

**INVENTORY MANAGEMENT APPROACHES AND
PERFORMANCE OF TEXTILE MANUFACTURING FIRMS IN
KENYA**

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FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF
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DECLARATION

Declaration by the student

This Research project is my original work and has not been presented for the award of a degree in any other university.

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Declaration by the supervisor

This research project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

This study is dedicated to my family for their love, support, encouragement and prayer which saw me through the entire course.

ACKNOWLEDGEMENTS

The journey to completion of this course has been challenging and inspiring at the same time. The successful completion of this study has been achieved by combined efforts of some other people who helped me with their various talents, instructions, experience and above all their valuable time. I wish to express my sincere gratitude to them.

I thank our Almighty God for his grace and sustenance that has seen me complete this course successfully. I want to return praise to him for the free life he has given me, wonderful opportunities that I have had, the knowledge to share with others and the strength to write this research project. My sincere appreciation is extended to my family members for being respectful to and patient with me while pre-occupied with the entire Masters in Business Administration course.

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ABSTRACT

Inventory management is a system concerned with integration of information, transportation, acquisition, inspection, material handling, warehousing, packaging and control of supplies and ensuring security of inventory. Inventory management aims at discovering and maintaining optimal levels of investment in all types of inventories and maximizing the flow of goods, information and other related resources like people and energy from the point of origin to the point of final consumption. The broad objective of this research was to establish the role of inventory management approaches on the performance of textile firms. Specifically, the study sought to establish the inventory management approaches used by textile firms in Kenya; to establish the level of effectiveness of inventory management approaches of Kenya's textile firms and to determine the relationship between inventory management approaches and performance of textile firms in Kenya. A descriptive cross sectional design was used in this study to examine inventory management approaches in textile manufacturing firms in Kenya. The target population included all the 35 textile manufacturing firms in Kenya. This study utilized primary data. Data was obtained using questionnaires developed by the researcher. The questionnaire contains questions and statements based on the research objectives. Data was prepared for analysis through editing, coding and data entry. Data editing was done to ensure data was accurate and consistent with the research questions and objectives. Data was analyzed using Statistical Package for Social Sciences (SPSS) programs and presented in form of tables to give representation of research findings and for ease of interpretation. Means and standard deviations were used to show the extent to which textile firms have adopted inventory management approaches and regression analysis was used to explain the relationships between inventory management and firm performance. The final report was then compiled after subjecting data through thorough analysis. The study established that manufacturing companies use information technology, lean inventory system and strategic supplier partnership as inventory management approaches. The study also concludes that there was a strong positive correlation between the inventory management practices and operational performance of the textile manufacturing firms. Finally, the the study found out that the inventory management approaches were effective with an average mean of 4.48 and a standard deviation of 0.453. The researcher recommends that the manufacturing companies should develop a policy framework to facilitate faster implementation of the best inventory management practices such as JIT and MRP. It is also recommended that such firms should consider investing in modern technology and implement EDI. This will reduce inventory costs and improve returns. Finally, the firms should also strengthen the supplier relation to the level of partnerships. This will facilitate implementation of programs such as Vendor Managed Inventory (VMI).

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The process of inventory management involves activities such as transporting, acquiring, inspecting, handling of materials as well as making sure that materials in the warehouse are safely handled. The objective is to ensure that the company maintain optimum levels of investment in materials (Peter, 2000). Inventory control is a major objective of any organization for better productivity, performance of the operation of the organization and maximization of the profit (Jacobs et al 2009). Inventories (materials) are like rivers. They must flow. The rivers are life giving and should not “dry up” but on the other hand should not flood (Schonberger & Knod, 1991).

Historically, inventory management is about either having too much or too little inventory in the warehouse. Companies that keep excessive levels of inventory experience a number of problems. The need to maintain small levels of inventory is due to the increased adoption of technology in many companies. This has enhanced fast operations and high quantities can be produced with the needed level of varieties (Tersine, 2009). Effective inventory management has for a long time been seen as the best strategy in achieving competitive advantage through efficient and effective manufacturing and distribution activities. Companies have equally achieved the required level of inventory management through effective supply chain management. Proper inventory management helps to reduce cost by avoiding wastage of money. It is also one of the best mechanisms adopted in improving customer care (Robert, 2011).

The need to maintain inventory of raw materials, work in progress, loose tools and other components is to ensure that there is enough safety stock. Companies should however not keep large inventory for safety purposes to reduce the cost of operations and of maintaining inventory. In the recent past, companies have changed their strategies in inventory management by maintaining low levels of inventory hence the adoption of just in time (J-I-T) system. This system is a situation where inventory is only acquired when needed (Kolias et al, 2011).

1.1.1 Inventory Management Approaches

Pandey (2005) posit that to determine the levels of inventory that a company should hold at any given time, companies operate through an inventory control system. This comprises of policies, procedures, processes and controls that helps in monitoring the levels of inventory to be maintained at any given time. This helps to facilitate inventory management which determines how much of inventory to hold and how the existing inventory should be manipulated. Inventory Management approaches can on the basis of whether the movement is fast, slow or non-moving. This depends on the rate of consumption of the materials and transactional frequency. Another popular approach is the ABC method. In this approach, the investment on inventory is kept low while avoiding stock out of critical items. This is achieved by critical analysis of annual consumption and the distribution trend to help prioritize investment in inventory. This method further analyses inventory in terms of three categories.

Economic order quantity on the other hand facilitates the minimization of total cost of handling inventory. According to Lee (2002) Economic Order Quantity helps in the determination of the point of intersection between holding cost and ordering cost.

Using EOQ, the level of inventory is continuously reviewed to monitor the attainment of reorder level (Lysons, 2012). According to Muckstadt et al. (2010) EOQ model is determined equating ordering costs and holding costs. Since the business environment is rapidly changing and highly competitive, there is an urgent need to use the modern inventory management approaches like lean inventory systems, strategic supplier partnership and information technology among others.

1.1.2 Firm Performance

Firm performance is achieved when companies are able to achieve effectiveness and efficiency in the production of goods and services compared to competitors. High performing companies experience the advantage obtained through superior productivity as measured by the firm's performance over its competitors. Firms will seek towards available resource optimization, cost reduction and quality services or product delivery to enable them become attractive such that they develop customer loyalty, and gain competitive advantage. Due to competition, companies must assess their performance based on effectiveness in inventory management (Livohi, 2012).

The nature of the global economy is highly competitive hence the need for suitable strategies to achieve high organizational performance levels (Gunasekaran & Kobu, 2006). Firms will perform and sustain performance if the resources resulting in the firm performance are kept alive and the firm establishes a set of managerial processes where these resources are flourished and utilized (Centindamar & Kilitcioglu, 2013).

Measuring the performance of the firm will provide the firm management with the insights of how to improve the things that matters to the firm existence and also find out those things that are of value to the stakeholders and the customers as well.

According to Santo and Brito (2012) firms measure their performance to obtain information that will enable the firm management to improve their operations and financial outcomes. Kalpan and Norton (1996) proposed that a firm that measures its performance identifies and improves the various internal functions and their resulting external outcomes; and by doing this, the firm will redesign its corporate strategies and become a market leader within the industry (Poter, 1986).

The need for effective management of inventory in any manufacturing organization is to ensure that the organization achieves good quality output, improved customer care, increased profitability and enhance participation in corporate social responsibility (Johnson, 2008). This can be achieved by ensuring that raw materials are delivered on time to the factory while finished are distributed in an effective way. Good inventory management therefore helps to meet customer demands promptly and hence subsequently leading to increased revenue to the organization. According to Lawson (2008) effective performance is achieved when the entire supply chain is effectively managed. Supply chain management should focus on cost measurement, quality improvement, timeliness in deliveries, and measurement of supplier performance and assessment of extent of customer satisfaction.

1.1.3 Textile Firms In Kenya

The manufacturing sector is significant contributor to Kenya's economy resulting in 10% GDP 12.5% exports and 13% formal employment (Osano et. al.2008). Like other manufacturing firms, textile manufacturing industry has for years faced such challenges as decrease in local demand, high oil prices, high transport costs, cheap imports, and the removal of quotas. The growth of the textile manufacturing sector has been affected by increased cost of electricity and poor transport. This has forced a

number of textile manufacturing firms to close operations and lay off some of their workers (Kenya Association of Manufacturers (KAM), 2015). Due to the changes of government policy, the public sector participation in textile manufacturing is much smaller than private sector thus emphasis is now being given privatization of industrial sector (Awino, 2012).

The manufacturing environment has changed however with such considerations as globalization, and technology development has led to manufacturing of all sizes by firms after realizing that if their inventory management was both efficient and effective. However, with an appreciation of the presence of challenges, proper analysis and improvement in inventory management would lead to greater benefits. Proper management of inventory would result in improved service, growth in market share, effective suppliers and distribution channels and provision of invaluable analytics for continuous improvement.

1.1.4 Textile Industry in India

The India Textile industry is significant in the world economy. The industry has realized some level of organization in the recent past due to the move towards economic liberalization. The industry has also received significant support from the Government making it achieve high level growth. The bigger percentage of the Indian economy is made up of the textile manufacturing and exportation. The industry is also one of the main sources of employment to the citizens and non-citizens of India.

1.2 Research Problem

The life blood of any organization, whether private or public productive or service organization is inventory. Because of shortage of materials to meet sudden increase in

customers demand, reduction in profit margin, low returns on equity, wastages of materials, pilferage arising due to excess stock and sleep in communication chains that exist in most industries, inventory management has become mandatory on each and every manager responsible for production in an organization. Inventory is one vital resource that any organization requires and just like any other resource that is very scarce and that requires effective management rather than neglect. The cost of acquiring these inventories is also important for the fact that too much of it will mean tying down capital and risk of becoming obsolete while having little could lead to shortage and production bottle neck. How then, to determine adequate quantity of raw material to buy, where to buy on a regular basis devoid of scarcity, the amount to invest on the inventory and projection towards maximizing profit is the concern of the study.

The reviewed literature would suggest that the area of inventory management and the performance of the production function has not been fully studied or the area is marred with problems as the authors present it but at the same time it is clear that inventory management is key to the financial and non-financial performance of the production function of a company Goldsby et al., (2005). In Greece, Koumanakos (2008) found out that when firms preserve a high level of inventories, they experience lower rate of returns. Ondiek (2012) conducted an examination of how Kenyan manufacturing firms recognize the benefits of effective management of materials. The study found out that good material management lead to reduced cost of operations. Yun (2012) found out that the use of inventory control systems affect significantly the operational performance of firms. There is very little related research work done on inventory management approaches and operational performance in Kenya's textile

sector. Therefore this study will seek to determine the role of inventory management approaches have on performance of textile manufacturing firms in Kenya. The research will answer the following questions in order to meet the objective of the study; which inventory management approaches are applied in textile manufacturing firms in Kenya?; What is the relationship between inventory management approaches and operational performance of textile firms in Kenya?; And lastly, what is the level of effectiveness of inventory management approaches of textile manufacturing firms in Kenya?

1.3 Research Objectives

1.3.1 General objective

The broad objective of this research is to establish the role of inventory management approaches on the performance of textile firms.

1.3.2 Specific objectives

- i. To establish the inventory management approaches used by textile firms in Kenya.
- ii. To establish the level of effectiveness of inventory management approaches of Kenya's textile firms.
- iii. To determine the relationship between inventory management approaches and performance of textile firms in Kenya.

1.4 Value of the study

This study will provide textile manufacturing firms with insight on how to manage their inventory and how this would influence the firms' operational performance. This would facilitate the need to come up with good strategies to control inventories and

ensure improved performance of textile manufacturing firms. Implementation of inventory management practices would lead to proper use of resources leading to high level service provision to all stakeholders. This will lead to improved economic performance and subsequently improved living standards in the country. The study would also lay a basis for future research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter gives a detailed explanation of the key concepts and relevant issues about the research topic under study. It gives a review of theoretical literature by observing the past study. It also cites the critical review, summary and gaps that the researcher intends to fill and the conceptual frame work which explains the study briefly.

2.2 Inventory Management Approaches

There are a number of problems arising from inventory management. This can be dealt with by formulating techniques that are relevant to the objectives of the company. Companies can adopt techniques such as the two bin system where one bin serves in holding the safety stock when the second bin is used up. In another technique called Golf classification, the classification of materials is according to the nature of suppliers. ABC analysis on the other hand ensures that management efforts are concentrated where results are likely to be achieved. VED classification classify spare parts according to how they are essential and desired while SED classification enables top management to sort materials as they are scarce or difficult to obtain. Most textile firms in Kenya have been relying on these traditional techniques despite the many benefits that are generated from the use of modern inventory management techniques.

2.2.1 Information Technology

According to Carter & Price (2010) reliance on information is key to its performance and existence. To effectively manage inventory, information technology is needed to

facilitate tracking and recording of inventory. The use of computers helps to keep proper records and maintain the relevant inventory levels at an optimum level. Through information technology, facilities such as Electronic Data Interchange (EDI) are used. In this system, direct communication can take place between different organizations involved in the handling of inventory. It involves transmitting and receiving of data in a structured manner by trading partners without the intervention of people (Jessop, 2006). EDI helps to link organizations with the suppliers making it possible to place an order anytime need arises. Through EDI, computers of organizations and suppliers are linked making it easy to monitor inventory levels and reduce possible delays where a need arises. This helps to reduce paper work, increase the level of accuracy, and reduce labour cost and possible delays due to instant communication.

Information technology also involves the use of Electronic point of sale (EPOS). This technology helps in scanning and capturing information relating to items that are sold. This system also facilitates verification and provision of on time reports regarding sales and other relevant information. This helps to reduce cost of handling inventory during selling and provision of instant information that can help to track items being sold and those in the store. The use of EPOS means that inventory is only acquired when needed to avoid obsolescence cost and the deterioration of stocks. The implication is achievement of customer satisfaction and subsequently financial performance (Lysons, 2012).

2.2.2 Lean Inventory System

Womack et al (2003) posit that lean inventory system means reduced level of inventories. It is based on the argument that by using reduced levels of inventory,

companies realize high profits as there is reduction in storage costs as well as the cost of handling and waste (Brigham & Gapenski, 2010). The concept of lean management is gaining a lot of interest because of the increase in competition. The argument is that when a company holds excess inventory, cash flows are affected while the cost of holding inventory increases. The effect on cash flows is based on the fact that excessive investment is held on inventory.

The concept of Just-In-Time means the practice of eliminating waste. This can be achieved by sharing the design of products with suppliers and customers, encouraging single sourcing, reduction in delays and putting in place preventive measures regarding inventory handling. The aim of JIT is to enhance improved return on investment by reducing the cost of handling inventory. The system works effectively where operations are integrated and alert mechanisms are put to signal changes in inventory levels. This would lead to significant improvement in return on investment, high quality and efficiency of operations. JIT generally leads to successful supply chain management and subsequently improved customer satisfaction (Lysons & Gillingham, 2003).

2.2.3 Strategic Supplier Partnerships

According to Lysons & Gillingham (2003) strategic supplier partnership means customers and suppliers committing themselves to specific objectives for mutual benefits on issues regarding inventory. It relies on ensuring successful JIT system. The objective is to reduce waste, shorten lead time, enhance improved operations and simplify activities (Bicheno, 2004). The argument is that when suppliers and customers are co-operating rather than confronting each other, they tend to have mutual benefit. Strategic partnership between suppliers and customers should be long

term to improve the relationship by giving the supplier enough time to do adequate investment in inventory. The partnership also requires that there is good communication system with increased personal and direct discussions on specifications. Equally, good communication would mean that suppliers are involved early enough especially at the design stage to eliminate possible wastage and possibilities of defective items (Brownell, 2005).

The partnership between suppliers and customers can also be on the basis of Vendor Managed Inventory (VMI). In this approach, there is improved access to inventory and the customer only pays for the inventory they have consumed but enjoy instant access. This helps to reduce investment in inventory as well as reduced cost of handling inventory (Loughrin, 2008). According to Lambert (2006) relationship between suppliers and customers ensures proper negotiations on specification requirements with the suppliers. This improves the competitive ability of companies and lead to improved performance (Borgatti & Foster, 2003). Further studies in related areas such as marketing and supply chain management shows the importance of such relationships terming it as economic boosters (Nagurney, 2010) as well as a means of bettering the firm's success and performance (Veludo, Macbeth & Purchsae, 2006).

2.3 Firm Performance

The concept of performance is a relative concept, and the measures used to determine the performance of the firm remains an issue of debate among researchers, academia and policy makers as well. Firm performance means the competitive ability of a company with the respect to the other players in the market. From the literature definitions, it is argued that a firm's performance is its competitive capability in a

homogeneous market or industry and succeeds better than others. Different researchers have supported the concept that success of a firm depends on its superior performance; and that the performance of the firm can be measured by the financial and nonfinancial performance (Liargovas & Skandalis, 2004). Hart & Ahuja, (1996), Konar & Cohen (1997) and Mallette & Fowler, (1992) proposed that the firm performance can be measured using financial performance. Using at least five years period of ROA is appropriate because it measures the long term strategy to survive and the structural variables of the firm (Wernefelt & Hansen, 1989).

Using nonfinancial measures, Kalpan & Norton, (1996) argued that with the growing age of the information systems, the financial or the accounting measures have become obsolete and inadequate to measure the firm performance. This is because the financial measure or tangible asset measure addresses the industrial age of a firm and neglect the growing contributing factors or intangible assets that must be managed to gain financial health of the firm. It is therefore important and adequate to measure the firm's superior performance using Balance Score Card that describes the method that a firm can measure and even manage to become financially healthy. Bezzel et al (1995) argued that the key determinants of a firm performance are the marketing expenditure, relative product quality and the level of productivity. According to Gunasekaran et al (2004) the operations of a firm can be adequately measured using the qualitative measures because it allows decision makers to create imaginations on how vague, uncertain or subjective the system is. Ian (2005) posits that firm performance can be measured by those that relates to results including output such as quality service, flexibility, resource utilization and innovation.

The researcher supports the strands that nonfinancial measures are more convenient measure that determines the information age firm performance even though the financial measures reflects the financial health of the firm. Building on the fuzzy controller logic model and the empirical research of (Kalpan & Norton (1996), Gunasekaran et al, 2004, Ian (2005), Panjehsouladgaram et al, 2010, and Waweru, et al 2015), this study will measure the performance of textile firms in Kenya by using nonfinancial performance that includes timely delivery of products and services, the firm cost improvement, the use of up to date technology within the firm, the effective and efficient utilization of facility and the firm's ability to meet shareholders requirements.

2.4 Inventory Management Approaches and Firm Performance

The performance of a firm depends on its selling, marketing, human resource management, reduced cost of production and maintenance of good inventory levels (Bourne &Walker 2005). This explains the significance of inventory management. Lwiki et al (2013) posit that inventory management ensures that companies operate at lower costs with significantly reduced financial commitment. It also leads to improved profit levels.

Performance index such as return on assets (ROA) is affected by the levels of inventory that a company maintains. When inventory levels change, return on assets also changes and this shows the significance of effective inventory management. Reduced investment in inventory as an asset on the balance sheet means reduced overall cost of operations.

2.5 Empirical Literature Review

Ondiek (2012) conducted an examination of how manufacturing firms in Kenya recognize the management of materials and the related benefits. The basis of the study is that successful inventory management leads to reduced cost of operations. The study found out that companies up to 23% recognize materials management as a means of achieving cost management results. The study also found out that companies in Kenya do not practice professional material management.

Akarro et al (2011) also conducted an examination of inventory situation at Urafiki Textile Mills Co. Ltd in Dar-er-salaam, Tanzania. The study adopted a cross sectional design relying on secondary data. The conclusion of the study was that adoption of EOQ significantly affect the quantities ordered in terms of reduced operational cost. The recommendation of the study is that the company should put in place inventory management system to effectively manage inventory.

Eroglu and Hofer (2011) in another study found out that inventory management has a significant and positive influence on performance of companies. This means that there is need maintain lean inventory level. In lean inventory management, investment in inventory should be significantly minimized. In their study of USA manufacturing firms covering the period 2003-2008, they established that through lean management of inventory, profitability is achieved and maintained at a higher level.

Koumanakos (2008) also studied how inventory management affect firm performance. The study concluded that companies that maintain lower levels of inventory experience lower rates of return. The study by Taplin (2006) established that the textile industry especially clothing lines provides more employment compared

to capital-intensive textile sector. Rajeev (2008) equally studied 91 Indian machine tool enterprises with the intention of evaluating how inventory management practices relates to inventory cost. This paper concluded that with good inventory management system, a firm experiences high inventory performance and general improved business performance. Finally, a study by Fullerton et al (2003) supports the fact that by implementing modern inventory management techniques, companies are able to out compete their rivals by achieving high levels of profitability with significant reduction of waste.

2.6 Summary and Gaps to be Filled

Inventory is held to serve as a safety measure for companies by reducing delays and any form of disruption of work. According to the review, overstocking, poor supplier relationships and poor utilization of information technology leads to poor management of inventory and this further influence the performance of the production function. The need for a good inventory management system is paramount since it reduces chances of running out of stock, overstocking, deterioration, obsolescence and high carrying cost. Effective inventory management system is essential for making in the production function and the company as a whole. Strategic supplier relationships, a lean inventory system and effective use of information technology are important to a company which expects its production function to operate efficiently and offer quality services.

The gap remains as to how inventory management can be for it to guarantee the performance of the operations function in any given manufacturing company. There is also need to bring attention of other researchers to understand the various inventory control methods, which may be appropriate to be used by each organization based on

activities they carry out. Also from the findings most inventory control is being done well in developed countries which enabled the countries to be competitive in the market. For example in early 1970s Just - In – Time (JIT) was Japanese management philosophy. The other researchers can now investigate how inventory management is done in Kenya compared to other developed countries.

Table 2.1 A Summary of studies done on inventory management and firm’s operations performance.

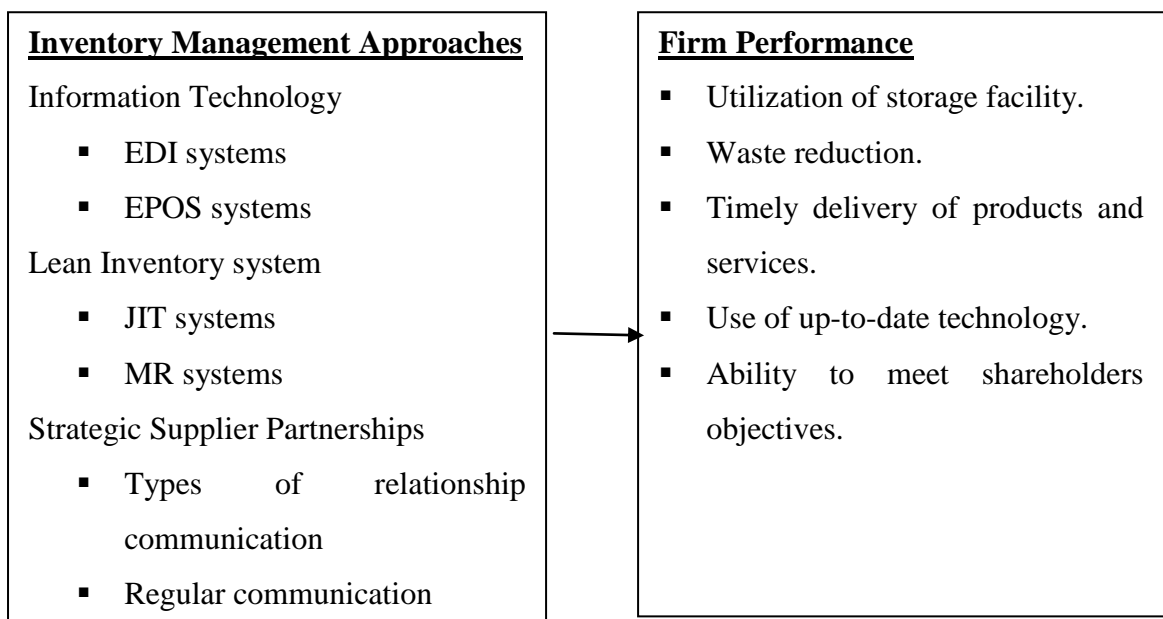
Author	Focus of the study	Research findings	Gap
Ondiek (2012)	Examined Kenyan manufacturing firms and benefits of adopting good materials management	Kenyan firms were not practicing professionalism in material management.	The study focused on the benefits and financial implications only leaving out non-financial benefits.
A.Karro et al, (2011)	To develop EOQ model to be used to determine number of units to order at Urafiki Textile Mills Co. Ltd. In Tanzania	The relationship between EOQs and ordered quantities at Urafiki in terms of operational cost reduction was significant.	His study focused only one approach that is economic order quantity model.
Erogiu & Hoffer (2011)	Relationship between inventory management performance by use of Empirical leanness indicators	Their study confirmed that leanness affects profit margins.	Their study focused on profit margins non-profit benefits were not discussed.
Koumanakos (2008)	Effects of inventory management of firm performance(Food, textile & chemical firms)	He found out that the higher the level of inventory preserved by a firm, the lower the rate of return	Failed to look into the scientific approaches of minimizing inventory in a firm.
Rajeev(2008)	Evaluating the relationship between inventory management	Effective inventory management practices have a positive inventory cost	Failed to look into the challenges encountered when implementing

	practices and inventory cost.	performance	effective inventory management practices.
Tapline(2006)	EU textile and clothing industry on employment opportunities.	Technological innovation and pursuit of nich markets was the only solution to unemployment.	Failed to discuss on how technological innovation affects the operational performance of a firm.

2.7 Conceptual Framework

The conceptual framework shows linkage between the independent variables to the dependent variable (Kombo et al, 2006). Kothari (2008) posits that variables can take different qualitative values. According to him a dependent variable relies on the other variable while an independent variable is the predictor variable. An independent variable is the presumed cause, whereas the dependent variable is the presumed effect. The schematic representation of the conceptual framework is shown in Figure 2.1 below:

Figure 2.1 Conceptual model



Source: Researcher (2016)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter consists of the following subtopics as they are discussed in the research study, study design, target population, sample design, sampling techniques, data collection and data analysis.

3.2 Research design

The study adopted a descriptive cross sectional design. In this design, data is gathered once over a long duration possibly days, weeks, months or years. This data would help to address the research (Cooper & Schindler, 2011). The advantage is based on the fact that a lot of insight is developed regarding the variables under study and this facilitates comparison of information over the period.

3.3 Population of the Study

According to KAM directory (2016) there are 35 textile manufacturing firms in Kenya (as listed in Appendix-) and all these firms were studied.

3.4 Sampling Design

This study focused on all the 35 textile firms in Kenya and therefore a census was conducted. According to Kothari (2008) in a census study, all the units forming the population are subjected to the study. For this study therefore, a census was appropriate since the population was studied as a whole.

3.5 Data collection

This study utilized primary data. Data was obtained using questionnaires developed by the researcher. The questionnaire contains questions and statements based on the research objectives. The questions were structured in such a way that they are easy to administer and analyze as well as aided the researcher obtain in depth responses on the survey (Kothari, 2008). It was divided into four sections: Section A deals with general information of respondents and the organization; Section B addresses the inventory approaches; Section C deals with firm performance and Section D deals with the level of effectiveness of inventory management approaches. The target respondents were operations, procurement and supply chain managers or any other person who may have the equivalent position. The questionnaires were dropped and picked up later by the researcher while others were sent using emails.

3.6 Data analysis

Data was prepared for analysis through editing, coding and data entry. Data editing was done to ensure data was accurate and consistent with the research questions and objectives. Data was analyzed using Statistical Package for Social Sciences (SPSS) programs and presented in form of tables to give representation of research findings and for ease of interpretation. Means and standard deviations were used to show the extent to which textile firms have adopted inventory management approaches and regression analysis was used to explain the relationships between inventory management and firm performance. The final report was then compiled after subjecting data through thorough analysis.

Table 3.1 Summary of Data collection and Data Analysis

Objective	Questionnaire	Data analysis
General information	Section A	Descriptive
Inventory management Approaches	Section B	Descriptive <ul style="list-style-type: none"> ▪ Mean ▪ Standard deviation
Relationship between dependent and independent variables	Section C	Regression Analysis
Level of effectiveness of inventory management approaches.	Section D	Descriptive <ul style="list-style-type: none"> ▪ Mean ▪ Standard deviation

The regression model to be used in analyzing the data will be:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + \varepsilon$$

Where:

Y – The firm performance (dependent variable)

X₁-X₃ – The independent variables

X₁ – Information Technology

X₂ – Lean inventory system

X₃ – Strategic supplier partnerships

B₀ – Are constant of the model

B₁ –B₃– Are the regression coefficients

ε – Stochastic error term

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter contains data analysis and findings from the study. The analysis is focused on the study objectives. The research sought to establish the role of inventory management approaches on the performance of textile firms. Specifically, the study aims to establish the inventory management approaches used by textile firms in Kenya; to establish the level of effectiveness of inventory management approaches of Kenya's textile firms and to determine the relationship between inventory management approaches and performance of textile firms in Kenya. Out of the 35 textile firms targeted, questionnaires were received from 30 respondents. This formed a response rate of 85.7%. The response rate was considered adequate for the study since it is above 50% as recommended by Mugenda (2003).

4.2 General information

The respondents were characterized by whether the firm is local or foreign; the period of time the firm has been in operation; whether the firm has operations outside Kenya and the job position of the respondents. The number of years the firm has been in operation helped to establish the extent of adoption of inventory management approaches. The longer the company has been in operation, the possibilities of getting valid information on challenges. The targeted respondents were the operations, procurement and supply chain managers or any other person who may have the equivalent position. The questionnaires were dropped and picked up later by the researcher while others were sent using emails. The analysis of the background information is as follows:

4.2.1 Type of the Firm

Table 4.1: Type of the Firm

Type of the Firm	Frequency	Percent
Local Firm	24	80.0
Foreign Firm	6	20.0
Total	30	100.0

Source: Research Data (2016)

The table 4.1 above shows that majority of the representing 80% are local firms while 20% are foreign firms. This means that the response is objectively balanced getting the views from both the foreign and mostly the local companies. When generalized the study would give an objective of such local firms.

4.2.2 Length of Operation

Table 4.2 Length of Operation

Duration	Frequency	Percent
5 - 10 years	10	33.3
11 - 20 years	12	40.0
Over 20 years	8	26.7
Total	30	100.0

Source: Research Data (2016)

The table 4.2 shows that 40% of the companies have been in operation for between 11-20 years while 33.3% have been in operation for between 5-10 years and 26.7% have been in operation for over 20 years. Averagely all the companies have been in business long enough to have a consistent application of inventory management approaches relevant for the study.

4.2.3 Operations outside Kenya

The respondents were asked whether the firms have operations outside Kenya. The response is as given in the table 4.3 below:

Table 4.3: Operations outside Kenya

Response	Frequency	Percent
No	14	46.7
Yes	16	53.3
Total	30	100.0

Source: Research Data (2016)

The table 4.3 shows that 53.3% were of the view that their firms have operations outside Kenya while 46.7 were of the contrary opinion. Averagely it shows the companies operated both in foreign countries and in Kenya. This shows a balanced and objective view that can be generalized for both locally operating companies as well as companies having operations outside the country.

4.2.4 Job Position

The respondents were asked regarding the positions they hold in the organization. This was intended to help establish the variety of views of respondents. The result is as shown in the table 4.4 below:

Table 4.4: Job Position

Position	Frequency	Percent
Operation Manager	18	60.0
Procurement Manager	8	26.7
Logistic Manager	4	13.3
Total	30	100.0

Source: Research Data (2016)

The majority of the respondents at 60% were operations managers while 26.7% were procurement managers and 13.3% were logistics managers. The finding shows variety of respondents hence giving reliable views regarding application of inventory management approaches.

4.3 Inventory Management Approaches

The respondents were asked to state the extent to which their firms practice the inventory management approaches of information technology; lean inventory system and strategic supplier partnership. The response is as given in the analysis below:

4.3.1 Information Technology

Table 4.5: Information Technology

Variables	N	Mean	Std. Deviation
The Firm Uses EPOS to capture information	30	4.27	.458
The firm uses EDI to exchange data with suppliers	30	4.40	.507
The firm uses Computers to manage inventory	30	4.87	.516
Staff members are well trained	30	4.33	.488
Valid N (Listwise)	30	4.47	.492

Source: Research Data (2016)

The table 4.5 shows that the most common practice under information technology is the use of computers to manage inventory with the mean of 4.87 and a standard deviation of 0.516. This shows that majority of the firms averagely used the practice and there was little variation in the views of the respondents regarding the use of computers to manage inventory. This was followed by the use of EDI by the firm to exchange data with suppliers with a mean of 4.40 and a standard deviation of 0.507. The standard deviation indicates high similarity in the responses that the firms use EDI to exchange data with suppliers. The training of staff members had a mean of 4.33 with a standard deviation of 0.488 showing a lower variation in responses that the firm's staff is well trained. The last practice is the use of EPOS to capture information with a mean of 4.27 and a standard deviation of 0.458. having the lowest standard deviation means that the responses are close to the mean of the data set, on average meaning only a few variations on the view that the firms use EPOS to capture information. The standard deviation average of 0.492 shows that there was no significant variation in the responses while an average mean of 4.47 shows that the companies' uses information technology as an inventory management approaches.

4.3.2 Lean Inventory System

Table 4.6: Lean Inventory System

Variable	N	Mean	Std. Deviation
The firm uses just in time system to manage inventory	30	4.87	.516
Barcode is widely used by the firm	30	4.87	.516
The firm uses material requirement planning	30	5.00	.000
Awareness of the scientific approaches	30	4.33	.976
Valid N (Listwise)	30	4.77	.502

Source: Research Data (2016)

The table 4.6 above shows that averagely the companies use lean inventory management with a mean of 4.77 while the mean standard deviation of 0.502 shows that there was no significant variation in the responses. The most commonly adopted practice was the use of material requirement planning with a mean of 5.00 followed by the use of just in time system and barcodes with a mean of 4.87 and a standard deviation of 0.516. This also shows little variation in the responses that the firms uses just in time system to manage inventory and the wide use of barcodes by the firms. The least practice was the awareness of the scientific approaches in inventory management with a mean of 4.33. This had a standard deviation of 0.976 showing the highest variation in the responses that the firms are aware of the scientific approaches in inventory management.

4.3.3 Strategic Supplier Partnership

Table 4.7: Strategic Supplier Partnership

Variable	N	Mean	Std. Deviation
The firm appraises its suppliers on a regular basis.	30	5.00	.000
Communication with suppliers and customers.	30	3.67	.976
A strong relationship between the firm and its customers.	30	4.20	.414
Stock management decisions solely made by the suppliers	30	4.00	.378
Valid N (Listwise)	30	4.22	.442

Source: Research Data (2016)

The table 4.7 above shows that the companies used strategic supplier partnership as an inventory management approach with a mean of 4.22. The mean standard deviation of 0.442, shows that there was no significant variation in the responses. The most

commonly used practice was the appraisal of suppliers on a regular basis with a mean of 5.00 that had no standard deviation. This means all the respondents were in agreement that the firms appraise suppliers on a regular basis. The development of a strong relationship between the firm and its customers had a mean of 4.20 with a standard deviation of 0.414. This also shows a lower variation that firms develop a strong relationship between the firm and its customers. The fact that stock management decisions are being made by the suppliers solely had a mean of 4.00 with a standard deviation of 0.378. The lower standard deviation shows that the responses are less spread out from the mean showing that there is high similarity in the agreement. The least practiced approach was the communication with the suppliers and customers with a mean of 3.67 which had the highest standard deviation of 0.976. This is a sign of high variations in responses from the mean.

4.4 Effectiveness of Inventory Management

The respondents were asked to indicate the level of effectiveness of the practices leading to inventory management in a firm. The analysis is based on a likert scale of 1-5 where; 1 = Not effective; 2 = Least effective; 3 = Fairly effective; 4 = Effective; 5 = highly effective. The analysis was done using descriptive statistics as follows:

Table 4.8: Effectiveness of Inventory Management

Variable	N	Mean	Std. Deviation
The level of effectiveness in preparation of inventory budget	30	4.20	.414
The level of effectiveness in updating inventory budget	30	3.40	.828
The level of effectiveness in use of computers in preparation of inventory budget	30	4.27	.458
The level of effectiveness in Regular stock taking	30	4.33	.488
Valid N (listwise)	30	4.05	.547

Source: Research Data (2016)

The table 4.8 above shows that the practices are effective in relation to inventory management with an average mean of 4.05. The standard deviation of 0.547 shows that there was no significant variation in the responses that inventory management was effective. The practices that were found to be more effective was regular stock taking with a mean of 4.33 and a standard deviation of 0.488. This shows a low variation in the responses that inventory management is effective in regular stock taking. The effectiveness of inventory management in the use of computers in preparation of inventory budget had a mean of 4.27 with a standard deviation of 0.458. This shows that only a few respondents had a different opinion regarding the effectiveness of inventory management on the use of computers in preparation inventory budget. The practices were also found to be effective in preparation of inventory budget with a mean of 4.20 and a standard deviation of 0.414 showing minimal variation from the mean. The least effect was on updating of inventory budget with a mean of 3.40 and the highest standard deviation of 0.828. This shows there was slightly higher variation on the agreement that inventory management is effective in updating inventory budget.

4.4.1 Relationship between Inventory Management Approaches and Operational Performance

A Multiple Regression analysis was employed in the study to explore the inventory management approaches and operational performance of the textile firms in Kenya.

Table 4.9: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.630 ^a	.397	.287	.38653232	.397	3.617	6	33	.007

Source: Research Data

From table 4.8, adjusted R^2 is 0.287 which means that there was 28.7% positive variation in operational performance index due to changes in independent variable and 71.3% is variation of the dependent variable due to other factors not in the model. The correlation coefficient tells us the strength of the relationship between the variables. The study found that the correlation coefficient was 0.630 thus there was a strong positive correlation between the inventory management practices and operational performance of the textile manufacturing firms.

Table 5.0: Analysis of Variance

	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.243	6	.540	3.617	.007 ^a
Residual	4.930	33	.149		
Total	8.173	39			

Source: Research Data

From ANOVA table the significant value for the model was 0.007 which means that the model was statistically significant since it is lower than 0.05.

Table 5.11: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.635	.532		1.083	.287
Information Technology (X ₁)	.560	.149	.268	1.968	.058
Lean Inventory System (X ₂)	.685	.121	.361	.957	.345
Strategic supplier partnership (X ₃)	.234	.168	.143	.258	.798

Source: Research data (2016)

From the table 4.12 the following regression equation was established:

$$Y = 0.635 + 0.560X_1 + 0.685X_2 + 0.234X_3 + \varepsilon$$

From the equation the study found that holding the independent variables constant, operational performance index would be 0.635. A factor increase in information technology would lead to an increase in operational performance by factor of 0.560.

This shows that operational performance index was positively significantly related to information technology as an inventory management practice. At the same time a unit increase in lean inventory system would lead to an increase in operational performance by 0.685 showing a positively significant correlation. Finally, an increase in a unit of strategic supplier partnership would lead to an increase of 0.234 in the firm's operational performance. This shows a positive but insignificant correlation. This analysis explains an existing positive relationship between the independent variables and operational performance.

4.5 Performance of the Firm

The respondents were finally asked to indicate the extent to which inventory management approaches contribute to the firm performance. They were presented with a list of sources of a firms' superior performance. They were asked to tick as appropriate using the following like scale of 1 -5 where; 1 = Not at all; 2 = little extent; 3 = moderate extent; 4 = large extent; 5 = very large. The analysis is given as descriptive in the table 5.12 below:

Table 5.12: Level of Effectiveness of Inventory Management Approaches

	N	Mean	Std. Deviation
Inventory management approaches have led to timely delivery of products and services to customers requirements	30	4.67	.488
Inventory management approaches have led to timely basis facilitation on delivery of order to customers	30	4.60	.507
Inventory management approaches have led to an experience of wastage reduction	30	4.27	.458
Inventory management approaches have led to effective utilization of storage facility.	30	4.13	.352
Inventory management approaches have led to the adoption of up to date technology within the firm	30	4.73	.458
Valid N (listwise)	30	4.48	.453

Source: Research Data (2016)

The table 5.12 above shows that the inventory management approaches were effective with an average mean of 4.48 and a standard deviation of 0.453. This shows a lower average variation in responses that inventory management approaches were effective. The approaches led to the adoption of up to date technology within the firm with a mean of 4.73 and a standard deviation of 0.458 hence less variation from the mean by the responses. This was followed by leading to timely delivery of products and services to customers requirements with a mean of 4.67 and a standard deviation of 0.488. The implication is that respondents were in agreement with minimal variation that inventory management practices lead to timely delivery of products and services to customer's requirements. The least effect was that inventory management approaches have led to effective utilization of storage facility in the firm having a

mean of 4.13 with a standard deviation of 0.352. The lower standard deviation means that the respondents were in agreement with a slight variation in responses.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the research findings and also presents conclusions and recommendations of the study. The conclusions are drawn from the findings of the study which sought to establish the role of inventory management approaches on the performance of textile firms. Specifically, the study aims to establish the inventory management approaches used by textile firms in Kenya; to establish the level of effectiveness of inventory management approaches of Kenya's textile firms and to determine the relationship between inventory management approaches and performance of textile firms in Kenya.

5.2 Summary of Findings

The targeted respondents were the operations, procurement and supply chain managers or any other person who may have the equivalent position. These managers were deemed to be well versed with the application of the inventory management approaches. The questionnaires were dropped and picked up later by the researcher while others were sent using emails.

The respondents were asked to state the extent to which their firms practice the inventory management approaches of information technology; lean inventory system and strategic supplier partnership. Regarding information technology, the most common practice is use of computers to manage inventory with the mean of 4.87, followed by the use of EDI by the firm to exchange data with suppliers with a mean of 4.40 and then the training of staff members with a mean of 4.33. The last practice is

the use of EPOS to capture information with a mean of 4.27. The standard deviation average of 0.492 shows that there was no significant variation in the responses while an average mean of 4.47 shows that the companies' uses information technology as an inventory management approaches.

The study also established that averagely the companies use lean inventory management with a mean of 4.77 while the mean standard deviation of 0.502 shows that there was no significant variation in the responses. The most commonly adopted practice was the use of material requirement planning with a mean of 5.00 followed by the use of just in time system and barcodes with a mean of 4.87. The least practice was the awareness of the scientific approaches in inventory management with a mean of 4.33. Finally, it was established that the companies used strategic supplier partnership as an inventory management approach with a mean of 4.22. The mean standard deviation of 0.442, shows that there was no significant variation in the responses. The most commonly used practice was the appraisal of suppliers on a regular basis with a mean of 5.00 followed by development of a strong relationship between the firm and its customers with a mean of 4.20 and then the fact that stock management decisions are being made by the suppliers solely with a mean of 4.00. The least practiced approach was the communication with the suppliers and customers with a mean of 3.67.

The study found out that the inventory management approaches were effective with an average mean of 4.48 and a standard deviation of 0.453. The approaches led to the adoption of up to date technology within the firm with a mean of 4.73 followed by leading to timely delivery of products and services to customers requirements with a

mean of 4.67. The least effect was that inventory management approaches have led to effective utilization of storage facility in the firm having a mean of 4.13.

The study found that the correlation coefficient was 0.630 thus there was a strong positive correlation between the inventory management practices and operational performance of the textile manufacturing firms. The regression coefficients also explain an existing positive relationship between the independent variables and operational performance.

5.3 Conclusions

The conclusions of the study are based on the objectives. The study sought to establish the role of inventory management approaches on the operational performance of textile firms. Specifically, the study sought to establish the inventory management approaches used by textile firms in Kenya; to establish the level of effectiveness of inventory management approaches of Kenya's textile firms and to determine the relationship between inventory management approaches and performance of textile firms in Kenya.

Regarding the first objective, the study found out that the companies used information technology, lean inventory system and strategic supplier partnership. Average mean of 4.47 shows that the companies' use information technology as an inventory management approach. The study also established that averagely the companies use lean inventory management with a mean of 4.77. Finally, it was established that the companies used strategic supplier partnership as an inventory management approach with a mean of 4.22. These findings are consistent with the study by Carter & Price

(2010) who found out that effective inventory management requires an effective information technology infrastructure.

Regarding the second objective, the study established that the inventory management approaches were effective with an average mean of 4.48 and a standard deviation of 0.453. The approaches led to the adoption of up to date technology within the firm with a mean of 4.73 followed by leading to timely delivery of products and services to customers requirements with a mean of 4.67. The least effect was that inventory management approaches have led to effective utilization of storage facility in the firm having a mean of 4.13. Finally, in the third objective, the study found out that there was a strong positive correlation between the inventory management practices and operational performance of the textile manufacturing firms.

The study findings are also consistent with the works of Fullerton et al, (2003). They found out that implementation of modern inventory management techniques enables companies to achieve and sustain high levels of competitive advantage.

5.4 Recommendations

According to the findings, the manufacturing companies should come up with the best mechanism of facilitating faster implementation of the best inventory management practices such as JIT and MRP. Another recommendation is for governments to have adequate policies to help regulate and facilitate operations of foreign companies especially in the area of inventory acquisition and management. The government should also work towards ensuring the economic environment is conducive enough to encourage effective inventory sourcing and management.

5.5 Limitations of the study

Firstly, the study suffered limitation of scope because it only covered companies involved in textile manufacturing. The study would give a better picture for policy reasons if it reflected a sample of all manufacturing companies. Secondly, it was not easy to collect data because some of the respondents were of the view that the data sought were sensitive and would amount to giving business secrets. The researcher had to assure them of the confidentiality of the data collected by showing them the introduction letter and affirmation that the information would be kept as confidential as possible. Lastly, it was not easy to have enough resources to facilitate data collection and the drafting of the report. Time constraints was eminent as well as limited finances.

5.6 Suggestions for Future Research

The study suggests that another research be conducted that uses a cross sectional survey of all manufacturing firms in the country to validate the results. A similar study can also be carried out to find out whether the same inventory management practices are relevant to service based organization. Further, a study should be conducted focusing on factors affecting the choice of inventory management approaches. This would help establish why companies choose different approaches. An in depth study can also be conducted using only one approach to see the extent of its adoption by such companies by increasing the nature and type of questions to be responded to in the questionnaire. Apart from inventory management, other aspects of working capital management including cash management approaches can also help to get more in depth about the analysis.

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APPENDIX I: RESEARCH QUESTIONNAIRE

This questionnaire has been designed to assist the researcher to collect data on the research topic: “Inventory Management Approaches and operational performance of Textile firm in Kenya.” You have been identified as one of the respondents in the study to provide information that will be used only for the purpose, of study. You are requested to complete the following questionnaire. The information you will provide will be held confidentially and in no way will your name or answer will be revealed. Please answer all the questions to the best of your knowledge.

SECTION A; General Information

1. Is the firm. a) Local firm (b) Foreign firm?

2. How long has the firm been in Operational
 - a) Below 5 years ()
 - b) 5 – 10 years()
 - c) 11 – 20 years ()
 - d) Over 20 years()

3. Does the firm have operations outside Kenya?

Yes () No..... ()

4. What job position do you hold?

Operation manager () Procurement manager..... ()

Logistic manager () Others () please specify

SECTION B: INVENTORY MANAGEMENT APPROACHES IN THE FIRM

5. To what extend does your firm practice the following inventory management approaches?

Tick as appropriate using the following scale of 1 – 5 where:

- 1= Not at all; 2 = Small extent: 3 = Moderate extent:
4 = Large extent: 5 = Very large extent

	Inventory Management Approaches	Responses				
		1	2	3	4	5
	Information Technology					
1.	The firm uses EPOS, to capture information relating goods sold					
2.	The firm uses EDI to exchange data with its suppliers					
3.	The firm, uses computers to manage its inventory					
4.	Staff members are well trained on use of IT					
	Lean Inventory system					
1.	The firm uses just-in-time system to manage its inventory					
2.	Enterprise Resource Planning system (Barcode) is widely used by the firm to manage its inventory					
3.	The firm uses material requirement planning to manage its inventor					
4	Management is aware of scientific approaches of inventory management					
	Strategic Supplier partnership					
1.	The firm appraises its suppliers regularly					
2.	The firm communicates with its suppliers and customers on what to procure and produce.					
3.	There is a strong relationship between the firm and its customers					
4.	Stock management decisions are solely made by the suppliers					

SECTION C: Effectiveness in Inventory Management

6) Indicate the level of effectiveness of the following practices relating to inventory management in a firm. Please Tick as appropriate using the following like it scale of 1-5 where:

1 = Not effective; 2 = Least effective; 3 = Fairly effective; 4 = Effective; 5 = Highly effective.

Practices	Respondents				
	1	2	3	4	5
Preparation of inventory budget					
Updating inventory budget					
Use computers in preparing inventory budget.					
Regular stock taking					

SECTION D: Performance of the firm

7. The following are some of the sources of a firm's superior performance please indicate the extent to which inventory management approaches contribute to the firm performance. Tick as appropriate using the following like scale of 1 -5 where;

1 = Not at all; 2 = little extent; 3 = moderate extent; 4 = large extent; 5 = very large

Performance parameters	Responses					
	1	2	3	4	5	
Inventory management approaches have led to timely delivery of products and services to customers thus meeting the customer requirements.						
Through inventory management approaches thus firms can facilitate on timely basis the delivery of order to customer						
Through inventory management approaches the firm has experienced wastage reduction						
Effective and efficient inventory management approaches has improved the utilization of the firms storage capacity						
Inventory management approaches has led to the adoption of up to date technology within the firm.						

Indicate any other measure of the firm performance which in your opinion that the firm must address in order to enhance its performance (optional)

APPENDIX II: LIST OF TEXTILE FIRMS IN KENYA

New wide garments (K) Ltd	Alltex EPZ ltd
Ngecha Industries Ltd	Alpha Knits
Senior Best garments Kenya EPZ Ltd	Ashton Apparel EPZ Ltd
Shin – Ace garments Kenya (EPZ) Ltd	Bedi Investments Ltd
Spin Knit Limited	Brilliant Garments
Spinners & Spinners Ltd	Fantex (k) Ltd
Savaredeal Uniforms Centre Ltd	Kamyn Industries Ltd
Straight-line Enterprises	Kavirondo fiments Ltd
Summit Fibers Ltd	Kema (EA) Ltd
Sunflag Textile and Knit wear mills Ltd	Knet – Knit Kenya Ltd
Tarpo industries Limited	Leena Appareis Ltd
Tieta Estate Ltd	Life works Shukrani Ltd
Thika cloth mills Ltd	Kenwear Garment manufacture
United Arian (EPZ) Ltd	Kikoy Co. Ltd
Vajas manufacturers Ltd	Le stud limited
Wildlife works (EPZ) Ltd	Longyum Garments
World of kikoys	Midio Textile (EA) Ltd
Adpack Ltd	