The Effect of Inventory Management on Organizational Performance Among Textile Manufacturing Firms in Kenya

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ABSTRACT
The purpose of the study was to analyze the effect of inventory management on supply chain performance in terms of profitability, reliability, cost, responsiveness, flexibility and asset management efficiency of textile manufacturing firms in Kenya. The study was guided by the inventory management theory. The study adopted the convergent parallel mixed methods design. The study targeted a total of 196 respondents drawn from employees of procurement departments and departmental heads of respective 15 textile manufacturing industries operating in Nairobi County. The sample size was therefore 139 respondents. Stratified and simple random sampling methods were used to select employees of procurement departments from their respective textile firms. Questionnaires and interview schedules were used to gather the data from primary sources. The study applied the use of both qualitative and quantitative data which was analyzed using statistical package for social sciences (SPSS Version 22). Inferential statistics using hierarchical multiple regression and Correlation analysis was applied to test the relationship between the variable and formulated hypothesis. The final analyzed

results were presented using tables, graphs and charts. The study established that textile manufacturing firms in Kenya have adoption of inventory management as a factor of supply chain influencing performance. The study concludes that inventory management possess the potential of positively influencing performance of Textile firms in and therefore recognizes the importance of inventory management in the supply chain and have put clear mechanisms in place and invested in current material flow systems to oversee smooth and transparent material flow that can be tracked along a supply chain.

Key words: Inventory Management, Organizational Performance And Manufacturing Firms

Introduction

The textile industry has gained recognition for its potential to contribute towards National development. Consequently, the Ministry of Industrialization and Enterprise Development has deemed it suitable to leverage Kenya's attainment of middle industrial economy status on the textile industry (MOIED, 2015). Despite recognition of the potential the industry possesses, it continues to face challenges such as infiltration by corrupt cartels and use of obsolete technology (Tuikong & Kurgat, 2015). In order for the industry to strive to remain competitive through value creation, an understanding of the complexity and dynamism of its supply chain management has potential to provide the platform upon which the success or failure of this important industry could be judged. Challenges faced by the textile firms in Kenya could for instance, be addressed if executives of such firms were made aware of factors that could determine performance of the supply chain in the textile industry and how they could impact on overall performance of these firms.

Statement of the Problem

Recognition of the Potential of the textile industry to contribute to Kenya's GDP has led to the leveraging of the country's vision for industrialization on the industry (the Kenya Textile and Fashion Industry Report, 2015 several studies have been conducted in the local context interrogating determinants of supply chain performance in diverse sectors. Among sectors that have consistently pointed towards ICT, infrastructure, customer–supplier relationships, inventory management, and transport management as determinants of their supply chains include Agriculture (Mwangi, 2013; Omai, 2013); Energy (Muthini, et al., 2017; Osoro et al., 2016; Ideet & Wanyoike, 2012);   Banking (Seghete, 2016); Public institutions (Weeks & Namusonge, 2016; Kanda & Iravo, 2015, Karimi & Namusonge, 2014); Public institutions (Namusonge, 2016; Wabwile & Namusonge, 2015; Waithaka et al., 2012). Inspite of the large number of studies identified, none of them specifically focus on the effect of inventory management on performance in the context of textile firms. Explaining performance in textile firms requires that key supply chain factors that be identified and addressed. The present study therefore sought to assess the effect of inventory management on supply chain performance specifically applicable to textile firms in Kenya.

Objective of the study
The objective of this study was to establish the effect of inventory management on supply chain performance among textile firms in Kenya.

Hypothesis
The utility of inventory control in supply chain management appears to be felt across a diversity of sectors in Kenya. No literature however exists showing how inventory management for instance directly impacts on the performance of textile firms in Kenya. In the absence of such evidence, the following postulation was made.

H_01: *inventory management has no significant effect on performance of textile firms in Nairobi City County.*

LITERATURE REVIEW
The management of materials in organizations cannot be achieved without reference to inventory, also referred to as stock. Inventory and its management remains a central theme in discourse on managing materials. Vrat (2014) in general terms defines inventory as the stock of goods physically stored to meet expected demand. However, from a material management axis, Vrat (2014) views inventory as resources that though having economic value for use remain idle. Vrat argues that it is sensible to set aside some physical stock that can take care of anticipated demands rather than cause delays in operations for lack of relevant materials, necessitating inventory in most organizations.

Kontus (2014) posits that inventory management is a key organizational function that helps in the development of policies aimed at optimal investment in inventory. Consequently, optimal inventory management can lead to maximization of liquidity and risk. Chambers and Lacey (2011) observe that inventory management seeks to strike a balance between benefits that accrue from holding inventory and costs of doing the same. Consequently, inventory management as noted by chambers and Lacey is a process designed to maximize the net benefits of the inventory, yet at the same time minimize expenses that go to it.The study was guided on lean theory.

Lean theory
Heizer and Render (2006) indicate that "inventory management or "inventory planning and control" refers to the ongoing provision of standard items with independent demand, where some speculative quantity should always be on hand.Lean theory therefore focuses on optimization of costs in inventory systems. It is posited that through this theory, decisions on manufacturing, warehousing, and general supply chain concerns can be expedited (Tempelmeier, 2011). The theory builds upon the economic order quantity (EOQ) model that seeks to optimize the quantity of any individual item ordered.

Choice of Lean Theory for this study was informed by the need to examine how inventory management influences organizational performance thereby calling for a prudent approach to inventory management. The theory therefore brings to the fore, the possibility of diversity in operating systems used to monitor levels of stock, and the difference in items that may

require different treatment. Lean theory is an extension of ideas of just in time. Kros, Falasca, and Nadler, (2006), elaborate just in time as a pull-based system designed to align the production and business processes throughout the supply chain. Green and Inman (2005) assessed the impact of lean theory on financial performance. They say that theory may eliminate buffer stock and minimize waste in production process. Eroglu and Hofer (2011) found that leanness positively affects profitability of a business firm. They argue that inventory leanness is the best inventory control tool. The theory elaborates on how manufacturers gain flexibility in their ordering decisions, reduce the stocks of inventory held on site and eliminate inventory carrying costs. At the aggregate level, the empirical strength of the lean explanation lies both in the timing and the magnitude of the adoption. However in the theory, inventory constrains a firm's ability to respond to fluctuations in demand. Scholarly studies indicate that companies successfully optimize inventory through lean supply chain practices and systems to achieve higher levels of asset utilization and customer satisfaction leading to improved organizational growth, profitability and market share (Green & Inman, 2005).

Another study suggesting a positive relationship between inventory management and performance was that of Eroglu and Hofer, (2011) in which their study focused on US manufacturing firms covering the period of 2003-2008. They found that leanness positively affects profit margins. According to Eroglu and Hofer, (2011) firms that are leaner than the industry average generally see positive returns to leanness. They used empirical leanness indicator as a measurement for inventory management. Contrary to the present study, their study focused on assessing the relationship between inventory performance and overall firm performance. Criticism leveled against the theory is that it can only be applicable when there is a close and long-term collaboration and sharing of information between a firm and its trading partners.

According to Lean Theory, inventory management act as a major component of any supply chain irrespective of whether it is product or service supply chain. Inventory management plays an important role in matching demand and supply within each and every partner in the entire supply chain, ultimately providing flexibility in coping up with external and internal events of the today's uncertain, globalized business environment (Bozarth et al. 2010). Ineffective inventory control is a major problem faced by industries in developing countries and that even the very basic inventory control concepts and techniques are not used by the majority of the companies studied. Due to the heavy reliance on imported industrial raw materials and parts, and the endemic bureaucratic delays and associated communication problems in developing countries, order lead times cannot be computed with any degree of accuracy (Chen, Frank, & Wu, 2007). Therefore, the Lean theory is of essence to the effectiveness of inventory management which will result to increased profitability, responsiveness, flexibility, cost effectiveness and asset management.
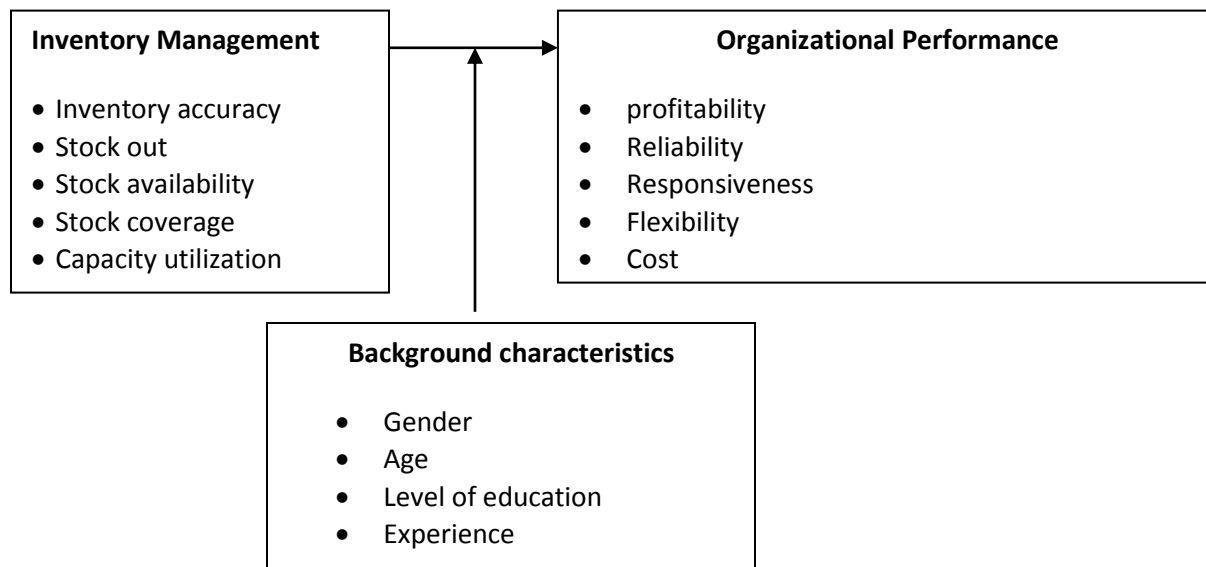
CONCEPTUAL FRAMEWORK
Based on the review of literature regarding the impact of inventory management on organizational performance, Inventory production as a supply chain driver has for instance

been found to exert direct influence on performance (Ambe, 2012). Moreover, inventory management is listed as a supply chain strategy that may impact positively on the performance of the wine industry in South Africa (Jooste et al., 2015). A number of inventory management practices that include Economic Order Quantity (EOQ), Just In Time (JIT), Marginal analysis, vendor managed inventory, and Order batching are reported to significantly predict performance in the agricultural sector (Mwangi, 2013) and also in retail institutions (Omondi & Namusonge, 2015). In addition, when referred to as material flow, inventory control has also had a direct effect on the performance of road construction projects (Ang'ana, 2012). On the basis of such evidence, the researcher conceptualized that inventory management could equally have a direct effect on performance of textile firms.

Independent Variable   **Dependent Variable**

Inventory Management	Organizational Performance
• Inventory accuracy • Stock out • Stock availability • Stock coverage • Capacity utilization	• profitability • Reliability • Responsiveness • Flexibility • Cost

Background characteristics

- Gender
- Age
- Level of education
- Experience

Moderating Variables

Inventory Management
Inventory management is another supply chain element that features prominently in empirical literature in relation to organizational performance. Mogere, Oloko and Okibo (2013) conducted a case study on Gianchore tea factory to assess how inventory control systems affect operational performance in the tea industry. Using a structured questionnaire to collect data and regression analysis, the study found out that use of material requirement planning, distribution planning, and vendor managed inventory had a positive influence on operations efficiency and by extension on organizational performance. Lwiki, Ojera, Mugenda and Wachira (2013) examined how inventory management practices used in the sugar manufacturing firms impact on those firms financial performance. The study used both primary data and secondary data. Correlation analysis results revealed that inventory management impacted positively with both return on sales and return on equity

Onchoke and Wanyoike (2016) analyzed the influence that inventory control practices used Agrichemical distributors operating in Nakuru Central Sub-county have on their procurement performance. The study used self–administered questionnaires that were dropped and picked. Regression analysis results revealed that inventory auditing, inventory security practices, and computerized inventory control positively and significantly influenced procurement performance.

Mwangi and Nyambura (2015) examined the role inventory management plays in the performance of companies engaged in food processing. Using the descriptive research design and multiple regression analysis, the study identified production maintenance, cost control, record reduced loss, and continuous supply as key elements of inventory management that play an important role in the performance of the food processing companies.

Wangari and Kagiri (2015) investigated the influence of practices used in inventory management at Safaricom Kenya Ltd on its competitiveness. Data was collected using drop and pick questionnaires. Regression analysis results revealed that inventory investment, inventory shrinkage and inventory turnover were significant predictors of competitiveness in Safaricom Ltd and by extension on organizational competitiveness. On the other hand, Ngei and Kihara (2017) sought to find out how inventory management systems used in firms that manufacture Gas in Nairobi City County influence performance of those firms. The study used both primary and secondary data, and was analyzed using multiple regressions. Results revealed that Vendor Managed Inventory (VMI), Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID) and e-procurement significantly predicted performance of gas firms.

Mukopi and Iravo (2015) analyzed effects of inventory management on performance from a sugar sector perspective. The study used 30 procurement personnel drawn from a target population of 100 personnel in Sugar firms in Western Kenya. Using ANOVA the study established that strategic supplier partnership; learn inventory systems; legal policies; and information technology related strongly with inventory management and hence firm performance.

Kitheka and Ondiek (2014) assessed how automation in the management of inventory impacts on performance of super markets operating in Western Kenya. The study used a descriptive survey design and targeted supermarkets operating in Kisumu, Kakamega and Bungoma towns. Regression analysis results revealed that automation of inventory management had a direct linear impact on performance of the supermarkets. Kimaiyo and Onchiri (2014) examined the role inventory management in new Kenya cooperative creameries plays on its performance. The study drew a sample of 83 respondents from a target population of 500 individuals. Using the descriptive research design, the study established that inventory management by way of holding stocks and ordering costs tended to increase performance of the firm. The utility of inventory control in supply chain management appears to be felt across a diversity of sectors in Kenya. No literature however exists showing how inventory management for instance directly impacts on the performance of textile firms in Kenya. In the absence of such evidence, the following postulation was made.

Organizational Performance

Organizational performance remains a central theme in contemporary literature. Scholars continue to ventilate on various factors that inform performance in diverse organizations. Awino (2015) for instance focuses on examining the role organizational structure plays in the performance of large firms in the manufacturing sector in Kenya. Her study uses the cross-sectional survey of large manufacturing firms to show that non-financial measures such as customer satisfaction, internal firm processes and firm image influences performance among large manufacturing firms. On the other hand, Shisia, Sang, Matoke and Omwario (2014) contend that strategic innovation has potential to impact positively on the performance of public universities in Kenya.

The influence of human capital on organizational performance has also been investigated. Odhon'g and Omolo (2015) focused on analyzing the effect the investment in human capital has on organizational performance from a pharmaceutical perspective. Using the inferential tests of association, the study revealed that organizational performance was associated with investment in quality, relevance, and reliability in the human capital. Kinyua-Njuguna, Munyoki and Kibera (2014) while focusing on internal organizational environment in the context of community-based organizations specializing in HIV and AIDS, established that the organization's internal environment tends to impact on relevance, efficiency and effectiveness of organizations.

Potential factors that impact on organizational performance have also received attention from a corporate governance perspective. Mbalwa, Kombo, Chepkoech, Koech and Shavulimo (2014) assessed the effect of corporate governance in Sugar manufacturing firms on their performance. The study used manufacturing firms drawn from Western Kenya and correlation analysis to show that corporate governance practices have positive correlations with organizational performance. Specific practices that come to focus here include characteristics of the board; top management, and stakeholder communication. Kitonga Bichanga and Muema (2016) identify strategic leadership variables such as human capital, ethical practices, and strategic direction as relating positively with organizational performance in the case of the not for profit organizations.

On the other hand, Kariuki and Murimi (2015) investigated employee empowerment and how it impacts on organizational performance. The study explored the case Tata chemicals in Magadi Kenya and found out that employee empowerment through information sharing and training tended to have a moderate impact on organizational performance. Christopher (2005 as cited in Chimwani, Iravo, and Tirimba, 2014) contends that in order for any responsive organization to meet its desired procurement goals such as the transformation of: functions to processes; inventory to information; products to customers; profit to performance and transactions to relations, there is need to continuously monitor the key measures of procurement performance. It is argued that despite the wide array of measures that can be deployed to measure procurement performance, the success of the measurement relies basically on a few indicators which can be determined by use of the balanced score card (Chimwani *et al.*, 2014). The balanced scorecard takes cognizance of the procurement goals which are often a mix of the

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organizations internal measures for managing resource utilization and total quality measures expected by customers.

Moreover, observations have been made to the effect that adherence to supply chain practices has potential to reduce operational costs and result in outputs that match organizational goals (Muma et al., 2014; Osuga et al, 2015). More evidence on the importance of supply chain practices is attributed to Kimotho (2014) who argues that satisfactory procurement performance has a direct impact on firm profitability, supplies, quality and competitiveness. There is no doubt therefore that use of appropriate supply chain practices remains the panacea to challenges facing the textile industry in Kenya. However, in the event of scanty evidence from a textile industry perspective, the present study yearned to identify supply chain determinants that could best predict firm performance in this important sector.

RESEARCH METHODOLOGY

The study adapted the convergent parallel mixed methods design. Under this design, the qualitative descriptive method was combined with the quantitative explanatory method to first and foremost describe the conceptualized supply chain determinants and performance criteria used by textile firms and, thereafter to try and explain the cause-effect relationship between supply chain determinants and procurement performance. The choice of this design was informed by the desire to make an exhaustive analysis of the problem by merging qualitative and quantitative data (Creswell, 2013). The population for the present study included the entire set of 15 firms dealing in textile and apparel production, the procurement departments and staff working in those departments. Stratified and simple random sampling methods were used to select employees of procurement departments from the respective textile firms and the final sample therefore consisted of 124 procurement department employees and 15 heads of procurement department. Both primary and secondary data was used for the study. Questionnaires and interview schedules were designed to collect primary data for purposes of the study in line with the two sets of study units identified, and consistent with the mixed methods research design settled upon. Secondary data comprised literature related to supply chain management and recognized publications. Data was first prepared and cleaned using descriptive statistics that included means, standard deviations, skewness and kurtosis, and standardized scores.

RESEARCH FINDINGS AND DISCUSSION

Response Rate

The study targeted 184 procurement department employees and 15 heads of department. The need to examine response rate was based on the urge to ascertain whether the proportion of response was representative of the targeted population and could inform decisions on the effect of supply chain drivers on procurement performance. Out of a sample of 139 made up of 124 employees and 15 heads of department, 106 employees and 9 heads of departments participated in the study. The overall response rate was therefore 82.7% distributed as shown in Table 4.1. On the basis of recommendations by Draugalis, Coons and Plaza (2008) indicating

that response rates approximately 60% should be the goal of researchers, this response rate was found to be suitable for purposes of the study.

Table 4.1: Response Rate

Category of respondent	Expected sample size	No responding	Response rate
Procurement Employee	124	106	85.4
Head of procurement department	15	9	60.0
Total	**139**	**115**	**82.7**

Inventory Management

This objective sought to find out the effect of inventory management on the performance of textile firms. Prior to examining the effect, a quantitative analysis of employee questionnaire responses was conducted to identify their awareness of inventory management practices being used in the firms. A total of six items were used to measure procurement employee's views on inventory management in the firms. Responses were elicited on the continuum scale $0.5 \leq R < 1.5$- strongly disagree; $1.5 \leq R < 2.5$ disagree; $2.5 \leq R < 3.5$–moderately agree; $3.5 \leq R < 4.5$–agree; $4.5 \leq R \leq 5$ – strongly agree.

The overall mean of 4.33 associated with a standard deviation of 0.613 indicates that procurement employees appeared to consistently agree to be aware of inventory management practices on offer in their respective firms (Table 4.5). Among key practices identified for inventory management included: achievement of demand forecasting to determine stock coverage (*M=4.22, SD=0.717*); proper material handling to address stock out (*M=4.42, SD=0.550*); timely response to customer references (*M=4.43, SD=0.535*); ensuring inventory accuracy (*M=4.43, SD=0.567*); optimizing capacity utilization (*M=4.30, SD=0.650*); and achieving optimal inventory (*M=4.28, SD=0.658*).

The implication of these results is that a number of initiatives have been undertaken by respective firms to manage inventory. More importantly, employees seem to be aware of these initiatives. In essence, textile firms operating in Nairobi County recognize the importance of inventory management in the success of supply chain processes. Consequently, management have taken regard of the need to fulfill orders accurately, plan and order inventory better, and more importantly, increase consumer satisfaction.

Table 4.5Inventory Management Practices

Statements	Mean	Std. Deviation
1. The firm achieves accurate demand forecasting to determine stock coverage	4.22	.717
2. The firm has put in place proper material handling in cases of stock out	4.42	.550
3. The firm makes timely response to customer references to ensure stock availability	4.43	.535
4. The firm has mechanisms in place to ensure inventory accuracy	4.34	.567
5. The firm optimizes utilization of its capacity	4.30	.650
6. The firm achieves optimal inventory	4.28	.658

Overall response: *M=4.33; SD=.613*

The findings regarding practices employed for inventory management among the sampled textile firms is a clear manifestation of the importance they attach to inventory management as a supply chain determinant of performance. The current state of the art practices for inventory management shows a desire not to leave nothing to chance and is consistent with views by Silvestro and Lustrato (2014) indicating that investment on material flow management has potential to ensure timeliness and efficiency in delivery of products to end users.

Use of diverse practices to manage inventory as found out in the present study points to textile firms as being keen to focus on synchronizing the flow of materials across their supply chain. This supports findings which show that firms use a number of practices to coordinate the flow of materials for purposes of attaining higher performance (Onchoke & Wanyoike, 2016; Mwangi & Nyambura, 2015).

The findings showing that textile firms in Nairobi County make timely response to customer references and that they have in place mechanisms for inventory accuracy vindicate the urge among these firms to remain competitive by controlling inventory. Other studies have also shown the utility of inventory management in improving operations efficiency (Mogere, Oloko &Okibo, 2013); improving returns on sales and returns on equity (Lwiki et al., 2013); increasing firm performance through holding stocks and ordering costs (Kitheka & Ondiek, 2014), and increasing competitiveness (Wangari, 2015).

Test of Hypothesis
Hypothesis **H$_0$2** postulated that inventory management had no significant effect on performance. The hierarchical multiple regressions results presented in Table 4.22 revealed that inventory management positively and significantly affects performance in textile firms in Nairobi County (β = 0.174, P<0.05). The implication is that a unit standard deviation increase in inventory management has potential to improve firm performance by 0.174 standard deviations. The hypothesis that inventory management had no significant effect on performance was therefore not supported.

The regression finding that shows that inventory management impacts positively on performance explains the descriptive and thematic findings which showed awareness among procurement employees and heads on the need to manage inventory. Moreover, it justifies the need to have in place various strategies and practices for inventory management and why it is necessary to consider modern inventory management systems.

Model Summary Results

The model summary statistics displayed in Table 4.20 show that when background characteristics were entered in model 1, the R-square was 0.046 implying that variation in background characteristics contributed only 4.6% of the variation in performance. However when the conceptualized determinants were entered in model 2, the coefficient of determination (R square) increased up to 0.828. The associated R-square change was 0.782 which implies that variation in the determinants contributed 78.2% of the variation in performance.

Table 4.20 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.215[a]	.046	.009	.52547	.046	1.227	4	101	.304
2	.910[b]	.828	.812	.22867	.782	87.465	5	96	.000

a. Predictors: (Constant), Experience in department, Gender of Respondent, Age of Respondent, Level of Education

b. Predictors: (Constant), Experience in department, Gender of Respondent, Age of Respondent, Level of Education, Warehouse Management, Transport Management, Inventory Management, Supply Chain Information Systems, Customer-Supplier Relationship

Regression Coefficients

An examination of the regression coefficients displayed in Table 4.22 indicates that although the coefficients of the background characteristics were not significant, those of all the conceptualized determinants were significant.

Table 4.22 Coefficients of Inventory Management

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1 (Constant)	4.591	.267		17.209	.000
Inventory Management	.148	.058	.174	2.538	.013

a. Dependent Variable: organizational performance

CONCLUSION AND RECOMMENDATIONS

Inventory management is a supply chain determinant of performance. Textile firms in Nairobi County appear to be conscious of the importance of inventory management in the supply chain and have put clear mechanisms in place and invested in current material flow systems to oversee smooth and transparent material flow that can be tracked along a supply chain. Systems such as ERP, VMI, EOQ, and RFI have potential to optimize inventory and material flow. Management should look to encourage continued use of modern inventory systems in order to optimize performance of the supply chain and by consequence overall performance of the firms. The current study was restricted to textile firms in Nairobi County. The findings may therefore have been influenced by the context in which this study was conducted. The researcher therefore recommends that similar studies should be replicated in textile firms in other regions so as to improve the external validity of the findings.

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