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Influence of Vendor Managed Inventory on Procurement Performance in Supermarket Outlets in Eldoret City in Kenya

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Abstract: Automated inventory management system contributes greatly to business digitalization, leading to increased system accuracy, the tuning of real-time tracking, early problem detection, and increased efficiency. Despite the advancements and inventory automation in organizations, some supermarkets have continued to experience challenges related to procurement processes. This study sought to establish the effect of Vendor managed Inventory (VMI) on procurement performance in supermarkets in Eldoret City in Kenya. The study was anchored on TAM theory. A cross-sectional survey research design was adopted with a target population of 103 procurement and IT employees in the ten supermarkets in Eldoret city in Kenya. A sample of 51 respondents was selected. A questionnaire structured in a 5-point Likert scale was adopted for primary data collection. The collected data was analyzed with the help of Statistical Package for Social Sciences (SPSS). The study established that VMI had a strong positive and significant relationship with procurement performance of supermarkets in Eldoret city in Kenya. The study concluded that VMI have a statistically significant influence on procurement performance of supermarkets in Kenya. The study recommended that the management in supermarkets in Eldoret city should empower the vendors who supply inventory to the supermarkets to adopt the dynamics of inventory management.

Keywords: Vendor Managed Inventory, Inventory, Automation, Procurement Performance, Management.

I. Introduction

Inventory managers experience supply chain problems, inaccurate forecasting, overstocking, under stocking and the ability to maintain competitiveness (Atnafu & Balda, 2018). Successful business owners and managers aim to optimize performance, manage inventory, and achieve desired goals (Li & Lim, 2018). The owners of firms experiencing financial problems can adjust inventory to the level to facilitate cash availability or important events in the business. Inaccurate demand forecasts can lead to unsold stock and increasing expenses (Yang, 2016). Maintaining proper inventory records is also critical because inaccurate records can negatively impact the firm's bottom line. Effective inventory management significantly affects the performance and sustainability of any business (Bendig et al., 2018).

Inventory handled on time and by the vendor maximizes on reducing inventory on hand and improves inventory turns (Ouyang et al., 2018). Inventory control also includes system and procedure for defining inventory requirements, set goals for reporting the real and expected inventory status of replenishment techniques and performing all functions related to monitoring and controlling inventory material management, With the primary objective of assessing or managing stock levels within the physical distribution system, the need for product availability is balanced against the need to optimize inventory keeping and handling costs (Akintokunbo & Obom, 2021). Inventory management is concerned with the efficient management of stock to achieve an optimum level of inventory in the firm's working capital.

Technological innovation in the supply chain has become very important, allowing improvements, in terms of efficiency and quality, in the management of physical, information and financial flows. According to Fatonah et al. (2018), an automated inventory management system contributes greatly to business digitalization, leading to increased system accuracy, the tuning of real-time tracking, early problem detection, and increased efficiency. Obviously, an automated inventory system is able to grant new possibilities any business. Either an e-commerce executive, small, medium, or perhaps a fortune-level supply chain business owner. Going digital and optimizing and streamlining inventory management increases bottom-line Return on investment. Moreover, it frees up cash flow to invest in the latest and greatest emerging tech (Ongeri & Osoro, 2021).

In order to effectively automate inventory management, several systems have been developed so as to ensure that firms, retail outlets included, hold the right quantities of stock so as to strike a balance between the costs involved and customer satisfaction. Such systems include Materials Requirement Planning (MRP), Vendor Managed Inventory (VMI), Radio Frequency Identification (RFID), Enterprise Resource Planning (ERP), Electronic Point of Sale (E-POS), and E-Procurement (Mwangi & Kitheka, 2018).

The adoption of Internet of Things (IoT) solutions to implement inventory management systems has presented vital enhancements in supply chain transparency and management. Sophisticated sensors allow automating the entire process of gathering and transmitting data related to stock in-transit and keep real-time tabs on inventory's movement, thereby minimizing the amount of hands-on involvement. Research has established that organizations that adopt IoT based inventory tracking systems help to reduce the labor costs by 35%-40% while increasing data reliability (Jones and Graham, 2018). The integration of IoT device with conventional ERP systems showed that it has facilitated the flow of information across organizational departments, which in turns enhance the decision-making procedures. The study also shows that companies that implement integrated IoT-ERP systems increase the inventory turnover rates by 45% and decrease the rate of stockouts by 50% (Rubel, 2021).

II. Statement of the Problem

Inventory management is a critical function in the retail sector, directly impacting procurement performance, customer satisfaction, and overall profitability. In Kenya's fast-growing urban centers such as Eldoret, the retail supermarket industry is increasingly competitive and reliant on efficient supply chain systems. However, many supermarkets continue to grapple with stock outs, overstocking, procurement delays, and inefficiencies arising from manual or semi-automated inventory systems (Kiarie & Orlando, 2022). Globally, automated inventory systems have been shown to reduce stockholding costs by up to 25% and improve order fulfillment accuracy by over 30% (PwC, 2021). Yet, in the Kenyan context, particularly outside Nairobi, there is limited empirical data quantifying the impact of automation on procurement efficiency in retail environments. Despite the global trend toward inventory management automation, a significant number of supermarkets in mid-tier urban regions in Kenya like Eldoret city still rely on outdated or fragmented systems. According to the Kenya Retail Sector Report (Cytonn, 2022), over 60% of retail stores in secondary cities operate with limited digital inventory tracking, resulting in an average stock discrepancy rate of 18%. This not only inflates procurement costs but also reduces responsiveness to market demand, undermining procurement performance. A few studies have been done to address the issue with automation. Wanjiru and Noor (2023) examined supply chain automation and performance of garment manufacturing companies in Nairobi City County in Kenya. Rapando and Juma (2020) assessed the influence of supply chain automation on inventory control in public institutions a case of Kaimosi friends University College in Kenya. Ntooki and Kyule (2021) examined the influence of electronic procurement practice on organizational performance at the judiciary of Kenya. Furthermore, Rose and Ondara (2022) studied the effect of inventory management controls on project performance of selected construction companies in

Nairobi City County in Kenya. It's notable that a majority of the studies are done in other sectors of the economy and not in the retail sector and specifically not in supermarkets. Contextually, there lacks understanding of the readiness, challenges, and actual effectiveness of adopting automation technologies in the unique socioeconomic and infrastructural landscape of Eldoret. As such, this study sought to fill these gaps by looking at the effect of inventory management automation on procurement performance of supermarkets in Eldoret City in Kenya.

III. Purpose of the Study

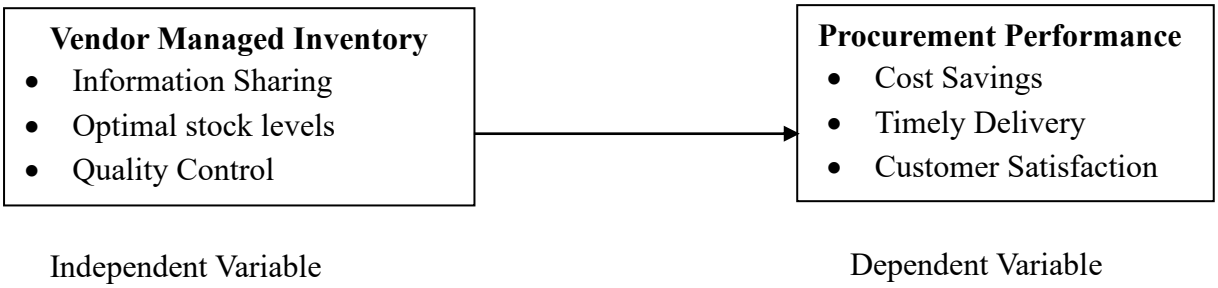
The study sought to examine the influence of vendor managed inventory (VMI) on procurement performance in supermarket outlets in Eldoret city in Kenya.

IV. Hypothesis of the Study

H_0: Vendor managed inventory has no statistically significant influence on procurement performance in supermarket outlets in Eldoret city in Kenya.

V. Conceptual Framework

The conceptual framework seeks to show the linkage between vendor managed inventory and procurement performance in retail supermarkets in Eldoret Kenya.



VI. Technology Acceptance Model (TAM)

Technology acceptance model (TAM) was originally proposed by Fred D. Davis (1989). The theory provides a useful theoretical lens for studying the effect of inventory automation on procurement performance. The theory argues that users perceived usefulness (PU) and perceived ease of use (PEOU) determine their attitude toward a new information system which in turn shapes behavioral intention and actual use. When employees and supply chain partners believe a system will improve job performance and is easy to use, they are more likely to adopt and use it (Davis, 1989). Future works extended and integrated TAM and explicitly added contextual and system quality factors to explain technology acceptance in organizational settings such as warehouses and retail stores (Venkatesh et al., 2003; Fahmi et al., 2024).

The core strength of TAM theory for automation and performance study lies in its ability to foreground human adoption as the critical link between technology investment and actual operational gains (Vankatesh et al., 2003). Recent reviews of retail digital transformation confirm that real-time inventory systems, barcode/RFID, and decision-support tools deliver value only when front-line users and trading partners engage with the systems (Wolniak & Stecuła, 2024). The theory has drawn criticism in that it over-emphasizes individual cognition and under-represents organizational, contractual and inter-firm governance factors that are central to supply chain practices. TAM also pays attention to early adoption and offers less direct explanation of how sustained use leads to measurable organizational outcomes unless combined with performance or governance theories (Fahmi et al., 2024).

The TAM theory provides a clear empirically tested way of explaining human acceptance mechanisms that mediate the effect of inventory automation on procurement performance. Applying the theory in supermarkets in Eldoret city helps understand the adoption of VMI, EDI and MRP frameworks among supermarket procurement staff and supplier contacts thus enabling the assessment of the perceptions as mediators between automation adoption and procurement performance.

VII. Vendor Managed Inventory and Procurement Performance

Amongst other inventory management systems, VMI has been described as an inventory and supply chain management tool in which the supplier has taken the responsibility for making decisions on the timing and amounts of inventory replenishment. This tool has also been called a continuous replenishment process, continual replenishment or automatic replenishment (Stadtler, 2015). The advantages of using VMI to the downstream member, usually a large retailer, have well been documented. Mwangi and Kitheka (2018) noted that the main advantages of VMI were reduced costs, and increased customer service levels to one or both participating members. VMI has greatly reduced inventory-carrying costs and stock-out problems while, at the same time, it offered the ability to synchronize both inventory and transportation decisions (Wambua et al., 2015). Further, it's been noted that VMI advantages included improved customer service, reduced demand uncertainty, reduced inventory requirements and reduced cost based (Mwangi & Kitheka, 2018).

In their study, Cherotich and Musau (2020) examined the influence of vendor managed inventory on procurement function of NCPB in Uasin Gishu County in Kenya. The study adopted stratified sampling technique in establishing the sample for the study. Questionnaires were used by the study to collect the data. The semi structured questionnaire was self-administered in order to increase response rate. The study found that vendor managed inventory has a positive and statistically significant effect on the procurement function at NCPB in Uasin Gishu County. The study concluded that inventory management needs to be embraced to help the management team appreciates the direct impact of these initiatives. The study recommended that adoption of flexible inventory management practices through appropriate research will help efficiently and effectively meet the business diverse yet drastic changing needs as well as address challenges arising from a dynamic global business environment.

Mwangi and Kitheka (2018) sought to establish the effect of vendor managed inventory on organizational performance of supermarkets in Mombasa County. A descriptive survey design was adopted as the major research design. All the supermarkets in Mombasa County constituted the study target population. Questionnaires were the major tool of data collection in the study and constituted of both closed-ended and open-ended questions. In this case, both qualitative and quantitative data was collected in the study. Study findings established that there existed a positive correlation between independent variables (Quality Control and Supplier Relationship Management) and dependent variable (Organizational Performance of Supermarkets). The study further recommended retail firms in Mombasa County to develop and implement sound quality control measures and at the same time invest in rigorous training of its staff so that they can accurately perform quality inventory control and retail firms in Mombasa County to consider fully integrating VMI to enhance the level of Supplier Relationship Management within and outside the organization.

Odiwuor and Muthoni (2023) examined the effect of vendor-managed inventory system on performance of retail outlets in Kenya. The study adapted a descriptive survey design with a target population of stores managers of 66 retail stores in Migori County. As such a census approach was adopted. Questionnaires were used to collect primary data. The collected data were analyzed descriptively. Based on findings for the study objective, VMI, which showed that control activities have a positive significant effect on performance of retail outlets hence implying that holding all factors constant, a unit increase in control activities leads to a significant increase in performance of retail outlets, it is concluded that control activities is an important factor in increasing performance of retail outlets in the organizations.

Wamoto, Kwasira and Ndolo (2023) examined the relationship between vendor managed inventory and operational performance of stores function in commercial state corporations in Kenya. The target population for the study was 906 Senior Management, Procurement Managers and Inventory Management Officers in the 54 Commercial State Corporations in Kenya. A sample of 99 respondents was chosen to participate in the study. Data collection was done

through a structured open and closed ended questionnaire. The study established significant influence of maintained Vendor Managed Inventory practices on operation performance of stores functions. The study recommended that Kenyan commercial state enterprises to continue allowing their inventory providers to participate in inventory management. The vendors should synchronize inventory classification with the companies; supply goods based on demand forecasts, and advise on inventory control.

Jelimo, Keitany and Evaline (2024) examined the effect of vendors managed inventory on the performance of selected supermarkets in Eldoret city in Kenya. The positivist approach was applied and an explanatory research design was applied. The study's target population was 1,004 employees of selected supermarkets in Eldoret City, Kenya. The study sample size was 317 employees, computed using the Yamane formula. The employees were selected using stratified and simple random sampling techniques. Data was collected using structured questioners and items anchored on a five-point Likert scale. Descriptive and inferential statistics was used to analyze data. Results revealed that vendor managed inventory was positively and significantly correlated to organization performance. Results further showed that vendor inventory management had a positive and significant effect on the performance of selected supermarkets in Eldoret City, Kenya. It was concluded that vendor inventory management is positively associated with supermarkets' overall performance.

VIII. Procurement Performance

In their study, Kogei and Gachengo (2025) examined the effect of inventory management on performance of selected Naivas supermarkets in Nairobi City County in Kenya. The study adopted a descriptive research design to investigate a sample size of 137 staff members from 8 randomly selected Naivas supermarkets in Nairobi City County. Semi-structured questionnaires were utilized to gather first-hand data from targeted respondents. The element of inventory management practices exceeded the threshold and thereby deemed reliable. Quantitative analysis revealed that inventory management showed moderate impact, limited by partial manual processes. To enhance performance through inventory management practices, it was recommended that Naivas supermarket should prioritize full automation of inventory tracking using IoT and AI-driven systems, building on the moderate but significant impact found in the study. Implementing vendor-managed inventory with key suppliers would further optimize stock levels, leveraging the strong correlation between SRM and inventory efficiency.

Bosibori (2017) did a comprehensive study on how inventory management influenced the outputs of supermarkets. The study sought to implementation of processes involved in inventory management as part of SCM in supermarkets in Kenya. The author specifically wanted to understand the effect of inventory automation on performance, how implementing quality control on inventory through automated devices could affect performance, and how maintaining minimal stock levels influenced performance. The study considered a descriptive research framework to analyze data. It was established that stock clearance was timely done, and stock disposal was done as well. The finding confirmed that good inventory management like computerized ordering, computerized receipts, inventory examined over a network, and maintenance of minimum stock positively affected supermarkets' performance. Nonetheless, the study was limited in its generalizability since it is dependent entirely on descriptive statistics, presenting a methodological gap.

Kiarie and Ndwiga (2019) examined the effect of different inventory control approaches on the performance of retail chain stores in Kenya. They focused on the effects of Economic Order Quantity, ABC analysis, VMI, and just-in-time techniques. The study used a descriptive research approach and focused on senior staff in retail chain stores as its population. The results showed that EOQ, ABC Analysis, JIT, and VMI all had a core function in improving the overall productivity of retail chain stores in Nairobi, Kenya. However, the study was limited to traditional inventory techniques

and may not be directly applicable to the present research. The current research recognizes the importance of considering the technological aspects of inventory control techniques.

Kathuki and Ndeto (2023) assessed inventory management techniques and procurement performance of public health centers in Mombasa County in Kenya. The study adopted descriptive research design. The target population was 148 employees of 37 public health centers operating in Mombasa City County. The study adopted stratified random sampling technique to pick 108 respondents determined using Yamane's sample determination formula. The study used questionnaire as main tool to collect primary data. The study findings revealed that inventory management techniques have a significant positive effect on procurement performance of public health centers in Mombasa city county, Kenya. This showed that upholding inventory management techniques would be essential in steering the procurement performance of public health centers in Mombasa city county Kenya.

Makori and Muturi (2018) examined the influence of inventory management practices on performance of procurement function among selected public health institutions in western Kenya. The sought to find out the effect of bin cards, automated systems and ABC systems on procurement performance in select health institutions in Western Kenya. The study was guided by three theories; Just in Time theory, vendor management theory and activity cost analysis theory. The study revealed that automated systems coordinate inventory management practices, automated systems enable better demand management and reduces the storage space.

IX. Research Methodology

9.1 Research Design

The study employed cross sectional survey research design. According to Upagade and Shende (2012), research design is the arrangement of condition from collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. It is the logical manner in which individuals or other units are compared and analyzed and acts as the basis of making interpretations from the data. This study targeted all the supermarkets in Eldoret city in Kenya. Specifically, the study was targeting procurement and IT employees in these supermarkets. There are a total of 103 employees in both procurement and IT departments. Therefore, the study targeted all the employees in these supermarkets in Eldoret city in Kenya.

9.2 Sample Size

To arrive at the sample, the study employed the formula by Yamane (1967) as indicated hereafter;

$$n = \frac{103}{1 + 103(0.1)^2}$$

$$= 50.74 \approx 51$$

To arrive at this sample the researcher employed stratified sampling technique where the sample was distributed across all the supermarkets. Simple random sampling was employed to select the respondents from each supermarket to form the sample in the study. This ensured that every employee is given equal chance to participate in the study.

9.3 Research Instruments

The study used structured questionnaires that was distributed to all the supermarket outlets employees chosen to participate in the study. Questionnaire is used to cope with the constraints of limited time and budget. A pilot study was conducted to check the validity and reliability of the questionnaire.

X. Findings and Analysis

10.1 Response Rate

The researcher distributed 51 questionnaires to be filled by the respondents. 39 of the questionnaires were properly filled and returned. This represented a response rate of 76.47%. which was characterized as very good (Mugenda & Mugenda, 2012).

10.2 Vendor Managed Inventory

The study began by examining respondents' views in relation to vendor managed inventory and procurement performance in supermarkets in Eldoret city. The means and standard deviation values were computed in this regard. The findings from the analysis were as presented in Table 1

Table 1: Descriptive Statistics on Vendor Managed Inventory

	N	Min	Max	M	StD
Our supermarket has a VMI system for communication with our suppliers	39	2	5	4.18	.790
VMI helps the supermarkets be able to share information with suppliers efficiently	39	3	5	4.21	.615
Through VMI we are able to monitor our stock levels	39	3	5	4.33	.577
VMI enables us to maintain our stock levels at optimum levels	39	3	5	4.28	.560
Through VMI, we have been able to avoid stocks expiring while in our shelves	39	2	5	4.00	.889
Due to VMI stock management, we maintain the best qualities of our products	39	2	5	4.21	.833
VMI helps ensure that we don't run out of stocks	39	2	5	4.21	.864
Valid N (listwise)	39				

The results in the Table 1 above indicated that the respondents were in agreement with all the items in regard to vendor managed inventory in supermarkets in Eldoret city. Hitherto, respondents agreed (M=4.18, SD=.790) that their supermarket has a VMI system for communication with their suppliers and that VMI helps them share information with suppliers efficiently (M=4.21, SD=.615). Conversely, respondents were in agreement (M=4.33, SD=.577) that through VMI, they are able to monitor their stock levels and that VMI helps them maintain their stock levels at optimal levels (M=4.28, SD=.560). These findings were in concurrence with Mwangi and Kitheka (2018) who observed that the main advantages of VMI were reduced costs and increased customer service levels. Nonetheless, respondents concurred (M=4.00, SD=.889) that through VMI, they have been able to avoid stocks expiring while in their shelves and that due to VMI stock management, they maintain the best qualities of their products. Lastly, they agreed that WMI helps ensure that they don't run out of stocks (M=4.21, SD=.864). Stadtler (2015) also concurred that VMI is a continuous replenishment tool. All the items returned standard deviation values less than 0.1 indicating that their views were cohesive in regard to vendor managed inventory.

10.3 Procurement Performance

The study further sought to examine the respondents' views in regard to procurement performance in supermarkets in Eldoret city. The means and standard deviation values in this regard were computed. The results from the analysis were as presented in Table 2

Table 2: Descriptive Statistics on Procurement Performance

	N	Min	Max	M	Std
There is timely delivery of goods and services	39	2	5	4.46	.822
The procured goods and services are of the right quality	39	3	5	4.49	.601
The procured goods are of the right price	39	3	5	4.56	.680
The exercise of procurement especially on tender evaluation is fair and just	39	3	5	4.33	.737
Suppliers offer products that consistently conform to our specifications	39	3	5	4.36	.584

Purchase orders/contracts are sent electronically to suppliers resulting in reduced contract award lead time	39	3	5	4.31	.766
Valid N (listwise)	39				

The findings in Table 2 gave an average response mean of 4.42 indicating that the respondents were in agreement with all the items relating to procurement performance. The respondents were in agreement (M=4.46, SD=.822) that there is timely delivery of goods and services in the supermarkets and that the procured goods and services are of the right quality (M=4.49, SD=.601). Further, the respondents strongly agreed (M=4.56, SD=.680) that the procured goods in the supermarkets are of the right price and that the exercise of procurement especially on tender evaluation is fair and just (M=4.33, SD=.737). Respondents concurred further (M=4.36, SD=.584) that suppliers offer products that consistently conform to the supermarket's specifications and that purchase orders/contracts are sent electronically to suppliers resulting in reduced contract award lead time (M=4.31, SD=.766). The respondents demonstrated cohesion in their views with all the items returning standard deviation values less than one.

10.4 Correlation Analysis

The study undertook correlation analysis to establish the association between the independent variables and the dependent variable. Pearson correlation coefficient was utilized in this regard. The composite mean scores of the independent variable were correlated with the composite mean score of the dependent variable. The findings from the analysis were as presented in Table 3

Table 3: Relationship between VMI and Procurement Performance

		Vendor Managed Inventory
Procurement Performance	Pearson Correlation	.698**
	Sig. (2-tailed)	.000
	N	39

**. Correlation is significant at the 0.01 level (2-tailed).

The results in table 3, demonstrated strong positive and significant relationship between the independent variables and the dependent variable. The study established the existence of a strong positive and significant (r=.698, p=.000) relationship between vendor managed inventory (VMI) and procurement performance of supermarkets in Eldoret city in Kenya. The findings were in agreement with Cherotich and Musau (2020) findings who also established a positive significant relationship with procurement function performance. Moreover, Odiwuor and Muthoni (2023) established that VMI had a positive and significant effect on performance of retail outlets. As such, the utilization of VMI in the supermarkets inventory management enhances the procurement performance.

XI. Conclusions and Recommendations

The study concludes that inventory management automation is a critical measure in enhancing procurement performance in supermarkets in Kenya. The findings demonstrated that inventory automation significantly explains the variation in procurement performance in supermarkets. On the other hand, VMI was shown to have a significant relationship with procurement performance. In this regard, VMI is directly related with procurement performance in supermarkets in Kenya. The study demonstrated that inventory automation significantly influences procurement performance. As such the study recommended that the management in supermarkets in Eldoret city should empower the vendors who supply inventory to the supermarkets to adopt the dynamics of inventory management. On the other hand, the supermarkets should enhance the utilization of VMI in order to enhance their interlink with their suppliers.

This will enable fluid coordination with the suppliers which will enhance their responsiveness to supermarkets inventory needs.

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