increased the productivity of the staff and prompt inventory management, which resulted in better warehouse performance outcomes. The findings also show that the

enhanced user efficiency leads to better warehouse performance based on faster data entry, better stock updates and enhanced decision-making processes. This observation is in line with Rahwani et al. (2023), who determined that the adoption of inventory applications in operational systems enhanced the productivity of employees and minimized delays in the workflow. Similarly, Apriyanti and Bernanda (2023) found that automated inventory systems increased the accuracy of data and made operations easier, allowing the warehouse staff to handle inventory records more efficiently. Moreover, the paper determined that managing inventory information systems can reduce errors that are instrumental in enhancing the performance of a warehouse. Automated systems reduce the errors in recording that are done manually, thus enhancing the accuracy of stocks and minimizing discrepancies. This observation resonates with Destro et al. (2023), as their study revealed that a decrease in the inaccuracies in inventory records led to a considerable enhancement in the performance of warehouses. Likewise, Sudarmi and Sunaryo (2024) have shown that ERP systems have improved the accuracy of inventory and minimized operational errors thus increasing efficiency in warehouse operations. System integration was also discovered to enhance the performance of the warehouse greatly as it enables the smooth transfer of communication between the warehouse, procurement and distribution units. This finding is in line with Masudin et al. (2021) findings that indicated that integrated information systems enhanced coordination and minimized operational inefficiencies within warehouse operations. Yoraani et al. (2025) also established that digital platform incorporated into the warehouse made it more responsive and enabled better monitoring of the inventory. On balance, these results prove that efficient inventory information systems can positively impact the performance of warehouses by increasing their efficiency, minimizing mistakes, and enhancing operational integration.

Conclusion

Given the impact of inventory information systems on the operations in the warehouse, the results of this study indicate that the inventory information system is important to the performance of a warehouse at the Medical Stores Department (MSD). Inventory information systems are mandatory to the various stakeholders in the health sector such as the warehouse managers, policymakers, logistics staff, and health administrators charged with the responsibility of ensuring unending supply of medicines because of their ability to enhance operational efficiency, reduce stock discrepancies, and enhance coordination among the various functions of the supply chain. According to the study, better user efficiency will allow warehouse staff to make the inventory transactions faster and more precise, whereas automated systems will assist in reducing errors by reducing manual recording errors and enhancing stock accuracy. Moreover, the integration of the system improves the coordination of procurement, storage, and distribution units, and, as a result, there is an increase in inventory visibility and the delivery of health commodities in time. Thus, it was concluded that there is a need to reinforce the process of adopting and proper usage of inventory information systems at MSD to enhance efficiency and service delivery in the warehouse. This suggestion supports the priorities of the Ministry of Health in Tanzania that focuses on the capacity to build supply chain systems and provide stable supply of basic medicines in all health facilities. The strategic plan identifies the necessity of enhanced planning of logistics and information systems to facilitate the provision of reliable healthcare services as well as overall performance of the health system.

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Implications

The findings from this study offer managerial implications, policymaking implications, and implications for future studies as follows:

Managerial Implications

The findings imply that MSD management should focus not only on acquiring inventory information systems but also on ensuring their effective utilization. Since user efficiency was associated with faster and more accurate inventory transactions, warehouse managers should strengthen practical user training, system support, and continuous assessment of employees' ability to use EPICOR-10 and eLMIS. Management should also strengthen automated controls for stock recording, reconciliation, and inventory updating to minimize manual errors and stock discrepancies. Furthermore, greater integration between procurement, warehousing, inventory control, and distribution functions is necessary to improve real-time information flow, inventory visibility, and operational coordination. These actions can enable MSD to obtain greater operational value from its existing digital infrastructure.

Policymaking Implications

The findings suggest that policymakers in MSD, the Ministry of Health, and related public health supply-chain institutions should place greater emphasis on interoperability, data quality, and effective utilization of digital inventory systems. Policies and digital supply-chain strategies should establish clear standards for integrating enterprise platforms such as EPICOR-10 with logistics information systems such as eLMIS. Institutional policies should also require regular monitoring of system utilization, inventory accuracy, stock discrepancies, and information synchronization. This would help ensure that investments in digital systems translate into improved medicine availability, timely order fulfilment, reduced inventory errors, and more reliable pharmaceutical supply operations. The study therefore supports a shift from technology acquisition toward effective implementation and integration.

Implications for Future Studies

Future studies should extend the present research by incorporating objective warehouse performance measures alongside employee perceptions. Indicators such as inventory record accuracy, order fill rate, stock-out rate, expiry wastage, and order-fulfilment lead time could provide stronger evidence of the operational effects of inventory information systems. Studies should also cover additional MSD zones and health-supply institutions to improve generalizability beyond MSD Headquarters and Mabibo Zonal Office. Longitudinal studies could further assess whether improvements in user efficiency and system integration produce sustained warehouse-performance gains over time. Future research may also examine whether system integration mediates the relationship between inventory information-system utilization and specific warehouse outcomes such as inventory accuracy, delivery speed, and order fulfilment.

Adherence to Ethics

The author(s) asserted that they did not have any potential conflicts of interest with the research, authorship and publication of this article. The ethical principles were also stringently observed

such as informed consent of the participants, confidentiality and appropriate recognition of the sources. All the procedures were in line with institutional and national research ethics.

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