African Journal of Procurement, Logistics & Supply Chain Management 2025, 8(3): 01-14

ISSN: 2676-2730
https://dx.doi.org/10.4314/ajplscm.v8i3.1
Journal Impact Factor (JIF): 6.782

Effect of Inventory Control on Medical Supply Chain Performance: The Moderating Role of Information Technology among Medical Stores Department Customers in Tanzania

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Abstract

Efficient inventory control is essential for ensuring the consistent availability of essential medicines and improving the performance of public healthcare supply chains. This study investigates the effect of inventory control (INC) on medical supply chain performance (MSCP) in Tanzania while examining the moderating role of information technology (IT). Grounded in the Resource-Based View and Institutional Theory, the study explores how internal capabilities and external institutional pressures interact to influence supply chain outcomes. Data were collected using a structured questionnaire comprising closed-ended items measured on a five-point Likert scale, adapted from validated instruments in existing literature. A multistage sampling technique was used to select respondents from stakeholders involved in the medical supply chain in the Songwe Region, with a sample size of 289. Quantitative data were analysed using SmartPLS 4.1.

The findings revealed that inventory control positively and significantly affected medical supply chain performance. Information technology also exhibited a strong direct positive effect on MSCP. However, IT negatively moderated the relationship between INC and MSCP, indicating that misalignment between digital systems and operational capacity may undermine performance gains. These findings underscore the importance of strategic alignment between IT investments and inventory practices. The study contributes to the literature by empirically validating the interaction between inventory control and IT in public health supply chains. It offers practical insights for enhancing supply chain performance in resource-constrained settings like Tanzania.

Keywords: *Inventory Control, Medical Supply Chain Performance, Information Technology, Resource-Based View, Institutional Theory.*

Citation: *Mwashiuya., S., Mchopa., D., A., & Shayo., A., F., (2025), "Effect of Inventory Control on Medical Supply Chain Performance: The Moderating Role of Information Technology among Medical Stores Department Customers in Tanzania", African Journal of Procurement, Logistics & Supply Chain Management Society 2025, 8(3): pp.01-14. DOI: https://dx.doi.org/10.4314/ajplscm.v8i3.1*

African Journal of Procurement, Logistics & Supply Chain Management 2025, 8(3): 01-14
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Submitted: 12 April 2025 | Accepted: 14 April 2025 | Published: 28 April 2025

1.0 INTRODUCTION

Efficient and dependable medical supply chains are crucial for attaining universal health coverage, enhancing patient outcomes, and fortifying health systems globally (Bell & Sherlock, 2020; Mekonen et al., 2025). These supply chains guarantee the consistent availability of vital medications, vaccines, and other health commodities in appropriate amounts at the designated time and location—directly leading to decreased morbidity and death rates(Mekonen et al., 2025). Efficient and reliable medical supply chains are fundamental to achieving universal health coverage, improving patient outcomes, and sustaining robust health systems worldwide. The efficiency and reliability of medical supply chains are primarily determined by the performance of the supply chain itself, which is influenced by several critical factors. These include supply chain structure, inventory control practices, forecasting methods, information technology, external environmental factors, technological readiness, and organisational readiness (Bell & Sherlock, 2020; Bialas et al.., 2023; George & Pillai, 2019; Polater & Demirdogen, 2018).

Countries with effective supply chain systems have used digitised platforms, optimised inventory management methods, and robust stakeholder coordination to improve supply chain performance, transparency, and cost efficiency (Khedr et al., 2023). Information technology (IT) is a crucial facilitator of this change, enabling precise forecasting, real-time stock-level visibility, and prompt decision-making (Abdulkadir et al., 2023; Yu et al., 2021). Inventory control, an essential element of supply chain management, is pivotal in minimising waste, decreasing expired stock, and optimising replenishment cycles (George & Pillai, 2019; Polater & Demirdogen, 2018). Public health supply chains often encounter enduring difficulties in low- and middle-income countries (LMICs), especially in sub-Saharan Africa. These include stock discrepancies, inadequate inventory management, disjointed logistics systems, and restricted utilisation of IT technologies (CAG, 2023; Goltsos et al., 2022). Although electronic Logistics Management Information Systems (eLMIS) have been implemented in several nations, their optimal functionality is often obstructed by inadequate system integration, insufficient infrastructure and deficiencies in human proficiency(Holloway, 2024).

Tanzania's Medical Stores Department (MSD) is the principal entity responsible for acquiring, storing, and delivering medical goods to public health institutions. The MSD has tried modernising its processes using digital technologies like eLMIS. Nevertheless, obstacles such as delayed shipments, inadequate visibility of inventory data, ineffective inventory management, and suboptimal use of existing technologies continue to exist(Holloway, 2024; Silabi et al., 2023). These difficulties impact supply chain efficiency, especially in distant and underdeveloped areas. The area of Songwe has been noted for its notably poor performance in health facilities and Health Facility Governing Committees (HFGCs)(Kesale et al., 2022). Reports indicate problems like recurrent stock-outs, ineffective inventory management, and inadequate adoption of digital systems despite technologies such as eLMIS (Silabi et al., 2023; Holloway, 2024). The problems indicate that introducing technology alone does not provide enhanced supply chain results without appropriate alignment with inventory management methods, organisational preparedness, and human resource capabilities (Goltsos et al., 2022).

While prior research indicates that inventory control and IT independently affect supply chain performance (George & Pillai, 2019; Yu et al., 2021), there is a paucity of empirical studies investigating the moderating role of IT in the relationship between inventory control and supply chain performance, particularly within public health systems in sub-Saharan Africa (Kabera & Mukanyangezi, 2024). The operational issues in Songwe have been recorded, although the precise moderating effect of IT in this connection is still inadequately examined. This research seeks to investigate the moderating influence of information technology on the link between inventory management procedures and medical supply chain performance among MSD clients in the Songwe area of Tanzania.

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2.0 LITERATURE REVIEW

This part is divided into two sections: a theoretical literature review and an empirical literature review. The theoretical literature review explains various theories that guide the study, while the empirical literature review indicates various studies from different authors.

2.1 Theoretical Literature Review

The study employed Resource-Based View Theory (RBV)(Barney, 1991) and Institutional Theory (INT) (Meyer & Rowan, 1977) to examine the effect of Inventory Control on Medical Supply Chain Performance in Tanzania. These theories provide complementary viewpoints, with RBV highlighting the internal strengths and resources of Tanzania's medical supply chain, while INT situates these strengths within the broader institutional context. The amalgamation of these theories facilitates evaluating the effect of inventory control on medical supply chain performance (MSCP), considering both internal competencies and external regulatory and environmental pressures.

RBV theory focuses on the significance of valuable, rare, inimitable and non-substitutable (VRIN) resources to gain a competitive advantage (Giustiziero et al., 2023). It applies to this study as RBV is particularly relevant in assessing the role of inventory control (INC)) and information technology (IT) influence medical supply chain performance. The effective coordination of these resources is crucial for guaranteeing timely purchases, appropriate inventory management, and efficient distribution of medical supplies throughout Tanzania's healthcare system.

RBV highlights the internal resources needed to optimise supply chain efficiency; it overlooks external environment factors like government policies, market dynamics and institutional constraints (Beamish & Chakravarty, 2021; Salsabila et al., 2022). This limitation led to the inclusion of Institutional Theory (INT) to address the broader institutional stimuli shaping medical supply chain performance in Tanzania. Within the medical supply chain framework, entities frequently adhere to institutional pressures to guarantee legitimacy, compliance, and efficiency (Craighead et al., 2020). These pressures can propel technological adoption, ensure policy compliance, and instigate supply chain reforms, eventually influencing supply chain performance and competitive advantage (Gupta et al., 2020). This idea is especially pertinent in public health supply chains, as governments, international funders, and regulatory agencies significantly influence the efficacy of procurement, inventory management, and distribution systems.

Institutional contexts significantly shape the implementation and utilisation of information technology (IT) within medical supply chains, rendering Institutional Theory (INT) particularly effective in elucidating IT integration obstacles (Meyer & Rowan, 1977). Regulatory authorities compel the adoption of designated digital systems, such as Electronic Logistic Management Information Systems (e-LMIS), to enhance supply chain transparency and efficiency.

2.2 *Empirical Literature Review and Hypothesis Development*

This section presents empirical evidence on the effects of inventory control (INC) on medical supply chain performance (MSCP). The study examined three essential attributes of inventory control: Order replenishment (Order processing), Expired stock items, Inventory carrying cost and the moderating role of information technology. Empirical evidence is used to analyse each attribute and develop a hypothesis.

2.2.1 Order Replenishment (Order Processing Efficiency) and Medical Supply Chain Performance.

Efficient order processing ensures that healthcare facilities receive timely resupplies of medicines and other medical commodities, reducing delays and stock-outs. George and Elrashid (2023) demonstrated that robust forecasting and replenishment models improved pharmaceutical supply chain performance in Bahrain. Similarly, Johnson et al. (2021) reported that, despite forecasting efforts in Kenyan hospitals, long order lead times led to persistent stock-outs, highlighting inefficiencies in replenishment systems. In Tanzania, Mwakyeja and Kimario (2024) found that inventory-related practices, including order processing, significantly influenced medical distribution outcomes at MSD.

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H1: Effective order replenishment practices positively influence Medical Supply Chain Performance (MSCP).

2.2.2 Expired Stock Items and Medical Supply Chain Performance

Expired stock presents a serious waste of resources and potential health risks. Sallwa (2023) found that Tanzanian health supply chains, especially during COVID-19, suffered delays and coordination breakdowns, contributing to medicine expiry. Similarly, Tefera & Anbessa (2024) noted poor post-procurement monitoring in Ethiopia, leading to ineffective management of expired Inventory. These findings indicate that monitoring expiration dates and rotating stock are essential to reasonable inventory control.

H2: Managing expired stock items influences Medical Supply Chain Performance (MSCP).

2.2.3 Inventory Carrying Cost and Medical Supply Chain Performance

Carrying cost refers to the financial burden of holding stock, including storage, insurance, and obsolescence costs. Khokhar (2023) observed that automation and control significantly reduced carrying costs in Pakistani medical supply chains. In the U.S., Essila (2023) emphasised that hybrid inventory models reduced unnecessary stock holding and overall costs. Managing these costs is critical to ensuring lean and responsive healthcare supply chains.

H3: Effective control of Inventory carrying costs influences Medical Supply Chain Performance (MSCP).

2.2.4 Moderating Role of Information Technology in the INC-MSCP Relationship

Information technology enhances inventory visibility, forecasting accuracy, and coordination. Dangi et al. (2023) confirmed that IT infrastructure, in tandem with inventory practices, led to better pharmaceutical supply chain outcomes. Milulu et al. (2024) found that eLMIS improved inventory management and drug availability in Tanzania. However, other studies (Holloway, 2024; Goltsos et al., 2022) warned that poor integration and capacity gaps could limit IT effectiveness. Beyond its direct effects, IT can also moderate the relationship between inventory control and supply chain performance. Studies by Yang et al. (2024), Yu et al. (2021), and Salamah et al. (2023) found that IT use strengthens coordination and amplifies the effects of inventory control on performance.

H4: *Information Technology (IT) positively moderates the relationship between Inventory Control (INC) and Medical Supply Chain Performance (MSCP).*

2.3 Conceptual Framework

This study's conceptual framework demonstrates the relationship between Inventory Control (INC) and Medical Supply Chain Performance (MSCP), with Information Technology (IT) serving as a moderating variable. This framework integrates the Resource-Based View (RBV) Theory and Institutional Theory (INT) to elucidate the impact of internal capabilities (SCI attributes) and external institutional factors (IT adoption) on supply chain performance. As shown in Figure 1

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https://dx.doi.org/10.4314/ajplscm.v8i3.1
Journal Impact Factor (JIF): 6.782

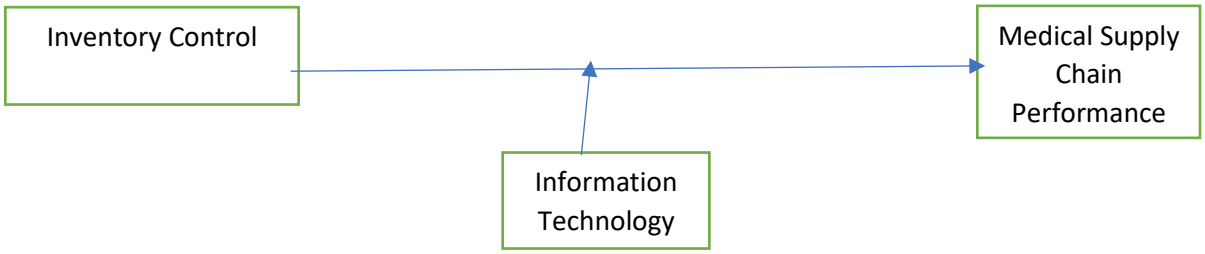

Figure 1: Conceptual Model of the study; Source: By Authors

3.0 METHODOLOGY

3.1 Research Philosophy, Design and Approach

This study employed a positivist approach and utilised an explanatory design with cross-sectional surveys. The rationale behind this philosophy is due to its focus on objective measurement, hypothesis testing and causal explanation(Creswell, 2018). In connection with that, an explanatory research design was selected as it is helpful for hypothesis-driven studies aiming to test causal relationships in determining how INC and IT affect MSCP (Bentouhami et al., 2021). Moreover, a cross-sectional research design through a survey strategy was employed in this study as it helps collect data at once and compares groups aligned with a design goal of assessing relationships between variables and efficiently testing hypotheses (Mukherji & Albon, 2022) where the research approach in this study was the deductive approach, which employs logic to test theories and hypotheses causally (Firdaus et al., 2021).

3.2 Sampling techniques and sample size

This study employed a multistage sampling approach to choose participants from the population of individuals involved in the medical supply chain in the Songwe Region. Multistage sampling was preferred because it allows considerable populations to be divided into manageable clusters, improving efficiency and effectiveness in data collection (Rahman et al., 2022). The researcher employed a sample size of 289 to investigate using the Yamane formula from 1967 (Ruamchart, 2023).

3.3 Data collection, analysis and presentation

The data for this study were gathered using a questionnaire that included closed-ended questions and employed a five-point Likert scale, which was adapted from previous research (Alzoubi et al., 2022; Senna et al., 2023). The quantitative data were analysed utilising descriptive statistics via IBM SPSS version 27 and Partial Least Squares Structural Equation Modelling (PLS-SEM) through SmartPLS 4.1 software. This study selected PLS-SEM over CB-SEM due to its capacity to readily specify interaction terms for delineating moderating effects within a path model, as well as its efficacy in addressing both simple moderations and intricate conditional process models that integrate moderation and mediation effects (Sarstedt et al., 2020). Findings from the analysis are displayed in tables and figures to improve visualisation.

3.4 Evaluation of models

Given the characteristics of the constructs and their indicators within the conceptual model, a reflective measurement model was deemed appropriate for this study. The analysis utilised PLS-SEM to evaluate the reflective and structural measurement models(Sarstedt et al., 2021). The procedures involved evaluating the indicator loading (reliability) surpassing 0.708. Additionally, the internal consistency reliability of the construct must exhibit a composite reliability exceeding 0.7 but not surpassing 0.95 (Hair et al., 2020). Furthermore, the convergent validity of the construct was evaluated using the Average Value Extracted (AVE) value, which surpassed 0.5 for all acceptable items. Finally, the discriminant validity was assessed using the Fornell-Larcker criterion. Similarly, the structural model's components were tested for

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collinearity. Hair et al. (2019) state that the ideal Variance Inflation Factor (VIF) value range is around three or below.

The main criterion for assessing the structural model in Partial Least Squares Structural Equation Modelling (PLS-SEM) when conducting a collinearity assessment is the significance of the path coefficients; a t-statistic greater than 1.96 at a significance level of 0.05 is considered acceptable, and p-values of 0.05 or less are considered statistically significant. Hair et al. (2019) found that R^2 values of 0.75, 0.50, and 0.25 are classified as weak, moderate, and significant, respectively. Small, medium, and high effect sizes are indicated by the effect sizes f2, which have values of 0.02, 0.15, and 0.35, respectively (Hair et al., 2019). The Q^2 effect size, which gauges predictive importance, should be negative, according to Sartedt et al. (2021). The measurement and structural models' assessment findings met the requirements outlined by Hair et al. (2019); hence, they were considered satisfactory.

4.0 DATA ANALYSIS

The response rate was 92%, which is representative and adequate for the analysis and reporting of the study. A response rate of 50% is deemed adequate, 60% is regarded as good, and 70% or higher is classified as excellent (Kuya & Kalei, 2022). This assertion served as the foundation for evaluating the response rate as exceptional. Table 1 presents the response rate of this study. The response rate exceeding 70% aligns with the findings of Salema & Buvik (2016), who reported an 86% response rate in their study titled "Buyer-supplier integration's influence on supplier logistics performance in Tanzania's hospital sector: The moderating influence of purchasers' cross-functional integration."

Table 1: Respondents' Rate

Type of Respondent	Expected Actual	Percent
Workers from Health centres and dispensaries in the Songwe Region	314 289	92

4.1 Indicator's Reliabilities, R^2 Values and Relevance of the Path Coefficients

The indicator's reliability was more significant than 0.708, as Hair et al. (2019) suggested, and the R^2 value was 0.772, as shown in Figure 2 below.

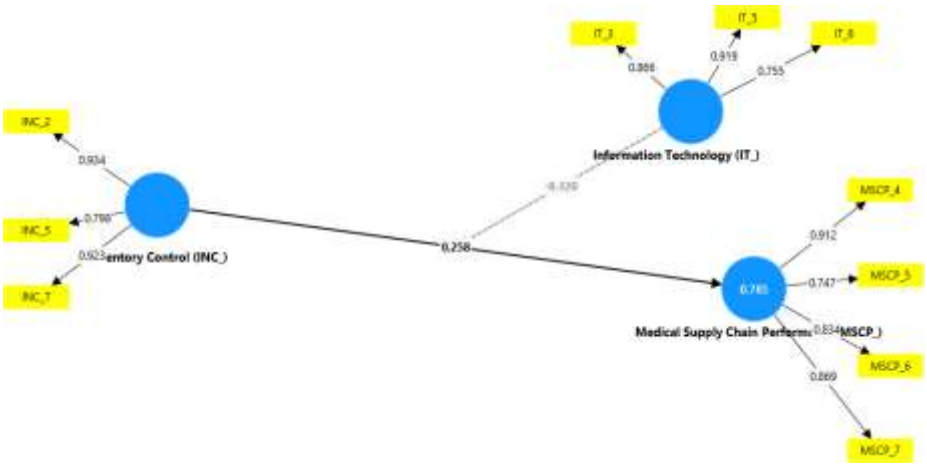

Figure i: Indicators reliability, R^2 value of relevance path coefficient with a moderating variable

4.2 Reliability and Convergent Validity Analysis Results

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Reliability was evaluated through Cronbach's alpha and Composite reliability, surpassing the required threshold of 0.7. Convergent validity was assessed using average variance extracted (AVE), with all items exceeding the minimum threshold of 0.5, as shown in Table 2.

Table 2: Reliability and convergent validity analysis results

	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
Information Technology (IT_)	0.807	0.885	0.722
Inventory Control (INC_)	0.862	0.917	0.787
Medical Supply Chain Performance(MSCP_)	0.866	0.907	0.71

4.3 Discriminant Validity Analysis

Discriminant validity was evaluated using the Fornell-Larcker criterion, which computed the square root of the average variance extracted (AVE) for every measurement model construct (Cheung et al., 2024). When the square root of a construct's AVE is greater than the highest correlation between that construct and any other construct, discriminant validity is verified. In this way, the empirical distinctiveness of the concept is confirmed, as it shares more variation with its indicators than with any other constructs in the model. The results are depicted in Table 3

Table 3: Discriminant Validity Analysis

	Information Technology (IT_)	Inventory Control (INC_)	Medical Supply Chain Performance(MSCP_)
Information Technology (IT_)	0.849		
Inventory Control (INC_)	0.431	0.887	
Medical Supply Chain Performance(MSCP_)	0.844	0.587	0.843

Q^2 Predict Results

The analysis found that all endogenous constructions had a Q^2 value smaller than zero, as depicted in Table 4. This indicates that an external construct (Information technology, Inventory Control) had the power to predict the endogenous construct's Medical supply chain performance.

Table 4: Q^2 Predict Results

	SSO	SSE	Q^2 (=1-SSE/SSO)
Information Technology (IT_)	867.000	867.000	0.000
Inventory Control (INC_)	867.000	867.000	0.000
Medical Supply Chain Performance(MSCP_)	1156.000	534.850	0.537

Collinearity Statistics by VIF Metric for Inner Model

The study examined collinearity metrics using the Variance Inflation Factor (VIF). The results for all items were below 3, indicating no collinearity issues among the predictor variables in the proposed study model. Table 5 displays the collinearity statistical results for the inner model of the proposed research framework, utilising the VIF measure.

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Table 5: Collinearity Statistics (VIF) for Inner Model Results

	VIF
Information Technology (IT_) -> Medical Supply Chain Performance(MSCP_)	1.457
Inventory Control (INC_) -> Medical Supply Chain Performance(MSCP_)	1.251
Information Technology (IT_) x Inventory Control (INC_) -> Medical Supply Chain Performance(MSCP_)	1.189

F ² Values Results

Sartedt et al. (2021) classify f² effect sizes as small, medium, and large based on thresholds of 0.02, 0.15, and 0.35, respectively. The study found that all correlations (f²) effect sizes were 0.008, 0.0202, and 1.966. The data indicate minimal, moderate, and substantial effect sizes for all hypotheses within the study model. Table 6 presents the results for F^2 in the study.

Table 6: The results for F^2

	f-square
Information Technology (IT_) -> Medical Supply Chain Performance(MSCP_)	1.925
Inventory Control (INC_) -> Medical Supply Chain Performance(MSCP_)	0.247
Information Technology (IT_) x Inventory Control (INC_) -> Medical Supply Chain Performance(MSCP_)	0.053

Assessing the R^2 Value of the Endogenous Constructs

All endogenous constructs exhibited an R^2 value greater than 0.25, as dictated by Sartedt et al. (2021); the variance accounted for by the exogenous construct in each of the endogenous constructs was measured by R^2 values. In this study, the exogenous construct, Information Technology (IT), influenced over 25% of the variation of the endogenous construct, Medical Supply Chain Performance (MSCP), through other exogenous variables, Inventory Control (INC), as depicted in table 7

Table 7: R^2 value results with moderating variable

	R-square	R-square adjusted
Medical Supply Chain Performance (MSCP_)	0.785	0.783

Statistical Significance of the Tested Hypotheses

The findings of this study, as shown in Figure 4, demonstrate that all expected relationships were statistically significant (with all p-values < 0.05). The findings indicate that the proposed research model applies to decision-making processes. This phenomenon can be attributed to the realisation of all hypothesised connections.

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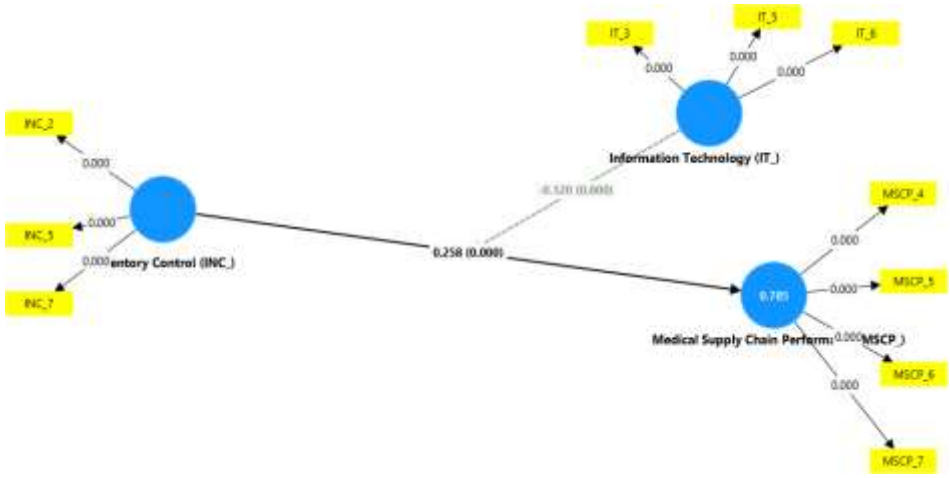

Figure 4: Statistical Significance Results of the Tested Hypotheses

Summary of Statistical Significance of Hypotheses Tested

Table 8, the results of the structural model analysis revealed that all the proposed hypotheses were statistically significant at the $p < 0.001$ level, indicating strong empirical support: H2 is supported, as Inventory Control ($\beta = 0.258$, $t = 6.699$, $p = 0.000$) positively and significantly affects Medical Supply Chain Performance (MSCP). The process improves order replenishment, expiration control, and inventory cost management, contributing meaningfully to overall supply chain effectiveness. H3 is also supported, showing that Information Technology ($\beta = 0.777$, $t = 22.532$, $p = 0.000$) strongly affects MSCP. Digital systems such as eLMIS significantly enhance supply chain visibility, accuracy, and responsiveness. H4 is also supported, with a significant adverse moderating effect ($\beta = -0.120$, $t = 3.843$, $p = 0.000$). It means that while IT enhances supply chain performance directly, its interaction with inventory control may weaken the positive impact of inventory practices if there is a misalignment between technology use and operational capacity.

Table 8: Findings of hypothesis tested from the model

	Original sample (O)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Information Technology (IT_) -> Medical Supply Chain Performance(MSCP_)	0.777	0.034	22.532	0.000
Inventory Control (INC_) -> Medical Supply Chain Performance(MSCP_)	0.258	0.039	6.699	0.000
Information Technology (IT_) x Inventory Control (INC_) -> Medical Supply Chain Performance(MSCP_)	-0.120	0.031	3.843	0.000

5.0 CONCLUSION

The primary aim of this study was to examine the effect of inventory control (INC) on medical supply chain performance (MSCP) while assessing the moderating role of information technology (IT) among Medical Stores Department (MSD) customers in Tanzania, with specific attention to the Songwe region. The findings offer strong empirical support for the proposed hypotheses and

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align meaningfully with both theoretical frameworks, the Resource-Based View (RBV) and the Institutional Theory (INT) and the reviewed empirical literature.

5.1 Findings

Inventory Control and Medical Supply Chain Performance: The study found that Inventory Control has a positive and statistically significant effect on Medical Supply Chain Performance ($\beta = 0.258$, $T = 6.699$, $p < 0.05$). This finding aligns with the Resource-Based View (RBV), which posits that organisational performance is driven by internal resources that are valuable, rare, inimitable, and non-substitutable (Barney, 1991; Giustiziero et al., 2023). Inventory control practices—including order replenishment, expired stock management, and cost containment—are internal capabilities that, when effectively deployed, enhance operational performance and service delivery. Empirically, this result is consistent with the findings of George and Elrashid (2023), who reported that structured replenishment systems improved supply chain performance in Bahraini hospitals, and with Johnson et al. (2021), who identified delays in replenishment and frequent stock-outs in Kenyan hospitals due to poor inventory coordination. Similarly, Tefera and Anbessa (2024) and Sallwa (2023) emphasised the importance of managing expired stock in improving supply chain efficiency in Ethiopia and Tanzania. Moreover, the positive effect of inventory cost management found by Khokhar (2023) and Essila (2023) further supports this study's findings.

Information Technology and Medical Supply Chain Performance: The direct path between Information Technology and MSCP was also positive and highly significant ($\beta = 0.777$, $T = 22.532$, $p < 0.001$), indicating that IT infrastructure is critical in improving medical supply chain performance. Aligns with the RBV perspective by confirming that IT systems (such as eLMIS) are a strategic resource that enhances supply chain coordination, visibility, and responsiveness (Yu et al., 2021; Dangi et al., 2023). Moreover, the result is consistent with Institutional Theory (INT), which emphasises that external institutional pressures—such as government mandates, donor expectations, and regulatory requirements—drive the adoption of technologies to ensure legitimacy and compliance (Meyer & Rowan, 1977; Craighead et al., 2020). In the Tanzanian context, the government-mandated adoption of eLMIS to improve transparency and accountability in public health supply chains aligns with this perspective. Milulu et al. (2024) reported that eLMIS significantly improved inventory accuracy and reduced stock-outs in the Singida District, which complements this study's findings in Songwe. Salamah et al. (2023) and Yang et al. (2024) also reached similar conclusions, demonstrating the transformative role of IT in enhancing supply chain coordination and performance.

Moderating Role of Information Technology: However, the study found a negative and statistically significant moderating effect of Information Technology on the relationship between Inventory Control and MSCP ($\beta = -0.120$, $T = 3.843$, $p < 0.05$). Suggests that while IT directly enhances MSCP, its interaction with inventory control weakens the positive effect of inventory practices on performance. This result may reflect an overreliance on digital systems in settings where institutional readiness, technical skills, or system integration remain weak. It supports Holloway (2024) and Goltsos et al. (2022), who argued that IT systems often underperform when not correctly aligned with operational processes, infrastructure, or user competence. This interpretation is further supported by the INT framework, which highlights the institutional pressures and barriers to effective technology adoption, including inadequate training, poor integration, and limited resource allocation (Mwakyeja & Kimario, 2024). The adverse moderation effect does not negate the value of IT but underscores the critical need for alignment between IT systems and inventory control practices. When technology is introduced without parallel investments in training, infrastructure, or organisational change, its potential to enhance performance is diminished or even reversed.

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5.2 Conclusion

This study set out to examine the effect of inventory control (INC) on medical supply chain performance (MSCP), with a particular focus on the moderating role of information technology (IT) among Medical Stores Department (MSD) customers in Tanzania. Drawing upon the Resource-Based View (RBV) and Institutional Theory (INT), the study explored how internal operational capabilities and external institutional influences collectively shape supply chain outcomes in public healthcare systems. The empirical findings provide strong support for the hypothesised relationships. First, inventory control positively and significantly influenced medical supply chain performance. Specifically, practices related to order replenishment, expired stock management, and Inventory carrying cost control contributed meaningfully to improved availability, efficiency, and responsiveness in the supply chain. These results affirm the centrality of internal resource optimisation as proposed by the RBV framework.

Second, the study confirmed that information technology substantially and directly affects supply chain performance. Integrating digital tools such as the electronic Logistics Management Information System (eLMIS) enhances data accuracy, visibility, and timely decision-making—aligning with theoretical perspectives and prior empirical findings, which validates IT as a critical strategic resource and reflects institutional compliance and modernisation efforts. However, the study also uncovered an adverse moderating effect of IT on the relationship between inventory control and supply chain performance. This unexpected finding suggests that the introduction of IT alone is insufficient; without proper integration, staff training, and institutional readiness, the benefits of IT may not fully materialise or may even interfere with existing inventory practices. This insight reinforces the Institutional Theory perspective, emphasising the importance of organisational alignment, regulatory frameworks, and contextual constraints in shaping technology-driven reforms.

The study concludes that inventory control and IT are essential, yet their interplay must be managed strategically. Investments in IT must be complemented by efforts to strengthen institutional capacity, improve user competence, and integrate systems seamlessly with core inventory functions. For Tanzania's public healthcare supply chain—and regions like Songwe in particular—addressing these systemic challenges is key to unlocking performance improvements and ensuring the consistent availability of life-saving medical commodities.

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ISSN: 2676-2730
https://dx.doi.org/10.4314/ajplscm.v8i3.1
Journal Impact Factor (JIF): 6.782

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https://dx.doi.org/10.4314/ajplscm.v8i3.1
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