EFFECT OF OPERATIONS STRATEGIES ON PERFORMANCE OF SUGAR MANUFACTURING SECTOR IN KENYA

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Effect of Operations Strategies on Performance of Sugar Manufacturing Sector in Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature.. Date..

Lawrence Okoth Odollo

This thesis has been submitted for examination with my approval as University Supervisor.

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DEDICATION

To my family and friends

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ABBREVIATIONS AND ACRONYMS

ARIMA	Autoregressive - Moving Averages
ASDS	Agricultural Sector Development Strategy
C.E.O	Chief Executive Officer
CMV	Common Method Variance problem
COMESA	Common Market for Eastern and Southern Africa
GDP	Gross Domestic Product
EFA	Exploratory Factor Analysis
EU	European Union
KSB	Kenya Sugar Board
KSISP	Kenya Sugar Industrial Strategic Plan
LMS	Lean Manufacturing System
MBV	Market Based View
MLSF	Medium and Large Scale Firms
MMRA	Moderated Multiple Regression Analysis
MPGLSQ	Modified Path – Goal Leadership Styles Questionnaire
MSC	Mumias Sugar Company
MT	Metric Tones

MTRV	Metric Tons Raw Value
NACOSTI	National Council for Science, Technology and Innovations
NCC	Nairobi City Council
OLS	Ordinary Least Squares
OPMM	Operations Performance Measurement Model
RBT	Routine Based Theory
RVB	Resource Based View
SDF	Sugar Development Fund
SEM	Structural Equation Modeling
SGS	School of Graduate Studies
SPSS	Statistical Package for Social Scientists
TSC	Taiwan Sugar Corporation

DEFINITION OF TERMS

Business strategy: refers to a set of intentions that will set the long-term direction of the actions that are needed to ensure future organizational success. The business strategy however, can only become a meaningful reality, in practice, if it is operationally enacted. Consequently, for a sugar manufacturing firm to out-compete their rivals, it must translate the customer requirements into strategic objectives for operations (Barnes, 2012).

Competitive priorities: are the key areas where a sugar manufacturing firm must perform well on a consistent basis to achieve its manufacturing mission. Competitive priorities therefore, offer a link between a firms' manufacturing performance and the market requirements. (Hallgren, 2010)

Decision areas: refer to a set of decisions required to manage firms' strategic resources of the operations (Slack & Lewis, 2009; 2011).

Infrastructural choices: refers to the systems used to enhance the utilization and control of manufacturing resources so the manufacturing firms can achieve high levels of productivity. Infrastructural decisions lubricate the decision-making and control activities of the operation and influence the activities within the operation's structure (Felipe & Marcia, 2014).

Leadership: refers to a social influence in which an individual enlists the aid and support of a group of other individuals in the accomplishment of a common task (Odollo, 2015)

Leadership styles: refers to a leader's behavior which is contingent on the nature and the demands of a particular situation (Kreitner & Kiniki, 2006). The current study used a modified Path – Goal Leadership Styles questionnaire, a situational leadership style that measure different aspects of leadership contingent of leader ability, work characteristics, and worker capability.

Operational performance: refers to the immediate outcome of a manufacturing operations that is often used to evaluate the performance of manufacturing firms. The study measures the performance through OPMM as a strategic management system, whose dimensions are efficiency and effectiveness (Ketema, 2015; Hallgren, 2010).

Operational: refers to daily actions within an organization devoted to managing resources and processes that produce and deliver goods and services (Sohel & Rodgers, 2013).

Operations: refer to the part of manufacturing plant that creates and delivers its products and services to the customers. When considered in their totality, operations constitute the organization’s long-term strategic direction (Slack & Lewis, 2011).

Operations strategy: is considered as a set of decisions and plans that involve developing, positioning and aligning of managerial policies and needed resources so that they are in fit with the overall business strategy (Boyer, Swink & Rosenzweig, 2015; Felipe & Marcia, 2014; Slack & Lewis, 2011).

Structural decisions: refer to the decisions that relate to physical arrangement, configurations of, and inter – linkage relationships of operations resources within the manufacturing firm (Slack & Lewis, 2011).

ABSTRACT

The overarching goal of manufacturing firms is long term survival and the ability to wade off competition evident in the industry. The current wave of globalization has resulted into fierce competition and as a result, the sugar firms soon realize that the current "competing on cost" strategy is an untenable, hence the need to refocus their strategies by deploy their potentially scarce resources into efficient transformation process. This calls for a strategic operations at all levels for any sugar manufacturing firm to stay afloat. This study assesses the effect of operations strategies on the performance of sugar firms in Kenya, with an aim of exploring the cause – effect relationship between operations strategies and performance. The specific objectives of the study were to: analyze the effect of competitive priorities on performance; assess the effect of structural decisions on performance; determine the effect of infrastructural choices on the performance; establish the effect of leadership styles on the performance of sugar manufacturing firms in Kenya; and to assess the moderating effect of leadership styles on the relationship between operations strategy and the performance of sugar manufacturing firms. To achieve the set objectives, the study developed and tested hypotheses. The theories on which the study was hinged are Strategic Contingency Theory, Resource Based Theory, Routine Based Theory, Institutional Theory and Path – Goal Theory of leadership. The study adopted descriptive survey research design anchored on realism ontology, and used both quantitative and qualitative approaches. The unit of analysis was sugar manufacturing plant, and hence the study targeted all the twelve registered and licensed sugar manufacturing firms in Kenya. The respondents were sought through both purposive and simple random sampling strategies. From the four categories of respondents, a sample size of one hundred and sixty five respondents was generated. Structured questionnaires and semi-structured interview schedule were the main tools to collect primary data from the targeted respondents. A pilot study was done to test the validity and reliability of the survey tools. Quantitative data collected was processed and analyzed both descriptively and inferentially using MS Excel and SPSS. EFA, regression analysis, correlation analysis and moderated multiple regression analysis were equally used, while qualitative data analysis was done through expert judgment, scenario mapping and critical thinking. Upon analysis, data was presented using frequency distribution tables. The study results revealed that competitive priorities have a significant effect on performance, structural decisions have no significant effect on performance, infrastructural choices have a significant effect on performance, and leadership styles was found to have a significant effect on performance. In addition, Operations Strategies was found to have a significant effect on performance, while leadership styles was found to have a significant moderating effect on the relationship between operations strategies and performance. Based on the findings, the study concluded that the management of these sugar firms need to identify appropriate operations strategies at their operations areas, contingent of their core and yet scarce resources. These needs to be managed well since the study found a statistical positive contribution of operations strategy to performance. The differential advantage of these strategies shall help to separate one firm form another in planning for resources, strategy implementation, and success of the operations strategies.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The Kenya's sugar sector is facing stiff competition from low-cost sugar manufacturing firms from established global economies which competes away the industry profits. Consequently, "competing on cost" (price leadership) strategy is becoming economically untenable. Due to massive globalized changes emanating from manufacturing technological advancements, frequent innovations, rapid developments as well as increased need to outsource some of the none-core manufacturing activities to specialized agents, it hence requires that the management of manufacturing firms devise appropriate strategies and make astute operational decisions and choices at all levels in order to ensure survival, and improve performance of the firm (Ketema, 2015). It is therefore, becoming increasingly evident that the expansion of world sugar production into the foreseeable future is unlikely (Ketema, 2015; Tyler, 2013).

The current economic crunch being experienced in the world has led to closure of several sugar mills. Specifically, the poor performance by Kenya sugar sector has led to closure of several sugar firms being put under receivership. The government has to bail out some of them, with latest being Mumias sugar company. In addition, revenues are below production cost for a growing number of millers (Czarnikow, 2013; Tyler, 2013). Globally, there has been a structural deficit in sugar production, and as Czarnikow (2013) further outlines, the projected world sugar production deficit has been steadily rising from 8.51 Metric Tons Raw Value (MTRV) in 2012 to 9.29 MTRV in 2015. To bridge this gap, large-scale and efficient factories are required in order to achieve economies of scale (Czarnikow, 2013). Unfortunately, this production dream has remained a mirage. According to Sciuto and Filho (2013), to achieve a competitive advantage, operation strategy must be interconnected and incorporated into the corporate strategy. When sugar manufacturing companies fail to recognize this relationship, they can be tied to uncompetitive production systems.

Although the manufacturing sector is far from the largest in most African economies in terms of output or employment, its growth is an instrumental driver for economic development. Policy makers have a special interest in the manufacturing sector since the sector is a potential engine of modernization, creator of job opportunities, and a generator of several positive spillover-effects in the country. However, as Söderbom (2011) opines, the performance of the manufacturing sector has been poor in the recent past decades in most African nations.

In Kenya, the manufacturing sector accounts for eleven percent (11%) of gross domestic product (GDP) (Mbalwa, Kombo, Chepkoech, Koech and Shavulimo, 2014). According to the authors, this is considered low compared to most middle income countries. The importance of sugar and its economic viability in Kenya is under threat from various factors within and without the sugar industry (Mbalwa *et al*., 2014). A study by Gachene, Kathumo, Gicheru and Kariuki (2012) identifies low productivity at factory level to be responsible for low sugar yields and capacity under-utilization, among other challenges. In addition, Tyler (2013) intones that ultimately, the sugar manufacturing factories need to be big and to operate with high capacity utilization in order to process cane at low cost. This requires that these sugar manufacturing firms diversify their strategies to attain the required production scales and standards. The sugar firms need to refocus their strategies, and as Hallgren (2010) would postulate, operations strategies offer firms an alternative and structured approach to decision making in facilitating an economic production to improve their competitiveness, survival and growth and performance to achieve the set objectives.

Manufacturing firms operating in emerging economies attempt to continuously improve their performances through operations contingent of market requirements. This enables them to address specific needs in order to cope up with the intense competitions in the industry (Ketema, 2015; Hallgren, 2010). Further Ketema (2015) intones that early scholars in the areas of operations strategy emphasize the importance of a firm's internal operations capabilities to achieve superior performance, better than their rivals. This offers them a comparative advantage in the market place. Initially, researchers argued that different manufacturing firms explored different environmental factors affecting firms' strategies and performance as key competitive drivers (Boyer and Lewis, 2002). However, other scholars (Schroeder, 2011), later found that the competitive forces (especially industry structure or attractiveness) have little or insignificant influence on a firm's performance. In view of this, according to Schroeder (2011), scholars started to explore the internal sources of competitive advantage on the basis of resource based view (RBV). This was an effort to help organizations analyze their internal capabilities and competences that contribute to better performance, and to offer firms a competitive advantage.

1.1.1 Operations Strategies

Operations strategies are a set of decisions and plans that involve developing and aligning managerial policies as well as scarce resources so that they are in fit with the overall business strategy (Boyer, Swink & Rosenzweig, 2015; Gong, 2013). Being a functional level strategy that links a manufacturing function with the corporate strategy (Ketema, 2015; Kotha & Orne, 2011; Slack & Lewis, 2009), they are often looked at from process and content dimensions. Several authors have identified the main elements of operations strategy as competitive priorities and strategic choices and decisions (Ketema, 2015; Kotha and Orne, 2011; Gagnon, 2009; Hallgren, 2010. However, James (2011) and Slack and Lewis (2009) view operations strategy as the total pattern of decisions which shape the long-term structural and infrastructural capabilities, and their contributions to a firm's overall strategy through a reconciliation of market requirements with operations resources. This connotes those operations strategies can only benefit sugar manufacturing firms when, and only if, the firms can vary their operations quickly enough to fit the ever dynamic and demanding customer requirements, as driven by the manufacturing vision. Thus, operations strategy focuses on firms competitive capabilities over the long term. Hence, sugar manufacturing firms need to identify the drivers of high performance for competitive advantage. In this regard, the current study therefore, proposes that the link between practice and performance (actions and outcomes) be the central focus of the sugar manufacturing firms.

A study outline by Kotha and Orne (2011) links the philosophical foundation of operations strategy to Skinner in 1969. In addition, Davis, Aquilano and Chase (2002) offer a brief history of operations strategy following the Second World War, and argues that within the business environment then, the operations function of manufacturing firms was to produce large quantities of standardized products at low costs, focusing on unskilled labour and using highly automated assembly-line-type facilities, regardless of the overall goals of the firm. However, with intense global competition coupled with continued high demand, the role of operations, (to minimize costs), remained virtually unchanged throughout the 1950s and early 1960s. However, by the late 1960s, Davis *et al.* (2002) intones that Skinner recognized this weakness among the United States of America manufacturers, hence the need for the manufacturing companies to develop an operations strategy that would complement the existing marketing and finance strategies.

According to Gong (2013) the initial emphasis of operations strategies was placed on finance and marketing functions of a manufacturing firm. However, in the current wave of competitiveness, researchers as well as business managers currently advocate for the use of operations strategy to strengthen a firm's competitive ability. In this connection, Gagnon (2009) argues that ever since 1969 when Skinner pointed out the missing link between operations function and strategy, managers have continued to integrate operations strategy into manufacturing process. The operations strategy model since then (figure 1.1), has evolved from merely ensuring that operations in all functional areas are coherent with business overall objectives, to where firms use operations as a key competitive weapon. This expansion is anchored on Porter's (2009) generic classification of strategies, as driven by market imperatives.

The operations strategy's primary concern is to reconcile the market requirements and firm's resources (James, 2011). In this regard, James further argues that it does this in two main ways. Firstly, by satisfying market requirements (measured by competitive factors) by setting appropriate performance objectives for operations, and secondly, by taking decisions on the deployment of operations resources which affects the performance objectives for operations. However, Gagnon (2009) is of the opinion that manufacturing firms need to view their competition from resource based view (RBV), and further intones this way, firms are enabled to develop, protect and leverage their unique operational resources and accrued advantages in order to change the rules of the competition.

Brown and Squire (2016) argues that the reason why literature fails to connect the contribution of operations strategy to performance is because researchers fail to acknowledge that firm – specific capabilities must be lined up with the activities taking place within the manufacturing firm. In this respect, Hallgren (2010) offers this important link, and further opines that the cardinal objective of operation strategy is to identify drivers of performance that lead to sustained competitive advantage. In addition, Hallgren (2010) advances these drivers into a content model of operations strategy. The model (Ketema, 2015; Hallgren, 2010; Davis, Aquilano & Chase, 2002) identifies the contents of operations strategy as competitive priorities and decision categories (areas), which Sciuto and Filho (2013); Gong (2013) Slack and Lewis (2009) and Wheelwright (2001) further divided into structural decisions and infrastructural choices (Figure 1.1).

Operations strategy contents are the specific decisions and choice actions which set the operations role, objectives and activities of the firm (Ketema, 2015). This approach is customarily distinguished from operations process within the operations strategy literature. Operations process comprise of the method that is used to make the specific content decisions. The current study therefore, conceptualized and discussed the three constituents of operations content model adopted from Ketema (2015); Gong (2013); Hallgren (2010), Slack and Lewis (2009), with the aim of assessing their contributions to performance.

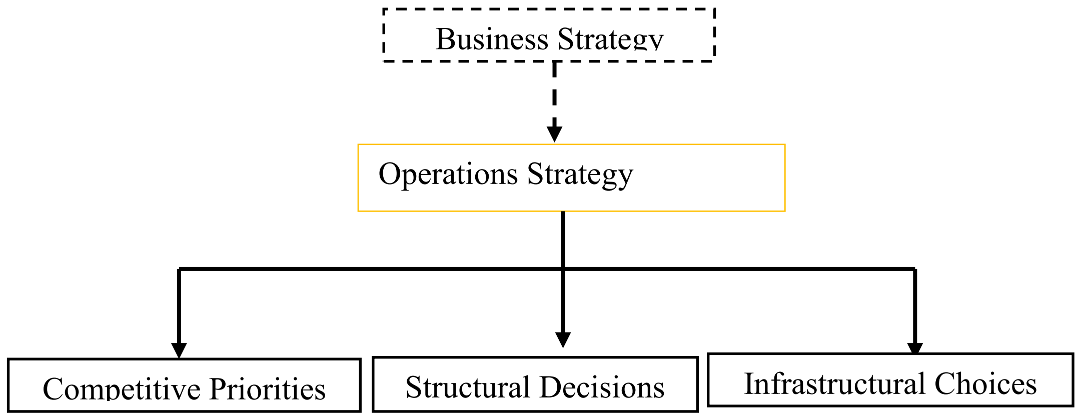

Figure 1.1: Content Model Operations Strategy

Source: Own conceptualization

As depicted in figure 1.1, a manufacturing firm's operations strategy is driven by three contents: competitive priorities, structural decision and infrastructural choices areas (Ketema, 2015; Sciuto & Filho, 2013; Gong, 2013; Slack & Lewis, 2009); Wheelwright (2001). These drivers when harnessed well lead to the achievement of improved (operations) performance.

While admitting that operations strategy must be an inherent part of a firm's long – term corporate strategy, Hershey (2013) notes that since manufacturing firms' strategies are often dynamic, they are obliged to make sensible decisions and choices that directly affect the business performance. In line with this, Jenkins, Baptista, and Porth (2015) are of the opinion that one of the greatest leadership challenges facing manufacturing firms is to find a fit between the overall production objectives and the operations, in a manner that ensures efficiency and effectiveness. This, according to Jenkins *et al.* (2015) is what sets apart the primary difference between sugar manufacturing firms that succeed and those that fail.

As a decision area, operations could become a formidable competitive weapon if the function was allowed to play a full strategic role within the organization (Barnes, 2012). Operations strategy has made it possible for manufacturing firms to effectively switch across competitive dimensions and decisions, as a consequence of hyper-competition, and as made possible through dynamic organizational processes to face the murky future. Slack (2007) contends that as an idea, operations strategy is neither clear on what constitutes 'operations', nor on exactly how operations can have a strategic impact on performance. This study proposed to examine both issues.

In addition, it considered whether operations strategy really reflects the reality of operations within the sugar firms, and equally examines the nature of the strategic contribution of operations strategy. Slack (2007) argues that no other functional strategy has such a direct impact on both revenue and cost, and adds that operations strategy co-ordinates diverse production skills and integrate multiple streams of technologies within the firm and enables the firm to stay ahead of the game.

According to Schroeder (2011), operations performance seems to be affected by various plant specific factors such as competitive priorities, and manufacturing decisions, as well as innovative manufacturing practices. Further, Kotha and Orne (2011) opine that the operations strategy is founded on contingency theory approach. The proponents of this school believe that the general form of strategic options available for a manufacturing firm is dramatically shaped by contingency factors inherent in these manufacturing firms. It is in this light that the current study proposes to assess the influence of leadership styles which is assumed to depend on contingency factors, and as a result, needs to be fluid to fit the situation at hand. However, Barnes (2012) argues that for a manufacturing firm to attain excellence in its operations, it is proper to assess the way a firm fits with the RBV of strategy. This enables a firm manage its current processes and develop in future. Hence the current study proposes to integrate contingency theory and RBV as theoretical strategies that anchor the study.

1.1.2 Operations Performance

When it comes to metrics, an old adage has it that what gets measured gets done (Davidson, 2013). Literature indicates that performance measurement provides the management with both means of control, which is specified in the gap between the expected and the actual, and also support for developing appropriate strategies to improve their performance (Enrique, 2012; Söderbom, 2011). In this connection, Malonza (2014) argues that operational performance is the measurable aspect of an organization's process by quantifying the process for efficiency and effectiveness of an action taken. According to Kasie and Belay (2013), since 14^{th} century when the traditional measures were first used, manufacturing firms have continued to incorporate the "best practices" in their operations. However, with the changes in technology and high production techniques, their usefulness has been questioned, especially as it relates to manufacturing strategies.

Fueling the doubt further is Hallgren (2010) who acknowledges that it is difficult to fairly assess the performance of a manufacturing firm since financial measures are usually plant level measures that are subject to external factors beyond the scope of manufacturing operations. Equally, Davidson (2013) argues that effective measuring, analyzing, and improving manufacturing metrics is not as simple. In addition, while there are certain metrics that work well for specific job roles, Davidson (2013) further intones that often, there exists multiple combinations of metric indicators needed to ensure that business objectives are being met. Moreover, the traditional performance measures have been criticized for encouraging short termism, lacking in strategic focus, and not being externally focused (Ogutu, 2017).

In order to overcome the above levied criticisms, several authors have suggested varied performance management frameworks to encourage more balanced performance measurements. In view of the above, the current study used an Operations Performance Measurement Model (OPMM), as a strategic management system performance measure, whose indicators are efficiency and effectiveness. Imperative to acknowledge is the fact that every dimension, to some extent, is vital for all operations, and as Hallgren (2010) notes, which of the performance indicator is the most important one is subject to competitive positioning of the manufacturing firm within the industry.

The use of OPMM is advanced by Hallgren (2010) and notes that firms which measure their performance using a combination of financial and non-financial measures achieve better performance. Even though most firms currently use balanced scorecard financial measures by Kaplan and Norton, however, Kasie and Belay (2013) argues that non-financial measures have not been integrated with each other, with financial measures as well as with strategic objectives of manufacturing firms to offer a more pragmatic view of measuring operational performance of manufacturing firms. All performance dimensions can be measured either from an internal as well as external perspective. Further, Kasie and Belay (2013) add that the internal perspective measurement represents measures which are useful for the internal monitoring and management of the manufacturing process.

The current study recommends the use of internal measurements to manage manufacturing process, which is hypothesized to positively contribute to operations performance. While sugar firms are more likely to adopt a combination of the above cited measurement indicators, Littlefield and Shah (2008) are of the opinion that the adoption of these indicators can never take place in a vacuum, and the key to improved performance lies in simultaneous use of multiple performance dimensions. This is in agreement with a study by Gong (2013) which recommended that to realize improved operations performance, it is vital for a sugar manufacturing firm to formulate a strategy that seeks a fit between business strategy in different functional units within the firm and performance.

1.1.3 The sugar industry

The origin of modern sugarcane production can be traced from New Guinea in 1768, reaching Tahiti by the end of the twentieth century (Rein, Turner and Mathias, 2011).

Although Sergey, Lindsay and Bichara (2013) note that sugar is grown in 130 countries, a report by SUCDEN (2013) records that sugar is produced in 120 countries. All the same, several changes and developments have been experienced in the recent times, leading to expansion in the sugar production. In addition, as much as a report by Rein, *et al*., (2011) acknowledges that the world sugar industry has expanded enormously over the past two decades, a study by Sergey *et al.* (2013) indicates that major world's sugar producers have experienced a decline in sugar production. However, several authors aver that sugar sector has evolved into a strategic economic driver in many developing economies in the world (Rein, *et al*., 2011; KPMG, 2007; Malyadri, Andhra & Sudheer, 2013), with Indian sugar industry accounting for twenty percent (20%) share in global sugar production (Adhirjha, 2012).

While acknowledging Africa as a global sugar industry rising star, Czarnikow (2013) forecast was that in the 2015/16 fiscal year, Africa sugar production would decline further, but consumption would grow by four (4) percent. A study by Soltan (2009) approximates that ten percent (10%) of the world's sugarcane harvest is in Africa, with South Africa being a major sugar producer, and is the world's 10th biggest producer of high quality sugar with an estimated mean annual production of about twenty Metric Tons (20 MT) of sugarcane. This translates into an annual income of about US$1 billion for the South African economy, contributing to an estimated 77,000 direct jobs, and 350,000 indirect jobs (Baiyegunhi & Arnold, 2011). Although Tyler (2013) notes that Africa may not be the worlds' largest sugar producer, it nevertheless, embraces some of the worlds' best production facilities.

The development of the sugar industry in Kenya is inextricably linked to the history of Asian Agricultural Settlement in the country during the initial colonial period, when they engaged in commercial agriculture at Kibos in the present day Nyanza region. A report by KSB (2012) indicates that industrial sugarcane farming was introduced in Kenya in 1902. However, a historical account by Szumbah and Imbambi (2014) traces Kenya sugar industry from 1922 when Miwani Sugar Company was established, followed by Ramisi sugar factory in 1927.

After independence, the government expanded its vision of the role and importance of the sugar industry as set out in Sessional Paper No 10 of 1965 (KSB, 2012), which sought, inter alia, to: accelerate socio-economic development, redress regional economic imbalances, promote indigenous entrepreneurship, and to promote foreign investment through joint ventures. In pursuit of the set goals, other sugar manufacturing factories were established, namely: Muhoroni (1966); Chemelil (1968); Mumias (1973); Nzoia (1978; Sony sugar (1979), West Kenya (1981), Soin (2006); Kibos sugar and Allied Industries (2007); Butali Sugar (2010); Kwale International sugar; Sukari industries at Ndhiwa; and Trans Mara sugar.

The Kenyan sugar industry is a major employer and contributor to the national economy (KSB, 2012), being a source of livelihood to 6 million people and employing approximately 500,000 (Ambia, 2014). Nonetheless, the industry faces a myriads of challenges including stiffest competition from low cost producers. The Kenya sugar industry currently produces 68 per cent (68%) of Kenya's domestic sugar requirements making the country a net importer of sugar (Ambia, 2014). The establishment of the State – owned sugar factories was predicated on the need to achieve self-sufficiency in sugar with a surplus for export in a globally competitive market, generate gainful employment and create wealth, supply raw materials for sugar related industries and to promote economic development in the rural economy (KSB, 2012).

In support of the fore mentioned goals, the Government increased her investment in the sugar industry and contributing about eleven (11) Billion Kenya shillings into the industry for cane development, factory rehabilitation, research and infrastructure development (KSB, 2012). Consequently, as Szumbah and Imbambi (2014) intone, the farm households and rural businesses depend on the injection of cash derived from the sugar industry. The survival of small towns and market places is also dependent on the incomes from the same. The industry is intricately weaved into the rural economies of most areas in western Kenya.

The Kenya Sugar Industry is guided by the industry's Strategic Plan for 2010-2014 which provides a road map of how the industry intends to be a "world class multi-product sugarcane industry." To achieve its strategic objectives of being a middle-income country by the year 2030, this revised strategic plan aimed at making sugar industry more efficient, diversified and globally competitive to contribute to the overall objective outlined in the Agricultural Sector Development Strategy (ASDS) (2009-2020) and the Kenya Vision 2030. In this regard, Ambia (2014) notes that the Kenya Sugar Industry Strategic Plan (KSISP) as a strategic unifying instrument, provides a framework for enhanced performance of the sugar industry premised on a rational utilization of all resources in the sector.

Due to its dismal performance, several studies have been done on Kenya sugar sector which attempt to suggest strategies to revamp it. For instance, Mutunga and Minja (2014) acknowledge that the entire manufacturing sector in Kenya position strategically by applying generic strategies, but not for any particular subsector of the manufacturing industry, more so sugar subsector. Specifically, their study focused on generic strategies used by manufacturing firms in Kenya. A study on organizational capabilities and performance of sugar companies in Kenya by Onyango, Wanjere, Egessa, and Masinde (2015) acknowledge that globally, firms are becoming more competitive by launching competitive strategies that give them an edge over others, hence developing core competence as competitive strategy.

In comparison, while carrying out research on the strategies adopted by Kenyan sugar companies in response to globalization, Atsango (2015) assessed mixed strategies of growth, innovativeness, differentiation and focus. Faced with various challenges like inefficient production process and stiff competition from low cost producers as well as high cost of sugar production in Kenya, Marangu, Oyagi and Gongera (2014) note that sugar firms have resulted into using various diversification strategies in order to build a competitive edge over their rivals and try to overcome these challenges. Their study analyzed the contribution of concentric strategies on sugar firm competitiveness in Kenya. From the literature, none has ever discussed the composite operations strategies and their overall contribution to the performance of these sugar manufacturing firms, instead, different authors focus on specific strategies that make up operations strategy.

1.2 Statement of the Research Problem

The deregulation of Kenya sugar sector has posed a myriad of challenges leading to a volatile production environment (Rein *et al.,* 2011, Wanyande, 2011). In addition, the restructuring of EU sugar protocol results to a 39% price cut (Ketema, 2015; Tyler, 2013), making international competitiveness difficult even for the most efficient sugar producer. This liberal regime has aggregate economic implications on local sugar firms. If not well managed, the Kenya sugar firms shall find it difficult to sustain competition. Moreover, the sugar manufacturing firms in Kenya have been operating below their capacity (Sergey et al., 2013; Wanyande, 2011), and have only been able to achieve 50-60% of their production targets (Ambia, 2014). Currently, sugar production stands at 520,000 MT while consumption which has increased steadily over the years, is at 740,000 MT leaving the country with a net deficit (Mbalwa *et al.,* 2014). To qualify this deficit, Omolo (2015) argues that the decline in productivity and efficiency is at factory level of production and decision-making.

Both the economic role of manufacturing sector as well as the strategic role of a firm's operations have been stressed in a range of operations strategy literature (Ketema, 2015; Sanders, 2014; Sohel & Rodger, 2012; Hallgren, 2010; Slack & Lewis, 2011; Gagnon, 2009; Rodrigues & Dorrego, 2008). Since the seminal work of Skinner in 1969, researchers have tried to integrate operations strategy into the manufacturing process as a key competitive weapon (Slack & Lewis, 2011; Hallgren, 2010; Gagnon, 2009; Hayes & Pisano, 2005).

Initially, operations strategy was hinged on market based view that require firms to align their manufacturing goals and strategic choices to attain a fit with external environment (Ketema, 2015; Slack & Lewis, 2011; James, 2011; Porter, 2009). However, Gagnon (2009) contends that manufacturing firms need to view their competition from RBV, that recognizes the strategic role of process, as well as developing resources and capabilities that enables a firm develop, protect and leverage its unique operational resources and accrued advantages.

Although both Marangu *et al*. (2014); Mutunga and Minja (2014) allude that Kenya sugar manufacturing sector position strategically by applying generic strategies, if this is so, why then are there high levels of production inefficiencies among these sugar firms? Moreover, among the challenges facing the performance of Kenya sugar industry include high cost of production characterized by operational inefficiencies (Omollo, 2015; Wamalwa, Onkware & Musiega, 2014). Unfortunately, the application of operations strategies into business strategies is still insufficient, and it is difficult today to find manufacturing companies that use their operations functions as a competitive weapon, yet it is a core functional level strategy that helps a manufacturing firm gain competitive advantage (Ketema, 2015; Gognon, 2009).

In addition, Brown and Square (2016) assert that firstly, evidence is lacking as to the extent to which sugar manufacturing firms utilize the operations strategy model within their strategic planning process, and secondly, there is little empirical evidence indicating how the model has been applied within sugar manufacturing sector, more so in developing economies. The current study thus postulated that the cardinal problem resides in the operations areas and the associated strategies as well as leadership by management. Through the mixed – method research designs based on realism ontology, production managers, operations supervisors, finance manager as well as floor workers were surveyed to assess the effect of operations strategy on the performance of sugar manufacturing firms in Kenya. To achieve this, the study collected both quantitative and qualitative data by use of structured questionnaire and interview schedule respectively.

1.3 Objectives of the study

1.3.1 General Objective

The overall objective in this study was to assess the effect of operations strategies on the performance of sugar manufacturing sector in Kenya.

1.3.2 Specific Objectives

To achieve the overall objective of the study, the following specific objectives guided the study:

1. To establish the effect of competitive priorities on the performance of sugar manufacturing sector;
2. To determine the effect of structural decisions on the performance of sugar manufacturing sector;
3. To determine the effect of infrastructural choices on the performance of sugar manufacturing sector;
4. To establish the effect of leadership styles on the performance of sugar manufacturing sector in Kenya;
5. To assess the effect of operations strategies on the performance of sugar manufacturing sector in Kenya;
6. To assess the moderating effect of leadership style on the relationship between operations strategy and the performance of sugar manufacturing sector.

1.4 Research Questions

Given the above specific study objectives, the study sought to answer the following research questions:

1. What is the effect of competitive priorities on the performance of sugar manufacturing firms?

2. What is the effect of structural decisions on the performance of sugar manufacturing firms?
3. What is the effect of infrastructural choices on the performance of sugar manufacturing firms?
4. What is the effect of leadership styles on the performance of sugar manufacturing firms in Kenya?
5. What is the effect of operations strategies on the performance of sugar manufacturing sector in Kenya?
6. What is the moderating effect of leadership style on the relationship between operations strategy and the performance of sugar manufacturing firms?

1.5 Research Hypotheses

The following hypotheses ware developed and statistically tested at 5 percent level of significance to target the achievement of the outlined objectives:

H_{01}: Competitive priorities have no statistical significant effect on performance of sugar manufacturing sector in Kenya.

H_{02}: Structural decisions have no statistical significant effect on performance of sugar manufacturing sector in Kenya.

H_{03}: Infrastructural choices have no statistical significant effect on the performance of sugar manufacturing sector in Kenya.

H_{04}: Leadership styles have no statistical significant effect on the performance of sugar manufacturing firms in Kenya.

H_{05}: Operations strategies have no statistical significant effect on the performance of sugar manufacturing sector in Kenya

H_{06}: Leadership styles have no statistical significant moderating effect on the relationship between operations strategies and performance of sugar manufacturing sector in Kenya.

1.6 Significance of the Study

The basic significance of this study was its contribution to the knowledge through exploring the effect of operations strategies on the performance of the sugar manufacturing sector, based on evidence from Kenya. In this regard, the study identified and discussed the drivers of operations performance, and revealed inter – relationships between and among these study variables. The study was expected to yield guidelines that will support sugar firms' management in policy making, in order to constructively manage the operations at all levels of manufacturing.

Henceforth, the managers will no longer rely on haphazard personal experience, subjective expert judgements, or on tradition in their management tasks, but will base their management methods, decisions actions, and leadership styles on concrete knowledge of issues of the manufacturing firms supported by research findings. This will improve the internal efficiency and help re – invent sugar manufacturing firms as centres of production excellence. The study findings will be core to both academicians and practitioners. On the academic front, the study findings shall be documented for future referencing in academic journals, and hence will enable future academic researchers in the area of operations strategy to make references.

The philosophical justification for the study was thus based on the researchers' inclination, as a strategic management trainer, to contribute to fill this gap on how best to manage sugar manufacturing firms for better performance, to attain market advantage. Moreover, the study findings provide an important information database upon which other scholars can develop their studies.

1.7 Scope of the Study

This study was based in Kenya and covered the entire sugar industry as its geographical scope. The study limited itself to the registered and licensed sugar and allied producing firms in Kenya by Kenya Sugar Board (KSB), and which were in operation by the time data was being collected. Equally, the study covered the entire sugar industry within the period of June 2010 and June 2016. Developments occurring after this time were not captured in this study. Moreover, the conceptual scope of the study was limited both by the stated study objectives and the given variables (competitive priorities, structural decisions, infrastructural choices, leadership styles, and performance). Therefore, only issues relating to the stated research variables were discussed.

This study focused on production section in the factory department of these sugar manufacturing firms. The study focused on the production department since that is the center of the manufacturing process, and all the production operations are coordinated and the departmental heads and supervisors are responsible for the operations in their areas, while floor workers are expected to execute the strategies to succeed in meeting its key success factors. The study respondents were the departmental heads and their supervisors, finance manager, and floor workers.

Efforts to critically examine the strategies at the operations area are a departure from the trend that emphasizes the strategies at corporate level. Secondly, most studies examine manufacturing performance from the financial aspect, targeting the overall and external performance perspective. However, the current research study proposes the use of an integrated approach, which in addition, assesses the performance from the internal perspective that aggregates manufacturing performance geared towards improving the efficiency of operations in the sugar manufacturing firms by making them more responsive to market needs. The adoption of both descriptive and experimental research designs is an attempt to critically understand the relationship between and among the stated study variables, which is a departure from the trend of most studies in this area that uses only one research design.

1.8 Limitations of the Study

Limitations relate to the process – factors that may impact on the study results (Kothari, 2010). In this study, only one industry that is, sugar industry in Kenya, was considered. The study did not address performance differences across manufacturing sector in Kenya. However, it is hoped that other manufacturing firms within and without Kenya, will equally find the results appropriate and suitable for their application. They could employ such findings and recommendations to improve their operations so as to improve their performance. Following a review of relevant literature, the researcher noted that data return rate is seldom 100 percent. Data for analysis was thus limited from the target respondents as proxy for plant level strategies and performance.

A number of safeguards were put in place to ensure that adequate data for analysis was obtained from the target population. Hence more questionnaires than initially intended were sent to the respondents in order to obtain the required data. In addition, due to logistical issues around the policies governing their internal operations, the researcher first sought authority to conduct the research in these firms by providing clear and sufficient background information about the study (Appendix I). Moreover, the respondents were assured of confidentiality of information provided since they were not required to indicate their names on the questionnaires.

The study used descriptive survey as a method of collecting primary data. Consequently, the study was subjected to reliability limitations of collection and usage of primary data, and validity of measures used in questionnaires. To circumvent these limitations, secondary sources were used to validate the respondents' responses; piloting of data collection tools was done to improve on the validity of the questionnaire. Cronbach's Alpha coefficient was equally used as a measure of reliability of the scale, which was used to assess the internal consistency among the study instrument items.

An analysis by Boyer and Lewis (2012) claims that the existing empirical studies of operations strategy are plagued by various methodological weaknesses, especially in the level of analysis, sample size, and survey respondent issues. This study sought to address these challenges, albeit by parts. According to Boyer and Lewis (2012), most studies on operations strategy examine large manufacturing companies that often include several plants, facilitating development of different capabilities within alternative sites. In contrast, the current study surveyed individual plants. In addition, Boyer and Lewis, argues that operations strategy is a plant level phenomenon, given that individual factories prioritize, and craft their strategic goals, then devote their scarce resources to this end.

Although the study assumed a direct relationship between operations strategy and performance, Nwibere and Olu-Daniels (2014) argue this relationship may in fact be indirect, if contextual factors or moderating variables are introduced, as has been done in the current study. Given that different countries' sectors are differently characterized, the current study variables may lead to different results among many studies. Consequently, these findings might not be applicable in all situations in all manufacturing sectors in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter presents a review of relevant secondary sources of literature under the following sub – headings: theoretical framework, conceptual framework, review of study variables, empirical review, critical review, and research gaps. From the review of relevant literature, both theoretical and conceptual frameworks for the study were generated by identifying the interrelationships between and among the study variables to guide the study.

2.2 Theoretical Framework

A theory is a systematic explanation of the relationship among phenomena (Ngumi, 2013). In essence, theories provide a generalized explanation to an occurrence, and thus offer the researcher a framework for the study. A theoretical framework refers to how a researcher both questions and develops thoughts or theories which are grouped together to frame the subject matter. According to Kothari (2010), theoretical framework is an explanation of a phenomenon that systematically explains the relationship among given phenomenon for purposes of explaining, predicting and controlling such a phenomenon.

This study was hinged on the following theories: Strategic Contingency Theory, Resource Based Theory, Routine Based Theory, Institutional Theory and Path – Goal Theory. Their arguments and implications to operations strategy and performance were explored. This study proposed an integrated theoretical approach rather than a single theoretical perspective to facilitate clear understanding of the effect of operations strategy on the performance of sugar manufacturing firms. Such an approach is supported by Suzana (2014) who calls for multiple theoretical perspectives.

2.2.1 Contingency Theory

Core to every manufacturing process is the question that describes the nature of the linkages between patterns of manufacturing decisions and manufacturing performance. The contingency theory of organizations offers a theoretical lens for this purpose (Helkiö, 2008). Developed by Hickson, Hinings, Lee, Schneck and Pennings (1971), contingency theory holds that no single way to manage manufacturing operations is best in every situation; hence managers need to study individual and situational differences before deciding on a course of action (Crawford, 2010). This is due to differing environmental and organizational needs and structures that affect an organization, coupled with differing resources and capabilities pertaining to individual organization.

As Ketema (2015) states, the strategic choices and decisions of a manufacturing strategy is a contingency – based approach which emphasizes the need for internal consistency between choices and strategic decisions in manufacturing operations areas. An outline by Voss (1995), as cited in Ketema (2015) suggests the need to integrate at least two paradigms together, for instance, competing through competitive priorities, and strategic choices or with best practices approach. The current study, therefore, proposes that for improved operations performance, sugar manufacturing firms need to employ a combination of operations strategies as depicted by integrated competitive priorities and decision choices.

While disputing the assumption that there is "one best way" to manage manufacturing firms, Hayes and Pisano (2005) contend that (i) different companies have different competitive capabilities, hence can adopt different "yardsticks of success" and (ii) different production systems (the composite of decisions in a number of key decision areas) have different operating characteristics and therefore, rather than adopting an industry-standard production system, the task for a company's manufacturing function is to construct a production system that, through a series of interrelated and internally consistent decisions, reflects strategies inherent in its specific competitive situation (Ketema, 2015).

As noted by Vastag (2009), when applied correctly, the theory allows for a maximum performance that can be achieved by a unit contingent on a set of operation decisions, that boil down to choices in plant design (structural) and plant operations infrastructural factors. The application of the theory thus will help the sugar manufacturing firm adopt and survive through various strategies, thereby maximizing its manufacturing performance (Helkiö, 2008). Given that each manufacturing strategy is not equally effective under all conditions, certain organizations actions are more appropriate than others. Organizational decision – makers undertake ration decisions crafted to cope up with the complexities and uncertainties of their situations, with the overall aim of improving their performance (Zeithaml, Varadarajan & Zeithaml, 2012). These uncertainties relate to differences in technological and environmental dimensions leading to differences in structures, strategies and decision processes. In addition, Zeithaml *et al.* (2012) argue that operationalization of these dimensions has become a norm in the contingency theory development, providing a manufacturing organization degree of self-control despite interdependence with its internal environment.

Sugar manufacturing firms need to use a combination of different operations strategies dependent on contingency factors with internal organizational designs that can improve its performance. The contingency theory within the manufacturing management context can be hypothesized to influence the strategic manufacturing decisions at all levels of operations. Sugar manufacturing process can hence be conceptualized as integrated sub-systems, in which Crawford (2010) notes the need to control the contingencies needed by other sub-units within the organization.

The more necessary these contingencies are for the work of other sub-units, the more power accrues to the controlling sub-unit. Within the current study, the exercise of power concerns the degree with which resources can be marshalled for use within decision areas of the manufacturing firm. Consequently, sugar manufacturing firms need to identify and adapt appropriate operations strategies in order to achieve fit with contextual variables. The notion of fit between contingency and organization leading to higher performance is very central in contingency theory of organizations (Helkiö, 2008).

2.2.2 Resource – Based Theory (RBV)

The Resource-Based View of a firm helps to identify and appraise a firms' strategic resources relative to its competitor. According to Brown and Squire (2016); Mbithi *et al*. (2015) and Ovidijus (2013, the RBV approach can be traced back to Penrose in 1959, who described a firm as a collection of productive resources, and as such, is more than just an administrative (Brown & Squire, 2016). According to Ovidijus (2013), the theory was further developed by Wernerfelt in 1980s. The RBV is considered an "inside – out" process of strategy, making it a more flexible strategic choice, hence widely used and acceptable theory of strategic management (Brown & Squire, 2016; Mbithi *et al.,* 2015; Jardón, 2011). In addition, Barnes (2012) argues that the premise of the RBV is that superior performance is contingent of the way an organization acquires, develops and deploys its rare resources and then builds its capabilities rather than the way it positions itself in the market place.

By identifying these critical resources, the current study postulates that individual sugar manufacturing firms use RBV as a source of competitive advantage, by emphasizing maximum utilization of critical yet scarce resources. In a firm, senior level strategists are charged with the responsibility to determine the best use of available resources. The implication is that leadership must therefore strike a balance between resource planning, acquisition, and utilization at the operations decision areas. This requires that the sugar firm, as responsibility, must strategically assess its resources, accumulate them and utilize them to meet market requirements, and as Brown and Squire (2016) propose, such capabilities are important means of gaining competitive advantage for sugar manufacturing firms in a highly competitive market.

The ability to develop and guard strategic capabilities depends on the ability to deploy and coordinate different resources at the disposal of the individual sugar firm, embedded in the operations routines (Brown & Squire, 2016). The success of building and utilizing the strategic resources guarantees sugar firms' performance and long – term growth and development. The current study, hence proposes that through the RBV, sugar firms need leadership which understands the importance of accruing, developing and sustaining operations capabilities, to utilize these strategic capabilities to gain a competitive advantage.

The RBV holds that for resources to be a success tool for competitive advantage, the sugar firm must sustain them over a period of time. For a resource to be a source of competitive advantage, Moller, Johansen and Boer (2013) outlines that this depends on: imperfect imitability, imperfect substitutability, and imperfect mobility. Within the overall concept of RBV, Moller *et al.* (2013) argues that the literature falls short of citing the importance of operations as a strategic factor in a manufacturing system. In addition, this theory has been criticized on the basis that it is difficult to identify which of the several resources of the firm account to its success. Moreover, Kariuki and Ngugi (2014) argued that RBV theory does not differentiate between performance factors associated with the resources of the firm and those related to the characteristics of the owner-manager. To overcome this limitation, both the characteristics of the manager and firms' resources were examined separately to make a sufficient case for operations strategy to facilitate a better understanding of capabilities and resource based strategy to enable sugar manufacturing firms in Kenya attain a fit between their internal operations and performance.

The proponents of RBV holds that sustained competitive advantage can be achieved more easily by exploiting internal rather than external factors (Brown & Squire, 2016; Mbithi *et al*., 2015; Moller *et al.,* 2013), even though Ovidijus (2013) differs and argues that there is no definite answer to which approach to strategic management is more important. Moreover, Boyer *et al.* (2015) underscores the RBV model as a solid theoretical foundation for understanding the role operations strategy plays in creating and sustaining a competitive advantage of any manufacturing firm in the industry. The current study focused on the internal factors influencing the operations of these sugar manufacturing. However, Moller *et al.,* (2013) contradicts this assertion by arguing that an accumulation of knowledge base through RBV strategy may not be sufficient. Therefore, the firm needs to develop critical routines to be undertaken within operations and decision areas in order to develop into excellence in the "right things."

2.2.3 Routine Based Theory.

Developed by Nelson and Winter in 1982, the routine based theory was an attempt to develop an evolutionary perspective of a firm capable of explaining organizational change (Becker, 2016). Routine based view emphasizes the importance of routines for a manufacturing process. Accordingly, the theory demands that manufacturing process develops various routines in an evolutionary path in their manufacturing process (Ketema, 2015). A manufacturing process emphasizes routine operations in their manufacturing process. Since the whole manufacturing is the sum of sub-processes, routine based theory help anchor these operations from the input point, and traces these interrelated operations to the output point. In this respect, the process routines so established by these sugar manufacturing firms enable the continuity of the manufacturing firm, which in turn, leads to internal stability of the manufacturing process (Rahmeyer, 2006).

These critical routines are time dependent, and through evolutionary process embedded in the manufacturing process, the sugar manufacturing firms should select and retain critical and beneficial routines that facilitate its success, but eliminate those routines that are success inhibitive. This implies that for a manufacturing process, past mistakes have a bearing on the success of the future processes. In essence, the frequent development of the manufacturing process will lead to frequency of successful routines. Further, Ketokivi and Schroeder (2004) intone that routines developed over time in this manner, are thus subject to path dependency and inertia and cannot be easily taken over or copied by competitors. This over time is capable of giving an individual sugar firm a competitive edge over its rivals.

Sugar manufacturing firms continuously introduce technical and organizational innovations into their manufacturing processes. This is likely to improve their adaptability in case of an unsatisfactory market performance and hence may help the firm open up new activities. These may enable it have a comparative advantage over market rivals. The adaptation of the sugar manufacturing firm over time will enable the firm drive evolutionary change corresponding to their respective firm – specific routines. This is because sugar manufacturing firms differ for efficiency reasons in the level of unit production costs. A modification of routines impedes the transmission and retention of invariable rules, being in conflict with evolution in nature. Thereby the explanation of stability and persistence of firm behavior will also be affected.

According to Junttila (2010) the study of routines in a manufacturing process helps the firms to identify and possibly measure its higher level elusive routines. In addition, Ketokivi and Schroeder (2004) further intone that the theory helps determine critical drivers to superior manufacturing performance. The current study hypothesized that the sugar manufacturing firms, through time have developed certain inherent routines, which have been in use over time. These successful routines are hence used by the firms in their processes, systems, culture, practices, and/or relationships to oversee performance of the whole manufacturing process most efficiently. In essence, the routine based theory is of the view that these critical routines may be more important for an organization more than structural and infrastructural resources alone for competitiveness. Successful routine therefore, is a critical tool in their totality, considered together with both structural and infrastructural decisions.

2.3.4 Institutional Theory

Within a manufacturing set – ups, institutional arguments are institutions that structure the actions within the manufacturing processes (Amenta & Ramsey, 2010). According to Tolbert and Zucker (2016), institutional theory was proposed by Mayer and Ruwan in 1977. The institutional theory constitutes the hypothesized infrastructures through which organizational structure factors exert their influence (Amenta & Ramsey, 2010). In addition, Ketema (2015) argues that since institutions provide the rules and regulations of the game that governs the structure and organizational interactions within decision areas of the production system, the role of institutional environment is important especially in the contemporary management of organizations.

According to Cai, Jun and Yang (2010), institutional theory would consider economic, social, cultural, and political forces within the manufacturing areas as an important operations environmental components that influence a firms' decisions and practices. The sugar sector environment in Kenya is highly volatile and unpredictable as a result of insufficient formal market – support institutions. In this connection, therefore, Dung (2012) argues that a firms strategy can be better be predicted through the use of institutional – based view, followed by resource based view (Brown & Squire, 2016; Dung, 2012; Moller *et al.,* 2003).

The institutional theory considers the processes by which an organization's structures become established as authoritative guidelines for social behavior (Kraft & Furlong, 2007). In addition, Cai *et al.* (2010) contends that institutional theory explains the existence of the boundaries and their internal organizational structures. Consequently, institutional factors must be considered in a manufacturing set-up along sides critical resources, since there exist various forces that apply varied pressures on, and influence a firms' decisions. This implies that changes are likely to occur within the sugar manufacturing system when the functional contributions of a given structural arrangements are exceeded by dysfunctions associated with that arrangement.

Within the institutional theorists' camp, Amenta and Ramsey (2010) claim that according to rational choice scholars, there exists a divergent view of what the central role of path dependent manufacturing process might be. In their argument, the strong version suggest that the path – dependent processes are rare and important, while the weak link of the theory, which is the contingency matters, is that the path dependent is ubiquitous and probably less influential. In spite of the dispute, the strong version seems to support, even though within the group there are disagreements equally.

From the aforementioned divergent views, the current study, therefore, proposed that the structural components of a manufacturing system must be integrated in order for the system to survive as a whole. The study adopts the institutional theory, in assessing the extent to which internal forces, influence manufacturing performance or henceforth contribute to the development and improvement of critical capabilities, through identifying both the dysfunctions and functional consequences of given structural arrangements within a given sugar manufacturing firm.

2.3.5 Path – Goal Theory of Leadership

In identifying the complexity of leadership and how leadership styles varies according to the work context, Northouse (2016); Ketema (2015); Kreitner and Kiniki (2006) view leadership from situational approach and contends that leadership style is contingent on the type of task to be performed, the authority of the leader and the nature of the environment around which the manufacturing is done. A seminal paper by Skinner in 1969, as cited in Ketema, (2015:59), emphasizes the importance of manufacturing leadership practices to successfully pursue operations strategies for improved performance. It hence advocates for proper leadership practices in order to improve manufacturing performance. In this connection, the current study conceptualizes the path–goal model of leader effectiveness, which states that a leader's behavior is contingent to the satisfaction, motivation and performance of the subordinates (Kreitner & Kiniki, 2006).

The Path – Goal theory can be traced back to Evans in 1970 then was further developed by House in 1971 (Clark, 2013). The theory is based on specifying a leaders' behavior that best fits employee and work environment in order to achieve the set objectives. The leaders' role is to select specific behavior that befits the employee and the environment, then guides the employee through her path in here daily work activities. According to Clark (2013), the goal is to increase employees' motivation, empowerment and satisfaction so that they can be more productive in their line of performance.

The Path – Goal theory of leadership further argues that leaders will have to engage in different types of leadership behavior dependent on the nature and the demands of a particular situation. This implies, therefore, that it is the managers' responsibility to smoothen barriers, manage situations as an on-going process to facilitate goal attainment, by creating a positive culture, direction and support needed to ensure that subordinates' personal goals are compatible with organizational goals. Other than the internal production environment, the current study equally hypothesize that the performance of any manufacturing process is contingent of the leader's behaviour which is dynamic and depends on the situation at work place. Given that sugar manufacturing process will most often be affected by differing situations and compounded by complex interactions among variables, the Path – goal theory explains how task and follower characteristics affect the impact of leadership hence their performance.

Based on its contribution to leader effectiveness, Northouse (2016) however, has criticized the Path – goal theory. Given that the theory is complex and incorporates several aspects of leadership styles, the author intone that interpreting the theory can be confusing at times, especially in differing situations. In addition, it has received partial support from empirical research studies, and that the theory is a one-way event, given that it is the leader that affects the followers' performance. This in essence, can make the follower become dependent on the leader. However, this is seen as a way of helping the followers reach their potential as well as meeting the organizations' set objectives.

2.3 Conceptual Framework

Conceptual framework is the researchers' own abstraction of the interrelationships among the study variables (Ravitch & Riggan, 2012) and helps make conceptual distinctions and organize ideas during research. There are five set of variables depicted in the conceptual framework: (1) competitive priorities comprising (a) cost, (b) delivery, and (c) quality priorities, (2) Structural decisions comprising (a) capacity, (b) process, (c) structure, and (d) operations development, (3) Infrastructure Choices comprising (a) work – force, (b) policies (c) communication, and (d) innovation, (4) leadership styles comprising (a) directive, (b) participative (c) supportive, and (d) achievement – oriented styles, (5) operations performance comprising (a) efficiency and (b) effectiveness.

The current study hypothesized that operations strategy (Independent Variable) linearly and directly influences operations performance (Dependent Variable) of sugar manufacturing firms in Kenya. Although the study assumed a simple linear relationship between operations strategies and performance, Frazier, Tix and Barron (2014) however, are of the opinion that relations amongst study variables are often complex. The relationship between operations strategies and performance was thus assumed to be modified by leadership styles. In view of the above statement of the research problem, the stated study objectives, as well as the theoretical foundations of the study, a framework depicting conceptual relationships among the study variables as presented in figure 2.1 was developed.

The conceptual framework contributes to empirical research report by identifying research variables, and clarifying relationships between and among the study variables. Linked to the problem statement, the study's conceptual framework was used to concisely describe the study variables setting the stage for presentation of the specific research objectives and research hypotheses that drove the research assessment, accompanied by visual depiction of the study variables and their measurements (fig 2.1).

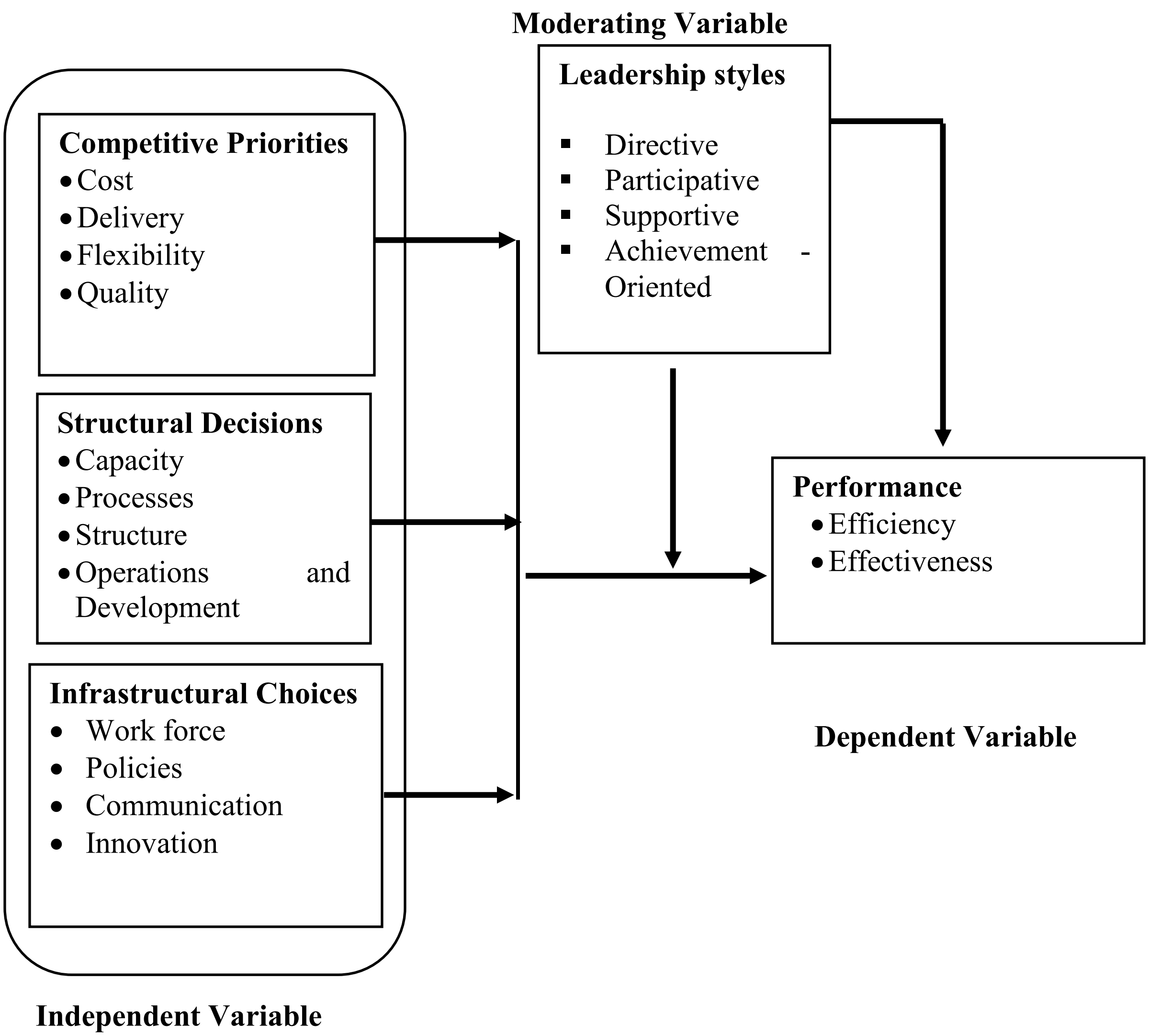

Figure 2.1: Conceptual framework

2.3.1 Competitive priorities

Competitive priorities have been christened differently. Whereas Gates (2010) and Rodrigues and Dorrego (2008) refer to them as critical success factors, and consequently defines them as the handful of key areas where an organization must perform well on a consistent basis to achieve its mission, Hallgren (2010) argues that they are a set of manufacturing objectives. Moreover, Slack and Lewis (2011) note, they offer the link between a firms' performance and the market requirements. In addition, Klaus and Charlotte (2015) refer to them as key success factors (KSF) and looks at them in four different ways: a) as a necessary ingredient in a management information system, b) as a unique characteristic of a company, c) as a heuristic tool for managers to sharpen their thinking, and d) as a description of the major skills and resources required to be successful in a given market.

A historical outline offered by Rodrigues and Dorrego (2008) argues that the concept of critical success factors was developed by Hofer and Schendel in 1977 and further deepened by Rockert in 1979 and Ohmae in 2004. In the current market murky environment, sugar manufacturing firms' fight with competitors in equal circumstances, and as Rodrigues and Dorrego affirm, the only factor will be a superior performance in developing competitive priorities as a distinct strategy at functional areas. In this connection, Abdulkareem, Adel and Anchor (2013) argue that competitive priorities are the dimensions that a firm's production system must possess to support the demands of the markets in which the firm wishes to compete. In addition, Felipe and Marcia (2014) view the production strategy as related to policies and goals for using the resources of a company, whose contents are determined by competitive priorities.

Identifying a firm's competitive priorities has long been considered a key element in manufacturing strategy (Sohel & Rodger, 2013). According to Sciuto and Filho (2013), the assemblage of competitive priorities has changed over time. However, despite the numerous competitive priorities offered in the operations strategy literature, Klaus and Charlotte (2015); Suzana and Harvey (2014) and Sciuto and Filho (2013) identify the widely accepted competitive priorities as cost, delivery, quality and flexibility.

In addition to the four stated competitive priorities, Suzana and Harvey (2014) introduced a fifth competitive priority called innovativeness, while both Sciuto and Filho (2013) and Boyer and Lewis (2002) introduced service in the mix. In spite of this however, Sciuto and Filho (2013) argue that some of these competitive priorities become mismatched and consequently, a company has to choose to prioritize their competitive priorities, depending on their levels of competence already accumulated. The current study however, sought to discuss the four agreed upon manufacturing competitive priorities consistent with various researchers (Klaus & Charlotte, 2015; Ketema, 2015; Sanders, 2014; Sohel & Rodger, 2013; Hallgren, 2010; Slack & Lewis, 2011).

In order to sustain the market demand and attain competitive advantage, sugar manufacturing firms must possess these dimensions and integrate them in their production system (Abdulkareem, Adel & Anchor, 2013). The current sustained specter of global competition certainly challenges Kenya sugar manufacturers to be competitive both locally and internationally, to spur development of manufacturing strategies in the sugar firms seeking competitive advantage. Identifying the sugar manufacturing firms' competitive priorities has long been considered a key element in the strategy (Ketema, 2015).

A study by Boyer and Lewis (2002) contents that competitive priorities emphasize strategic position of sugar manufacturing firm on developing a firms' specific manufacturing capabilities that may enhance a plant's position in the marketplace. The strategic position, hence, guides decisions and choices regarding the production process, capacity, technology, planning, and control adopted by the firm. While measuring and examining the relative importance of competitive priorities to a manufacturing firm, Adebayo, Vila and Gimenez (2012) acknowledge that over the years, there exists a divergence view about what factors constitute competitiveness priorities for a manufacturing firm, and the discrepancy about which of the chosen factors are to be considered. This, therefore, further underscores the various terms by which they are referred to and their number, further compounding the challenge of identifying the specific factors to be used.

An underlying assumption when using competitive priorities to measure the contribution of operations strategy to a firms' performance is that there should be a relative ranking of the importance of different priorities (Boyer & Lewis, 2002). Several researchers (Sciuto & Filho, 2013; Slack & Lewi, 2011; Hallgren, 2010) believe that some competitive priorities become mismatched and hence a company must choose to prioritize a subset of criteria competitive priorities, depending on their levels of competence already accumulated. In addition, trade-offs are not static and will continuously change with time and circumstances under which manufacturing takes place within the operation areas (Kongkiti & Kanchana, 2007).

The basic question that is in the lips of every manufacturer therefore has been: is a trade – off among competitive priorities a possibility? Accordingly, there has been a heated debate that has ensued over the need for trade – offs in the priorities (Adeyemi, 2010). While some researchers have called for manufacturing plants to focus on a single manufacturing capability and hence as such devote its valuable yet limited resources accordingly, other researchers argue that the use of advanced technologies should allow concurrent improvements in competitive priorities (Adebayo *et al.*, 2012; Boyer & Lewis, 2002). Yet, Boyer and Lewis (2002) acknowledge the fact that there is limited empirical evidence pro or against the trade – off model.

The study was based on the premise that as sugar manufacturing firms improve on their key competitive priorities as a distinct strategy at functional areas, the operations performance improves as well. And it is on this premise that the study formulated the relevant null hypothesis stated as:

> H_{01}: *There is no significant effect of competitive priorities on performance of sugar manufacturing firms in Kenya.*

2.3.2 Structural Decisions

According to Slack and Lewis (2011) structural decisions as those which shape the “building blocks” of the operations and hence define a manufacturing firms’ overall tangible shape and architecture. Structural decisions relate to tangible aspects of the firm, facilities, the way equipment and personnel are organized in processes and inter – linkage relationships within the manufacturing firm (Stoup and Christensen, 2000). Strategy for sugar manufacturing firms, is essentially about how the specific firm seeks to survive and prosper within its environment over the long-term, hence the structural decisions and actions taken within its operations have a direct impact on its long – term performance.

Structural decisions often involve major capital investment decisions, which once made will set the direction of operations, and ties the operations of the sugar firm long- term. These decisions have a long – term effect on the resources and capabilities of the sugar manufacturing firm, and influences it's the firms' future performance, and as Barnes (2012) would intone, such expensive strategic decisions must be considered as the only ones for the benefit of the sugar manufacturing firm. For example, since a manufacturing firm's rate of output is structurally dependent on the competitive priorities that the specific sugar firm chooses, it must be closely tied to the capacity decisions that will influence the output rate and volume. Equally, Barnes (2012) concludes that a firm's manufacturing cost is affected by structural design, while the quality is influenced by the fit between structural design, capacity and the market requirements. Thus the sugar manufacturing firm must also have protective capacity in order to deal with disruptions in delivery, while flexibility – when demand stabilizes – there may be excess capacity, which can result in high costs per unit and wasted resources.

A sugar manufacturing firm needs to make a decision between high volume of homogeneous products and low volume of differentiated products. In this respect, Gong (2013) presents a product – process matrix to examine market – manufacturing congruence problems and to help manufacturing process decisions. The matrix relates to process structure dimensions that describe the process choice and the stages of the product – life cycle that may be appropriate to fulfill the demand. From Gongs' elucidation, the matrix can further be used to facilitate a winning competitive advantage by sugar manufacturing firms in Kenya.

The current study outlines that the structural decisions by manufacturing firms is measured by a firm's production capacity, manufacturing process, the structure and the location of the manufacturing plant. The current study is thus based on the premise that as sugar manufacturing firms choose appropriate tangible and architectural dimensions as a distinct strategy at functional areas, the operations performance improves as well. And it is on this premise that the study formulated the relevant null hypothesis stated as:

> ***H_{02}***: *There is no significant effect of structural decisions on performance of sugar manufacturing firms in Kenya.*

2.3.3 Infrastructural Choices

According to Hallgren (2010), infrastructural choices in manufacturing related issues were first highlighted by Hayes and Wheelwright (1984). Further, Hallgren (2010) intones that the operationalization of operations strategy comes through a pattern of choices. The success of structural decisions is intertwined with infrastructural choices that are made by the management of the manufacturing firm. Infrastructural choices relate to systems that are used to enhance the utilization of the structural resource to control those resources so the business achieves high levels of productivity. In addition, Luger, Butler and Winch (2013) sees infrastructure as a refinement standard within the production process.

Infrastructural decisions affect the work force, manufacturing systems, and organizational culture that lubricate the decision-making and control activities of the operation. According to Wheelright (2001), to mould the equipment and people into a coordinated whole, it requires that the manufacturing firm specify policies for production planning and control, inventory and logistic systems, and workforce management.

Furthermore, Felipe and Marcia (2014) postulate that a manufacturing firms' production strategy is related to the policies and goals for using the resources of a sugar firm, and its content is determined by competitive priorities and the areas of structural and infrastructural decisions and choices, which play a fundamental role in manufacturing process and, must be aligned to the competitive strategy. In additionally, Slack and

Lewis (2012) are in agreement by intoning that infrastructural strategy areas influence the activities that take place within the operation's structure.

Due to the increased competitive pressure, the acceleration of technological change and the development of knowledge, Rolstadas (2012) argues that there has been a shift in focus towards infrastructure decisions. This, in addition, has been necessitated by increased flexibility and customization. Infrastructure is built over time through day – to – day practice, top management commitment, and cross – functional efforts to create capabilities that support and leverage the firms' structure. This is in agreement with the study by Barnes (2012) which outlines key infrastructure choices areas to comprise human resource, policies, communication and innovation and performance measurements. Comparatively, the infrastructural choices are narrow and flexible, implying that the sugar manufacturing firms can quickly and easily vary them as response internal requirements. In this respect, Barnes (2014) further intones that it is easy to change aspects of operations infrastructure quickly than the structure.

Based on the existing quality improvement methodologies open to a manufacturing firm seeking to improve the quality of process outputs, Gong (2013) would reason that the sugar manufacturing firm needs to identify and remove the causes of production errors and minimizing variability in manufacturing processes, and hence lay infrastructure for future development of low cost and high quality competencies. This underscores Slack and Lewis' (2012) intention by concluding that in some investment decisions appropriate infrastructure is needed to support the main operations facility and can be as significant as, if not more than, the investment in the operation itself. In essence, a set of reporting relationships can be embedded within an organizational structure which may reflect different structural and infrastructural process.

The current study hence was based on the premise that as sugar manufacturing firms improve their infrastructural choices as a distinct strategy at functional areas, the operations performance improves as well. It is on this premise that the study formulated the relevant null hypothesis stated as:

***H_{03}**: There is no significant effect of infrastructural choices on the performance of sugar manufacturing firms in Kenya.*

2.3.4 Leadership Styles

The topic leadership has fascinated people for centuries, definitions abound. Disagreement about the definition of leadership stems from the fact that it involves a complex interaction among the leader, the followers, and the situation (Kreitner & Kiniki, 2006). However, the varied definitions of leadership do agree on a social influence as a common thread. Some researchers define leadership in terms of personality and physical traits, while others believe leadership is represented by a set of prescribed behaviors. There is a common thread, however, among the differing views of leadership. The common thread is social influence.

On one hand, Bevan (2016) summarizes influence as compliance, while on another hand influence is presented as working effectively with people. It hence involves logical, emotional as well as cooperative appeals that an effective leader must possess. Leadership at work as manufacturing process is a dynamic process where the leader is not only responsible for the group's tasks, but also actively seeks the collaboration and commitment of all subordinates in achieving group goals in a particular context (Sostrine, 2017; Kreitner & Kiniki, 2006). In addition, Sostrin (2017) asserts that emerging leaders are encouraged to adopt a blend of styles, using rotational – specific leadership approaches around them, a philosophy that Sostrine refers to as situational leadership.

A study by Gumusluoglua and Arzu (2009) observes that leadership style is more of how the subordinates perceive their leader's behavior than how the leader thinks he behaves because one's subordinates will treat him/her based on how they perceive his/her behavior in various situations. This implies that the floor workers' assessment of the managers' and supervisors' leadership styles are most likely to be the managements' styles of leading the manufacturing department in these sugar firms. In the current study, leadership style is assumed to be situational hence the study adopts Path – goal theory of leadership. The theory outlines the four leadership styles which can either be directive; participative, supportive; or achievement-oriented, adopted from path – goal theory of leadership (Northouse, 2016).

Different authors have discussed the relationship between leadership styles and organizational performance. For instance, Szumbah and Imbambi (2014) argue that leadership is intricately related to a manufacturing performance, and observe that the cost of leadership can be measured in dollar terms. This implies that a good operations leader needs to be a good technician, an economist and must possess adequate skills in human management. Study findings from prior studies about the role of leadership in increasing performance of a firm are mixed. Whereas most studies have indicated a direct and significant relationship between leadership styles and performance, other studies however, suggest that role of leadership is not so important in achieving the organizational performance (Karamat, 2013).

Situational leadership philosophy helps to performers in high – demand organizations who have no time (or margin for error) to engage in long cycles of trial and reflections in order to get the mix just right (Sostrin, 2017). Consequently, there exist contradictory findings on the role of leadership in organizational performance suggesting that the moderating role of leadership in organizational performance needs to be further empirically tested. Moreover, Obiwuru *et al*. (2011) argues that the degree to which an individual demonstrates leadership characters depends both on his characteristics and personal abilities and also on the characteristics of the situation and environment in which the leader operates.

Therefore, leadership style in a manufacturing firm is a core factor that plays significant role in influencing the interest and commitment of the individuals in the organization. The manager therefore, needs to find a leadership style that best suits the situation in order to improve performance. This confirms a study by Koech and Namusonge (2012) which suggests that leadership styles by the leader at work place accounts for the variations in the performance. Following this, the foregoing elucidations, the current study is based on the premise that leadership styles as used by the management influence the performance of sugar manufacturing firms.

The current study uses path-goal theory of leadership whose dimensions are directive, participative, supportive and achievement oriented (Northouse, 2016; Kreitner & Kiniki, 2006). This helps expand the focus of prior research, which dealt exclusively with task – and relationship – oriented behaviours (Northouse, 2016). From the above elucidations, the study inferred the following relevant null hypothesis to be stated as:

> ***H_{04}***: *There is no significant effect of leadership styles on the performance of sugar manufacturing firms in Kenya.*

2.3.5 Moderating Variable

According to Frazier *et al.* (2014), a moderator is a variable that alters the direction or strength of the relation between an explanatory and dependent variables. Relations between variables are often more complex. In essence, a moderator effect is a complex interaction in which the effect of one variable depends on the level of another, and as Fairchild and MacKinnon (2010) argue, a moderator's effect can be enhancing, reducing, or changing the influence of the explanatory variables. A linear relationships between and among variables are rare, hence it is important to test any moderating factor that may complicate any existing direct relationship(s) among variables (Alkahtani, 2016; Carte & Russell, 2013).

The current study assumes linear relationship between operations strategy and performance of sugar manufacturing firms in Kenya. However, this relationship might be complicated by leadership styles of the management at the operations areas. Hence, the current study is based on the premise that the introduction of leadership styles moderates this relationship, and consequently influences the performance of sugar manufacturing firms. It is on this premise that the study formulated the relevant null hypothesis stated as:

H*$_{05}$*:* *Leadership style has no moderating effect on the relationship between operations strategies and performance of sugar manufacturing firms in Kenya.

2.4 Empirical Literature Review

2.4.1Competitive Priorities

Several authors have argued that sugar manufacturing firms in Kenya face both high cost of production and stiff competition from within the industry and Common Market for Eastern and Southern Africa (COMESA) (Motaroki & Odollo, 2016; Omolo, 2015; Malonza, 2014; Wekesa, 2014; Hongo, 2013; Wanyande, 2011). Specifically, a case study by Hongo (2013) explored strategic responses to the environmental changes in the sugar industry. The study sought the strategies that Sony Sugar Company uses in order to stay competitive within the dynamic business environment. Data was collected from four departments and analyzed by use of descriptive statistics and content analysis. In conclusion, the study recommends that the company embarks on further research on quality, and technological innovation to be more responsive.

A study by Wekesa (2014) explored the effects of competitive strategies on organizational performance in the sugar industry in Kenya. The study focused on generic strategies as modeled by Porter. Data was collected from 108 respondents from nine (9) sugar firms in Kenya and was analyzed by descriptively statistics and regression analysis. The study established that cost leadership is the main strategy that sugar manufacturing firms use, with 78.8% of the respondents indicating that the company prices its products lower than its competitors.

In contrast, a study by Abdulkareem *et al.* (2013) explored the relationship between competitive priorities and competitive advantage of firms in the Jordian industrial sector in Qatar. The study targeted 88 listed Jordanian manufacturing firms. A cross – sectional survey research design was adopted and data was collected primarily through structured questionnaires. The study revealed that competitive priorities has a 77.5 percent influence (R^2 = 0.775) on competitiveness of the manufacturing firms. A multiple regression analysis showed a significant positive relationship of each competitive priorities with explanatory variable standardized coefficients as 0.568 (quality), 0.312 (cost), 0.121 (delivery), and 0.209 for flexibility respectively.

These findings confirm study findings by Sohel and Roger (2013) which concluded that the majority of manufacturing firms rank quality as the most important competitive priority. In addition, the study results by Abdulkareem *et al*. (2013) are congruent with the study findings by Ketema (2015) that identified competitive priorities as the main drivers of both structural and infrastructural decisions and manufacturing performance. However, study results by Abdulkareem *et al*. 92013) are inconsistent with Wekesa (2014) on which competitive constructs are more important. In response, the current study used EFA to identify least number of competitive priorities factors which accounts for the common variance.

A study by Christiansen, Berry, Bruun, and Ward (2003) on mapping of competitive priorities and operational performance in groups of Danish manufacturing companies, suggests that operational performance is influenced by the implementation of bundles of manufacturing practices, and a human-related factors, in order to attain internal fit. In their study, a Mann – Whitney U – test analysis showed that the firms differ on their main competitive priorities. However, the study concluded that firms emphasize low price, which herein referred to as cost. In addition, the study concluded that those firms that excel in cost do so at the expense of delivery speed and delivery reliability. The study results confirms a study survey by Littlefield and Shah (2008) which found that in the face of demand uncertainty, market pressures drive manufactures to focus on manufacturing operations with 63 percent of the sampled firms were forced to reduce their manufacturing costs.

An empirical study by Sohel and Roger (2013) identified dimensions of competitive priorities and concluded that the majority of manufacturing firms ranked quality as the most important competitive priority. The study results confirm study results by

Abdulkareem *et al.* (2013). The study results negate the study by Wekesa (2014) and Littlefield and Shah (2008) which rank cost as a priority for the majority of manufacturing firms. However, the current study sought to assess all the four agreed competitive priorities to determine, not necessarily in order of priorities, but which is one(s) is/are more pursued by the sugar manufacturing firm in Kenya for better operations performance.

An empirical study conducted by Boyer and Lewis (2002) sought to investigate the need of attaining a meaningful trade – off among the competitive priorities. A large, yet a focused case study sample of 271 manufacturing plants were surveyed. Data was collected from multiple respondents from each of the manufacturing plants to allow inter – rater reliability. Self – administered questionnaires with sixteen (16) likert – scale questions targeting the plant manager and an operator were sent out, with a response rate of 40.6 percent. The study found a significant correlation between quality and flexibility ($r = 0.37$, $\rho < 0.01$), while the correlations between delivery and cost priorities were found to be insignificant.

These variations in the study results within the plant level imply therefore, that using a single respondent to assess a plant's overall operations strategies might provide a skewed perception of what constitute an appropriate competitive priority for the manufacturing plant. Consequently, delivery, flexibility and quality were identified as the important competitive priorities around which the correlations were significant. As a result, trade – off were determined between delivery and flexibility as well as between delivery and quality.

2.4.2 Structural Decisions

A study by Ketema (2015) analyzed drivers of manufacturing performance in medium and large scale firms in Ethiopia. Data was gathered at plant level from 197 MLSF by use of a quant – emphasis mixed method approach along with cross – sectional survey design, and the collected data was analyzed qualitatively. The hypothesized relationships were analyzed by Structural equation modeling (SEM). Important to the current study is that operations performance is greatly influenced by competitive priorities (55.7%), structural decisions (68.2%), and infrastructural choices (74.6%). In addition, the study concluded that structural and infrastructural manufacturing decisions have a joint significant influence on manufacturing performance when a firm seeks to achieve quality and delivery priorities.

Based on a single case study in a metallurgical company Sciuto and Filho (2013) carried out a case study on the relationship between Operation Strategy and the Lean Manufacturing System. Primary data was collected by both semi – structured interviews and direct observation of two production managers, while secondary data was collected through in-depth document analysis. The analysis revealed that infrastructural areas greatly and positively influence the implementation of lean manufacturing system, which leveraged various process improvements, mainly administrative, aimed at increasing productivity, development of robust performance indicators, and improved interface with suppliers.

2.4.3 Infrastructural Choices

A survey conducted by Luger *et al.* (2013) among 500 manufacturing firms in the United Kingdom (UK) based on a two – step methodology, revealed that infrastructure ranked third as a component of competitiveness. The study further showed that infrastructural choices are a key component of a firm's competiveness and attractiveness which is critical for policy concerns. Although the study ranked infrastructure third, it however concluded that comparisons of importance of infrastructure to manufacturing competitiveness are difficult to make across firms because of differing demographics, industry mix, among others.

A study by Magutu, Mbeche, Nyamwange, Mwove, Ndubai, and Nyaang (2010) documents a study case of operations strategy used in solid waste management, alongside the challenges facing its implementation by Nairobi City Council. Data was drawn from managers and was analyzed descriptively. The study results showed that the management and employees together formulate operations strategy as part of planning process to achieve a fit between operational and organizational goals. The study, upon evaluation of the operations strategies used by NCC, revealed that NCC had not invested enough time and effort in implementing its operations strategy. This can be hypothesized as to be the main reason for its inefficiency in managing waste. Although the study was done on solid waste management, the results are central to the current study. However, it is not clear whether these sugar firms involve the employees in strategy formulation, and at what level this is done. Even if this is so, the cardinal question would be how much time and effort is invested in executing these strategies as a means to improve the performance.

To contribute to the achievement of competitive advantage, it is advisable that the culture of continuous improvement of operations strategies be incorporated in the corporate strategy. However, when companies do not recognize the relationship between operation strategy and corporate strategy, they can be stuck in wasteful uncompetitive production systems. In this connection, a study by Sciuto and Filho (2013) on operations strategy of a large metallurgical company, discusses whether there is alignment between improvement programs that have been deployed as part of the lean manufacturing system (LMS) and the production's competitive priorities as perceived by managers in Spain.

The study was based on a case study of a single company, focusing on the strategic contribution of operations strategy on LMS. In addition, Sciuto and Filho (2013) used a direct observation research technique. Primary data was collected through semi-structured interviews. The study concluded that improvement programs implemented with LMS have involved almost exclusively infrastructural decision areas and was never oriented to the production competitive priorities. In addition, "quality" criterion was given a priority over "delivery". This ranking confirms a study by Suzana and Millar, 2014; Wamalwa *et al.* (2014); and Gong 2013. However, the current study collected primary data by use of structure questionnaires and interview schedules. In addition, the study results contradicted the findings from other authors (Sohel and Schroeder, 2013; Abdulkareem *et al*., 2010; ward *et al*., 2008).

This study results were in tandem by Abdulkareem *et al.* (2013); Sohel and Roger (2013) and Christiansen *et al.* (2003). Interestingly, just like the study by Katema (2015), Sciuto and Filho (2013), the study results revealed that “cost” was never cited by managers as a critical feature of the process. This underscores the conclusion earlier made that different companies differently emphasize competitive priories, and that researchers are often divided on which competitive priorities dimensions and their number are to be used as drivers to superior performance.

A study by Malonza (2014) sought to explore the contribution of manufacturing efficiency on operational performance of Mumias Sugar Company Limited. The study adopted a descriptive case study methodology. Data was collected by use of an interview guide and was analyzed by ARIMA. The study findings revealed that factory time efficiency has 5.9 percent effect (R^2 = 0.059) on operational performance and consequently there has been reduction of waste and improved quality in operations due to improved efficiencies and standardization of processes. Similarly, Wamalwa *et al*. (2014) examined effects of manufacturing techniques implementation on factory time efficiency in Mumias Sugar Company. Purposive sampling was used to select respondents from across six departments.

Unlike the study by Malonza, the study by Wamalwa *et al*. (2014) collected data using structured questionnaires and analysis was done using both descriptive and inferential statistics. Interestingly, the study results revealed that Mumias Sugar Company has only adopted practices relating to delivery and further concluded that there is little impact of these delivery practices to factory time efficiency. In addition, Kalali, Anvari, Ali and Davod (2011) explored reasons why strategic plans implementations fail in health service industry. The study reviewed sixteen (16) variables and using exploratory and confirmatory factor analysis, structural dimension had an effect of 0.67 as effective factor on the failure of strategic decisions implementation. This further underscores the order of importance by which firms need to undertake the structural decisions in order to improve their performance.

To explore the efficiency dynamics of Sugar Industry of Pakistan, Raheman, Qayyum and Afza (2010) conducted a study among twenty (20) sugar and allied firms within 2000 – 2010 periods. Data for the study was obtained from secondary sources in the form of annual reports of the sugar firms listed on Karachi Stock Exchange for the period and analyzed using Data Envelopment Analysis (DEA) and Malmquist Index approach to calculate the total factor productivity growth of listed sugar firms. The empirical estimates of the study revealed that both efficiency and technological progress and innovation accounted for sixty nine percent (69%) improvement in performance. However, the current study used primary data collected by use of structured questionnaire, but secondary data was collected by use of interview schedules, while production schedules and records were perused. The content analysis showed that on average, production has been on the decline mode for a decade for most of these firms.

2.4.4 Leadership Styles

Although a linear relationship between operations strategy and performance of sugar manufacturing firms was proposed, this relationship however, is moderated by leadership styles. A study by Wanyande (2011) blames the problem of inefficiency in the sugar industry on poor leadership, among other challenges. Superior performance requires a paradigm shift in managerial approach to leadership in the current wave of a rapidly evolving technology accompanied by increasing competition and market globalization. This implies that the style of leadership the management employs must be elastic enough to suit the contingencies within and without the manufacturing firm.

In order to assess the impact of impact of leadership style on both employee creativity and organizational innovation, Gumusluoglua and Arzu (2009) designed a model and tested 163 R&D personnel and managers at 43 micro- and small-sized Turkish software development companies. The regression analysis results revealed that there is direct positively association between leadership and organizational performance. In addition, Wang, Shieh and Tang (2010) carried out a research study on the effect of leadership style on organizational performance.

The study collected primary data from 246 respondents using questionnaires from corporate owners, executors and operators of Kaohsiung's Nanzi EPZ in South Taiwan. The study results revealed that leadership style accounts for 8.8 percent (R^2 = 0.08) variation on organizational performance. Although this study found a weak positive relationship, the results are in tandem with other studies. The current study hence sought to assess this actual relationship in Kenya manufacturing sector, more so in sugar manufacturing firms.

A study by Obiwuru *et al.* (2011) assessed the effects of leadership style on organizational performance in selected small scale enterprises in Nigeria. The study focused on transformational and transactional leadership styles and used a survey design, and employed evaluative quantitative analysis method. The study used mainly primary data generated through a structured Multifactor Leadership Questionnaire (MLQ) administered on selected respondents, and an OLS multiple regression models were used. The result concluded that transformational leadership style accounts for 48.64 percent (R^2 = 0.4864) in the variation of performance while transactional leadership style accounts for 96.9 percent (R^2 = 0.9689). However, the current study assessed the effect of situational leadership styles.

In addition, a study by Wang *et al.* (2010) examined the relationship between leadership style and organizational performance in Taiwan, China. Primary data was collected from high – class cadres and operation staff using structured questionnaires obtaining 41% recovery rate. A regression analysis was used to discuss the hypotheses formulated. The study concluded that leadership has a significantly positive effect on the performance of an organization ($F = 5.977$, $\rho < 0.001$). This implies that to improve the performance of an organization, the management must equally use appropriate leadership style. It is on this premise that the current study postulates that the outcome of leadership must be fluid and be contingent on the reigning situation. Although the study by Obiwuru *et al.* (2011) was done in a service industry, its implication can be useful in a manufacturing set up. However, the study used charismatic and visionary leadership styles unlike the current study that focuses on the situational leadership styles.

A study by Ojokuku, Odetayo and Sajuyigbe (2012) examined the impact of leadership style on organizational performance in selected Banks in Nigeria. A purposive sampling technique was used to collect primary data from sixty (60) respondents through structured questionnaire. Both Pearson product moment correlation and Regression analysis were used to examine the relationship between leadership style dimensions and organizational performance. The study findings revealed that leadership style dimensions jointly account for 23 percent variance in organization performance.

A study designed to examine how leadership influence performance efficiency in the nursing service environment, Yeh, Chen, Lo, Chou, Huang, Chiu, and Wan (2016) used matched pairs sample design to survey 135 head nurses and 1353 registered nurses on leadership styles. Efficiency was calculated using Data Envelopment Analysis. Tobit regression was used for analysis. From the analysis, initiating structure leadership style, characterized by high agreeableness, high openness was related to higher efficiency. This hence implies that openness has a direct relationship with efficiency and therefore, would improve operational efficiency.

In a similar fashion, a study by Odollo (2015) sought to assess the effect of leadership on performance of individual workers in education sector. The study results revealed that leadership styles accounts for 26.4 percent of the variability in workers performance ($R^2 = 0.264$). Similarly, Koech and Namusonge (2012) designed a descriptive survey research to investigate the perception of middle and senior managers and to establish their effect on organizational performance in thirty (30) State owned Corporations in Mombasa, Kenya. Primary data was collected by use of structured research questionnaire and questionnaire items were measured using a five-point Likert- scale. From the study results, correlations between the transformational-leadership factors and organizational performance ratings were found to be high (0.518 to 0.696, $P < .05$), and as expected, correlations between the transactional-leadership behaviors and organizational performance were relatively low (0.219 to 0.375, $P < .05$). This indicates that the management ought to strive to inspire subordinates, and get more involved to provide meaningful and challenging work. This will hence stimulate subordinates' efforts to become more innovative and creative thereby improving their performance.

A study by Alkahtani (2016) discussed the interactive influence of leadership styles on employees' organizational performance. Questionnaires were used to collect primary data from a sample of 200 employees spread across Jeddah Metals manufacturing factory. Data was quantitatively analyzed. The study found that leadership behaviors explained 48 percent of the variance in organizational performance. Leadership is thus instrumental in an organization given that the culture instituted in these organizations are created and entrenched by the leadership in their areas of operations. These studies, although done in a service industry, their results underscore the perceived relationship between leadership styles and performance, which can equally be used to assess the effect of leadership styles on performance in a manufacturing sector.

2.5 Critique of the existing literature relevant to the study

Several studies have attempted to incorporate operations strategy into the corporate strategy, and interconnect it to manufacturing performance as a vehicle for competitive advantage. However, out of thirty – one (31) operations management journals reviewed, Boyer *et al*. (2015) concludes that authors in the area of operations have divergent views of what strategies constitute operations strategy. While Hill (1994) looks at operations strategy decisions as managing both process and value chain, and further considers operations design choice as a process, as well as infrastructure, Boyer *et al.* (2015) refers to content operations strategy what Hill, in part, refers to as strategic design choices.

However, their choices of what constitute which of their two measurements are not in tandem. Hallgren (2010) outlines operations strategy model content, which identifies two major constituents of manufacturing strategy content, which are competitive priorities and decision categories. This agrees with the analysis by Boyer *et al.* (2015). From the above elucidations, the current study proposes to integrate the views of Hallgren (2010), which also agrees with the analysis by both Boyer *et al.* (2015) and Slack and Lewis (2011).

A study by Hongo (2013) sought to assess strategies that sugar producing firms use to stay competitive in the face of changing business environment. The study recommends that companies embark on further research on quality, and technological innovation to be more responsive. The current study finds the focus on quality and technological advancement alone to be a narrow competitive strategy as used by the sugar manufacturing firm. Therefore, the current study sought to focus on operations areas and the strategies that these sugar firms employ in order to effectively compete. Moreover, the current study will focus on all sugar firms, unlike the study by Hongo (20130 which was a case study, and used content analysis.

With an interest to counter the ever increasing both local and global competition, Mbithi, Muturi and Rambo (2014) assessed the performance implication of sugar firms in Kenya through market development approaches. The study used the external performance approach to determine performance. In the same line, initiatives to ensure survival in the market, has led sugar industry in Kenya to incur heavy costs in a bid to attract new and retain old customers. In addition, the study only targeted the four public sugar manufacturing firms in Western Kenya, namely: Muhoroni, Nzoia, South Nyanza and Chemilil. The study concluded that to stay afloat, sugar manufacturing firms use branding strategies to improve the performance. The current study however, explored the strategies used by the market from the internal measurements to manage manufacturing process, as recommended by Yatundu, Abuga, and Olala, 2015; Malonza 2014; Kasie and Belay, 2013; Hallgren, 2010). In addition, unlike a study by Mbithi *et* *al.*, (2014) that focused on four state-owned sugar forms, the current study assessed all the twelve sugar manufacturing firms – both public and private, as licensed in Kenya.

A study by Szumbah and Imbambi (2014) sought to assess the relationship between plant and equipment maintenance strategies and the factory performance of the Kenya sugar firms, due to the continued deficit in national sugar production occasioned by the inability of sugar industry in Kenya to consistently produce sugar at the factory rated capacities. However, the study only focused on five sugar forms, namely: South Nyanza, Mumias, Chemelil, Muhoroni, Nzoia and West Kenya Sugar Companies. Moreover, the study focused only on structural decisions as a strategy, which from the literature is a sub – set of operations strategy. This study therefore is considered incomprehensive given that one, it never addressed the composite operations strategy, and its scope was limited as it never assessed all the sugar firms in Kenya.

A study by Li-Min, Yen and Yu (2014) undertook a case study on a state – owned Taiwan Sugar Corporation (TSC) enterprise. The study was based on several aspects of servitization, a form of service differentiation used to take advantage of financial, strategic, and marketing opportunities. The study revealed that TSC implemented the concept of strategic service innovation to create value innovation under the developing trend of a globalized industry. Li-Min, *et al.* (2014) argue that the time is currently fitting for manufacturing companies to have a service revolution in order to survive in the competitive and dynamic business environment of a globalized economy. Consequently, manufacturers have invested significantly in service-specific capacities, although the study concludes that some surveys illustrate that investment in the service business still remains low. This implies that sugar manufacturing firms should revolutionize the manufacturing strategies in order to wade off competition evidence in the murky market. This calls for synergized operations strategies to achieve the set objectives.

Literature is awash with most studies done in the sugar industry in Kenya to have focused on generic strategies as modeled by Porter (Katema, 2015; Mutunga & Minja, 2014; Wekesa, 2014; Abdilkareem *et al.*, 2013; Sohel & Roger, 2013). A study by Wekesa focused only on Porters generic strategies focusing mainly on cost leadership. Data was collected data from nine (9) sugar firms in Kenya and analyzed only descriptively, and used regression analysis.

Similarly, a study by Abdulkareem *et al.* (2013) concentrated on the competitive priorities as part of operations strategy. However, the current study seeks to assess all the twelve (12) sugar firms. However, the current study will focus on sugar manufacturing firms in Kenya, and will include competitive priorities, structural and infrastructural decision as operations strategies that a study by Wekesa and Abdulkareem *et al*. did not assess. This will facilitate a better assessment of the contribution of operations strategy on performance.

A related study, by part though, conducted by Ketema (2015) in MLSF in Ethiopia, interestingly, this study did not support the idea that cost – related investments significantly influence operations performance. However, the statistical analysis was done at 1% level of significance. The author further intones that the available evidence is primarily on data obtained from manufacturing firms in developed economies. This negates the study results by Mutunga and Minja (2014) that reveals that sugar manufacturing firms in Kenya compete on generic strategies. However, the current study seeks to bridge this gap by exploring the effect of operations strategies, of which competitive priorities has a major contribution to operations performance in sugar manufacturing firms in Kenya, but at 5% level of significance.

However, study results by Ketema (2015) reveals that although firms consistently emphasize on competitive priorities, their statistical influence on overall plant performance through the manufacturing decision areas is not as strong as that of quality and delivery priorities. The study results negate a study by Abdulkareem *et al*. (2013);

Sciuto and Filho (2013), and Sohel and Rodger (2012) that emphasize competitive priorities as a source of competitive advantage for a sugar manufacturing firm.

A study by Ketema (2015) indicates that external learning capability of the manufacturing plant does not significantly influence manufacturing performance. The current study sought to analyze the performance of sugar manufacturing firms from the internal environment, that will enable the specific sugar manufacturing firm achieve the much needed manufacturing – based competitive advantage. A local study conducted by Magutu, Mbeche, Nyamwange, Mwove, Ndubai, and Nyaang (2010) documents operations strategy (operationalized by competitive priorities) used in solid waste management by Nairobi City Council. The study by Magutu *et al*. (2010) was done in the service industry. However, the current study focused on manufacturing industry, and more specifically sugar sector in Kenya.

A similar study to Maloza (2014) was conducted by Wamalwa *et al*. (2014) employed purposive sampling to select respondents from across six departments within a single sugar manufacturing factory. This approach was found to be weak and may be biased, and hence the current proposes to collect data from several respondents, in a hierarchical manner so as to validate the data results. Most studies carried out on the effect of leadership styles have focused on behavioral, transformational and or transactional leadership (Yeh *et al.*, 2016; Ojukuku, 2012; Koeach & Namusonge, 2012; Obiwuru, 2011). However, the current study focuses on path – goal theory of leadership which postulates that the differing manufacturing circumstances of individual sugar firms call for different leadership styles, which is contingent on specific situations.

2.6 Summary of the Literature Reviewed

This chapter reviewed both theoretical and empirical literature on the key study variables. Specifically, the chapter outlined the theoretical framework that formed the foundation of the study. A conceptual framework developed provided schematic relationships among the study variables, which are independent variables (competitive priorities, structural decisions, and infrastructural choices), operations performance, and leadership styles. A critique of the existing literature was equally presented with an aim of highlighting research gap(s) that the study hoped to fill. The literature reviewed in this chapter revealed that most authors have done substantive work on competitive priorities, overlooking other operations strategies that sugar manufacturing firms employ to improve their performance. The next chapter (3) describes the research methodology used to conduct the study.

2.7 Research Gaps

A critical review of both theoretical and empirical literature yielded limited information on the composite effect of operations strategies on performance. Specifically, the researcher got inadequate research findings linking the contribution of operations strategies to performance in Kenya's sugar manufacturing sector. Most of the related literature concentrates on competitive priorities, – to a greater extent focused on Porters' generic strategies. This does not reveal the empirical contribution of operations strategy on performance, in the sugar manufacturing sector in Kenya.

The review of existing literature further shows that operations strategies as used by manufacturing firms is anchored on the developing a fit between manufacturing objectives and strategic decisions with environmental requirements. In light of this, internally oriented performance measurements have been given limited prominence (Brown and Square, 2016). Moreover, empirical evidence is lacking on the use of RBV (Barnes, 2012; Moller *et al.*, 2003), and routine – based approaches related to firms' operations as a strategy to improve performance in the sugar sector in Kenya.

Even though Ketema (2015) avers that operations strategy and their contributions to superior performance and competitive advantage has been explored more so in the developed economies, few studies on operations strategy and performance have been done in the developing and emerging economies (Katema, 2015). In addition, a review of the existing literature reveals that the entire sugar manufacturing sector positions strategically by competing on cost (Wekesa, 2014; Mutunga & Minja, 2014; Abdilkareem *et al.*, 2013). However, the Kenya sugar industry is facing stiff competition from low-cost sugar firms from well-established global economies. Therefore, local sugar manufacturing firms need to realize that the current competition on cost strategy is an untenable.

Following study recommendations by Hayes and Pisano (2005) that different firms have different production systems (the composite of decisions in a number of key decision areas), therefore, rather than adopting an a single strategy, the task for a company's manufacturing function is to construct a production system that, through a series of interrelated and internally consistent decisions, reflects a combination of operations strategies inherent in its specific competitive situation.

This study therefore, was an effort to assess the contribution of operations strategy in Kenya, a developing economy. Following a study recommendation by Magutu *et al.* (2010) that firms need to invest enough time and effort in implementing its operations strategy; this can be hypothesized as to be the main failure agent in the sugar sector in Kenya. In view of the foregoing discussion, the central question Kenya sugar manufacturing firms need to address in setting and implementing their strategic goals and operations will be "to improve which operations strategy?" The literature reviewed fails to offer a comprehensive analysis and/ or evidence of combined as well as multiple contributions of the three operations strategy variables to performance.

A study by Katema (2015) concludes that the role of operations strategy has only been studied in a fragmented way in the literature, and hence the current study is intended to fill the gap of inadequate information and understanding that exists in relation to the operations strategy and its contribution to manufacturing performance, more so in the sugar manufacturing sector in Kenya as an emerging economy. In addition, the findings of this study would add to the growing list of studies on operations strategy.

CHAPTER THREE

RESEARCH METHODOLOGY

Research methodology is a conceptual structure within which a research is conducted, and it outlines the blue print for collecting, measuring, and analysing data (Kothari, 2010). It is a detailed procedure to be followed to realize the research objectives. This chapter describes research philosophy, research design, target population, data collection procedure, pilot testing, analysis and presentation of data, the measurement scales operationalizing the study variables, and the study hypotheses testing framework.

3.1 Research Philosophy

Research philosophy is a theoretical framework which underpins the research process, and provides a guiding structure and a range of acceptable research tools to aid the researcher seek answers to the hypotheses posited (Creswell, 2006). Although Creswell states two fundamental research paradigms as *positivism* and *phenomenological*, Lee (2006) identifies five primary paradigms that signify alternative views of the world, viz: positivism, realism, critical theory, constructivism, and participatory.

According to Lee (2006), the alternative inquiry paradigms compete on three fundamental, but interrelated assumptions thus: Ontology – which refers to the form and nature of the reality that the researcher investigates; Epistemology – explains the relationship between the researcher and that reality; and Methodology – which defines the techniques used by the researcher to examine that reality. These research paradigms are located in a philosophical continuum and that their boundaries continually shift (Abdulkareem, Adel, & Anchor, 2010; Lee, 2006).

Drawing from their different characteristics, the current study adopted realism view. Realism, also known as post – positivism, emphasizes objectivity and assumes that reality is imperfect, and that human intelligence is flawed and situations may not be easily manipulated (Lee, 2006). The methodology was be used to assess process –

oriented and are more concerned with underlying causal tendencies. In addition, the methodology was found appropriate due to the need for large quantitative data that was expected to satisfy the stated study objectives. Moreover, the methodology was equally appropriate for the current study since it allowed situational information to be collected from their natural settings, with an objective of assessing the causative effect of operations strategy on the performance of sugar manufacturing firms in Kenya.

3.2 Research Design

Whereas Kothari (2010) defines research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy with procedure, Onen and Yuko (2009) avers that research design is the overall strategy for conducting the research, chosen to integrate different components of the study in a coherent and logical way, thereby, ensuring that the research problem is effectively addressed. The cardinal role of research design is to minimize the chance of drawing incorrect causal inferences from the data set so collected and analysed (Creswell, 2003). This, in effect, infers that the research design proposed for the current study is a logical task undertaken to ensure that the data collected will enable the researcher to test the above stated hypotheses as unambiguously as possible.

In order to achieve the set objectives, the study adopted descriptive survey research design, and used both quantitative and qualitative methods. Whereas Kombo and Tromp (2009) avow that descriptive research design involve measurement, classification, analysis, comparison and interpretation of data, Kothari (2010) is of the view that descriptive research aims at exploring and describing the state of affairs as it exists. Descriptive research design was hence used to diagnostically determine the frequency with which the study variable constructs occur. It further explored relationships between operations strategies and operations performance in order to facilitate predictions. This was accompanied by narration of facts and characteristics as they were observed.

To generate data for the study, a cross – sectional survey design was used. According to Kothari (2010), a cross – sectional survey involves a collection of quantifiable data by use of structured questionnaire from more than one case at a single point in time about several variables, and is examined for patterns for associations.

3.3 Target Population

Several authors have defined population differently. Whereas Kombo and Tromp (2006) define it as a group of individuals, objects or items from which samples are drawn for measurement, both Kothari (2010); Onen and Yuko (2009) views it as the researchers 'universe'. For a specific study, Kothari (2010) describes population as a collection of all elements under consideration, from which a researcher intends to make inferences. Going by these divers definitions, the target population were all the twelve (12) sugar manufacturing firms registered (table 3.1), and licensed by Kenya Sugar Board as at June 2015, which were equally the unit of analysis for the current study.

3.4 Sample and Sampling Techniques

A sample is a collection of units chosen from the population to represent it (Kombo & Tromp, 2009). The sample was selected in such a way as to ensure that every element in the population was represented in the sample in proportion to their numbers in the population. This ensured that it replicated characteristics of population it purports to represent (Kothari, 2010; Onen & Yuko, 2009). This study followed an argument by Ketema (2015) that it is customary to use informants/respondents (single or multiple) in collecting data about organizational attributes and/or practices. Even though, Patton (2002), as cited in KIM (2009) though argues that sample size depends on what and individual researcher would wish to know, what has credibility, and the degree of accuracy reflected by the level of error that can be tolerated.

The study used both purposive and simple random mixed sampling techniques to get the respondents sample size. According to Kothari (2009), purposive sampling involves a deliberate selection of particular units of the universe to constitute a sample. In addition, Ngumi (2013) notes that purposive sampling applies expert knowledge of the population to select in a non-random manner, a sample of elements that represents a cross-section of the population. Thus purposeful sampling enabled the researcher to select specific respondents who were to provide the most extensive information about the variables under study. In this regard, production managers (n_1 = 12), operations supervisors (n_2 = 35) and finance managers (n_3 = 12) were purposively sampled.

Besides conveniently sampling respondents, a sample of floor workers was drawn through a simple random sampling technique. To determine the sample size of floor workers, the study adopted a formula provided by Nassiuma (2000):

$$n = \frac{Nc^2}{c^2+(N-1)e^2},$$ where n = Sample size, N = Population, c = covariance, while e = standard error.

Nassiuma (2000) further asserts that in most surveys, a coefficient of variation in the range of $21\% \leq C \leq 30\%$ and a standard error in the range $2\% \leq e \leq 5\%$ is usually acceptable. The current study therefore used a coefficient variation of 21% and a standard error of 2%. The lower limits for coefficient of variation and standard error were selected so as to ensure low variability for stability of sample data set, and to minimize the degree of error.

The application of the formula to the category of floor workers gives a total sample size of 99. The sample of respondents per sugar manufacturing firm was obtained by proportionately apportioning a sample size to each firm, and then, respondents were randomly sampled. Table 3.1 represents the sample size of each sugar manufacturing firm distributed proportionately. The overall sample size for the study was one hundred and sixty three ($n_1 + n_2 + n_3 + n_4$ = 163) respondents selected for the study as shown in the table 3.1. However, figures were rounded up for statistical analysis.

A sampling frame for the study comprised a list of twelve sugar manufacturing firms in Kenya, which was used in the selection of a sample (table 3.1). Appendix VI thus provides the list of the entire sugar manufacturing firms in Kenya, sourced from the Kenya Sugar Board website as at December 2015.

Table 3.1: Sampling frame

	Respondents' Category				
Sugar Firm	**Production Manager**	**Operations Supervisors**	**Finance Manager**	**Floor workers**	
				Target	**Sample**
Mumias Sugar Co.	1	4	1	126	14
Nzoia Sugar Co.	1	3	1	108	12
West Kenya Sugar	1	2	1	87	10
Miwani Sugar Co.	1	3	1	89	10
Chemelil Sugar Co.	1	4	1	102	11
Muhoroni Sugar Co.	1	3	1	92	10
Kibos Sugar Co.	1	2	1	56	6
Sony Sugar Co.	1	4	1	82	9
Butali Sugar Co.	1	3	1	45	5
Transmara Sugar Co.	1	3	1	57	7
Sukari Sugar Co.	1	2	1	43	5
Kwale International	1	2	1	39	5
Totals	$\mathbf{n_1 = 12}$	$\mathbf{n_2 = 35}$	$\mathbf{n_3 = 12}$	**926**	$\mathbf{n_4 = 104}$

An analysis of sample respondents by Boyer and Lewis (2012) reveals that most studies collect information from a single manager from within each site. The assumption is that such managers are knowledgeable and have accurate and detailed information regarding operations strategy, decisions areas, and operations performance of the sugar firm. However, collecting data from multiple respondents may allow for an assessment of inter-rater reliability, allows informants to address issues in their areas of expertise and/or scope, as well as reduces common method bias (Boyer & Lewis, 2012; Ketema, 2015). This emphasizes the need to analyse responses from individuals at varied hierarchical levels. The study therefore, sought to collect data from the heads of production unit, finance managers, operations supervisors, as well as floor workers in the production departments of these sugar manufacturing firms, since they are directly responsible for the operations in these sugar firms.

Surveying managers, who help develop the operations strategy and both supervisors and floor workers who apply the strategies in their daily work, provides more insights into the level of strategic consensus within a particular plant (Ketema, 2015). Further, identifying multiple respondents for the study, was a preliminary precaution mechanism to ensure reliability, allows informants to address particular issues in their areas of expertise/or scope, as well as minimize Common Method Variance (CMV) problem.

In addition, the data was further tested for CMV problem before commencing data analysis through exploratory factor analysis (EFA). This helped check whether a single factor or multiple factors account for majority of variance in the measures (Ketema, 2015) of the study variables. According to Ketema, CMV is not a problem if several factors with an Eigen value greater than one are identified in the test. Given this assertion, for each study variable, the study identified several components before extraction, after extraction and after rotation.

3.5 Measurement of Study Variables

Measurement is the process of mapping aspects of a domain onto other aspects of a range according to some rules of correspondent (Kothari, 2009). The measures and their indicators in this study were obtained from extensive review of relevant literature and have been validated in different studies.

Operations strategy is the independent variable (measure by competitive priorities, structural decisions, and infrastructural choices); performance is the dependent variable (measured by effectiveness and efficiency), while leadership styles are the moderating variable. An attempt was made to include several items (a total of 163 items) in the questionnaires that theoretically measure a total of 18 latent constructs. This offers a viable opportunity to create score aggregates to be subjected to EFA to be used to reduce data.

Table 3.2: Summary of measures operationalizing the study variables

Table 3.2a: Measures – Competitive Priorities Dimensions

Construct	Indicator/ Item	Scale	Type of Analyses
Cost	• Manufacturing unit cost • Labour productivity • Inventory turn over • Product distribution	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Delivery	• On-time delivery • Delivery promises • Queuing times • Manufacturing cycle time	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Flexibility	• Variable volume of products • Capacity adjustment • Production design changes • Technology adoption • Product mix	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Quality	• Manufacturing consistency • Solving customer complains • Certification • Environmental concerns	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis

Table 3.2 summarizes the measures operationalizing study variables in each objective, their key indicators, scale of measurement, and the type of analyses used in this study. Competitive priorities were measured by four constructs namely: cost, delivery, flexibility, and quality. Each construct item dimension was measured by at least four indicators as shown in table 3.2.a

The structural decision dimensions were equally measured using four (4) constructs, namely: capacity, process, structure, as well as operations development and improvement. Each construct had at least four measurements indicators. Table 3.2b shows the structural decisions dimensions, its indicators, scale type as well as type of analysis that was performed.

Table 3.2b: Measures – Structural Decisions Dimensions

Construct	Indicator / Item	Scale	Type of Analyses
Capacity	• Scale of production • Size of stores and sites • Location of operations • Physical plants	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Process	• Degree of automation • Routine activities • Technology capacity • Connectivity	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Structure	• Hierarchy of authority • Division of labour • Rules and procedures • Planning	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Operations Development and improvement	• Improvements • Benchmarking • Learning process	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis

Infrastructural choices were measured by four (4) constructs, namely: work – force, policies, communication, and innovations. Each construct dimension was measured by four indicators. Table 3.2c shows the infrastructural choices constructs, their indicators, scale of measurement, as well as type of analyses used.

Table 3.2c: Measures – Infrastructural Choices Dimensions

Construct	Indicator/ Item	Scale	Type of Analyses
Work force	• Labour motivation • Competence • Worker safety • Development programs	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Policies	• Rules and regulations • Procedures • Standard practices • Grades	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Communication	• Level of connectivity • Organization structure • Monitoring performance • Access to information	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Innovations	• Computer Aided Design • Refining processes • Manufacturing systems • Design errors	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis

The study performance was measured by use of OPMM, as a strategic management system performance measure, whose constructs were efficiency and effectiveness. The performance variable was measured by a total of seven (7) measurement items. Table 3.2d shows the performance constructs, measurement indicators, scale of measurement, and type of analyses.

Table 3.2d: Measures – Operations Performance Dimensions

Construct	Indicator	Scale	Type of Analyses
Efficiency	• Productivity • Equipment utilization • Production schedule • Process management	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis
Effectiveness	• Quality • Volume of output • Timeliness	Ratio	○ Frequency analysis ○ Exploratory factor analysis ○ OLS Regression Analysis

The study explored leadership styles as a moderating variable and adopted situational leadership theory, with four styles, namely: directive, participative, supportive, and achievement – oriented. The leadership variable was measured by a total of fifteen (15) measurement items as shown in table 3.2e.

Table 3.2e: Measures – Leadership Styles Dimensions

Construct	Indicator	Scale	Type of Analyses
Directing	• Expectations • Directives • Rules and policies • Explanations	Interval	○ Frequency analysis ○ Exploratory factor analysis ○ Correlation Analysis ○ Regression Analysis
Participative	• Consultations • Active listening • Suggestion	Interval	○ Frequency analysis ○ Exploratory factor analysis ○ Correlation Analysis ○ Regression Analysis
Supportive	• Friendly relationships • Group cohesion • Offer help • Sensitive to needs	Interval	○ Frequency analysis ○ Exploratory factor analysis ○ Correlation Analysis ○ Regression Analysis
Achievement – Oriented	• Expectations • Goal setting • Improvements • Trust	Interval	○ Frequency analysis ○ Exploratory factor analysis ○ Correlation Analysis ○ Regression Analysis

3.6 Data Collection Method and Instruments

This study collected both primary and secondary data and utilized both quantitative and qualitative approaches. According to Coopers and Schindler (2013), quantitative data is one that describes data distribution by use of numerical, while qualitative data is one that is organized according to emerging themes. The study considered it critical to use both as one is insufficient on its own to capture all trends for the study.

Whereas primary data is a first – hand information collected from the field by the researcher purposefully for the study at hand, secondary data however, is a data set already collected and compiled by other party (ies) or agencies related to the area of study and or study variables. Secondary data is categorized into two main sources – internal and external (Kothari, 20100. The study equally used external sources of data as a way to validate and supplement the primary data that was collected for analysis. The researcher reviewed relevant literature on study variables from business strategy and operations books and journals, Kenya Sugar Board publications on the individual firms' performance, Sugar sector Strategic Plans (SSP), individual sugar firm's production schedules for the last five years, and other relevant documents from authoritative sources on the topic and variables under study. This facilitated validation of past results on the study variables. Primary data was collected by use of structured questionnaires, structured interview schedules. Structured questionnaire were administered to operations supervisors as well as floor works, while interview schedule was administered to both the production and finance managers, while relevant documents of individual company were perused through to extract the relevant information to validate the information for the study.

3.6.1 Questionnaire

Structured questionnaire (Appendix II) with guidance and options provided for the answer was the principal tool for collecting primary data from the targeted respondents for this study. The use of questionnaire was guided by nature of data to be collected as well as the objectives of the study. Given the purpose of the study, the researcher was mainly concerned with views, opinions, perceptions, feelings and / or attitudes of the respondents. Such kind of information can only be objectively collected by use of questionnaires (Onen & Yuko, 2009; Kothari, 2007). Further, Kothari (2010) conjectures that questionnaires are free from bias of the interviewer, cost effective and time saving since they can be used to gather targeted voluminous information from the respondents within a short time. In addition, the respondents for the current study were considered literate so they had no problem of responding to questionnaire items.

The entire questionnaire items had fixed – response alternatives, requiring the respondents to select from the stated options, located using five – point Likert type scale. The intent of the Likert scale is that the statement represents different aspects of the same attitude (Allen & Seaman, 2007). The respondents were required to indicate the extent of their perception of various questionnaire items along the slanting Likert scale.

Moreover, Ward, McCreey, Ritzman and Sharma (2008) aver that likert scales that require the respondents to provide a relative assessment on a continuum are commonly used for collecting primary data in empirical operations strategy research, and allows for relative measurement of multiple items combined as summated scales. In addition, regardless of what construct they are meant to address, Ward *et al.* (2008) argue that likert scale allows multiple study measurement items to be combined, thus allowing more confidence in the estimation of the underlying construct.

The questionnaire was divided into three parts. The first part is demographic data seeking background information about the respondents and the sugar firms. The second part is divided into four sections, each with sets of question items relating to the relevant study variables i.e. independent variables – competitive priorities, structural decisions, and infrastructural choices, and moderating variable – leadership styles. The third part had a set of question items soliciting answers relating to operations performance (Dependent Variable). A 'drop and pick' technique was used to administer the questionnaires. Likert scale response categories were strongly agree (**SA**), agree (**A**), neutral (**N**), disagree (**D**) and strongly disagree (**SD**).

3.6.2 Interview Guide

An interview guide is an outline of closed and open ended questions that form a basis for and guides the interviewing process; it provides a structure that aids in obtaining the necessary information (Kothari, 2010). Since an interview is an oral exchange between the interviewer and the interviewee, it provided an option of elaborating or clarifying items after they were presented. The study used a semi – structured set of predetermined questions and of highly standardised techniques of recording while administering personal interviews with both operations and finance managers (Appendix III).

3.7 Data Collection Procedure

Before going to the field to collect actual data for the study, the researcher, through the director of the study centre, applied to the National Council of Science, Technology and Innovations (NACOSTI) for a research authorization and permits to collect data from the sugar firms in Kenya (Appendices I, XXII and XXIII). The researcher then visited sugar firms and formally requested the respondents, through their respective Human Resource office of the firm to participate in the study.

With the help of departmental heads of respective sugar firm, the researcher scheduled for appointments with the prospective respondents, specifying the date and time of data collection. The researcher administered the questionnaires in person, and in two occasions, with the help of qualified research assistants who had been trained on handling data collection.

3.8 Pilot Test

Pilot testing was done prior to carrying out the actual research in order to ensure that the research tools developed for use in the research are suitable in their content, and that the respondents are interpreting the questions in a manner intended by providing proxy data for a selection of a probability sample (Coopers & Schindler, 2013; Kothari, 2010).

Data collection instruments were pre-tested on a pilot survey targeting respondents from two sugar firms, but which were not included in the actual study. Both Kothari (2010) and Mugenda and Mugenda (2003) advise that the number of pre-tested firms should be small, about 1% - 10 % of the target population. The responses obtained from the pilot study were used to determine the validity and reliability of the questionnaire of which the relevant amendments were made to the questionnaire items before administering it to the actual study respondents. The purpose of pilot study was to test reliability and validity of the study instruments to ensure that the tools measure what they were supposed to measure. The researcher, therefore, was able to refine the data collection instruments accordingly.

3.8.1 Reliability of Research Instruments

Reliability refers to the degree of consistency between two measures of the same thing (O'Connor, 2011). It measures the degree of accuracy in the measurements an instrument provides. Reliability hence ensures that the research instrument can be replicated, but still generate similar data when used by independent researchers in a different study. To ensure reliability, questionnaire was piloted in two similar sugar firms that were not included in the study to improve their validity and reliability coefficients. This helped to check the suitability and clarity of the questions of the instrument designed, relevance and comprehension of the information being sought, the language used, logic and content validity of the instruments from the responses given. Items that were either unclear or ambiguous were rephrased accordingly.

The study utilized Likert – type scales. From the piloted responses, using Statistical Package for Social Scientists (SPSS) version 21, Cronbach Alpha coefficients were calculated on the study variable items to determine construct reliability. Mathematically, if there are ***p*** sub-items used, Cronbach Alpha coefficient (α) is calculated thus:

$$\alpha = \frac{p}{p-1}\left(\frac{S_t^2 - \Sigma s_i^2}{S_t^2}\right)$$

where S_t^2 is the variance of the scores for the summation of the individual sub-items and ΣS_i^2 is the sum of the variance of individual items. The Alpha coefficient can take any value from zero (shows that no internal consistency) to one (complete internal consistency). In this case, as Coopers and Schindler (2013); Kothari (2010); Ketema (2009) and Sekaran (2003) advice, the Cronbach Alpha coefficient of the sub – items is expected to yield an acceptable minimum coefficient value of 0.7. Items failing to satisfy this condition were dropped from the scale. In addition, all the Cronbach Alpha coefficients calculated for the items were found to be above the minimum acceptable threshold of 0.70, which ensured construct reliability. Accordingly, table 3.4 shows the Cronbach Alpha coefficient values of the various study variables.

Table 3.3 shows the reliability indices from the pilot study. From the pilot study reliability statistics, all the variables met the minimum reliability threshold, hence was conclude that the instruments were sufficiently reliable for the study.

Table 3.3: Pilot Study Reliability Indices

Piloted study variables	Cronbach's Alpha	N of Items
Performance	.875	9
Competitive Priorities	.934	16
Structural Decisions	.917	16
Infrastructural Choices	.936	18
Leadership Styles	.818	15

3.8.2 Validity of Research Instruments

Validity is a measure of accuracy of the research instrument. In addition, Kombo and Tromp (2007) as well as Kothari (2007) assert that validity is the extent to which a research instrument actually measures what it is supposed to measure. In this study, the questionnaire items were guided by the conceptual framework constructs (figure 2.1) in order to measure operations strategy, operations performance and leadership styles. Moreover, Ketema (2009) advises that to assure validity, the construct measures and their indicators be taken from several conceptual and empirical literatures, as the current study had done, evidenced from various cited sources.

Content validity ensures that the questionnaires items are as representative of the study variables under study that are to be measured. To attain content validity, the research instrument scales were built on the basis of prior literatures, which were validated in different empirical studies. Moreover, the questionnaires were given to two research experts to evaluate the relevance of each item in the instruments to the study objectives. The experts were expected to rate each item on a four – point slanting scale: very relevant (4), quiet relevant (3), somewhat relevant (2), and not relevant (1). The content validity hence was determined using Content Validity Index (CVI).

Mathematically, C.V.I was determined as thus:

$C.V.I = \frac{n_{3/4}}{N}$, where:

$n_{3/4}$ were items rated 3 or 4 by both experts, and N is the total number of items in the

questionnaire. The C. V. I was expected to yield a minimum acceptable index of 0.8, and those questionnaire items that did not meet the criterion were either restructured or dropped from the questionnaire. The results were then used to fine – tune the questionnaire items to ensure that the instruments measured as accurately as possible the salient research characteristics that they were intended to measure (Onen & Yuko, 2009; Kombo & Tromp, 2007). Consequently, the CVI index of the pilot study instrument yielded an index of 0.867, which was considered sufficient.

To ensure both construct and convergent validity, the study used factor loadings. The factor loadings analyses sought to extract the least number of factors that accounted for the common variance of a set of variables and showed by how much the co-variation among the observed variables each one accounted for. According to Hair, Black, Babin, Anderson, and Tathan (2010), factor loadings greater than 0.3 are considered to meet the minimum acceptable level. Loadings of 0.40 are considered more important, while factor loadings of 0.50 or more are considered highly significant. Hence the least factor loading thresh-hold expected was 0.4. From the analyses, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy test of study measurement items were above the recommended minimum index of 0.5. Table 3.3 shows a summary of the KMO Measure of Sampling Adequacy test indices.

Table 3.4: KMO Measure of Sampling Adequacy test

Variable	KMO test index
Performance	0.710
Competitive Priorities	0.762
Structural Decisions	0.738
Infrastructural Choices	0.811
Leadership Styles	0.781

Discriminant validity as a measure of the "degree' or the "extent" to which a measurement items are different from others was used to determine whether there exists inter – correlations among the study items (Ketema, 2015). From the individual inter – item correlations as presented in different sections of the variable analyses, the correlations were found to fall below the 0.7, which showed that the constructs had less than half their variance in common.

3.8.3 Diagnostic Tests

The proposed regression model assumed the following: to be linear in the parameters though may not be linear in the variables; the explanatory values are independent of the error term; Homoscedasticity or constant variance. (The variance of the error term is the same regardless of the value of explanatory variables); There is no autocorrelation between two explanatory values; Normality; no or little multicollinearity. When these assumptions are violated, the study results are likely to give biased estimates of the parameters (Gujarati, 2014; Fairchild & MacKinnon (2010). Following these assumptions, the study conducted linearity, normality, homoscedasticity; autocorrelation, multicollinearity tests, as well as models specifications to establish the validity of the model and to enable the researcher draw meaningful conclusions:

3.8.3.1 Linearity test

Linearity means that the mean values of the outcome variable for each increment of the predictor(s) lie along the linear regression line. The multiple regression proposed can only be an accurate estimate of the relationship between manufacturing performance and operations strategy variables if the relationships are linear in nature.

3.8.3.2 Normality test

The distribution of occurrence for the variables was tested for normality within the regression analysis through statistical analysis generated by the SPSS version 21. The classical linear regression model assumes that each of the errors is normally distributed along a regression line with a mean of zero and a unit variance (Field, 2003). The current study ran Shapiro – Wilk tests. This test is considered by However, Doan and Seward (2011) as a more robust normality test. Conducting analysis on non-normally distributed data set can lead to incorrect results (Ketema, 2009; Gujarati, 2014; Field, 2003). According to Ketema, the Shapiro - Wilk test compares the cumulative distribution function for variables within a specified distribution. For a normally distributed data, the Shapiro – Wilk significance value should be greater than the level of significance, $\alpha = 0.05$. According to Field (2003), a non – significant Shapiro – Wilk test ($\rho > 0.05$) indicates that the distribution is probably normal, whereas when the test is significant ($\rho < 0.05$), it indicates a deviation from normality.

3.8.3.3 Homoscedasticity test

Homoscedasticity means that the variance of errors is the same across all levels of the independent variables. According to Field (2003), heteroscedasticity can lead to serious distortion of findings and hence can weaken the analysis thus increasing the possibility of a Type I error. The problem of heteroscedasticity was minimized (and where possible eliminated) by ensuring normality of data used in hypothesis testing, and that the right functional forms of regression model was adopted.

3.8.3.4 Autocorrelation test

Gujarati (2014) defines autocorrelation as a correlation between explanatory variables residuals. Testing for autocorrelation helped show the distribution of disturbance (errors). The study conducted an autocorrelation analysis using Durbin-Watson ***d*** test defined mathematically by:

$$\boldsymbol{d} = \frac{\sum_{t=2}^{t=n}\left(\epsilon_{t-}\ \epsilon_{t-1}\right)^2}{\sum_{t=1}^{t=n}\epsilon_t^2},$$ where $\in$ refers to error term, while t-1 means that one

observation is lost when taking successive differences.

Durbin-Watson ***d*** test assumes that the variance of the error term is homoscedastic. Both Gujarati (2014) and Field (2003) argue that as a general rule, Durbin-Watson statistic varies between zero and four, with the values below one and above three is a cause for alarm. However, Gujarati argues that Durbin-Watson statistic preferably need to be two (2) as an indication of absence of autocorrelation, for a better prediction of the regression model.

3.8.3.5 Multicollinearity

Multicollinearity refers to a situation where there is a strong correlation among the explanatory variables in a multiple regression model (Andren, 2012; Field, 2003). In addition, Field (2003) further intones that low level of collinearity poses little threat to the model, but as collinearity increases so do standard errors of the $\boldsymbol{\beta}$ coefficients, thereby increasing the probability of a good predictor variables to be found statistically insignificant and hence can be rejected from the model (a type II error), leading to unstable predictor equations.

To test multicollinearity, correlation matrix, Variance Inflation Factor (VIF) and Tolerance were generated. Field (2003) advises that very high correlations (above 0.90) indicate the presence collinearity. However, the correlation matrix misses more subtle forms of multicollinearity. The study hence generated VIF, Tolerance and Eigenvalues. Mathematically, VIF is mathematically determined thus $\frac{1}{1-R^2}$. Further, Gujarati (2004)

argues that as a rule of the thump, the closer the tolerance is to one, the greater the evidence that the variable is not collinear with other repressors. Field (2003) acknowledges that there is no hard and fast rules about what value of VIF should be to cause concern, but suggests that any VIF value substantially above 1 may indicate the presence of multicollinearity, which may be biasing the regression model. The presence of multicollinearity indicates that one variable can successfully predict an outcome of another variable. In addition, presence of multicollinearity is indicated by a tolerance of less than 0.1.

3.8.3.6 Model Specification

According to Gujarati (2014), model specification errors occur when a relevant variable has been omitted from the model, unnecessary variables have been included in the model, wrong functional form of model has been adopted, or a presence of errors of measurements. Through the critical review of the relevant literature on the study variables leading to the development of the conceptual framework (figure 2.1), some of these errors have been addressed. The study conducted the Durbin-Watson ***d*** tests, ***F*** tests and R^2 in order to obtain a fit for the study since the p-value was significant at 5% level of confidence. Further, Gujarati (2014) intones that if both Durbin-Watson ***d*** and F-values are highly significant, it may indicate that the model is mis-specified.

The study assumed a multiple linear relationship among the study constructs, and was expected to follow a generic regression model in the form:

$$OP = \beta_0 + \beta_1 \mathbf{CP} + \beta_2 \mathbf{SD} + \beta_3 \mathbf{IFC} + \varepsilon_I \ldots\ldots\ldots\ldots\ldots\ldots \textit{Equation 3.1}$$

Where: OP = dependent variable (Operations Performance).

β_0 = the value of OP when independent variables are zero.

β_{1-3} = Regression coefficients for each explanatory variable.

CP = Competitive Priorities

SD = Structural Decisions

IFC = Infrastructural Choices

LS = Leadership Styles

ε = Error term.

3.9 Data Processing, Analysis and Presentation

Data analysis relates to how gathered data is managed to achieve the objective of the research study. According to Kombo and Tromp (2007), data analysis involves scrutinizing the acquired information and making inferences. Collected data was processed and analyzed using IBM's SPSS version 21 and, while Microsoft Excel 2010 was used to generate various means to facilitate generation of statistics inferentially.

Upon collection, data was cleaned by editing to ensure accuracy, uniformity, completeness, consistency. Data was then coded by assigning unique identifiers to aid its traceability, then entered in the Statistical Package for Social Sciences (SPSS) version 21.0 software prepared data base for analysis. This software is ideal for its analytical superiority, availability and the ability to handle large quantity of data (Field, 2003). The

SPSS database was designed based on the pre-coded questionnaires sub-themes. The responses of each identified questionnaire items were keyed into the prepared database. Results of data analysis are presented in frequency distribution tables in chapter four. The study generated both quantitative and qualitative data.

3.9.1 Quantitative Data Analysis

Quantitative data collected was analyzed by use of both descriptive and inferential statistics to determine trends and to enable comparisons among the study variables in order to make deductions; interpretations; conclusions; and possible recommendations. Quantitative data were elicited from the structured, closed-ended questions in the questionnaire where frequencies and percentages of distributions, as well as mean scores and standard deviations were computed, evaluated and then ranked to give relative importance of each of the explanatory variables. Inferentially, a two-tail hypotheses test was calculated to test each of the five study hypotheses in order to address specific variables as summarized in Table 3.2, at $\alpha = 0.05$ level of significance with significant differences recorded at $p < 0.05$.

For comparison purposes, the key variable factors were identified using confirmatory factor analysis. This helped in checking dimensionality of the scale. Using exploratory factor analysis, the number of components to extract was determined using the Eigen values, which were expected to be greater than one (Fields, 2003). Factor loadings were set at 0.4 and used Principal Component Analysis (PCA) method to extract the factors.

3.9.2 Qualitative Data Analysis

Qualitative data gives information on responses, opinions and feelings, while quantitative data gathers information related to degrees and levels of operations strategies. Qualitative data collected was condensed by editing, paraphrasing, and summarized in order to derive meaning from it. Qualitative data collected was organized according to themes and patterns of occurrence derived from the five objectives of the study. It was analysed using content analysis technique. This was necessitated since the data was collected by use of open ended questions in the interview schedule (Hsieh & Shannon, 2005).

The qualitative data responses through semi – structured interview schedule were analyzed through expert judgment, scenario mapping and critical thinking. This, according to Kosikoh (2014), involves reading through the questionnaires, developing codes, coding the data, and drawing connections amongst various discrete pieces of data. The qualitative data analysed was brief and was obtained from few production documents and additional comments given by both production and finance managers in the interview schedule.

3.9.3 Data Presentation

Analysed data was presented using tables, equations and texts. Tables were used to present descriptive data, while equations were used to present inferential statistics. Explanations and discussions of both descriptive and inferential statistics was done using texts.

3.9.4 Hypothesis Testing

The stated hypotheses were analyzed in their null form through Hierarchical Regression Analysis, correlation analysis, and moderated multiple regression analysis:

i. Hierarchical Regression Analysis

To assess the direct effect of competitive priorities, structural decisions and infrastructural choices on the operations performance of sugar manufacturing firms in Kenya as stated in the objectives (1), (2), (3), (4) and (5), the study utilized hierarchical regression analysis. As more variables are added to the regression equation, the hierarchical regression analysis is able to conduct sensitivity analysis. The slopes of the equations were used to determine which operations strategy had a greater influence on the performance of the sugar manufacturing firms.

The regression coefficients were extracted using ordinary least square (OLS) method. The extracted coefficients were tested for their significance at α = 5% significance level using two – tailed ***t***-test. The significance of the overall model fit was tested using the adjusted coefficient of determination (R^2) and ***F- test***. According to Gujarati (2014), an adjusted R^2 is preferred given that it gives a better estimate of the model than R^2 which tends to give an overly optimistic picture of the fit of the regression. A Steins' formula which shows how well the model cross-validates is given by:

$$adjusted\ R^2 = 1 - \left\{\left(\frac{n-1}{n-k-1}\right)\left(\frac{n-2}{n-k-2}\right)\left(\frac{n+1}{n}\right)\right\}(1-R^2),$$ where: R^2 is the unadjusted values, ***n*** is the number of subjects, and ***k*** is the number of predictors in the model (Field, 2003). In addition, the value of F – statistic shall be calculated mathematically as thus:

$$F = \frac{\frac{R^2}{(K-1)}}{\frac{1-R^2}{(n-k)}}$$, and compare with the critical value $F_\alpha(k-1, n-k)$; where α, k, n represent the level of significance, the number of parameters to be estimated, and the number of observations respectively. Where calculated F was greater than the critical F, the study rejected the *null* hypothesis and concluded that the overall model is significant.

ii. Correlation Analysis

A correlation analysis was used to examine the relationship among the study constructs of the study variables. The correlation coefficient was computed to determine the nature and strength of the relationship (if any) that exists among the study variables. The value of R^2 generated for each study objective indicated the level of variation on performance as accounted for by each study variable.

iii. Moderated Multiple Regression Analysis (MMRA)

The hypothesis in objective six was tested by assessing the significance of the interaction of the moderating variable (leadership styles) on the relationship between the independent variables (operations strategies) in explaining the dependent variable (Performance), through MMRA. Each individual β was tested for significance at 95% confidence level using a two tailed ***t-test***. The overall significance of the moderation model was tested using R^2 change which indicates the change in variations explained by the introduction of the interactive variable (Frazier *et al*., 2014; Fairchild & MacKinnon, 2010).

The MMR model was conceptualized by a combined multiple regression model in the form:

$$OP = \beta_0 + \beta_1 CP + \beta_2 SD + \beta_3 IFC + \beta_4 \mathbf{Z} + \beta_5 \mathbf{Z} * CP + \beta_6 \mathbf{Z} * SD + \beta_7 \mathbf{Z} * IF + \varepsilon_i \ldots\ldots Equation\ 3.2\ (Conceptualized\ MMR\ Equation)$$

where **Z** is the corresponding coefficients of the moderating variable. Table 3.3 shows a summary of the hypothesis testing framework highlighting the hypothesis test and the decision rule and the model used.

Table 3.5: Hypothesis Testing Framework

	Null Hypothesis	Hypothesis test	Decision Rule and Model
H_{01}	There is no statistical significance relationship between Competitive priorities and performance of sugar manufacturing sector in Kenya.	Karl Pearson's zero order Coefficient of correlation (Beta test). $H_0 : \beta_1 = 0$ $H_1: \beta_1 \neq 0$ To conduct a t - test to determine individual significance of the relationship. To conduct an F - test (ANOVA test) to assess overall robustness and significance of the simple regression model.	Reject H_{01} if p-value $<\alpha$ and confirm the alternative hypothesis $MP = \beta_0+\beta_1CP + \varepsilon$
H_{02}	There is no significant relationship between Structural decisions and performance of sugar manufacturing sector in Kenya.	Karl Pearson's zero order Coefficient of correlation (Beta test). $H0 : \beta_2 = 0$ $H1: \beta_2 \neq 0$ To conduct a t - test to determine individual significance of the relationship. To conduct an F - test (ANOVA test) to assess overall robustness and significance of the simple regression model.	Reject H_{02} if p-value $<\alpha$ and confirm the alternative hypothesis $MP = \beta_0+\beta_2SD + \varepsilon$
H_{03}	There is no statistical relationship between Infrastructural choices and operations performance of sugar manufacturing sector in Kenya.	Karl Pearson's zero order Coefficient of correlation (Beta test). $H0 : \beta_3 = 0$ $H1: \beta_3 \neq 0$ To conduct a t - test to determine individual significance of the relationship. To conduct an F - test (ANOVA test) to assess overall robustness and significance of the simple regression model.	Reject H_{03} if p-value $<\alpha$ and confirm the alternative hypothesis $MP = \beta_0+\beta_3IFC + \varepsilon$

		Karl Pearson's zero order	
H_{04}	There is no significant effect of leadership style on the performance of sugar manufacturing sector in Kenya.	Coefficient of correlation (Beta test). H0 : $\beta_4 = 0$ H1: $\beta_4 \neq 0$ To conduct a t - test to determine individual significance of the relationship. To conduct an F - test (ANOVA test) to assess overall robustness and significance of the simple regression model.	Reject H_{04} if p-value $<\alpha$ and confirm the alternative hypothesis $OP = \beta_0 + \beta_4 LS + \varepsilon$
H_{05}	There is no significant effect of operations strategies on the performance of sugar manufacturing sector in Kenya	Karl Pearson's zero order Coefficient of correlation (Beta test). H0 : $\beta_4 = 0$ H1: $\beta_4 \neq 0$ To conduct a t - test to determine individual significance of the relationship. To conduct an F - test (ANOVA test) to assess overall robustness and significance of the simple regression model.	Reject H_{05} if p-value $<\alpha$ and confirm the alternative hypothesis $P = \beta_0 + \beta_4 OP + \varepsilon$
H_{06}	Leadership style has no significant effect on the relationship between operations strategies and performance of sugar manufacturing firms in Kenya.	To conduct a t - test to determine individual significance of the relationship. To conduct an F - test (ANOVA test) to assess overall robustness and significance of the simple regression model. To conduct a MMR analysis to determine effect of a moderator	$OP = \beta_0 + \beta_1 CP + \beta_2 SD + \beta_3 IFC +$

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter describes data analysis, interpretation, and discussions of patterns on the study variables covered in the conceptual framework (Figure 1.1) under the following sub-headings: Effect of competitive priorities on performance, Effect of structural decisions on the performance, Effect of infrastructural choices on performance, Effect of operations strategies on performance, Effect of leadership styles on performance, and the effect of leadership styles on the relationship between operations strategy and the performance. In each case, descriptive statistics, EFA, Correlation results as well as regression analysis of the study variables are presented and discussed.

4.2 Preliminary Study

A pilot survey was conducted among fourteen (14) respondents in two sugar manufacturing firms in December, 2016, in order to test reliability and validity of the research instruments. A structured questionnaire and interview schedule were both used to collect primary data from the two firms. Upon attaining the completed questionnaires, several modifications to the questions were made to remove ambiguities and enhance clarity. From the pilot study, a "neutral" point was noted in a number of likert – scale structured questions.

According to Churchill and Iacobucci (2005), most researchers endorse that the fence – sitter respondent who do not know an answer nor has no opinion should be allowed to state as much. Thus the "neutral" category was included in the questionnaire to secure stability of response. In addition, some responses, for whatever reason, left some questions unanswered. Such questions were identified, and while setting up SPSS database, a unique number (99) was used to identify them.

4.3 Response level, Data coding and Cleaning

The population comprised all the twelve sugar manufacturing firms registered in Kenya within the last five years. Although the study had intended to collect data from a sample of 165 respondents, data was successfully obtained from 131 of them (Table 4.1). This represents a response rate of 79.4 percent of the target population. A study by Boyer and Lewis (2002) found a return rate of 40.6 percent, while a study by Malaba, Ogolla, and Mburu (2014) had a return rate of 74.5 percent. Comparatively a return rate of 79.4 percent was considered good enough to validate the current study results, which surpasses the 10 percent of the total population as recommended by Kothari (2010). The return rate of 79.4 percent was attributed to the use of self-administered questionnaires. In addition, the respondents were equally guaranteed confidentiality of the information offered.

Table 4.1: Data Response Rate

Sampled	Responded	Response Rate (%)
165	131	79.4

Upon collection, the data was coded and then cleaned through extensive checks for consistency, after which descriptive and inferential statistics were generated by use of SPSS version 21.0 software. Upon obtaining data from the field, it is logical to assess and prepare the data for different kinds of analyses, and as Ketema (2015) argues, for accuracy purposes, it is important to test the quality of the data before conducting extensive advanced analyses.

Accordingly, the responses in the individual questionnaires were cleaned, coded and entered in the SPSS version 21.0 software pre-pared database, checked for data entry errors, and examined for the accuracy and validity of the assumptions of normality

(Gujarati, 2014; Butt, 2009; Field, 2003), in order to facilitate quantitative analysis. Following this, additional statistical tests were made such as checking the data for non-response bias, normality, common method bias, linearity and independence as well as reliability and validity of the study measurement items. The procedures followed and resultant statistics obtained are presented in the following sections.

4.4 Demographic Profile of Respondents

The study explored the demographic data of the valid respondents by analyzing their experience and academic qualifications. To assess the level of work experience, the study required the respondent to indicate on a continuum how long they had worked in the organization. The study assumed that experience gained through extended working period injects high level and yet competencies necessary in carrying out ones duties (Abdulkareem, *et al.,* 2010). The study results are represented in table 4.2.

Table 4.2: How long have you worked in this organization

		Frequency	Percent	Cumulative Percent
Valid	Less than 1 year	9	6.9	6.9
	1 - 5 years	32	24.4	31.3
	6 - 10 years	43	32.8	64.1
	Over 10 years	47	35.9	100.0
	Total	131	100.0	

The level of work experience as illustrated in table 4.2 indicates that 9 (6.9 percent) had worked in their current organization in less than a year, 32 (24.4 percent) had worked between one and five years, 43 (32.8 percent) had worked for between six and ten years, while 47 (35.9 percent) had worked for over ten years. This implies that an accumulation of 68.7 percent of the respondents were found to have gained the necessary competences embedded in skills, knowledge and experience as key to competitive advantage.

From the strategic perspective, the competencies gained through time are contingent of function, routines and processes in an organization. At one instance, the researcher came across one manager who confessed to have had a twenty (20) years' experience working with one of the firm, twelve of which in the same position. The manager indicated that he had mastered the routines "mentally" and needed no reminder of what to do and when to do it. This level of experience was assumed to have led to the development of critical path routines that contributed to the success of the system.

To assess the experience attained so far in developing and following routines at the same work station, going through similar processes through time, the respondents were required to indicate the period worked at their current station then. The item results were recorded in table 4.3.

Table 4.3: For how long have you worked at the current position?

		Frequency	Valid Percent	Cumulative Percent
Valid	Less than 3 year	23	17.6	17.6
	4 -6 years	36	27.5	45.0
	7-9 years	30	22.9	67.9
	Above 10 years	42	32.1	100.0
	Total	131	100.0	

From the study results to determine the experience of respondents in their current position, 23 (17.6 %) of respondents had worked for less than three years, 36 (27.5 %) had worked between four and six years, 30 (22.9%) had worked between seven and nine years, while the majority 42 (32.1%) had worked at their current position. These study findings confirms conclusions by Katema (2015); Bhargava and Anbazhagan (2014), and Abdulkareem *et al*. (2010) that respondents with a high working experience have the technical knowledge that assists in providing reliable data on the study problem under investigation.

This indicates that on average, an accumulation of 93.1 percent had prerequisite experience and thus understood technical issues on the variables under study. In assessing the level of experience both at organizational level and the current position, these study findings are consistent with the Resource Based View theory which in this case, would view these intangible resources as specific to individual firms.

In order to determine the academic qualification attained, the respondents were required to indicate their level of formal qualifications attained. The results of the measurement item were as presented in table 4.4.

Table 4.4: What is the highest academic qualification attained so far

		Frequency	Valid Percent	Cumulative Percent
Valid	Certificate	9	6.9	6.9
	Diploma	49	37.4	44.3
	Bachelors	54	41.2	85.5
	Masters	19	14.5	100.0
	Total	131	100.0	

From the table, 9 (6.9%) of the valid respondents had Certificate qualification, 49 (37. 4%) had Diploma, 54 (41.2%) had Bachelor degree, while 19 (14.5%) had Masters Degree qualification. None of the respondents had a doctorate qualification. This indicates that the target respondents had adequate technical knowledge and skills on the study problem. The study considered this a prerequisite to provide reliable information on the study variables.

However, several managers could not appreciate the link between higher academic qualification and general performance of the firm. From the interviews, a production manager indicated that all that the production process needs is "hands on" experience to perform. This however contradicted several studies that positively associate higher qualification with better performance (Ketema, 2015; Odollo, 2015; Bhargava & Anbazhagan, 2014).

4.5 Analysis of Study Variables

This section presents analyses results of the study variables organized according to the study objectives. The section presents descriptive study results, diagnostic tests, as well as correlation and regression analyses. The Independent variable - operations strategies – was operationalized by competitive priorities, structural decisions and infrastructural choices. In the study, performance was the dependent variable, while leadership styles were hypothesized to moderate the relationship between operations strategies and performance.

4.5.1 Performance

Operations performance was assessed using two constructs, namely: efficiency and effectiveness. Each of the construct was measured by four indicators as presented in table 3.3.1. The two construct measurement items were later subjected to exploratory factor analysis. The next section outlines descriptive statistics for performance variable.

4.5.1.1 Descriptive Statistics for Performance measurement Items

The respondents were required to select the option that best described their feelings on the stated performance indicator items. Frequencies, expressed as a percentage of the sample, were used to explain the number of times the respondents (dis)agreed with the hypothesized state. Descriptive statistics were generated for each performance construct. The study sought to assess how best the presented study statements described the efficiency of the sugar manufacturing system. The performance indicators were measured on a five-point Likert scale, where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, while 5 = Strongly Agree. Table 4.5 shows descriptive statistics results for performance measures.

Table 4.5: Descriptive statistics for Efficiency and Effectiveness items

Efficiency Items	**Mean**	**S. D**
The process procedures improve efficiency	4.26	0.55
Employees productivity is much higher that the industry average	3.50	1.15
The firm regularly improves internal operations processes	3.95	0.81
Key Performance Metrics are reviewed frequently	3.89	0.93
Impediments that hold up progress are resolved on time	3.63	1.12
Effectiveness Items		
Scale of operation is sufficient to produce the required volume	3.82	1.02
Operations maintain flexibility while increasing accountability	3.65	1.06
The activities are undertaken as scheduled	3.71	1.12
Sugar products meet prescribed quality standards	4.25	0.47

Means: 1 – 1.8 = **SD**, 1.9 – 2.7 = **D**, 2.8 – 3.3 = **N**, 3.4 – 4.2 = A, Above 4.2 = **SA**
SD *=Strongly Disagree,* ***D*** *=Disagree,* ***N*** *= Neutral,* ***A*** *= Agree,* ***SA*** *=Strongly Agree*

From table 4.5 on the assessment of the extent to which the production procedures improve efficiency, the item had a mean of 4.26 with standard deviation of 0.55. To determine the productivity of employees', the item averaging at 3.50 and a standard deviation of 1.15. In addition, to explore if an individual firm regularly improves internal operations processes, the item had a mean response of 3.95 with standard deviation of 0.81, while to explore if Key Performance Metrics are reviewed frequently, the item had a mean response of 3.89 with a standard deviation of 0.93.

The study results revealed that all the efficiency indicators had a mean greater than 3.2, about which the respondents generally agreed and is an indication that the efficiency measurement items listed are of considerable importance (Abdulkareem *et al.,* 2010). To assess how best the presented study statements described the effectiveness of the sugar manufacturing system, the study results equally revealed means of 3.82, 3.65, 3.71, and 4.25, all of which are above 3.2. This further proves the respondents generally agreed that the effectiveness measurement items were of considerable importance.

4.5.1.2 Diagnostic Tests

This section contains various diagnostic tests performed on the performance measurement items of the research instrument before actual inferential analyses were done of the study variables.

Normality test

The distribution of each measurement item was examined by conducting Shapiro – Wilk test for normality distribution as shown in table 4.6. From the study results, all the performance measurement items had significance level greater than the stated significance level ($\alpha = 0.05$). The test confirms that the deviations from normality are insignificant, implies that data collected relating to performance is approximately normal.

Table 4.6: Tests of Normality for Efficiency and Effectiveness items

Performance measurement items	Shapiro-Wilk		
	Statistic	df	Sig.
Production process improves efficiency	.647	131	.084
Productivity of employees is higher	.820	131	.139
Regular improvement of internal operations	.707	131	.089
Key performance metrics are reviewed frequently	.756	130	.169
Impediments are resolved timely	.798	131	.306
Scale of operation able to meet the volume required	.756	131	.157
Operations maintain flexibility	.819	131	.340
Activities are taken as scheduled	.802	131	.303
Sugar products meet prescribed quality standards	.618	131	.074

a. Lilliefors Significance Correction

Reliability test for Performance Measurement items

A reliability analysis was conducted by use of Cronbach's Alpha, which measures internal consistancy (Sekaran, 2003), as well as ensuring construct reliability of a construct (Abdulkareem, 2010). From table 4.7, the Cronbach's Alpha reliability coefficient for performance was found to be 0.803. This relibility index is greater than the minimum Cronbach's alpha coefficient threshold of 0.70, and was considered sufficiently reliable **(**Sekaran, 2003); Katema, 2009). Based on these findings, the study hence concluded that the indicator items were reliable to measure what they were intended to measure, and hence can be used in the subsequent analyses of data in assessing the relationships between and among the study constructs.

Table 4.7: Reliability Statistics for Performance items

Cronbach's Alpha	N of Items
.803	9

The ANOVA table 4.8 indicates that F- Ratio which is a measure of the variation explained by the model and the variation explained by unsystematic factors. Given that the F-ratio is greater than one ($F(129,8) = 15.163$, $p<0.05$), it is an indication that experimental manipulation had some effect above and beyond the effect of individual differences. This implies that there is no chance that the effect occurred by chance.

Table 4.8: ANOVA model for Performance items

		Sum of Squares	Df	Mean Square	F	Sig
Between People		399.432	129	3.096		
Within People	Between Items	74.092	8	9.262	15.163	.000
	Residual	630.352	1032	.611		
	Total	704.444	1040	.677		
Total		1103.877	1169	.944		

Grand Mean = 3.8564

4.5.1.3 Exploratory Factor Analysis for Operations Performance

The validity of the model constructs was assessed by subjecting the variable item responses from the questionnaires to Exploratory Factor Analysis (EFA) to assess the extent to which the observed indicators represents an underlying latent construct fitted with the pre-specified theoretically driven model (Hair, Black, Babin, Anderson, & Tathan, 2005), and aid to identify the least number of factors which can account for the common variance of a set of variables. The EFA helped reduce the number of items whose loadings fall below 0.4, and thus strengthening the content validity of the items contained in the factors for ease of interpretation. The study used orthogonal rotation (Varimax) which is a matrix of the factor loadings for each variable onto each factor and the coefficients calculated after being rotated.

The initial part of the factor extraction process was to determine the linear components within the data set (eigenvectors). All of the nine performance measurement items were subjected to the factor analysis. By use of Kaiser Criterion, SPSS was used to retain components with Eigen values ≥ 1. Consequently, only one component was extracted as presented in table 4.9.

Table 4.9: Total Variance of Performance items Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.242	74.743	74.743	2.242	74.743	74.743
2	.453	15.108	89.851			
3	.304	10.149	100.000			

Extraction Method: Principal Component Analysis.

Presented in table 4.9 is a list of eigenvalues associated with the linear component (factor) upon extraction. Accumulatively, the extracted factor explained 74.743 percent of the total variance in the operations performance items. This implies that the system identified one factor structure with the relative importance. This underscores the assertion of Brown (2006) that it important to conduct a factor analysis in order to produce a solution with the best simple structure. That is to foster interpretability by maximizing factor loadings close to 1.0 and minimizing factor loadings close to 0.0.

From the component matrix for performance items presented in table 4.10, the extracted factor is highly and positively related with “Activities are taken as scheduled” with a coefficient of 0.887, followed by “Key performance metrics are reviewed frequently” (0.877), and lastly “Regular improvement of internal operations” had a positive coefficient of 0.829. From the extracted study items, the component extracted is mapped onto efficiency. This implies that efficiency was identified as the most preferred performance indicator by the study.

Table 4.10: Component Matrix[a] for Performance

	Component
	Efficiency
Activities are taken as scheduled	.887
Key performance metrics are reviewed frequently	.877
Regular improvement of internal operations	.829

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

These results confirm a study by Malonza (2014) which sought to explore the contribution of manufacturing efficiency on operational performance of Mumias Sugar Company Limited. The study findings revealed that overally, the factory efficiency has a 50.9 percent emphasis (R^2 = 0.509) on operational performance and consequently, when amplified, led to a reduction of waste but improved quality in operations due to improved efficiencies and standardization of processes.

The results further confirm assertion by Wamalwa *et al*. (2014) that factory efficiency determines factory production operations throughout the production period without interruptions, and as such, it is an important indicator to operational performance of a manufacturing industry. In addition, although a study by Raheman *et al.,* (2010) revealed a small magnitude improvement of efficiency to large-scale manufacturing, its contribution was concluded to be important to performance. The above studies confirm assertion by several supervisors that core to their operations is efficiency, which was the main focus of their individual management achievements. This, according to the managers, had a direct bearing on the costs of operations and overall performance of the production section.

From the extracted communality matrix associated with efficiency measurement items, the average of the communalities is given by 0.748 (Appendix IXX). This therefore, confirms the argument by Field (2003) that for accuracy purposes, the communality extracted for a sample should be greater than or equal to 0.70. Consequently, the average communality for the extracted items is considered appropriate enough as a show of accuracy of the items of measurement.

In order to validate construct validity of performance measurement items, Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy and Bartlett's Test of Sphericity as a measure of sampling adequacy was conducted to determine appropriate items for analysis (Field, 2003), results of which were presented in table 4.11

Table 4.11: KMO and Bartlett's Test for Performance items

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.710
	Approx. Chi-Square	149.165
Bartlett's Test of Sphericity	Df	3
	Sig.	.000

For adequacy, the KMO test statistic has a minimum threshold index of 0.5 (Williams, Brown and Onsman, 2010). However, Field (2003) intones that statistic values greater than 0.7 are regarded good measure. From the results presented in table 4.12, the KMO of sampling adequacy had an index of 0.710 which is greater than the conventional minimum probability value of 0.5, implying that factor analysis is good and hence appropriate for the data set. Equally presented in table 4.11 is Bartlett's Test of Sphericity which contains an approximated Chi-square of 149.165, with an associated p – value lower than the conventional probability value of 0.05 (Hair *et al.*, 2013; Williams *et al.,* 2010; Field, 2003). It was hence concluded that the factor analysis was appropriate for assessing construct validity of the scale. Consequently, from the Bartlett's Test of Sphericity results, the study rejected the null hypothesis which means that the variables have a strong association.

4.5.2 Effect of Competitive Priorities on Performance

The first objective was to analyse the effect of competitive priorities on performance of sugar manufacturing firms in Kenya. Competitive priorities were assessed using four constructs, namely: cost, flexibility, delivery, and quality. Each competitive priorities construct was measured by four indicators as presented in table 3.3.1. This section presents descriptive analysis, various diagnostic tests, and correlation and regression analyses of each of the construct of competitive priorities.

4.5.2.1 Descriptive Statistics

Frequencies, expressed as a percentage of the sample, were used to describe the number of times the respondents (dis)agreed with the hypothesized state. The respondents were required to indicate the extent to which they felt about various competitive priorities items. The descriptive statistics was generated for each of the four construct of the study variable. Table 4.12 presents descriptive statistics results for items on the measurement of competitive priorities items.

From table 4.12, all flexibility, delivery, and quality measurement items had their means above 3.3. This indicates that the respondents generally agreed on the importance of the items as a measure of competitive priorities, and by extension, are of considerable importance in sugar manufacturing performance in Kenya. In this connection, (Abdulkareem *et al*., 2013), argue that competitive priorities facilitate creation of operations and hence the management of these sugar manufacturing firms need to improve them in order to enhance their competitive advantage.

Table 4.12: Descriptive statistics for Competitive Priorities items

Cost Items	Mean	S. D
The company has low manufacturing unit cost	3.11	1.15
Operations costs are managed effectively	3.89	1.04
Firms make efforts to control production cost	4.12	0.53
Firms control materials supply and product distribution	3.85	0.87
Flexibility Items		
The production system allows for adjustment on the design	4.00	0.84
Resources deployed as per changes in technology	4.07	0.95
manufacturing system is able to perform different processes	3.82	1.06
The workforce is able to perform a range of tasks	4.15	0.71
Delivery Items		
The system is able to deliver products on-time	3.78	0.97
Queuing period is reduced	3.66	1.03
Short manufacturing cycle	3.70	1.03
The system deliver products on demand on time	3.77	1.06
Quality items		
The products produced as per the pre-established standards	4.25	0.73
The process ensure consistency in operations	3.06	1.31
Customers complaints are effectively dealt with on time	3.46	1.24
Manufacturing system meets environmental requirements	4.25	0.67

Means: 1 – 1.8 = **SD**, 1.9 – 2.7 = **D**, 2.8 – 3.3 = **N**, 3.4 – 4.2 = A, Above 4.2 = **SA**

SD*=Strongly Disagree,* ***D****=Disagree,* ***N*** *=Neutral,* ***A*** *=Agree,* ***SA****=Strongly Agree*

However, in as much as these descriptive results do agree on the overage importance of the contribution of cost, flexibility, delivery and quality constructs of competitive priorities, an analysis of comments by both production and finance managers tended to converge towards cost as the major factor of focus among the various sugar manufacturing firms. This results into a complex goal – focus, where the floor workers and supervisors are conflicting with the goal of policy makers – the managers.

As Abdulkareem *et al.* (2013) cautions, each manager should be aware that each competitive priority is a complex construct which has a unique influence on operations strategy of a firm. In addition, since firms face varied factors, it is important for managers to identify and pursue the right competitive priority(s) at the operations level (Sohel & Rodger, 2013). Conclusively, Rosenfield (2014) is of the opinion that focusing on lower costs, often did not contribute to overall performance since they may have a reducing effect on other operational objectives of the firm, hindering the capacity to obtain a trade – off among the chosen competitive priorities.

4.5.2.2 Diagnostic Tests

This section contains various diagnostic tests performed on the competitive priorities measurement items before the actual inferential analyses were done of the study variables.

Normality test

In order to analyze the data using inferential statistical techniques, the distribution of each variable was examined to assess normality by running a Shapiro – Wilk test on the data set to avoid making incorrect interpretations of the results (Doan and Seward, 2011) as a more robust normality test (Ketema, 2009; Gujarati, 2014; Field, 2003). For a normally distributed data, the Shapiro – Wilk significance value should be greater than the level of significance, $\alpha = 0.05$. Table 4.13 shows the distribution of occurrence for the variables for normality done by conducting a Shapiro – Wilk test.

Table 4.13: Tests of Normality for Competitive Priorities items

Competitive Priorities measurement items	Shapiro-Wilk		
	Statistic	df	Sig.
The company has low manufacturing cost	.796	131	.136
Operations costs are managed effectively	.817	130	.295
Firm puts effort in controlling costs	.682	130	.231
The firm controls materials supply	.799	131	.084
Production system allows for adjustment on the design	.814	130	.180
Resources deployed in response to changes in technology	.785	131	.203
Manufacturing system performs different processes	.813	131	.194
The workforce is able to perform a range of tasks	.768	131	.305
The system delivers products on time	.825	131	.083
Queueing period is highly reduced	.797	131	.231
Short manufacturing cycle time	.854	131	.093
System takes a shorter time to deliver products on demand	.781	131	.206
Products meet the pre-established standards	.730	131	.088
Process ensures consistency in operations	.843	131	.192
Customers complains are handled on time	.872	131	.225
Manufacturing system meets environmental requirements	.757	131	.287

a. Lilliefors Significance Correction

From the study results represented in table 4.13, all the measurement items of competitive priority had significance level greater than the stated significance level ($\alpha = 0.05$). The test confirms that the deviations from normality are insignificant, implies that data collected relating to competitive priority is approximately normal (Doan & Seward, 2011).

Reliability test for competitive priorities

Katema (2009) intones that it is important to test for reliability of meaures in a study prior to examining relationships between constructs leading to drawing of conclusions regarding the same.The measures of the competitive priorities were subjected to reliability test using Cronbach's alpha coefficient as shown in table 4.14 in order to assess construct reliability.

Table 4.14: Reliability Statistics for Competitive Priorities

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.807	0.811	16

The Cronbach's Alpha reliability coefficient for competitive priorities was 0.807. This relibility statistic is greater than the minimum accepted Cronbach's alpha coefficient of 0.70, ensuring construct reliability. This was considered to be reliable in that they all had alpha coefficient **(**O'Connor, 2011; Ketema, 2009; Sekaran, 2003). In addition, Ward *et al.* (2008) generalizes that for exploratory work, alpha values in the range of 0.5 to 0.6 or greater are acceptable as a measure of internal construct consistency. Based on these results and findings, the study can conclude that the specific indicators are reliable and accurate to measure what they are intended to measure, and hence can be used in the subsequent analyses of data in assessing the relationships between the constructs (O'Connor, 2011).

The ANOVA table 4.15 indicates that F- Ratio which is a measure of the variation explained by the model and the variation explained by unsystematic factors. Given that the F-ratio is greater than one ($F(127, 15) = 22.427$, $p < 0.05$), it is an indication that experimental manipulation had some effect above and beyond the effect of individual differences. This implies that there is no chance that the effect occurred by chance. Consequently, given that the studys ρ - value is greater that the set level of significance, the study therefore rejects the null hypothesis, and concludes that competitive priorities have an effect on performance.

Table 4.15: ANOVA Model for Competitive Priorities

		Sum of Squares	df	Mean Square	F	Sig
Between People		496.107	127	3.906		
Within People	Between Items	248.264	15	16.551	22.427	.000
	Residual	1405.861	1905	.738		
	Total	1654.125	1920	.862		
Total		2150.232	2047	1.050		

Grand Mean = 3.8154

4.5.2.3 Exploratory Factor Analysis for Competitive Priorities variable

The validity of the model constructs was assessed by exposing the variable item responses from the questionnaire to factor analysis, in order to assess the extent to which the observed indicators represents an underlying latent construct fitted with the pre-specified theoretically driven model (Hair *et al.,* 2005), and aid to identify the least number of factors which can account for the common variance of a set of variables and shows by how much the co-variation among the observed variables each one accounts for.

The EFA helped reduce the number of items whose loadings fall below 0.4, and thus strengthening the content validity of the items contained in the factors. The study used orthogonal rotation (Varimax) which is a matrix of the factor loadings for each variable onto each factor and the coefficients calculate after being rotated. The initial part of the factor extraction process was to determine the linear components within the data set (eigenvectors). Competitive priorities with thirteen (13) measurement items were subjected to the explorative factor analysis. By use of Kaiser criterion, SPSS was used to retain components with Eigen values ≥ 1. Consequently, two components were extracted as presented in table 4.16.

Table 4.16: Total Variance of Competitive Priorities Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cumul %	Total	% of Var.	Cumul %	Total	% of Var.	Cumul %
1	2.684	53.675	53.675	2.684	53.675	53.675	2.327	46.543	46.543
2	1.152	23.047	76.722	1.152	23.047	76.722	1.509	30.179	76.722
3	.594	11.880	88.602						
4	.372	7.436	96.038						
5	.198	3.962	100.00						

Extraction Method: Principal Component Analysis.

Presented in table 4.16 is a list of eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, five linear factors were identified, while after extraction, two components were extracted, and displayed eigenvalues associated with each factor representing the variance explained by that particular linear component. Accumulatively, the two extracted factors explained 76.72 percent of the total variance. This indicates that the amount of information loss is relatively small when the number of indicators was reduced, meaning that fewer indicators can be used to analyse the data.

However, on an individual basis, component one accounted for 53.68 percent of variance while component two accounted for approximately 23.05 percent of the total variance of competitive priorities. Rotation has the effect of optimizing the factor structure and states the relative importance of the factor. However, after extraction and rotation, factor one accounts for 46.54 percent of variance, while factor two accounts for approximately 30.18 percent of the total variance of competitive priorities.

The study requested that all loading less than 0.4 be suppressed in the output, hence providing blank spaces for many of the loadings in table 4.17. The study used orthogonal rotation (varimax rotation) for ease of interpretation because the factor loadings represent correlations between the indicators and the latent factors. From the study results, table 4.17 implies that the system has identified two important factors to be loaded in the analysis. The rest are dropped from the analysis.

Table 4.17: Rotated Component Matrix[a] for Competitive Priorities items

	Component	
	Delivery	**Flexibility**
Queueing period is highly reduced	.925	
The system delivers products on time	.879	
System takes a shorter time to deliver products on demand	.811	
Production system allows for adjustment on the design		.854
Manufacturing system performs different processes		.830

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

From the rotated component matrix in table 4.17, factor one is highly and positively related with "Queuing period is highly reduced" (0.925) followed by "The system takes a shorter time to deliver products on demand" (0.899). The second factor highly and positively related with "Production system allows for adjustment on the design" with a positive relation coefficient of 0.854, followed by the "Manufacturing system performs different processes" with a coefficient of (0.830).

From the extracted components of the competitive priorities in table 4.17, component one is mapped onto delivery while component two is mapped onto flexibility construct respectively. This implies that the study identified both delivery and flexibility as the important competitive priority strategies that these sugar manufacturing firms use. These results however, contradicted the general perception of sugar firms' managers who were in agreement that their firms focused more on cost at all levels. There appears a paradox between cost focus and the performance. The managers however submitted that as much as their policy is to minimize costs across operations areas, over time, the firms' production costs seem to ever increasing lowering their bottom line.

Comparatively, this study results confirm a study by Wamalwa *et al*. (2014) which examined effects of manufacturing techniques implementation on factory time efficiency in Mumias Sugar Company. Interestingly, the study results revealed that Mumias Sugar Company has only adopted practices relating to delivery and further concluded that there is little impact of these delivery practices to factory time efficiency. Although the study identified only two priorities out of four, Adebayo *et al.* (2012) acknowledges that over the years, there exists divergent views of what factor exactly constitute competitive priorities for a particular manufacturing firm, and there is equally a discrepancy about which of these chosen factors are to be pursued (Suzana & Harvey, 2014; Sciuto & Filho, 2013); Boyer & Lewis, 2002).

The competitive priorities study construct items which contributed most to the constructs were thus identified in their order of importance. These results concur with a study by Sohel and Schroeder (2013) which identified Delivery importance over Innovation, Efficiency and Quality respectively. These study findings however, were inconsistent with study results by Abdulkareem, *et al.* (2010) which ranked quality with an average of 4.213 as the most important competitive priority followed by cost (3.27). Flexibility and delivery were ranked third and fourth with an average of 3.127 and 3.081 respectively. In addition, Ward *et al.* (2008) equally ranked flexibility over delivery.

Although Abdulkareem *et al.* (2010) used arithmetic mean to rank different competitive priorities, the current study utilized factor analysis to extract the factors that explains the common variance. Moreover, in as much as a study by Abdulkareem *et al*., ranked flexibility over delivery, the current study however, ranked delivery over flexibility. However, Ward *et al*. (2008) is of the opinion that manufacturing firms which value flexibility greatly will tend to choose job – shop type processes. Conversely, flexibility as a strategic capability tends to be lower for firms that have flow – type process designs, just like these sugar manufacturing firms are set up.

The study equally generated a reproduced correlations table (Appendix VII) that indicates a principal diagonal of communalities. From communality table, the average of the communalities is given by 0.77. This average communality confirms an argument fronted by Field (2003) that for accuracy purposes, the average communality of the extracted items should be greater than or equal to 0.70. Hence, the average communality is considered sufficient enough as a show of accuracy of the identified items of measurement.

In order to validate construct validity of competitive priorities, Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy and Bartlett's Test of Sphericity as a measure of sampling adequacy conducted to identify appropriate items for analysis. In addition, Williams, Brown and Onsman (2010) argue that for adequacy, the KMO test statistic has a minimum threshold index of 0.5, as Field (2003) further intones, values greater than 0.7 are regarded good.

Table 4.18: KMO and Bartlett's Test of Sampling Adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.762
Bartlett's Test of Sphericity	Approx. Chi-Square	253.026
	Df	10
	Sig.	.000

From the results presented in table 4.18, the KMO of sampling adequacy had an index of 0.762 which is greater than the conventional minimum probability value of 0.5, implying that factor analysis is appropriate for the data set (Hair *et al.*, 2013; Williams *et al.*, 2010; Field, 2003). Moreover, the Bartlett's Test of Sphericity contains an approximated Chi-square of 253.026, with an associated p – value of 0.000, which is lower than the conventional probability value of 0.05. It was hence concluded that the factor analysis was appropriate for assessing construct validity of the scale. Consequently, from the

Bartlett's Test of Sphericity results, the study rejected the null hypothesis which means that the variables have a strong association.

4.5.2.4 Correlation Analysis

Correlation statistics measures the extent of association between the ordering of two random variables although; a significant correlation does not necessarily indicate causality but rather a common linkage in a sequence of events. Thus, the current study analyzed the relationships that are inherent among the extracted competitive priorities study components. Subsequently, delivery and flexibility were the two constructs with the common factors that account for common variance of competitive priorities which were extracted. Table 4.19 shows the analyzed correlations results amongst the study variables.

Table 4.19: Construct level Correlations matrix

		Delivery	**Flexibility**	**Efficiency**
Delivery	Pearson Correlation	1		
Flexibility	Pearson Correlation	.588*	1	
	Sig. (2-tailed)	.012		
Efficiency	Pearson Correlation	.723*	.068	1
	Sig. (2-tailed)	.027	.032	

*. Correlation is significant at the 0.05 level (2-tailed).

As depicted in table 4.19, the Pearson Correlation results showed that delivery is moderately and positively correlated with flexibility, and significantly different from zero at 5 percent level of significance ($r = 0.588$, $\rho < 0.05$). The correlations output equally indicate that delivery is positively related with efficiency performance of sugar manufacturing process. Moreover, the relationship was found to be significant (r =

0.723, $\rho < 0.05$). In addition, the study found a weak but positive correlation between flexibility and efficiency performance. The relationship was however found to be insignificantly related with efficiency ($r = 0.068$, $\rho > 0.05$). From the correlations table 4.19, all the correlation coefficients are low ($r = 0.068$) to just above moderate ($r = 0.723$), implying that multicollinearity is minimal among the set of identified competitive priorities construct indicators.

The strong correlation coefficient between delivery and efficiency performance was expected given that there is always a high complementarity in the implementation of a flexible manufacturing decisions or practices, in an effort to gain a competitive advantage. This equally explains the above moderate yet significant correlation between the identified competitive priorities constructs, that is delivery and flexibility ($r = 0.588$, $\rho < 0.05$). Given that various operations decisions are often made together in order to achieve strategic goals of a manufacturing firm (Ketema, 2015), this could explain the above average correlations between delivery and flexibility.

The study equally examined the possibility of attaining a trade – off among the competitive priorities. Following the seminal work of Skinner in 1999, the conclusion was that different production systems exhibit different operating characteristics; hence the burden facing leaders is to decide which dimensions of competitive priorities are most important. In this study, the respondents were asked to rate the competitive priorities as given prominence by their respective manufacturing processes. For comparison purposes, by their means, the competitive priorities descriptive statistics showed that most of the sugar manufacturing firms in Kenya focus on flexibility (mean 4.01), followed by quality (mean 3.81), cost (mean 3.74) while the firms have least interest in delivery (mean 3.28). Other than flexibility, all the other descriptive statistics indicate that the three competitive priorities are moderately emphasized by these sugar manufacturing firms in Kenya, given that on average, they have means below 4.0 (Suzana & Millar, 2014).

An underlying assumption when using competitive priorities to measure the contribution of operations strategy to a firms' performance is that there should be a relative ranking of the importance of different priorities (Boyer & Lewis, 2002). The significant correlation statistic between flexibility and delivery (r = 0.588, < 0.05) implies the substitutability between the two identified competitive priorities. This study results confirm study results by several researchers which found a possible trade – off between delivery and flexibility (Suzana & Millar, 2014; Gong, 2013; Boyer & Lewis, 2002). However, according to Suzana and Millar (2014), this cumulative capability theory may mean that the trade – off among the competitive priorities may not be necessary though, and a firm may simultaneously pursue multiple competitive priorities.

Moreover, Inman (2015) argues that whereas firms usually focus on one distinctive competency (rarely more than two), but for some competencies there are trade – offs involved. In addition, in as much as the study confirms a trade – off, attention is drawn to a conclusion by Boyer and Lewis that although a trade – off may exist depending on the proximity the operating and asset frontiers of an organization are, for the manufacturing firms to be successful, the management needs to choose an appropriate operating decisions and choices.

However, these results are inconsistent with study results by Wekesa (2014) which concluded that the majority (78.8 percent) of sugar manufacturing firms in Kenya use cost leadership as their main competitive priority strategy. In addition, a study results by Abdulkareem *et al.* (2013) ranked cost second (mean 0.312) after quality (mean 0.568). However, this study results confirms results by Abdulkareem *et al.* which ranked cost (mean 0.312) second after quality. On overage, there seems a mismatch between the management's goal of cost drive and the actual requirement of production system that demands flexibility and speed of delivery in the process.

On individual measurement items, the competitive priorities Extracted Correlation Matrix (Appendix VIII) shows the correlations coefficients among the extracted competitive priorities measurement items are all positive and significantly different from zero. In addition, the correlation coefficients among the measurement items are between low ($r = 0.161$, $\rho < 0.05$) to strong ($r = 0.755$, $\rho < 0.05$), with most of the measurement items recording weak to moderate correlations coefficients. The strong correlation between delivery and flexibility is however consistent with existing literature due to the complementarity between the two constructs. However, the weak and insignificant correlation coefficient between flexibility and operations efficiency ($r = 0.068$, $\rho > 0.05$), is inconsistent with the study results by Zakaria, Dahalan, and Musaibah (2012) which determined a significant and positive relationship between flexibility and performance ($r = 0.394$, $\rho < 0.05$).

This study equally sought to assess the overall relationship between the competitive priorities and the performance of sugar manufacturing firms in Kenya. Table 4.20 shows that statistically, the overall relationship between competitive priorities and performance was found to be significant and positive, with a strong correlation coefficient ($r = 0.661$, $\rho < 0.05$). Although the study found a strong correlation coefficient between competitive priorities and performance, the coefficient is not high enough to cause alarm about autocorrelation. This implies that multicollinearity is minimal among the set of competitive priorities variables, as Field (2003) acknowledges.

4.5.2.3 Regression Analysis

The first objective of this study was to analyze the effect of competitive priorities on the performance of sugar manufacturing firms in Kenya. The study predicted that the relationship between competitive priorities and performance is not statistically significant. The resultant competitive priorities were measured by delivery and flexibility constructs. The aggregate mean scores of the extracted competitive priorities constructs measurement items were regressed against the aggregate mean scores of the extracted performance measures items, and a summary of the regression results is presented in the model summary table 4.20.

Table 4.20: Model Summary[b] of Delivery, Flexibility and Efficiency variables

Model	R	R^2	Adj. R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df1	df2	Sig. F Change	
1	.661[a]	.437	.326	.23733	.437	5.094	1	2	.041	1.996

a. Predictors: (Constant), Delivery, Flexibility
b. Dependent Variable: Efficiency

The study results showed that delivery and flexibility jointly accounted for 43.7 percent variation in efficiency of sugar manufacturing firms ($R^2 = 0.437$). This implies that 56.3 percent (1 – 0.563) is accounted for by other variables other than delivery and flexibility. The regression results revealed a statistically significant and positive linear relationship between delivery, flexibility and efficiency of sugar manufacturing firms ($r = 0.661$, $\rho < 0.05$). This study results confirm a study findings by Abdulkareem *et al.* (2010) which, significantly determined that competitive priorities jointly account for 77.5 percent variation in performance ($R^2 = 0.775$, $\rho < 0.01$). Interestingly, a study by Bolo (2011) showed that 24.8 percent of variations in corporate performance is significantly explained by core capabilities ($R^2 = 0.248$, $\rho < 0.01$). In view of this, Bolo (2011) however found a weak explanatory power of core capabilities on performance.

The value of adjusted $R^2 = 0.326$ shows how well the model generalizes the prediction. The shrinkage (about 11.1%) shows that if the model were derived from the population rather than a sample, it would account for about 11.1 percent less variance in the outcome. In addition, the model causes the R^2 to change from zero to 0.437, and this change in the amount of variance explained was found to be significant at 5% level of significance ($F(1, 1) = 5.094$, $p < 0.05$).

Table 4.20 equally shows the Durbin-Watson statistic (***d*** = 1.996), which was used to conduct an autocorrelation analysis. Although statisticians agree that there is no hard facts about the right value of Durbin-Watson statistic, both Gujarati (2014) and Field (2003) argue that as a conservative rule, Durbin-Watson statistic values below one and above three is a cause for alarm as a better prediction of the regression model, although Field intones that the closer the Durbin-Watson statistic is to two (2), the better.

The model parameters table 4.21 shows the β-value which indicates the relationship between delivery, flexibility and performance of sugar manufacturing firms. The test on the beta coefficients of the resulting model indicates that the model is a significant estimator of the relationship among delivery, flexibility and performance variables.

Table 4.21: Beta Coefficients[a] of Delivery, Flexibility and Efficiency

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	S. Error	Beta			Tol.	VIF
	(Constant)	4.669	.418		11.17	.025		
1	Delivery	2.388	.251	3.66	9.514	.038	.974	1.027
	Flexibility	1.733	.287	2.689	6.038	.018	.976	1.025

a. Dependent Variable: Efficiency

The model parameters in table 4.22 indicate that when delivery component is used as a predictor, it makes a significant contribution to the model (t (1.96) = 9.514, $\rho < 0.05$). In addition, the predictive contribution of flexibility in the model is equally significant (t (1.96) = 6.038, $\rho < 0.050$. From the magnitude of the ***t*** – statistics, delivery was found to have a better contribution to operations efficiency.

Included also in table 4.22 are the measures of whether there is collinearity in the data by providing the VIF and Tolerance statistics. Gujarati (2004) argues that as a rule of the thump, the closer the tolerance is to one, the greater the evidence that the variable is not collinear with other repressors, and from the study statistics of the model, both VIF and

Tolerance statistics are either one or approximately one, confirming that collinearity is not a problem for the model.

The hypothesis test criteria was that the null hypothesis H_{01} should be rejected if $\beta \neq 0$ and p-value ≤ 0.05 otherwise fail to reject H_{01} if the p-value > 0.05. Subsequently, the study sought to test the first null hypothesis stated thus:

H_{01}: There is no significant effect of Competitive Priorities on the performance of sugar manufacturing firms in Kenya.

From the model in table 4.22, it can hence be deduced that the linear functional relationship between delivery, flexibility and efficiency measurements of sugar firms follow the following regression model:

$$\text{Performance} = \beta_0 + \beta_1 \textbf{\textit{Delivery}} + \beta_2 \textbf{\textit{Flexibility}} + \varepsilon_i$$

$$= 4.669 + (2.388 \textbf{\textit{Delivery}}) + (1.733 \textbf{\textit{Flexibility}}) + \varepsilon_i \quad \text{….}\textbf{\textit{Equation 4.2}}$$

From a foregoing discussions, several studies have supported the strategic role of competitive priorities to operations performance (Ketema, 2015; Wekesa, 2014; Sohel & Roger, 2013; Abdulkareem *et al.*, 2010; Boyer & Lewis, 2002), which have found a strong and significant relationship between competitive priorities and firm performance. However, Abdulkareem *et al.* (2010) however, cautions that each manager, in their operations areas should be alive to the fact that each competitive priority is a complex construct which has a unique influence on the planning and implementation of the operations strategy of a firm. In addition, Ward *et al.* (2008) found operations measures a key driver to any manufacturing decision making. This implies that these competitive priorities are useful to both the policy makers and researcher, since they are core in guiding operational decisions.

Several authors have tried to inter – link the need for strategic resonance between operations processes within firms. For instance Moller *et al.* (2013) identifies three different but strongly related features of a firm that must be recognized as a firm's strategy, its structure, and its core capabilities. A strategic resonance implies that the manufacturing frim must focus on capabilities, competencies, as well as developing resource driven strategies. Core to this study is the strategic role of operations strategies, as hinged on core capabilities, to performance. This requires that the sugar manufacturing firms must align their core capabilities to be in synch with its strategies.

The usefulness to researchers of better measures of competitive priorities is evident since there exist empirical study results of the strategic contribution of competitive priorities as a managerial utility in auding the operations strategy of the sugar manufacturing firm and choosing an appropriate priority to be emphasized in line with the strategic objective of the firm. These results are inconsistent with the expectations of the theory that competitive priorities have a significant contribution to performance. Although this might not be new, they come from an area which traditionally has not been extensively studied in manufacturing research. It appears that in Kenya, just like other developing economies, the sugar manufacturing firms pursue different portfolio of competitive priorities as strategies.

Literature emphasizes the importance of identifying and pursuing the right competitive priority(s) at the operations level (Sohel & Rodger, 2013). Competitive priorities are strategic preferences chosen by a firm to compete on, as a response to marketplace requirements. However, organizations may choose to pursue the same competitive priority yet their performance on that competitive priority may vary widely. The individual firms' factors that influence which of the competitive priorities to pursue are varied. For example, Rosenfield (2014) concludes that focusing on competitive priority programs that achieve operational objectives (e.g. lower costs), often did not contribute to overall performance since they may have a reducing effect on other operational objectives of the firm. However, obtaining a trade – off between flexibility and delivery offers a simulative alternative way of thinking since, rather than remaining static, the manufacturing system must continuously improve, and preferably improve along more than one dimension at the same time.

This study results however, contradicts a study by Rusjan (2005) that found no significant relationship for three manufacturing competitive priorities results (quality, flexibility, and speed of delivery). However, Rusjan (2005) justifies this insignificant relationship by arguing that competitive priorities are traditionally related to manufacturing strategic decision areas are impacted by decisions made in other business functional areas. In addition, a study by Jardón (2011) concluded that even though competitive priorities can generate best performance, the process of their deployment is not sufficiently known, since most authors assess the direct effect of some or all defined competitive priorities whereas their impact in a process can occur indirectly through other competencies that the firm has accumulated.

4.5.3 Effect of Structural Decisions on Performance

The second objective of the study was to assess the effect of structural decisions on the performance of sugar manufacturing firms in Kenya. Structural decisions study variable was measured using Capacity, Process, Structure, and Operations Development and Improvements constructs. The following section presents the descriptive, factor analysis, as well as correlation and regression analyses for structural decisions variable.

4.5.3.1 Descriptive statistics for Structural Decisions items

Frequencies, expressed as a percentage of the sample, were used to show the number of times the respondents (dis)agreed with the hypothesized state. The respondents were required to indicate on a continuum of 1 – 5, the extent to which they perceived of various structural decisions measurement items. The descriptive statistics results were generated and presented in table 4.22.

Table 4.22: Descriptive statistics for Structural Decisions measurement items

Capacity measurement Items	Mean	S. D
The capacity of the firm is adequately utilized	3.39	1.24
The scale of production system is adequate to meet the demand	3.33	1.17
The capacity of stores adequate to accommodate the production	4.31	0.47
The arrangement of floor area allows for free movement	4.25	0.53
Process measurement items		
Structural enhancements meet current code requirements	4.12	0.71
The operations system gets the right information real time	4.13	0.84
Lots of repeated work is done in the production process	4.15	0.90
The production technology currently in use is adequate	3.2	1.24
Structure measurement items		
Authorization resides in the high chain of command	4.28	0.54
The management structure is decentralized	2.88	1.30
The operations is divided into areas of specialization	3.9	0.94
Management operates on strict rules and procedures	4.29	0.63
Operations Development		
Production system continuously makes minor improvements	3.65	1.07
The management frequently appraise the process	4.08	0.82
K. P. I are relayed to affected parties for real time action	4.19	0.62
Management benchmarks best practices with competitors	3.77	1.09

Means: 1 – 1.8 = SD, 1.9 – 2.7 = D, 2.8 – 3.3 = N, 3.4 – 4.2 = A, Above 4.2 = SA
***SD** =Strongly Disagree, **D** =Disagree, **N** =Neutral, **A**= Agree, **SA** = Strongly Agree*

On average, all the capacity, process, and operations development structural decisions measurement items had a mean above 3.2. However, of the process construct, the "management structure is decentralized" measurement item had a mean of 2.88, with standard deviation of 1.30. The mean of the item confirms that authority resides in high chain of command, as well as the fact that the management operates on strict rules and prescribed procedures. This further confirms the fact that these sugar manufacturing firms have highly centralized their operations. At individual items, to assess whether authority resides in high chain of command, the item had a mean response of 4.28 and standard deviation of 0.54. In addition, to explore whether the management operates of strict rules and procedures, the item had a mean of 4.29 and standard deviation 0.63, it would have been easy for them to indicate whether or not the structure is decentralized.

The study results confirm the interview with managers, which revealed that the management style by private sugar manufacturing firms was more directives, with little room for manipulation, unlike the public sugar firms. The managers and supervisors of these firms confessed to this, since they receive instructions from the top management as regards to the execution of these instructions. Following this, some plant supervisors lamented about the frustrations that they experience, especially when operations fall out of place with the targeted plans. In as much as some managers revealed that the technology in use is adequate given their scale of operation, they however, seemed to have agreed on the fact that they tend to emphasize on repeated work routines, as a way of attaining the standard code requirements. This however, negates that data from floor workers, going by the low mean from the measurement item.

In addition, the interview information revealed that the firms benchmark, and even borrow best manufacturing practices. This was equally confirmed by 74.1 percent of workers who generally agreed that the management benchmarks best practices with competitors. This shows that the management of sugar manufacturing firms in Kenya allows for benchmarking of the best practices operations with other competitors. The managers perceived the centralized structure as inhibitive to decision making. This feeling was equally echoed by several floor workers who felt that most of privately owned firms do not give them room to exercise their autonomy in decision making. In essence, this deters the flow of work since a lot of consultations have to be made. In addition, the state owned firms suffer similar but of a lesser fate.

4.5.3.2 Diagnostic Tests

This section contains various diagnostic tests performed on the structural decision research measurement items before actual inferential analyses were done of the second objective.

Normality test

The Shapiro – Wilk test statistics distribution of occurrence for the variables for normality as contained in table 4.23 revealed that all the measures had a significance index more than the stated $\alpha = 0.05$. The test statistics confirm that the deviations from normality are insignificant, an indication that data collected relating to structural decisions is approximately normal (Doan & Seward, 2011).

Table 4.23: Normality test for Structural Decision items

Structural Decisions measurement items	Shapiro-Wilk		
	Statistic	Df	Sig.
Capacity of the firm is adequately utilized	.834	129	.079
Scale of production is adequate for the demand	.798	130	.143
Capacity of stores accommodates production	.583	131	.098
The floor area arrangement allows free movement	.671	130	.170
Structural enhancements meet code requirements	.701	131	.084
Operation system gets information real-time	.769	130	.263
Lots of repeated work is done in the system	.777	131	.216
Technology currently in use is adequate	.825	131	.091
Authorization resides in high chain of command	.712	131	.152
Management structure is centralized	.854	130	.307
Operations is divided into specialized areas	.790	131	.276
Management depend on strict rules and procedures	.739	131	.275
Process continuously make minor improvements	.757	131	.370
Management frequently appraise the system	.712	131	.258
KPI are communicated real time	.719	131	.326
Management benchmarks with competitors	.818	131	.084

a. Lilliefors Significance Correction

Reliability test for Structural Decisions

The measures of the structural decisions was subjected to reliability test using Cronbach's alpha coefficient in order to assess construct reliability. As depicted in Table 4.24, the Cronbach's Alpha reliability coefficient for structural decisions measurement items was 0.758, which is greater than the minimum accepted Cronbach's alpha coefficient of 0.70. This was considered to be reliable ensuring sufficient construct reliability (Sekaran, 2003; Ketema, 2009). Based on the results, the study conclude that the specific structural decisions indicators were reliable to measure what they were intended to measure, and hence can be used in the subsequent analyses of data in assessing the relationships between the constructs.

Table 4.24: Reliability Statistics for Structural Decisions

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.758	.780	16

The ANOVA indicates that F- Ratio which is a measure of the variation explained by the model and the variation explained by unsystematic factors. Given that the F-ratio revealed in the ANOVA table 4.25 is greater than one ($F = 7.761$, $p<0.05$), it is an indication that experimental manipulation had some effect above and beyond the effect of individual differences. This implies that there is no chance that the effect occurred by chance.

Table 4.25: ANOVA statistics for Structural Decisions items

		Sum of Squares	df	Mean Square	F	Sig
Between People		1891.391	126	15.012		
	Between Items	83.116	15	5.541	7.761	.000
Within People	Residual	1350.134	1890	.714		
	Total	1733.250	1905	.910		
Total		2105.179	2031	1.037		

Grand Mean = 3.8691

4.5.3.3 Exploratory Factor analysis

The validity of the model constructs was assessed by exposing the structural decisions variable items responses from the questionnaire to exploratory factor analysis to assess the extent to which the observed indicators represents an underlying latent construct fitted with the pre-specified theoretically driven model (Hair *et al.,* 2005), and aid to identify the least number of factors which can account for the common variance of a set of variables and, to show by how much the co-variation among the observed variables each one accounts for.

The initial part of the factor extraction process was to determine the linear components within the data set (eigenvectors). Structural decisions with sixteen measurement items were subjected to the factor analysis. The components were extracted by principal component analysis using Varimax with Kaiser Normalization method, and components with Eigen values ≥ 1 were retained. Consequently, three components were extracted as presented in table 4.26.

Table 4.28: Total Variance of Structural Decisions Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var	Cum %	Total	% of Var	Cum %	Total	% of Var	Cum %
1	2.397	34.245	34.245	2.397	34.245	34.245	2.076	29.656	29.656
2	1.358	19.400	53.645	1.358	19.400	53.645	1.453	20.752	50.407
3	1.173	16.763	70.409	1.173	16.763	70.409	1.400	20.001	70.409
4	.670	9.572	79.981						
5	.563	8.041	88.022						
6	.442	6.313	94.335						
7	.397	5.665	100.000						

Extraction Method: Principal Component Analysis.

Presented in table 4.27 is a list of eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, seven linear factors were identified, while after extraction, three components were extracted, and displayed eigenvalues associated with each factor representing the variance explained by that particular linear component. Accumulatively, the three extracted factors explained approximately 70.41 percent of the total variance. This indicates that the amount of information loss is relatively smaller when the number of indicators was reduced. This indicates that fewer indicators can be used to analyse the data.

However, on an individual basis, component one accounted for 34.245 percent of the total variance, component two 19.4 percent, while component three accounted for approximately 16.763 percent of the total variance of structural decisions. Rotation has the effect of optimizing the factor structure and states the relative importance of the factor. However, after extraction and rotation, factor one accounts for approximately 29.66 percent, factor two accounted for 20.752 percent, while factor three accounted for approximately 20.0 percent of the total variance of structural decisions strategies as used by these sugar manufacturing firms in in Kenya.

Thus from the study findings, salient factors which had more than 0.4 factor loadings were retained to represent substantive values to strengthen the content validity of the items contained in the factors (Hair *et al.,* 2005; Field, 2003). From the study results of the Rotated Component Matrix table 4.27, the system identified three important factors to be loaded in the analysis. The rest are dropped from the analysis.

Table 4.27: Rotated Component Matrix[a] for Structural Decisions items

	Component		
	ODI	**Process**	**Structure**
KPI are communicated real time	.816		
Management frequently appraise the system	.810		
Management benchmarks with competitors	.770		
Technology currently in use is adequate		.820	
Structural enhancements meet code requirements		.765	
Operations is divided into specialized areas			.842
Capacity of stores accommodates production			.776

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

From the rotated component matrix, factor one is highly and positively related with the "KPI are communicated real time" measurement item with a coefficient of 0.816, followed by the "Management frequently appraise the system" measurement item (0.810), while the "Management benchmarks with competitors" measuring item (0.770) respectively. The second component was highly and positively related with the "Technology currently in use is adequate" measuring item (0.820), followed by the "Structural enhancements meet current code requirements" measuring item with correlation coefficient of 0.765. Component three was positively related with the "Operations is divided into specialized areas" measuring item with a coefficient of 0.842 followed by the "Capacity of stores accommodates production" measuring item (0.776).

From the extracted components of the structural decisions in table 4.28, component one is mapped onto Operations Development and Improvements, component two is mapped onto Process, while component three is mapped onto Structure constructs respectively. This implies that the study identified Operations Development and Improvements, Process, and Structure as the three important structural decisions strategies that these sugar manufacturing firms use. The construct measuring items which contributed most to the constructs were thus identified in their order of importance. There exists empirical study results (Ward *et al.,* 2008) that shows a functional relationship between process choice and competitive priorities by a manufacturing firm.

The study equally generated a reproduced correlations table (Appendix XI) that indicates a principal diagonal of communalities. From the communality table of structural decisions, (Appendix XI), the average of the communalities was given by 0.747 which is more than the minimum threshold of 0.70, which according to Field (2003), is an indication that the extracted items are sufficient enough as a show of accuracy of the identified items of measurement.

In order to validate construct validity of structural decisions, the KMO of sampling adequacy in table 4.28 had an index of 0.738 which is greater than the conventional minimum probability value of 0.5, implying that factor analysis is appropriate for the data set. Moreover, the Bartlett's Test of Sphericity contains an approximated Chi-square of 215.48, with an associated p – value lower than the conventional probability value of 0.05. It was hence concluded that the factor analysis was appropriate for assessing construct validity of the scale (Williams *et al*., 2010; Field, 2003). Consequently, from the Bartlett's Test of Sphericity results, the study rejected the null hypothesis which means that the variables have a strong association.

Table 4.28: KMO and Bartlett's Test of Sampling Adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.738
Bartlett's Test of Sphericity	Approx. Chi-Square	215.479
	Df	21
	Sig.	.000

4.5.2.4 Correlation Analysis

Correlation statistics measures the extent of association between the ordering of two random variables although; a significant correlation does not necessarily indicate causality but rather a common linkage in a sequence of events. Thus, the current study analyzed the relationships that are inherent among the extracted structural decision study factors. Consequently, Operations Development and Improvements, Process, and Structure were the three constructs with the common factors that account for common variance of structural decisions which were extracted. Table 4.29 shows the correlations analysis results.

Table 4.29: Correlations matrix ODI, Process and Structure variables

		ODI	Process	Structure
ODI	Pearson Correlation	1		
Process	Pearson Correlation	.504*	1	
	Sig. (2-tailed)	.036		
Structure	Pearson Correlation	.210**	.165*	1
	Sig. (2-tailed)	.006	.012	

*. Correlation is significant at the 0.05 level (2-tailed).

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

Pearson Correlation results in table 4.29 showed that operations development and improvements is moderately and positively related with process. In addition, the relationship was found to be significant ($r = 0.504$, $\rho < 0.05$). Equally, the relationship between structure and process and operations development and improvements were both weak but positively significant ($r = 0.165$, $\rho < 0.05$) and ($r = 0.210$, $\rho < 0.01$) respectively. From the correlations table 4.29 all the correlation coefficients among the study constructs are between low ($r = 0.165$) to moderate ($r = 0.504$), implying that multicollinearity is minimal among the set of identified structural decisions variable indicators (Field, 2003). On individual measurement items, the structural decisions Extracted Correlation Matrix (Appendix X) shows the correlations coefficients among the extracted the structural decisions measurement items.

4.5.2.5 Regression Analysis

The second objective of the study was to assess the effect of structural decisions on the performance of sugar manufacturing firms in Kenya. The study predicted that the relationship between structural decisions and performance is not statistically significant. The resultant structural decisions were measured by operations development and improvements, process and structure constructs. The aggregate mean scores of the extracted structural decisions constructs measurement items were regressed against the aggregate mean scores of the extracted performance measures items, and results presented in table 4.30.

Table 4.30: The Model Summary[b] of Operations Development, Process and Structure

Model	R	R^2	Adj. R^2	S. E of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df1	df2	Sig. F Change	
1	.785[a]	.616	.232	.23117	.616	8.694	1	1	.426	2.187

a. Predictors: (Constant), Operations Development & Improvements, Process, Structure

b. Dependent Variable: Efficiency

The model summary in table 4.30 indicates that operations development and improvements, process, and structure generally accounted for 61.6 percent variation in performance of sugar manufacturing firms ($R^2 = 0.616$). This implies that 38.4 percent is accounted for by other variables other than structural decisions not considered by the objective. However, the regression results revealed a statistically insignificant but positive linear relationship ($R^2 = 0.661$, $\rho > 0.05$). The change statistics shows the F-ratio which is insignificant ($F(1,1) = 8.694$, $\rho > 0.05$), and was unlikely to have happened by chance. This study results however, disagree with study by Rodrı´guez and Padilla (2014) that found a significant relationship between an emphasized structural decision and erformance.

The value of adjusted $R^2 = 0.232$ shows how well the model generalizes the prediction. The shrinkage (about 23.2%) shows that if the model were derived from the population rather than a sample, it would account for about 23.2 percent less variance in the outcome. In addition, the model causes the R^2 to change from zero to 0.616, and this change in the amount of variance explained was found to be insignificant at 5% level of significance. Table 4.31 equally shows the Durbin-Watson statistic (*d = 2.187*), which was used to conduct an autocorrelation analysis. The value is within the conservative rule, although statisticians agree that there is no hard fact about the right value of Durbin-Watson statistic (Gujarati, 2014; Field, 2003).

The model coefficient parameters in table 4.31 show the β-value which indicates the relationship between the structural decisions measurements (operations development and improvements, process and structure) and performance (efficiency). The three structural predictors had varied contributions to efficiency. For instance, the contribution of operations development and improvements was found to be statistically significant (t (1.96) = 2.784, $\rho < 0.05$. However, both the process and structure had insignificant contribution (t (1.96) = 1.709, $\rho > 0.05$) and (t (1.96) = 2.571, $\rho > 0.05$) respectively. From the magnitude of the ***t*** – statistics, Operations Development and Innovations has a better contribution followed by structure and then process.

Table 4.31: Beta Coefficients[a] of Structural Decisions variables

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. E	Beta			Tol	VIF
1	(Constant)	3.525	.731		4.822	.116		
	ODI	.103	.037	.211	2.784	.027	1.000	1.000
	Process	.323	.189	.496	1.709	.338	.984	1.017
	Structure	.576	.224	.643	2.571	.066	.951	1.052

a. Dependent Variable: Efficiency

Included also in table 4.31 are the measures of whether there is collinearity in the data by providing the VIF and Tolerance statistics. Gujarati (2004) argues that as a rule of the thump, the closer the tolerance is to one, the greater the evidence that the variable is not collinear with other repressors, and from the study statistics of the model, both VIF and Tolerance statistics are either one or approximately one, confirming that collinearity is not a problem for the model.

The hypothesis test criteria was that the null hypothesis H_{02} should be rejected if $\beta \neq 0$ and p-value ≤ 0.05 otherwise fail to reject H_{02} if the p-value > 0.05. Consequently, the study sought to test the second null hypothesis stated thus:

> *H_{02}: There is no statistical significant effect of Structural Decisions on the performance of sugar manufacturing firms in Kenya.*

The structural decisions were measured by operations development and improvements, process as well as structure. The study found a significant relationship between operations development and innovations and efficiency (t (1.96) = 2.784, $\rho < 0.05$, whereas at 0.05 level of significance, there was an insignificant relationship between process and efficiency (t (1.96) = 0. 1.709, $\rho > 0.05$), and between structure and efficiency (t (1.96) = 2.571, $\rho > 0.05$). From the magnitude of the *t* – statistics, the study revealed that operations development and improvements had a better contribution to operations efficiency, followed by structure then process. However, the contribution of both process and structure were found to be insignificant.

From the model in table 4.31, it can hence be deduced that the linear functional relationship between competitive priorities measurements and performance of sugar firms follow the following regression model:

$$\text{Performance} = \beta_0 + \beta_1 \boldsymbol{ODI} + \beta_2 \boldsymbol{P} + \beta 3 \boldsymbol{S} + \varepsilon_i$$

$$= 3.525+(0.103\boldsymbol{ODI})+(0.323\boldsymbol{S})+(0.576\boldsymbol{S}) + \varepsilon_i \quad \text{……..} \textbf{\textit{Equation 4.3}}$$

where: **ODI** = Operations Development and Improvements

P = Process, while

S = Structure

From the beta coefficient table 4.31, the study therefore failed to reject the null hypothesis since $\beta \neq 0$ and p-value > α, hence concluded that structural decisions have a statistical but insignificant and positive relationship with efficiency of sugar manufacturing firms in Kenya, implying that structural decisions make a positive contribution, even though the contribution is insignificant, to performance of sugar firms for this model.

The standardized coefficient indicates that as operations development and improvement increase by one standard deviation, the efficiency of sugar manufacturing firms improve by 0.211. An improvement by one standard deviation in process improves efficiency by 0.496, while a one standard deviation improvement in the structure leads to an improvement of efficiency by 0.643, holding the effect of all other predictors invariant (Field, 2003).

Structural decisions have been regarded as the "building blocks" of the operations and hence define a manufacturing firm's overall tangible shape and architecture (Slack & Lewis, 2011). Further, they essentially define how a specific manufacturing firm seeks to survive and prosper within its environment over the long-term; hence the structural decisions and actions taken within its operations have a direct impact on its long – term performance. Since structural decisions involve heavy capital investment decisions and once made, ties the operations of sugar manufacturing firms' in the long – term. It therefore associates a significant contribution to performance to a manufacturing process. This study results however, dismisses the assumed relationship.

In equal measure, empirical evidence by Iyer, Koudal, Saranga, and Seshadri (2011) suggests that operations process (which is herein regarded as a structural construct) and quality management practices contribute to the better performance of manufacturing functions a corporate level in just a few sectors. In addition, Rodrı´guez (2014) found no significant relationship between the decisions in the dimensions of quality management systems and overall performance. A study by Sanjay, Gajendra and Usha (2013) acknowledge that product layout process as a more suited to handle standardized products in large volume. In this line, Sanjay *et al.* (2013) did further conclude that a standardized manufacturing process is a necessity to improved performance.

Contrary to this study results, several studies have found a significant contribution of structural decisions to manufacturing process. For instance, Gong (2013) presented a product – process matrix in which structural dimensions were found to be appropriate facilitation of a winning competitive advantage by a manufacturing firm, while a study by Rodrı´guez (2014) found a statistical and significantly positive relationship between structural decisions and its contribution to performance. Moreover, Ketema (2015) revealed that structural decisions improve operations performance by 68.2 percent, while a study by Szumbah and Imbambi (2014) concluded that maintenance tasks related to structural designs have meaningful effects on the achievement of factory performance indicators, with respondents acknowledging that five out of seven performance indicators (approximately 71.5%) are very frequently affected by the structural decisions, and all scored a mean response above 3.80.

However, a study by Zeithaml *et al.* (2012) concludes that given that each operations strategy is not equally effective under all conditions, certain manufacturing firm's actions have a better fit than others, as a results of different manufacturing complexities and uncertainties of their situations. Accordingly, these differing technological and environmental dimensions demand that these sugar manufacturing firms adopt different structures, strategies and decision processes. This could be the reason in the study results.

4.5.4 Effect of Infrastructural Choices on Performance

The third objective of the study was to determine the effect of infrastructural choices on the performance of sugar manufacturing firms in Kenya. Infrastructural choices were assessed using four constructs, namely: workforce, policies, communication, and innovations. Each construct was measured by four indicators as presented in table 3.3a. The following section presents descriptive, various diagnostic tests, correlation and regression analyses of each of the construct of infrastructural choices.

4.5.4.1 Descriptive Statistics

Frequencies, expressed as a percentage of the sample, were used to describe the number of times the respondents (dis)agreed with the hypothesized state. The respondents were asked to indicate the extent to which they felt about various infrastructural choices measurement items. The descriptive statistics was generated for each of the four constructs of the study variable. Table 4.32 presents the descriptive statistics for the infrastructural choices measurement items.

All the workforce measurement items had a mean greater than 3.2 implying that the respondents generally agreed that the work – force is competent in their areas of responsibilities to take up their roles and duties in their respective areas of operations. In essence, this should lead to a superior performance, according to Zaim, Yasar, and Üna, (2013). However, the lowest mean was for the "the management facilitates employees' further training in areas of specialization" measurement item. This is an indication that although training important in developing employees' skills and competence, the management gives it a lower premium.

In assessing policies, the respondents were non-committal whether the management involves the workers while setting the policies, with a lower mean of 3.18 and a standard deviation of 1.03. It shows that the management leas adopt a participatory approach while setting targets. It could equally means that these competent employees prefer free hand in their areas of work.

Both communication and innovation measurement items had their means greater than 3.2, indicating that respondents generally agreed that the constructs are of considerable importance (Abdulkareem *et al*., 2010) in determining infrastructural choices at the operations areas. This was confirmed with the fact that the management bases its practices on formal mechanisms while transferring the practices among various areas of work, with the measurement item had a mean of 3.72, standard deviation of 1.03.

Table 4.32: Descriptive statistics for Infrastructural Choices measurement items

Work – force measurement items	Mean	S.D
The team is empowered to make decisions to meet its goals	4.02	1.02
The team is prepared to take responsibilities that help achieve its goals.	3.96	0.86
The workforce has the prerequisite competence related to their tasks	4.03	0.97
The management facilitates employees' further training in areas of specialization	3.51	1.16
Policies measurement items		
The operations policies and procedures adopted help to achieve the set objectives	4.14	0.69
The management involves workers while setting policies	3.18	1.03
There exists high formalization of work procedures	4.08	0.74
The manufacturing processes follow standard practices	4.27	0.49
Communication measurement items		
The production system allows easy access	4.06	0.92
Mechanisms exists to help employees communicate their innovative ideas	3.82	0.91
Objectives are communicated to employees on a one–to–one basis	3.75	0.93
The information system provides timely necessary performance objective reports	3.89	0.96
The management takes timely action on information from all stake-holders	3.56	1.02
Formal mechanisms exists to transfer best practices among various areas of work.	3.72	1.03
Innovations measurement items		
The system and processes are automated by use of Computer Aided Design	3.66	1.13
There is continuous improvement of the system to refine the process	3.78	1.03
Manufacturing process uses best production method available	3.79	1.03
The operations and production process has minimum possible error	3.56	1.20

Means: 1 – 1.8 = SD, 1.9 – 2.7 = D, 2.8 – 3.3 = N, 3.4 – 4.2 = A, Above 4.2 = SA
***SD** = Strongly Disagree, **D** = Disagree, **N** = Neutral, **A** = Agree, **SA** = Strongly Agree*

4.5.4.2 Diagnostic Tests

The section outlines various diagnostic tests performed on the infrastructural choices measurement items before actual inferential analyses were done on the study variables.

Normality test

In order to analyze the data using inferential statistical techniques, the normality distribution of occurrence for the variable was examined using the Shapiro – Wilk test, presented in table 4.33, whose results revealed that all the measures had a significance index more than the stated $\alpha = 0.05$. The test confirms that the deviations from normality are insignificant, an indication that data collected relating to infrastructural choices was approximately normal.

Table 4.33: Tests of Normality for Infrastructural Choices items

Infrastructural Choices measurement items	Shapiro-Wilk		
	Statistic	df	Sig.
Team empowered to make decisions	.762	131	.134
Team takes responsibilities to achieve	.721	131	.083
Work-force has prerequisite competence to perform	.774	131	.304
Employees' further training is facilitated	.756	131	.088
policies adopted help achieve set objectives	.778	131	.300
Workers are involved in setting objectives	.838	131	.213
Work procedures are formalized	.738	131	.344
Manufacturing process follow standard practices	.652	131	.064
Production system allows easy access	.764	131	.083
Mechanism exist for employees to share ideas	.765	131	.074
Objectives are communicated on one to one basis	.791	131	.136
Performance objective reports provided timely	.725	131	.079
Timely action taken on information	.809	131	.077
Best practices transferred formally	.782	131	.086
System is automated by use of CAD	.817	131	.065
Continuous improvement to refine the process	.789	131	.093
Manufacturing process uses best method available	.799	131	.095
Operations process minimizes error	.797	131	.075

a. Lilliefors Significance Correction

Reliability test

All the eighteen (18) measurement items of the infrastructural choices were subjected to reliability test using Cronbach's alpha coefficient as shown in table 4.34 in order to assess construct reliability.

Table 4.34: Reliability Statistics for Infrastructural Choices items

Cronbach's Alpha	N of Items
.915	18

As depicted in Table 4.34, the Cronbach's Alpha reliability coefficient for infrastructural choices based on standardized items was 0.915, which is greater than the minimum accepted Cronbach's alpha coefficient of 0.70 **(**Sekaran, 2003; Katema, 2009). This was considered to be excellently reliable, ensuring sufficient construct reliability. Based on the results, the study conclude that the specific infrastructural choices measurement items were reliable to measure what they were intended to measure, and hence can be used in the subsequent analyses of data in assessing the relationships between the constructs.

The ANOVA table 4.35 indicates that F- Ratio which is a measure of the variation explained by the model and the variation explained by unsystematic factors. Given that the F-ratio is greater than one and significant ($F(130, 17) = 16.310$, $p<0.05$), it is an indication that experimental manipulation had some effect above and beyond the effect of individual differences. This implies that there is no chance that the effect occurred by chance.

Table 4.35: ANOVA model for Infrastructural Choices measurement items

		Sum of Squares	df	Mean Square	F	Sig
Between People		966.240	130	7.433		
Within People	Between Items	176.090	17	10.358	16.310	.000
	Residual	1403.577	2210	.635		
	Total	1579.667	2227	.709		
Total		2545.907	2357	1.080		

Grand Mean = 3.8024

4.5.4.3 Exploratory Factor Analysis

The validity of the model constructs was assessed by exposing the infrastructural choices variable items responses from the questionnaire to exploratory factor analysis, in order to assess the extent to which the observed indicators represents an underlying latent construct fitted with the pre-specified theoretically driven model (Hair, *et al.,* 2005), and to identify the least number of factors which can account for the common variance of a set of variables and, to show by how much the co-variation among the observed variables each one accounts for (Field, 2003).

The initial part of the factor extraction process was to determine the linear components within the data set (eigenvectors). Infrastructural decisions with eighteen (18) measurement items were subjected to the factor analysis. Three infrastructural choices components with Eigen values ≥ 1 were extracted and retained to be loaded in the analysis, as shown in table 4.36.

Table 4.36: Total Variance of Infra structural Choices items Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var	Cum %	Total	% of Var	Cum %	Total	% of Var	Cum %
1	4.523	50.252	50.252	4.523	50.252	50.252	2.611	29.007	29.007
2	1.223	13.585	63.837	1.223	13.585	63.837	2.185	24.279	53.286
3	1.005	11.171	75.008	1.005	11.171	75.008	1.955	21.722	75.008
4	.643	7.144	82.151						
5	.473	5.255	87.406						
6	.426	4.734	92.140						
7	.292	3.244	95.384						
8	.239	2.659	98.043						
9	.176	1.957	100.00						

Extraction Method: Principal Component Analysis.

Presented in table 4.36 is a list of eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, nine (9) linear factors were identified, while after extraction, three components were extracted, and displayed eigenvalues associated with each factor representing the variance explained by that particular linear component. Accumulatively, the three extracted factors explained approximately 75 percent of the total variance in Infra structural choices. This indicates that the amount of information loss is relatively smaller when the number of indicators was reduced. This implies that fewer indicators can be used to analyse the data.

However, on an individual basis, it can be deduced that component one accounted for 50.252 percent of the total variance, component two accounted for 13.585 percent, while component three accounted for approximately 11.17 percent of the total variance of structural decisions. Rotation has the effect of optimizing the factor structure and states the relative importance of the factor. However, after extraction and rotation, factor one accounts for approximately 29 percent, factor two accounted for approximately 24.28 percent, while factor three accounted for 21.72 percent of the total variance of infra-structural choices strategies as used by these sugar manufacturing firms in in Kenya.

Table 4.37: Rotated Component Matrix[a] for Infrastructural Choices items

Infrastructural Choices measurement items	Component		
	Policies	Communication	Workforce
Manufacturing process follow standard practices	.808		
Work procedures are formalized	.794		
Policies adopted help achieve set objectives	.754		
Best practices transferred formally		.802	
Performance objective reports provided timely		.761	
Timely action taken on information		.758	
Team empowered to make decisions			.885
Team takes responsibilities to achieve			.874

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

From the rotated component matrix table 4.37, factor one is highly and positively related with "Manufacturing process follow standard practices" measurement item (0.808), followed by "Work procedures are formalized" measurement item with coefficient 0.794, while the "Policies and procedures adopted help achieve set objectives" item had a coefficient of 0.754. The second component is highly and positively related with the "Best practices transferred formally" measurement item (0.802), followed by the "Performance objective reports provided timely" item (0.761), while the "Timely action taken on information" item had a coefficient of 0.758. In addition, factor three is highly and positively related with two items, namely: the “Team empowered to make decisions” measurement item with a coefficient of 0.885 followed by the “Team takes responsibilities to achieve” measurement item which had a coefficient of 0.874.

From the extracted components of the structural decisions in table 4.37, component one is mapped onto Policies, component two is mapped onto Communication, while component three is mapped onto Work – force respectively. The construct items which contributed most to the constructs were thus identified in their order of importance. This implies that the study identified Policies, Communication, as well Work – force respectively, as the important infrastructural choices strategies that these sugar manufacturing firms currently employ.

The study equally generated a reproduced correlations table (Appendix XI) that indicates a principal diagonal of communalities. From the communality table of infrastructural choices, the average of the communalities is given by 0.75, which is more than the minimum acceptable threshold of 0.70, an indication that the extracted infrastructural choices measurement items were sufficient enough as a show of accuracy of the identified items of measurement (Field, 2003).

In order to validate construct validity of infrastructural choices, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity as a measure of sampling adequacy as shown in table 4.38, indicates that the KMO of sampling adequacy had an index of 0.811 which is greater than the conventional minimum probability value of 0.5, implying that factor analysis is appropriate for the data set.

In addition, the Bartlett's Test of Sphericity contains an approximated Chi-square of 596.254, with an associated p – value lower than the conventional probability value of 0.05. It was hence concluded that the factor analysis was appropriate for assessing construct validity of the scale. Consequently, from the Bartlett's Test of Sphericity results, the study rejected the null hypothesis which means that the infrastructural choices variables have a strong association (Hair *et al.*, 2013; Williams *et al.*, 2010; Field, 2003).

Table 4.38: KMO and Bartlett's Test of Sampling Adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.811
Bartlett's Test of Sphericity	Approx. Chi-Square	596.254
	df	36
	Sig.	.000

4.5.4.4 Correlation Analysis

Correlation statistics measures the extent of association between the ordering of two random variables although; a significant correlation does not necessarily indicate causality but rather a common linkage in a sequence of events. Thus, the current study analyzed the relationships that are inherent among the extracted infra structural choices study items. Consequently, Policies, Communication, and Work - force were the three constructs with the common factors that accounted for common variance of infra structural choices which were extracted and correlated, and whose results are presented in table 4.39.

Table 4.39: Correlations for Infra structural Choices indicators

		Policy	Communication	Workforce
Policy	Pearson Correlation	1		
Communication	Pearson Correlation	.313**	1	
	Sig. (2-tailed)	.007		.
Workforce	Pearson Correlation	.588**	.165**	1
	Sig. (2-tailed)	.003	.015	

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

Pearson Correlation results in table 4.39 shows that policy is positively weak but significantly related with communication with a Pearson Correlation coefficient $r = 0.313$, $\rho < 0.05$. The correlations output equally shows that policy is positively moderate and equally significantly correlated with work force, with a coefficient of $r = 0.588$, $\rho < 0.05$. In addition, the study found a weak but significantly positive relationship between communication and work force with $r = 0.165$, $\rho < 0.05$. From the correlations table 4.36 all the correlation coefficients are low ($r = 0.165$) to moderate ($r = 0.588$), implying that multicollinearity is minimal among the set of identified infra structural construct indicators. This has the advantages of decreasing the probability of committing type II error that can lead to rejecting a good predictor from the model. However, as Field (2003) acknowledges, obtaining less than perfect multicollinearity is practically unavoidable.

On an individual measurement items, the Infra structural choices extracted correlation matrix (Appendix XII) shows the correlations coefficients among the extracted infra structural choices measurement items. The displayed correlation coefficients are between low ($r = 0.223$) to just above moderate ($r = 0.782$), with most of the measurement items recording moderate correlations coefficients. This is a further indication of lack of autocorrelation among the construct measurements items. In general, all the identified infrastructure measurement items as presented in Appendix XII were found to be significant.

4.5.4.5 Regression Analysis

The third objective of the study was to determine the effect of infrastructural choices on the performance of sugar manufacturing firms in Kenya. The study predicted that the relationship between infrastructural choices and performance is not statistically significant at 5% level of significance. The resultant infrastructural choices were measured by Policies, Communication, and Work – force. The aggregate mean scores of the extracted infrastructural choices constructs measurement items were regressed against the aggregate mean scores of the extracted performance measures items, and results presented in table 4.40.

Table 4.40: Model Summary[b] of Infrastructural Choices

Model	R	R^2	Adj. R^2	S. E. of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df1	df2	Sig. F Change	
1	.605[a]	.366	.267	.41246	.366	3.518	1	1	.018	1.147

a. Predictors: (Constant), Policies, Communication, Workforce

b. Dependent Variable: Efficiency

The model summary of infrastructural choices in table 4.40 indicated that Infrastructural choices generally accounted for 36.6 percent variation in performance of sugar manufacturing firms (R^2 = 0.366). This implies that 63.4 percent variation in performance is accounted for by other variables other than infrastructural choices. In addition, the overall regression results revealed a statistically significant and positive linear relationship between infrastructural choices and performance of sugar manufacturing firms ($R^2 = 0.366$, $\rho < 0.05$).

The value of adjusted $R^2 = 0.267$ shows how well the model generalizes the prediction. The shrinkage (about 9.9%) shows that if the model were derived from the population rather than a sample, it would account for about 9.9 percent less variance in the performance of these sugar manufacturing firms. In addition, the model causes the R^2 to change from zero to 0.366, and this change in the amount of variance explained was found to be insignificant at 5% level of significance ($F(1, 1) = 3.518$, $p < 0.05$). Table 4.40 equally shows the Durbin-Watson statistic (*d = 1.147*), which is in tandem with the rule of the thump as a measure of autocorrelation analysis (Gujarati (2014; Field (2003). Equally included in table 4.41 are the collinearity measures in the data by providing the

VIF and Tolerance statistics, which meet the rule of the thump as evidence that the variable is not collinear with other repressors (Both Gujarati, 2004; Field, 2003).

The model coefficient parameters in table 4.41 shows the β-value which indicates that production policies and procedures significantly contribute to the operations performance of the firm ($t\ (1.96) = 0.441$, $\rho < 0.05$). In addition, the study showed that communication equally have a significant contribution to performance ($t\ (1.96) = 6.256$, $\rho < 0.05$), while workforce had a significant contribution to performance ($t\ (1.96) = 4.476$, $\rho < 0.05$). From the magnitude of the individual ***t*** – statistics, the study showed that communication has a better contribution to the performance, followed by workforce quality, and then policies.

Table 4.41: Beta Coefficients[a] of Infrastructural Choices constructs

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. E	Beta			Tol	VIF
1	(Constant)	4.696	1.385		3.391	.013		
	Policies	.472	1.070	.404	.441	.036	.987	1.013
	Communication	.488	.078	.506	6.256	.044	.986	1.014
	Work-force	.367	.082	.390	4.476	.025	.987	1.013

a. Dependent Variable: Efficiency

The hypothesis test criteria was that the null hypothesis H_{03} should be rejected if $\beta \neq 0$ and p-value ≤ 0.05 otherwise fail to reject H_{03} if the p-value > 0.05. Consequently, the study sought to test the third null hypothesis stated thus:

H_{03}: There is no statistical significant effect of Infrastructural Choices on the performance of sugar manufacturing firms in Kenya.

From the model in table 4.41, it can hence be deduced that the linear functional relationship between infrastructural Choices measurements and performance of sugar firms follow the following regression model:

$$\text{Performance} = \beta_0 + \beta_1 \boldsymbol{P} + \beta_2 \boldsymbol{C} + \beta 3 \boldsymbol{WF} + \varepsilon_i$$

$$= 4.696+(0.472\boldsymbol{P})+(0.488\boldsymbol{C})+ (0.367\ \boldsymbol{WF}) + \varepsilon_i \text{ ……..} \textit{\textbf{Equation 4.4}}$$

where: P = Policies, while

C = Communications

WF = Work – force

From the above regression study results model, given that all infrastructural choices constructs were significant, the study therefore rejected the null hypothesis since $\beta \neq 0$ while the p-value < α, hence concluded that infrastructural choices have a statistical and significantly positive relationship with performance of sugar manufacturing firms in Kenya, implying that infrastructural choices make a significant and a positive contribution to performance of sugar firms in Kenya.

For this model, the standardized coefficient indicates that as policies, communication, and workforce increase by one standard deviation, the operations performance improves by 0.472, 0.472, and 0.488 standard deviations respectively, holding the effect of all other predictors invariant (Field, 2003). Equally included in table 4.41 are the measures of whether there is collinearity in the data by providing the VIF and Tolerance statistics. From the current model, both the VIF and Tolerance statistics are approximately one, confirming that there were no cases of serial collinearity for the model, and as Gujarati

(2004) opines that as a rule of the thump, the closer the tolerance is to one, the greater the evidence that the variable is not collinear with other repressors.

Infrastructural choices have an evolving relationship with operations in the manufacturing industry. Their developments allows the management to make the right investment, bearing in mind the long lags and high manufacturing costs associated with infrastructure development. Conversely, changes in infrastructural choices drives changes in manufacturing. This study results indicate that infrastructural choices have a statistical significance influence on performance (R^2 = 0.366, $\rho < 0.05$). This study results confirm a study conclusion by Sciuto and Filho (2013) that infrastructural areas greatly and positively influence various process improvements aimed at increasing productivity and development of robust performance indicators. Moreover, the study confirms a study by Ketema (2015) which found that 74.6% percent of operations performance is greatly influenced by infrastructural choices (R^2 = 0.746). In addition, the Ketema concluded that structural and infrastructural manufacturing decisions significantly influence manufacturing performance when a firm seeks to achieve quality and delivery priorities.

This underscores the strategic goal of KSB Strategic Plan (2010 – 2014) that projected increased performance of sugar manufacturing firms by strengthening institutional policies. Although the study results reveal a significant relationship between policies and workforce on performance, the contribution of communication on performance was however, found to be statistically insignificant, even though both Barnes (2012) and Andersen (2001) outline communication as a core component of infrastructural choice as a performance measurement.

Given that this study results have found operations policies and procedures to be core component of sugar manufacturing process, the study hence adopts the conclusions by Cai *et al.* (2010) that institutional theory provides the rules and policies that govern the structure and organizational interactions within the decision areas. Moreover, Kraft and Furlong (2007) contents that institutional theory emphasize authoritative guidelines and explains the boundaries of both social behaviour and organization's structure, which is intertwined with a firm's critical resources.

Even though a study by Andersen (2001) observes a direct and positive relationship between communication and performance, it offers an interesting insight of the performance association of communication enhancing contribution, and its interactions with different contemporary strategic decision – making approaches. Andersen (2001) further highlights large discrepancies and urges a further examination of the mechanics of the alleged performance relationship. The current study results points to the insinuation by Andersen (2001) that communication's contribution to performance is mixed and needs a further examination.

But overally, infrastructural choices was found to have a statistical significance effect on performance. This study results confirm the study conclusion by Felipe and Marcia (2014) that manufacturing firms' production strategy is related to the policies and goals, and that infrastructural choices and decisions play a fundamental role in a manufacturing process, and must be aligned to the competitive priorities. Several studies have assessed the contribution of infrastructural choices in the manufacturing process. For instance, Hallgren (2010) argues that infrastructural choices relate to manufacturing systems used to enhance the utilization of structural decisions and are used to control the resources, and further lubricate the decision – making, and control the activities of the operation so that the firm may achieve high levels of productivity. This underscores the significance of infrastructural choices to the manufacturing process.

A study by Slack and Lewis (2012) equally concluded that infrastructural choices strategy areas influence the activities that take place within the operations structure. In addition, Rodrı´guez (2014) found a significant and positive relationship between infrastructural practices and policies on overall performance. This further compounds the greater emphasis on manufacturing infrastructure by the firms. Accordingly, the new paradigm reaffirms how manufacturing firms employs to select and control the performance of its structural decisions. In essence, a superior infrastructure allows the firm to extract a better performance.

Although a study by Iyer *et al.* (2011) argues that a few studies have suggested that there are few infrastructural elements which are receiving attention in the recent times, this study results posits a significant linkage between infrastructural choices and manufacturing performance. This suggests a strong need for infrastructural improvements, support from these sugar manufacturing firms' management in order to improve their performance.

4.5.5 Effect of Leadership Styles on Performance

This study assumed that the leadership style is situational (Northouse, 2016; Ketema, 2015; Kreitner and Kiniki, 2006), as a result, adopted Path – Goal Theory of leadership. The theory outlines four leadership styles, viz, Directive, participative, supportive, and achievement – oriented leadership styles (Appendix II: Section D). The study hypothesized that the performance of these sugar manufacturing firms may be influenced by the leadership style adopted by the leaders as the situation may warrant. Hence, the study sought to assess the type of leadership style (s) dominantly used, and their extent influence on the performance.

The scoring interpretation offered by Northouse (2016) provides vital information about which leadership style(s) the leader uses most often and which one(s) is less used. In addition, hence, it was used to assess the varied contributions to the performance. Table 4.43 provides the leadership style, scoring method and its interpretation.

Each of the leadership style was measured using five items as provided for in table 4.42. Consequently, Directive leadership style had a mean score of 3.84, Supportive leadership style 3.07, Participative leadership style 3.58, while Achievement – Oriented leadership style had a mean score of 3.05. Hence, directive, participative, and achievement – oriented leadership styles had moderate scores while supportive leadership style was found to have low scores, which indicates that it was the least preferred leadership style.

Table 4.42: Leadership styles Scoring grid

Leadership Style	Scoring items	Scoring Interpretation
Directive	1, 5, 9, 14, 18	A common score is 4.6. Score above 5.6 are considered high, scores below 3.6 are considered low
Supportive	2, 8, 11, 15, 20	A common score is 5.6. Scores above 6.6 are considered high, scores below 4.6 are considered low
Participative	3, 4, 7, 12, 17	A common score is 4.2. Score above 5.2 are considered high, score below 3.2 are considered low
Achievement-Oriented	6, 10, 13, 16, 19	A common score is 3.8. Score above 4.8 are considered high, score below 2.8 are considered low

Source: Adopted from A path-Goal Theory Investigation of Superior-Subordinate Relationships, by Northouse (2016).

The leadership styles were measured using four constructs, namely: Directive, Supportive, Participative, and Achievement – Oriented leadership styles. Each construct was measured by four indicators as presented in table 3.3a. The following section presents descriptive, various diagnostic tests, correlation and regression analyses of each of the leadership styles.

4.5.5.1 Descriptive Statistics

Frequencies, expressed as a percentage of the sample, were used to describe the number of times the respondents either agreed or disagreed with the hypothesized leadership state. The respondents were required to indicate on a continuum of 1 – 5 Likert slanting scale, the extent to which they perceived of various infrastructural decisions items. The descriptive statistics was generated for each of the four construct of the study variable, and the results summarized in table 4.43.

To describe the directive leadership style as used by the management of these sugar manufacturing firms, the study results showed that of the valid respondents, the majority generally agreed that the followers are made aware of what is expected of them. The measurement item had a mean of 4.04 and a standard deviation of 1.13. To describe the level of target information, the majority of respondents generally agreed that leader informs subordinates what needs to be done and show them how it is to be done. The measurement item summed up to a mean of 3.98 with standard deviation of 0.88.

To assess the level of adherence to rules and the operating procedures, the measurement item had a mean of 3.49 and a standard deviation of 1.34. In order to determine the how challenging it is to meet the set targets, the item measurement summed up to a mean of 3.16 and a standard deviation of 1.45. Comparatively, it seems that the subordinates are more or less divided as to whether the leadership is stretching far their achievement potentials consistently.

Table 4.43: Descriptive statistics for Leadership Styles measurement items

Directive leadership style items	**Mean**	**S.D**
Followers are made aware of what is expected of them	4.04	1.13
The leader informs subordinates what needs to be done and how it is to be done	3.98	0.88
The followers are asked to follow standard rules and procedures	3.49	1.34
The leader consistently set challenging goals to be met	3.16	1.45
Supportive Leadership style items		
The leader maintains a friendly working relationship with the followers	4.03	1.11
The leader does little things to make it pleasant for the group	2.59	1.14
The leader's behavior is thoughtful of followers' personal needs	2.61	1.28
Leader helps followers overcome their problems to accomplishing their tasks	3.04	1.46
Participative Leadership Style items		
The leader consults with the followers whenever there is a problem	3.95	0.99
The leader listens receptively to followers' ideas and suggestions	3.69	1.13
The leader acts without consulting followers	2.69	1.03
The leader encourages continual improvement in followers performance	3.16	1.45
Achievement – Oriented leadership Style items		
Followers are made aware of their expectations	3.847	1.078
Leaders set challenging goals	2.756	1.301
Leaders encourage improvement in followers' performance	3.160	1.446
Leaders show doubt in the ability of follower to meet objectives	2.405	1.556
Leaders consistently set challenging goals	2.400	1.416

Mean: 1 – 1.8 = **N**, 1.9 – 2.7 = **S**, 2.8 – 3.3 = **O**, 3.4 – 4.2 = **U**, Above 4.2 = **A**

Key: **N** – Never, **S** – Seldom, **O** – Occasionally, **U** – Usually, **A** – Always

Equally, the study sought to determine the supportive leadership style, if, is used by the various leaders. To describe the level of working relationship between the leaders and the subordinates, the majority of respondents generally agreed that the leader maintains a friendly working relationship with the followers with the item measurement summing up to a mean of 4.03 and a standard deviation of 1.11. In addition, there was a moderate number of valid respondents who generally agreed that the leader does little things to make it pleasant for the group with the measurement item summing up to a mean of 2.59 and a standard deviation of 1.14. This however, negates the philosophy behind supportive style of leadership.

In order to assess personal needs of followers, the measurement item summed up to a mean of 2.61 and a standard deviation of 1.28. This further compounds the fact that the leaders are neither thoughtful of followers' personal needs, nor are do they do little things in order to make it pleasant for the group. Moreover, when asked to indicate the challenging level of the goals, the measurement item summed up to a mean of 3.04 and a standard deviation of 1.46.

The study equally sought to determine the participative leadership style, if, is used by the various leaders. To determine the level of consultation among the subordinates and the leaders, generally respondents agreed that the leader consults with the followers whenever there is an issue to be tackled with a mean of 3.95 and a standard deviation of 0.99. However, to explore whether the leader acts without consulting followers, the item summed to a mean of 2.69 and a standard deviation of 1.03. To show if the leader listens to followers, respondents moderately agreed that the leader listens receptively to followers' ideas and suggestions with the measurement item averaging to 3.69 and a standard deviation of 1.13. In addition, to determine whether or not the leader encourages continual improvement, the measurement item summed to a mean of 3.16 and a standard deviation of 1.45.

4.5.5.2 Diagnostic Tests for Leadership Styles

This section contains various diagnostic tests performed on the research instruments on the leadership styles measures before actual inferential analyses were done of the study variable.

Normality test

In order to analyze the data using inferential statistical techniques, the normality distribution of occurrence for the variable was examined the values of skewness and kurtosis statistics. While both supportive and achievement – oriented leadership styles showed positive coefficient of skewness (1.507 and 0.747 respectively), both directive and participative leadership styles revealed negative skewness statistics (-1.423 and -1.748 respectively).

Although the study results of leadership styles indicators revealed negative skewness, all the skewness coefficient values fall within the acceptable range of $Z_{Sk=} \pm_{1.96}$

($Z = \frac{SK_W}{std\ Error}$), that is, Z – scores for directive style is -1.423, supportive style is 1.48,

participative style is 1.72, while for achievement – oriented leadership style is 0.82. Therefore, it was concluded that there were no cases of excessive skewness as well as kurtosis in the data set displayed. In addition, the Shapiro – Wilk test statistics in table 4.44, which is considered a more robust normality test was equally displayed (Doan and Seward, 2011), revealed that all the leadership styles measurement items were insignificant, an indication that the distribution of all the four measures of leadership styles are approximately normal.

Table 4.44: Tests of Normality for Leadership Styles measurement items

	Shapiro-Wilk		
	Statistic	df	Sig.
Followers are made aware of their expectations	.765	131	.096
Leader maintains friendly relationship	.805	131	.152
Leaders consult with followers	.842	131	.084
Leaders listen receptively to followers ideas	.878	131	.202
Leaders inform followers what to be done	.842	131	.105
Followers are made aware of their expectations	.831	131	.089
Leaders act without consulting followers	.882	131	.221
Leaders make the group pleasant	.895	131	.072
Followers adhere to standard rules	.858	131	.207
Leaders set challenging goals	.897	131	.062
Followers are helped to overcome problems	.864	131	.121
Leaders encourage continuous improvement in followers' performance	.865	131	.097
Leaders show doubt in the ability of follower to meet objectives	.868	131	.072
Leaders consistently set challenging goals	.888	131	.081
Leaders' are thoughtful of followers' needs	.870	131	.078

a. Lilliefors Significance Correction

Reliability test

The seventeen (17) measurement items of the four leadership styles constructs were subjected to a reliability test using Cronbach's alpha coefficient as shown in table 4.45 in order to assess construct reliability.

Table 4.45: Reliability Statistics for Leadership Styles items

Cronbach's Alpha	N of Items
.802	15

As depicted in Table 4.45, the Cronbach's Alpha reliability coefficient for leadership styles items was 0.802. This statistic is greater than the minimum accepted Cronbach's alpha coefficient of 0.70 **(**Sekaran, 2003; Katema, 2009), hence was considered to be reliable ensuring sufficient construct reliability of the construct items. Based on the results, the study conclude that the specific leadership styles items were reliable to measure what they were intended to measure, and hence can be used in the subsequent analyses of data in assessing the relationships between the constructs.

The ANOVA table 4.46 indicates that F- Ratio which is a measure of the variation explained by the model and the variation explained by unsystematic factors. Given that the F-ratio is greater than one ($F(130, 14) = 48.780$, $p<0.05$), it is an indication that experimental manipulation had some effect above and beyond the effect of individual differences. This implies that there is no chance that the effect occurred by chance.

Table 4.46: ANOVA statistics for Leadership Styles items

		Sum of Squares	df	Mean Square	F	Sig
Between People		726.969	130	5.592		
Within People	Between Items	754.609	14	53.901	48.780	.000
	Residual	2010.191	1820	1.105		
	Total	2764.800	1834	1.508		
Total		3491.769	1964	1.778		
Grand Mean = 3.2453						

4.5.5.3 Exploratory Factor Analysis

The validity of the model constructs was assessed by exposing the leadership styles variable with sixteen (16) measurement items to exploratory factor analysis in order to assess the extent to which the observed indicators represents an underlying latent construct fitted with the pre-specified theoretically driven model (Hair *et al.,* 2005), and aid to identify the least number of factors which can account for the common variance of a set of variables and, to show by how much the co-variation among the observed variables each one accounts for. The initial part of the factor extraction process was to determine the linear components within the data set (eigenvectors). Two leadership styles components with Eigen values ≥ 1 were extracted and retained, whose results are presented in table 4.47.

Table 4.47: Total Variance of Leadership Styles Explained

Componen	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var	Cum %	Total	% of Var	Cum %	Total	% of Var	Cum %
1	3.378	48.252	48.252	3.378	48.252	48.252	2.947	42.097	42.097
2	1.887	26.959	75.211	1.887	26.959	75.211	2.318	33.114	75.211
3	.627	8.960	84.171						
4	.433	6.193	90.364						
5	.333	4.752	95.116						
6	.200	2.858	97.974						
7	.142	2.026	100.00						

Extraction Method: Principal Component Analysis.

Presented in table 4.47 is a list of eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation. Before extraction, seven linear factors were identified, while after extraction, two components were extracted, and displayed eigenvalues associated with each factor representing the variance explained by that particular linear component. Accumulatively, the two extracted factors explained approximately 75.2 percent of the total variance in leadership styles. This indicates that the amount of information loss is relatively smaller when the number of indicators was reduced, according to Hair *et al.* (2005) and Field (2003). However, on an individual basis, it can be deduced that component one accounted for 48.252 percent of the total variance while component two accounted for 26.959 percent of the total variance of leadership styles.

Rotation has the effect of optimizing the factor structure and states the relative importance of the factor. However, after extraction and rotation, factor one accounts for approximately 42.097 percent while factor two accounted for approximately 33.11 percent of the total variance of leadership styles as used by the leaders of these sugar manufacturing firms in in Kenya.

As a matrix of the factor loadings for each variable onto each factor, and for the coefficients calculation after being rotated, the salient factors which had more than 0.4 factor loadings were retained. From the study results shown in table 4.48, the system has identified two important factors to be loaded in the analysis. The rest are dropped from the analysis.

Table 4.48: Rotated Component Matrix[a] for Leadership Styles items

Leadership Styles measurement items	Component	
	1	2
Leaders consult with followers	.891	
Leaders listen receptively to followers ideas	.870	
Leaders inform followers what to be done	.855	
Leader maintains friendly relationship	.723	
Leaders encourage improvement in followers' performance		.903
Followers are helped to overcome problems		.850
Leaders' are thoughtful of followers' needs		.845

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 3 iterations.

From the rotated component matrix in table 4.48, factor one is highly and positively related with "Leaders consult with followers" measurement item with a coefficient of 0.891, followed by the "Leaders listen receptively to followers ideas" leadership item with 0.870, then the "Leaders inform followers what to be done" item had a coefficient of 0.855, while the ‘Leader maintains friendly relationship” leadership item had a relation coefficient of 0.723. Factor two is highly and positively related with "Leaders encourage improvement in followers’ performance” leadership style item (0.903), followed by the “Followers are helped to overcome problems” item (0.850), then the “Leaders' are thoughtful of followers' needs” item with a coefficient of 0.845.

From the extracted components of leadership styles in table 4.48, component one is mapped onto Participative leadership styles, while component two is mapped onto Supportive leadership styles respectively. The construct items which contributed most to the constructs were thus identified in their order of importance. This implies that the study identified Supportive and Participative leadership styles respectively, as the important leadership approaches that the leaders in these sugar manufacturing firms currently employ.

The study equally generated a reproduced correlations table (Appendix XI) that indicates a principal diagonal of communalities. From the communality table of leadership styles, (Appendix XXI), the average of the communalities is given by 0.753, which is more than the minimum acceptable threshold of 0.70, is an indication that the extracted leadership styles items were sufficient enough as a show of accuracy of the identified items of measurement Field (2003).

In order to validate construct validity of leadership styles items, the KMO Measure of Sampling Adequacy in table 4.49 had an index of 0.718 which is greater than the conventional minimum probability value of 0.5, implying that factor analysis is appropriate for the data set. In addition, Bartlett's Test of Sphericity contains an approximated Chi-square of 521.700, with an associated p – value lower than the conventional probability value of 0.05. It was hence concluded that the factor analysis was appropriate for assessing construct validity of the scale (Hair *et al.*, 2013; Williams *et al*., 2010; Field, 2003). Consequently, from the Bartlett's Test of Sphericity results, the study rejected the null hypothesis which means that leadership styles variables have a strong association.

Table 4.49: KMO and Bartlett's Test of Sampling Adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.718
Bartlett's Test of Sphericity	Approx. Chi-Square	521.700
	Df	21
	Sig.	.000

4.5.5.4 Correlation Analysis

Correlation statistics measures the extent of association between the ordering of two random variables although; a significant correlation does not necessarily indicate causality but rather a common linkage in a sequence of events. Thus, the current study analyzed the relationships that are inherent among the extracted leadership styles study variable items. Subsequently, Participative leadership styles and Supportive leadership styles were the two constructs with the common factors that account for common variance of leadership styles which were extracted, and whose correlations results are presented in table 4.50.

Table 4.50: Correlations output for Leadership Styles and Efficiency

		Supportive	Participative	Efficiency
Supportive	Pearson Correlation	1		
Participative	Pearson Correlation	-.263*	1	
	Sig. (2-tailed)	.018		.
Efficiency	Pearson Correlation	.752*	.438*	1
	Sig. (2-tailed)	.048	.021	

*. Correlation is significant at the 0.05 level (2-tailed).

Pearson Correlation results in table 4.50 showed that supportive leadership style is weakly but negatively correlated with participative leadership style. However, this relationship was found to be significant at 5% level of significance ($r = -0.263$, $\rho < 0.05$). The correlations output equally indicate that supportive leadership styles are strong and positively related with efficiency of sugar manufacturing process. In addition, the relationship was found to be significant ($r = 0.752$, $\rho < 0.05$).

Moreover, the study found approximately moderate and positive correlation between participative leadership style and efficiency, with the relationship being significantly ($r = 0.438$, $\rho < 0.05$). From the correlations table 4.50, all the correlation coefficients range between low ($r = -0.263$) to just above moderate ($r = 0.752$), implying that multicollinearity is minimal among the set of identified leadership styles construct indicators. This has the advantages of decreasing the probability of committing type II error that can lead to rejecting a good predictor from the model, as Field (2003) acknowledges.

On an individual measurement items, the leadership styles Extracted Correlation Matrix (Appendix XXII) shows the correlations coefficients among the extracted leadership styles measurement items are between low ($r = -0.053$, $\rho > 0.05$) to strong ($r = 0.815$, $\rho < 0.05$), with most of the measurement items recording weak to moderate correlations coefficients. This is a further indication of lack of autocorrelation among the construct measurements items.

4.5.5.5 Regression Analysis

The fourth objective of the study was to establish the effect of leadership styles on the performance of sugar manufacturing firms in Kenya. The study predicted that the relationship between leadership styles and performance of sugar manufacturing firm in Kenya is not statistically significant. The resultant leadership styles were measured by Participative and Supportive leadership styles. The aggregate mean scores of the extracted leadership styles measurement items were regressed against the aggregate mean scores of the extracted performance measures items (efficiency).

The model summary in Table 4.51 shows that leadership styles jointly accounted for 17.8 percent variation in performance of sugar manufacturing firms ($R^2 = 0.178$). This implies that 48.6 percent (1 – 0.514) is accounted for by other variables not considered by the study. However, the overall regression results revealed a statistically insignificant but positive linear relationship between leadership styles and performance of sugar manufacturing firms ($R^2 = 17.8$, $\rho > 0.05$).

Table 4.51: Model Summary[b] for Participative and Supportive styles

Model	R	R^2	Adj. R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df 1	df 2	Sig. F Change	
1	.422[a]	.178	.127	.18873	.178	2.385	1	4	.044	1.214

a. Predictors: (Constant), Participative and Supportive leadership styles

b. Dependent Variable: Efficiency

The value of adjusted $R^2 = 0.127$ shows how well the model generalizes the prediction. The shrinkage (about 5.1%) shows that if the model were derived from the population rather than a sample, it would account for about 5.1 percent less variance in the outcome. In addition, the model causes the R^2 to change from zero to 0.178, and this change in the amount of variance explained was found to be significant at 5% level of significance ($F(1, 4) = 2.385$, $p < 0.05$). Table 4.52 equally shows the Durbin-Watson statistic (***d*** **=** 1.214), which affirms the rule of the thump used to conduct an autocorrelation analysis (Gujarati, 2014; Field, 2003).

The model parameters in table 4.52 shows the β-value which indicates that participative leadership style makes a significant contribution to the model ($t(196) = 1.140$, $\rho < 0.05$), while supportive leadership style equally has a significant and positive predictive contribution to the model ($t(1.96) = 1.654$, $\rho < 0.05$). However, based on individual ***t* –** statistics of the leadership style, supportive leadership style has a better contribution than participative leadership style respectively.

Table 4.52: Beta Coefficientsa of Leadership Styles and Efficiency variables

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tol.	VIF
1	(Constant)	2.699	1.108		2.436	.025		
	Participative	.406	.356	.275	1.140	.048	1.000	1.000
	Supportive	.243	.147	.063	1.654	.027	.964	1.037

a. Dependent Variable: Efficiency

Included also in table 4.52 are the measures of whether there is collinearity in the data by providing the VIF and Tolerance statistics, which indicates that tolerance for both supportive and participative leadership style are either one or approximately one, which, according to Gujarati (2004) is an evidence that collinearity with other repressors in the model is minimized.

The hypothesis test criteria was that the null hypothesis H_{04} should be rejected if $\beta \neq 0$ and p-value ≤ 0.05 otherwise fail to reject H_{04} if the p-value > 0.05. Hence the study sought to test the fourth null hypothesis stated thus:

H_{04}: There is no significant effect of Leadership Styles on performance of sugar manufacturing firms in Kenya.

From the model in table 4.52 it can hence be deduced that the linear functional relationship between leadership styles measurements and performance of sugar firms follow the following regression model:

$$\text{Performance} = \beta_0 + \beta_1\boldsymbol{PL} + \beta_2\boldsymbol{SL} + \varepsilon_i$$

$$= 2.699 + (0.406\ \boldsymbol{PL}) + (0.243\ \boldsymbol{SL}) + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots \textbf{\textit{Equation 4.6}}$$

where: PL = Participative Leadership Style, while

SL = Supportive Leadership Style

Leadership at work as manufacturing process is a dynamic process where the leader is not only responsible for the group's tasks, but also actively seeks the collaboration and commitment of all subordinates in achieving group goals in a particular context (Sostrin, 2017; Kreitner & Kiniki, 2006). This underscores the significant effect of the selective leadership styles that were identified by the study, as mostly in use by these sugar manufacturing firms in Kenya.

The current study found a significant contribution of leadership style to performance, confirming several past study results (Szumbah & Imbambi; Karamat, 2013 Koech & Namusonge, 2012; Obiwuru *et al.*, 2011; Wang *et al.*, 2010; Gumusluoglua & Arzu, 2009). In addition, Guiding the operations strategy is operations leaders who are capable, knowledgeable and energetic (Slack & Lewis, 2011).

4.5.6 Effect of Operations Strategies on Performance

The study sought to assess the overall effect of operations strategies on the performance of sugar manufacturing firms in Kenya. The study hypothesized that operations strategies linearly and directly influence performance of these sugar manufacturing firms. Operations Strategies was operationalized by four variables, namely: Competitive Priorities, Structural Decisions, and Infrastructural Choices. Each of the independent variable was measured using four constructs (figure 2.1). Each of the constructs was equally measured using four measurement items, in which a total of sixteen measurement items were subjected to exploratory factor analysis to identify the least number of factors which account for the common variance and, to show by how much the co-variation among the observed variables each one accounts for.

The operations strategies measurement items were subjected to EFA, in which two constructs for competitive priorities (Delivery and Flexibility), three constructs for structural decisions (Process, Structures, and Operations Development and Innovation), three constructs for infrastructural choices (policies, communication and work – force) were respectively identified, while efficiency was identified for performance as factors that accounts for the common variance of the study variables. The following section assesses correlation and multiple regression analyses of the effect of operations strategies on efficiency.

4.5.6.1 Correlation Analysis

The correlation statistics was used to measure the extent of association between two random variables of the identified independent constructs, which is Competitive Priorities (Delivery and Flexibility), Structural Decisions (Process, Structure, and Operations Development and Innovation), Infrastructural Choices (Policies, Communication, and Work-force), which were the constructs with the common factors that account for common variance of operations strategies extracted. Appendix XIII shows an array of correlations coefficients analysis results. The Pearson Correlation results show that a number of constructs had significant relationships. However, the appendix indicates a number of constructs had negative but insignificant correlation coefficients.

4.5.6.2 Regression Analysis

The main objective of the study was to assess the effect of operations strategies on the performance of sugar manufacturing firms in Kenya. The study predicted that the relationship between operations strategies and performance is not statistically significant at 5% level of significance. The resultant operations strategies were measured by Competitive Priorities, Structural Decisions, and Infrastructural Choices. The aggregate mean scores of the extracted operations strategies constructs measurement items were regressed against the aggregate mean scores of the extracted performance (Efficiency) measures items.

The study sought to assess the effect of operations strategies on the performance of sugar manufacturing firms in Kenya. When the aggregate mean scores of the extracted performance measures were regressed against the aggregate mean scores of the extracted operations strategies measurement items to determine the overall regression model fit, the effect was as summarized in Table 4.53.

The model summary of operations strategies in table 4.53 indicated operations strategies generally accounted for 21.7 percent variation in performance of sugar manufacturing firms (R^2 = 0.217). This implies that 78.3 percent variation in performance is accounted for by other variables other than operations strategies. In addition, the overall regression results revealed a statistically significant and positive linear relationship between operations strategies and performance of sugar manufacturing firms in Kenya (R^2 = 0.217, $\rho < 0.05$).

Table 4.53: Model Summary[b] of Operations Strategies

Model	R	R^2	Adj. R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df 1	df 2	Sig. F Change	
1	.466[a]	.217	.119	.18479	.217	2.219	1	8	.017	2.156

a. Predictors: (Constant), Delivery, Flexibility, Operations development, Process, Structure, policy, Communication, Work-force

b. Dependent Variable: Efficiency

The study results validate a study by Kwasi and Acquaah (2008) which found a minimal significant direct relationship between operations strategy and firm performance. By extension, Kwasi and Acquaah (2008) further argue that this weak relationship is due to the fact that operations strategies at business level performance is as a result of multi-level contributions from several functional areas, and consequently, an impact of individual decision area might be difficult to isolate.

The value of adjusted R^2 = 0.119 indicated how well the model generalizes the prediction. The shrinkage (about 9.8%) shows that if the model were derived from the population rather than a sample, it would account for about 9.8 percent less variance in the performance of these sugar manufacturing firms. In addition, the model causes the R^2 to change from zero to 0.217, though this change in the amount of variance explained was found to be insignificant at 5% level of significance ($F (1, 8) = 2.219$, $\rho > 0.05$). Table 4.54 equally shows the Durbin-Watson statistic (*d = 2.156*), which falls within the rule of the thump as a measure of autocorrelation, and to have a better prediction power of the model (Gujarati, 2014; Field, 2003). The analysis of variance (ANOVA) as shown in table 4.54 indicates that the F-ratio, which is greater than one is very unlikely to have happened by chance ($F (1, 8) = 2.219$, $\rho < 0.05$).

Table 4.54: Overall ANOVA a of Operations Strategies and Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.076	1	.076	2.219	.017[b]
	Residual	.273	8	.034		
	Total	.349	9			

a. Dependent Variable: Efficiency

b. Predictors: (Constant), Flexibility, Delivery, ODI, Process, Policies, Communication, Workforce

The model coefficient parameters in table 4.55 shows the β-value which indicates that for competitive priorities, flexibility construct had a significant contribution to performance ($t (1.96) = 7.283$, $\rho < 0.05$), while flexibility equally had a significant influence on performance ($t (1.96) = 2.911$, $\rho < 0.050$. Regarding structural decisions, both operations development and innovations (ODI) and structure had a significant contribution to performance with (t (1.96) = 0.825, ρ < 0.05, and (t (1.96) = 0.395, ρ < 0.05) respectively while process construct had an insignificant contribution (t (1.96) = 4.639, ρ > 0.05). In addition, the analysis results showed that all the infrastructural choices constructs individually had a significant contribution to performance (t (1.96) = 4.613, ρ < 0.05, (t (1.96) = 5.745, ρ < 0.05, and (t (1.96) = 4.748, ρ < 0.05) for policies, communication, and workforce respectively.

From the magnitude of the individual ***t*** – statistics, flexibility was found to have a better contribution to the performance, followed by communication, work place policies, manufacturing processes, delivery, operations development and innovations while a firms structures was found to have the least contribution, although the firms' structures were found to have an insignificant contribution to performance at 5% level of significance. Equally included also in table 4.56 are the collinearity measures in the data by providing the VIF and Tolerance statistics (Gujarati, 2004; Field, 2003).

Table 4.55: Beta Coefficients[a] of Operations Strategies constructs

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. E	Beta			Tol	VIF
1	(Constant)	.927	.135		6.858	.015		
	Delivery	.286	.039	.537	7.283	.036	1.000	1.000
	Flexibility	2.868	.985	2.907	2.911	.041	1.000	1.000
	ODI	.262	.318	.638	.825	.006	.989	1.011
	Process	.266	.073	.498	3.589	.035	1.000	1.000
	Structure	1.658	4.203	1.888	.395	.761	1.000	1.000
	Policies	2.394	.519	3.098	4.613	.013	0.998	1.002
	Communication	.293	.051	.798	5.745	.031	.988	1.012
	Workforce	.321	.068	.372	4.748	.003	.989	1.011

a. Dependent Variable: Efficiency

The hypothesis test criteria was that the null hypothesis H_{05} should be rejected if $\beta \neq 0$ and p-value ≤ 0.05 otherwise fail to reject H_{05} if the p-value > 0.05. Consequently, the study sought to test the fifth null hypothesis stated thus:

H_{05}: There is no statistical significant effect of Operations Strategies on the performance of sugar manufacturing firms in Kenya.

From the beta coefficients as displayed in table 4.56, it can hence be deduced that the linear functional relationship between delivery, flexibility, ODI, process, structure, policies, communication, workforce and efficiency variables follow the following regression model:

$$\text{Performance} = \beta_0 + \beta_1 \boldsymbol{Del} + \beta_2 \boldsymbol{Flex} + \beta_3 \boldsymbol{ODI} + \beta_4 \boldsymbol{Pro} + \beta_5 \boldsymbol{Struc} + \beta_6 \boldsymbol{Pol} + \beta_7 \boldsymbol{Com} + \beta_8 \boldsymbol{WF} + \varepsilon_i$$

$$= 0.927 + (.286\boldsymbol{Del}) + (2.868\boldsymbol{Flex}) + (.262\boldsymbol{ODI}) + (.266\boldsymbol{Pro}) + (1.658\boldsymbol{Struc}) + (2.394\boldsymbol{Pol}) + (.293\boldsymbol{Com}) + (.321\boldsymbol{WF}) + \varepsilon_i$$

…………………………………….. *Equation 4.4*

where: ***Del*** = Delivery,

Flex = Flexibility

ODI = Operations Development and Innovations

Pro = Process

Struc = Structure

Pol = Policies

Com = Communication

WF = Work – force

The overall model summary of operations strategies in table 4.56 indicates that operations strategies generally accounted for 21.7 percent variation in performance of sugar manufacturing firms (R^2 = 0.217). This implies that 78.3 percent variation in performance is accounted for by other variables other than operations strategies. In addition, the overall regression results revealed a statistically significant and positive linear relationship between operations strategies and performance of sugar manufacturing firms in Kenya ($R^2 = 0.217$, $\rho < 0.05$).

The study results validate a study by Kwasi and Acquaah (2008) which found a minimal significant direct relationship between operations strategy and firm performance. By extension, Kwasi and Acquaah (2008) further argue that this weak relationship is due to the fact that operations strategies at business level performance is as a result of multi-level contributions from several functional areas, and consequently, an impact of individual decision area might be difficult to isolate.

The operations strategies bind the various operations decisions, choices and actions into a cohesive consistent response to competitive forces by linking the firm policies, programs, and structural systems, into a systematic response to the competitive priorities chosen and communicated by the corporate strategy (Inman, 2015). Literature claims that to contribute to the achievement of competitive advantage, it is advisable that operations strategies be incorporated in the corporate strategy. However, when companies do not recognize the relationship between operation strategy and corporate strategy, they can be stuck in wasteful uncompetitive production systems (Sohel and Roger, 2013). This study confirmed the above elucidations, with 21.7 percent of the variations in the performance of these sugar manufacturing firms are attributed to operations strategy ($R^2 = 0.217$, $\rho < 0.05$). These results are consistent with study results by Ketema, (2015) which concluded that 55.7 percent of performance of sugar manufacturing firms in Ethiopia in influenced by operations strategies.

Moreover, various authors have acknowledged a significant contribution of operations strategies to performance (Malonza (2014; Sciuto and Filho, 2013; Magutu *et al*., 2010).

In line with this study findings as well as study by various stated authors, this study results confirm the strategic contingency theory, which emphasize the linkages between patterns of manufacturing decisions and performance.

Accordingly, the study further confirms the implication by Vistag (2009) that when appropriately applied, the theory allows for maximum performance that can be achieved by a unit contingent on a set of operations decisions, that boils down to choices in both structural and infrastructural factors. Interestingly, this study found an insignificant contribution of structural decisions on manufacturing performance. However, a study by Zeithaml *et al.* (2012) questioned the contribution of structural decisions and concluded that operations strategy is not equally effective under all conditions, due to differing firm's complexities and uncertainties of their situations.

To achieve a certain level of performance through different combinations of either or both of structural decisions and infrastructural choices, a firm must have a leeway in making strategic decisions that provide a given set of competitive priorities (Arasa & Githinji, 2014). Structural decisions, unlike infrastructural choices, once made locks the firms' flexibility, deterring trade – offs and organization's ability to learn and accumulate skills. Keteme (2015) intones that since competitive priorities are accomplished through structural and infrastructural decisions and choices respectively, it therefore requires the firm's management to carefully make decisions and appropriate choices at the operational areas. Ketema further argue that researchers have obtained evidence supporting the idea that decisions in these areas positively relate to operations performance.

Although the current study found a weak, but positive contribution of operations strategy to performance, the study results were significant and confirmed past studies, an indication that in order to improve performance, the sugar manufacturing firms need to improve the operations strategies consistent with the strategic objectives. The implication of operations – based strategy in the literature is profound. Both the structural and infrastructural decisions and choices respectively have been the basis of choosing and implementing a corporate strategy.

In too many instances, a firm's operations function is not geared to the business's corporate objectives (Inman, 2015). Since the manufacturing system itself may be good, rarely is it designed to meet the firm's long – term needs. Hence, operations is seen as a neutral force, concerned solely with efficiency, and has little place within the corporate consciousness. The need for an operations strategy that reflects and supports the corporate strategy therefore, is not only crucial for the success of the corporate strategy but also because many decisions are structural in nature. Firms that fail to fully exploit the strategic power of operations will be hampered in their competitive abilities and vulnerable to attack from those competitors who do exploit their operations strategy. To do this effectively, operations must be involved throughout the whole of the corporate strategy.

Different firms within the same industry have differing capabilities, and weaknesses, and hence choose to compete on different platforms, and consequently, each involves a different set of trade – offs (Klaus & Charlotte, 2015). In essence, no one operating system is universally superior under all competitive situations and for all companies alike. This would mean that a firm’s production system must have a customized design that reflects the priorities areas and the trade – offs inherent in these firms’ own competitive situations and strategies.

4.5.7 Effect of Leadership Styles on the relationship between Operations Strategies and Performance

Although the study assumed a linear relationship between operations strategies and performance of sugar manufacturing firms in Kenya, this relationship however, may be influenced by the introduction of a third variable. Consequently, the study hypothesized that the introduction of a leadership style may alter the influence of operations strategies on performance (Fairchild & MacKinnon, 2010).

The sixth objective of the study was to assess the effect of leadership styles on the relationship between operations strategies and the performance of sugar manufacturing firms in Kenya. Moderated multiple regression analysis was conducted to empirically determine whether or not leadership styles moderate the relationship between operations strategies and performance of sugar manufacturing firms in Kenya. The study predicted that, at 5% level of significance, leadership styles had no statistical effect on the relationship between operations strategies and performance. The hypothesis test criterion was that the null hypothesis H_{06} should be rejected if $\beta \neq 0$ and p-value ≤ 0.05 otherwise fail to reject H_{06} if the p-value > 0.05. Consequently, the study sought to test the sixth null hypothesis stated thus:

H_{06}: Leadership Styles have no effect on the relationship between Operations Strategies and performance of sugar manufacturing firms in Kenya.

The aggregate mean scores of the extracted performance measures were regressed against the aggregate mean scores of the extracted operations strategies measurement items, when leadership styles were introduced, in order to determine the overall regression model fit. The overall model summary of operations strategies in table 4.56 indicates that operations strategies generally, and that operations strategies significantly accounts for 21.7 percent variation in performance of sugar manufacturing firms (R^2 = 0.217, $\rho < 0.05$). This implies that 78.3 percent variation in performance is accounted for by other variables other than operations strategies.

The moderated model summary table 4.56 indicates that when leadership styles were introduced in the analysis, as a predictor, the model predicts approximately 19.2 percent variation in the performance of sugar manufacturing firms. The study found this relationship to be statistically significant (R^2 = 0.192, $\rho < 0.05$). The value of adjusted coefficient of determination (Adjusted R^2 = -0.346) shows that if the model were derived from the population rather than the sample, it would account for about 34.6 percent less variance in the performance of sugar manufacturing firms. In addition, the model causes

R^2 to change from zero to 0.192, and this change in the amount of variance explained gives an F-ratio of 5.238, which is significant ($p < 0.05$).

Table 4.56: Moderated Model Summary of Operations Strategies and Leadership

Model	R	R^2	Adj. R^2	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R^2 Change	F Change	df1	df2	Sig. F Change	
1	.439[a]	.192	-.346	.21604	.192	5.238	2	3	.026	1.801

a. Predictors: (Constant), Leadership Styles, Operations Strategies

b. Dependent Variable: Efficiency

Following the moderated results, introduction of leadership style in the overall regression model causes the overall adjusted coefficient of determination to change from 21.7 percent in table 4.54 to an overall moderated coefficient of determination of 19.2 percent in table 4.56. This implies that leadership style has a negative effect of approximately 2.5 percent. In addition, this reducing effect of leadership styles on the relationship between operations strategies and performance in table 4.56 was found to be overally significant. However, Karamat (2013) argues that past study results about the role of leadership in performance are mixed and needs to be further explored. This could be the reason why several authors, just like the current study, have found a weak contribution of leadership style and performance.

Although a linear relationship between operations strategy and performance of sugar manufacturing firms was proposed, the study established that this relationship however, is moderated by leadership styles, by leadership style accounting for 2.2 variations in the relationship. The results underscore a conclusion by Wanyande (2011) which blames the problem of inefficiency in the sugar industry on poor leadership, among other challenges. This implies that for a superior operations performance, a paradigm shift in managerial approach to leadership in the current wave of a rapidly evolving technology accompanied by increasing competition and market globalization must be taken into consideration. This demands that the style of leadership the management employs must be elastic enough to suit the contingencies within and without the manufacturing firm (Obiwuru *et al.,* 2011; Arzu, 2009; Kreitner & Kiniki, 2006).

The moderated regression model coefficients in table 4.57 indicates the β-values which shows the relationship between operations strategies and performance of sugar manufacturing firms, as moderated by the introduction of leadership styles used by the management of these sugar manufacturing firms in their daily operations. The test on the beta coefficients of the resulting moderated regression model indicates t – values for competitive priorities ($t = -2.793$, $\rho < 0.05$), for structural decisions ($t = 0.641$, $\rho > 0.05$). Infrastructural choices had a t – value of 0.332, $\rho > 0.05$), while leadership styles had a statistically but insignificant effect on the relationship between operations strategies and performance, given that at $\alpha = 0.05$, leadership style effect hat a t – statistic of 1.069, $\rho > 0.05$.

Table 4.57: Moderated Coefficients[a] of Operations Strategies and Leadership

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. E.	Beta	t	Sig.	Tol.	VIF
(Constant)	4.589	1.088		4.218	.008		
Competitive Priorities	-.401	.144	-.720	-2.785	.038	.989	1.012
Structural Decisions	.073	.115	.168	.635	.550	.953	1.049
Infrastructural Choices	.067	.202	.090	.332	.037	.985	1.015
Leadership Styles	.094	.088	.284	1.069	.034	.931	1.074

a. Dependent Variable: Performance

An introduction of leadership style in the relationship between operations strategies and performance revealed an overall significant decreasing effect of leadership style used by the management on the relationship between competitive priorities and performance ($t = -2.785$, $\rho < 0.05$). However, this effect was found to be negative implying that an attempt by a sugar manufacturing firm to use any of the competitive priorities (delivery and flexibility), the performance is likely to decrease by a value of 0.720 given the interaction of leadership style. However, the study found positive but insignificant effect of leadership style on the relationship between structural decisions ($t = 0.635$, $\rho > 0.05$), infrastructural choices ($t = 0.332$, $\rho < 0.05$), and leadership style ($t = 1.069$, $\rho < 0.05$) on performance of sugar manufacturing firms in Kenya.

The reducing interactive effect of leadership style on the relationship between operations strategies used by sugar manufacturing firms in Kenya follows a conclusion by Fairchild and MacKinnon (2010), arguing that a moderator's effect can either be enhancing, reducing, or changing the influence of the explanatory variables. Even though several studies have found a direct enhancing effect of leadership on the influence of explanatory variables on performance (Odollo, 2015; Koech & Namusonge, 2012; Biwuru *et al*., 2011; Faichild & MacKinnon, 2010; Wang *et al*., 2010; Gumusluoglua & Arzu, 2009), however, Karamat (2013) argues that this role of leadership is not so important in achieving organizational performance.

The moderation effect of leadership styles on operations performance of sugar manufacturing firms in Kenya was tested using the hierarchical Moderated Multiple Regression (MMR) model. From the moderated multiple regression model in table 4.68, it can be deduced that the linear functional relationship between operations strategies and operations performance of sugar manufacturing firms when leadership style is introduced follow the following moderated multiple regression model in the form:

$$OP = \beta_0 + \beta_1 \boldsymbol{CP} + \beta_2 \boldsymbol{SD} + \beta_3 \boldsymbol{IFC} + \beta_4 \boldsymbol{Z} + \beta_5 \boldsymbol{Z} * \boldsymbol{CP} + \beta_6 \boldsymbol{Z} * \boldsymbol{SD} + \beta_7 \boldsymbol{Z} * \boldsymbol{IFC} + \varepsilon_i \ldots \ldots \textbf{Equation 4.9 (Conceptualized MMR Equation)}$$

where **Z** is the corresponding coefficients of leadership styles, as a moderating variable. Hence, following the study results as, the MMR model was deduced to be:

$$OP = -1.658 + (3.098\mathbf{CP}) + (0.798\mathbf{SD}) + (0.372\mathbf{IFC}) + (4.589\mathbf{Z}) - (0.720\mathbf{ZCP}) +$$

$$(0.168\ \mathbf{ZSD}) + (0.09\ \mathbf{IFC}) + \varepsilon_i \text{ ....} \textit{Equation 4.10 (MRM Equation)}$$

Where: OP = dependent variable (Operations Performance).

CP = Competitive Priorities

SD = Structural Decisions

IFC = Infrastructural Choices

Z = Moderating effect of Leadership Style

ε_i = Error term.

According to the Moderated Multiple Regression analysis results, the study found that leadership styles have a moderating effect on the relationship between operations strategies (competitive priorities, structural decisions, and infrastructural choices) and performance (efficiency) of sugar manufacturing firms in Kenya. This is supported by the study done by Obiwuru *et al*. (2011) which concluded that leadership behavior accounts for a 48.64 percent positive effect on performance. In addition, a study by Ojokuku *et al.* designed to examine the impact of leadership styles on performance, showed that leadership styles dimensions jointly account for 23 percent variance in the organization performance.

From the analyses of the stated hypotheses, table 4.58 shows a summary of the research hypotheses framework and their results. In response to the central question posed by Hayes and Pisano (2005) about which of the operations strategies to be focused on and be improved by sugar manufacturing firm, the study therefore concludes that of these, competitive priorities, as well as infrastructural choices should be improved, since the study found statistical significance on operations performance. This satisfies the quest of both Hayes and Pisano (2005) and Ketema (2015) for the need to assess the composite effect of operations strategies and their contributions to the performance in a manufacturing industry. However, the study failed to find a statistical significance between structural decisions and performance.

Table 4.58: Summary of the hypotheses, their results and conclusion

Hypotheses	Description	Beta	t–value	Comment
H_{01}	Competitive Priorities have no significant effect on Performance.	0.661	0.882	Rejected
H_{02}	Structural Decisions have no significant effect on Performance.	0.785	1.266	Failed to Reject
H_{03}	Infrastructural Choices have no significant effect on Performance	0.405	0.761	Rejected
H_{04}	Leadership Styles have no significant effect on Performance	0.422	0.931	Rejected
H_{05}	Operations Strategies have no significant effect on Performance	0.466	1.490	Rejected
H_{06}	Leadership Styles have no significant effect on the relationship between Operations Strategies and Performance	0.126	.230	Rejected

4.5.8 Optimal (Revised Conceptual Framework) Model

According to the combined model aforementioned, structural decisions with beta coefficient of 0.785 and t-value of 1.266, $\rho > 0.05$, showed insignificant influence on the performance of sugar manufacturing firms in Kenya. Various study variables measurement items were subjected to EFA, yielded respective constructs that explain common variances to the individual study variables. The items that did not meet the requirements were removed from the analysis. Moreover, structural decisions as a strategy showed an insignificant relationship with performance, and were equally removed from the final relationship. This then led to a revised conceptual framework as indicated in figure 4.1. The insignificance of structural decisions as shown in the model is a pointer that structural decisions have been overstated in these sugar manufacturing firms.

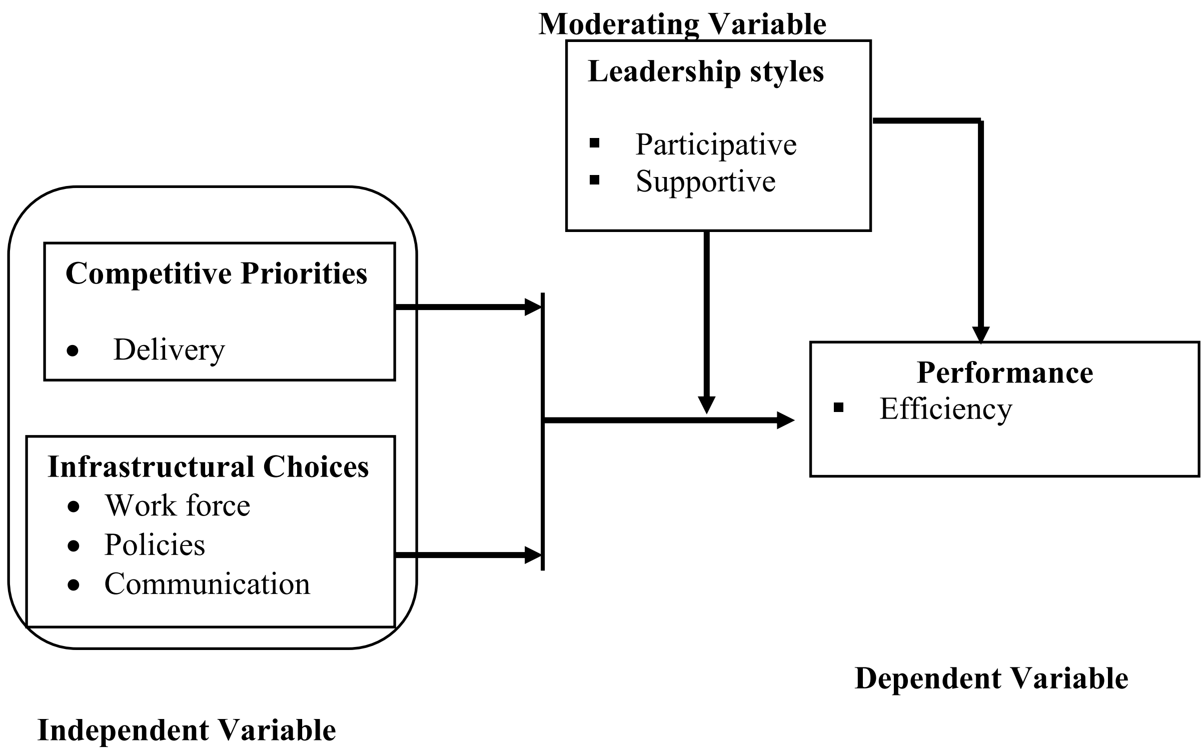

Figure 4.1: Optimal (Revised Conceptual Framework) Model

4.6 Chapter Summary

This chapter presented detailed analyses and discussions of the findings of various study variables. The analyses were done as per the study objectives and results presented. The preliminary study results discussed included response rate and various diagnostic tests, descriptive, as well as inferential analyses, which were corroborated with past study results and appropriate inferences drawn. Regression and correlation as well as Analysis of Variance and other statistics were performed to enhance data interpretation and discussions. Most of the theories and ideas reviewed were confirmed by the findings, but in some cases, the theories and ideas were contradicted. The following chapter (5) presents a general summary, conclusions, recommendations as per study objectives, as well as proposed possible areas for further research.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of major findings, relevant discussions, conclusions and necessary recommendations of the study based on the study variables. The study findings are presented per the study objectives, on the basis of descriptive and inferential statistical output analyses. Based on these findings, conclusions are made as a basis of making both policy and research recommendations to the beneficiaries of the study for practice and academia. Lastly, areas for further research are identified.

5.2 Summary of Research Findings

This section provides a summary of the findings of the study which were based on the specific objectives. The specific objectives were based on the study variables, namely: competitive priorities, structural decisions, infrastructural choices, and leadership styles. Their effect on performance was assessed.

The pilot study and preliminary findings were in line with other studies around the world which have studied operations strategies and its contribution to performance in the manufacturing sector, for instance, Brown and Squire (2016), Ketema (2015), Boyer, *et al.,* (2015), Sciuto and Filho (2013), Gong (2013), James (2011), Kotha and Orne (2011), Hallgren (2010), Slack and Lewis (2009), Gagnon (2009), Davis, Aquilano and Chase (2002), and Wheelwright (2001).

A statistically acceptable number of targeted samples completed and returned the data collection instruments, all of which were analyzed. The response rate of 79.4 percent of the target population was comparable to previous studies for example, Malaba, *et al.,* (2014) Mutunga, *et al.* (2014), and Boyer and Lewis (2002). This response rate was considered good enough to validate the current study results, which surpasses the 10 percent of the total population as recommended by both Kothari (2010) and Boyer and Lewis (2002). The use of “drop – and – pick” method improved the response rate, while calling the heads of the chosen functional units through telephone personalized the exercise.

5.2.1 Competitive Priorities and Performance

The first specific objective of the study was to analyze the effect of competitive priorities on the performance of sugar manufacturing firms in Kenya. Competitive priorities were measured using four constructs namely: cost, delivery, flexibility, and quality.

All the sixteen (16) measurement items of competitive priorities were subjected to exploratory factor analysis (EFA) to extract the least number of factors which can account for the common variance of a set of competitive priorities variable. Upon extraction and rotation, two factors - delivery and flexibility – were identified. The communality of the extracted factors was considered sufficient to show accuracy of the identified items of measurement of competitive priorities. To validate construct validity of competitive priorities, the KMO of sampling adequacy and the Bartlett's Test of Sphericity were performed to determine the appropriateness of using factor analysis (Hair *et al.*, 2013), and were appropriate for assessing construct validity of the scale.

Pearson Correlation results showed that delivery is moderately and positively correlated with flexibility, and significantly different from zero. The correlations output equally indicate that delivery is positively related with performance of sugar manufacturing process. However, the relationship was found to be highly insignificant. In addition, the study found a weak and negative correlation between flexibility and performance. The relationship was equally found to be insignificant.

The strong correlation coefficient between delivery and performance was expected given that there is always a high complementarity in the implementation of a flexible manufacturing decisions or practices, in an effort to gain a competitive advantage. The study equally examined the possibility of attaining a trade – off among the competitive priorities. For comparison purposes, by their means, the competitive priorities descriptive statistics showed that most of the sugar manufacturing firms in Kenya focus on flexibility, followed by quality, cost while the firms has least interest in delivery.

The study findings revealed a positive and a significant statistical effect of competitive priorities on performance of sugar manufacturing firms in Kenya. Moreover, at individual level, the study found an insignificant effect of flexibility on performance in addition to delivery which equally had a significant effect on performance. Therefore, at 5% level of significance, the study rejected the null hypothesis and hence concluded that competitive priorities have a significant effect on performance of sugar manufacturing firms in Kenya.

5.2.2 Structural Decisions and Performance

The second specific objective of the study was to assess the effect of structural decisions on the performance of sugar manufacturing firms in Kenya. Structural decisions were operationalized using capacity, process, structure, as well as operations development and improvement constructs. Descriptively, operations development and improvements measurement items had a higher mean followed by process, then structure, while capacity measurement items had least mean. All the measurement items indicated that the respondents generally agreed with the hypothesized state, an indication that the structural decisions items were of considerable importance.

All the sixteen (16) measurement items of structural decisions measurement items were subjected to exploratory factor analysis (EFA) to extract the least number of factors which can account for the common variance of a set of structural decisions variable. Upon extraction and rotation, three factors were identified (operations development and improvements, process, and structure). The average communality of the extracted factors was considered sufficient to show accuracy of the identified items of measurement of competitive priorities.

To validate construct validity of structural decisions, the KMO of sampling adequacy and Bartlett's Test of Sphericity were performed to determine the appropriateness of using factor analysis (Hair *et al.,* 2013), and was hence concluded that the factor analysis was appropriate for assessing construct validity of the scale.

The Pearson Correlation results showed that operations development and improvements is moderately and has a significant positive relationship with process. Equally, the relationship between structure and process and operations development and improvements were both weak but positively significant. The correlations of operations development and improvements is strongly and positively correlated with efficiency and the relationship between structure and efficiency was found to be moderately positive. However, the relationships were found to be highly insignificant at 5% level of significance. In addition, the relationship between process and performance was found to be strong and positively insignificant.

The study findings revealed a positive but insignificant statistical effect of structural decisions on performance of sugar manufacturing firms in Kenya. However, at individual level, the study found an insignificant effect of operations development and innovations on performance, structure, while process equally had insignificant effect on performance. The study accepted the null hypothesis at 5% level of significance and hence concluded that structural decisions have no significant effect on performance of sugar manufacturing firms in Kenya. Overally, the study established that structural decisions are strongly and positively related to performance, although the relationship was found to be insignificant at 5 percent level of significant.

5.2.3 Infrastructural Choices and Performance

The third specific study objective was to determine the effect of infrastructural choices on the performance of sugar manufacturing firms in Kenya. Infrastructural choices were operationalized by work – force, policies, communication, as well as innovations constructs. The descriptive results by means revealed that management policies and procedures ranked highest, followed by work – force and communication, while innovations had the least mean.

All the eighteen (18) measurement items of infrastructural choices measurement items were subjected to exploratory factor analysis (EFA) to extract the least number of factors which can account for the common variance of a set of infrastructural choices variable. Upon extraction and rotation, three factors were identified (policies, communication, and workforce). The communality of the extracted factors was considered sufficient to show accuracy of the identified items of measurement of infrastructural choices. To validate the construct validity of competitive priorities, the KMO of sampling adequacy and Bartlett's Test of Sphericity were performed to determine the appropriateness of using factor analysis (Hair *et al.,* 2013), and were hence concluded that the factor analysis was appropriate for assessing construct validity of the scale.

Pearson Correlation results showed that policy is weakly but positively related with communication. However, this relationship was found to be insignificant. The correlations equally shows that policy is moderately and positively correlated with work force. Moreover, this relationship was found to be significant, since. In addition, the study found a weak but significantly positive relationship between communication and work force.

The study findings revealed a positive and significant statistical effect of infrastructural choices on performance of sugar manufacturing firms in Kenya. At individual level, the study found that policies had the most effect on performance followed by communications, while workforce had the least effect on performance. Therefore, at 5% level of significance, the study rejected the null hypothesis and hence concluded that infrastructural choices have statistical significant effect on performance of sugar manufacturing firms in Kenya.

5.2.4 Operations Strategies and Performance

The main objective of the study was to assess the effect of operations strategies on the performance of sugar manufacturing firms in Kenya. The operations strategies were measured by competitive priorities (flexibility and delivery), structural decisions (operations development and improvements, process, and structure), and infrastructural choices (policies, communication, and workforce). The Pearson Correlation results show that delivery construct had a negative and significant correlation coefficient with operations development and improvements, while structure had a positive by insignificant correlation coefficient with process. However, the study reveals that work – force variable had insignificant correlations with delivery, operations development and innovations, policy, and communication. Even though these correlations were insignificant, these correlation coefficients were showed to be weak.

The model coefficient parameters in table 4.44 shows the β-value which indicates that for competitive priorities, flexibility construct had a significant contribution to efficiency, while flexibility equally had a significant influence on efficiency. Regarding structural decisions, both operations development and improvements (ODI) and structure had a significant contribution to efficiency, while process construct had an insignificant contribution. In addition, the analysis results showed that all the infrastructural choices constructs individually had a significant contribution to performance.

5.2.5 Leadership Styles and Performance

The fifth objective of the study was to establish the effect of leadership styles on the performance of sugar manufacturing firms in Kenya. Leadership styles were measured by participative and supportive leadership styles. The descriptive results indicated that directive leadership styles ranked higher followed by participative style, then supportive leadership style, while achievement – oriented leadership style ranked least.

All the sixteen (16) measurement items of leadership styles were subjected to exploratory factor analysis (EFA) to extract the least number of factors which can account for the common variance of a set of leadership styles variable. Upon extraction and rotation, two latent factors were identified (participative and supportive leadership styles). The average communality of the extracted factors was considered sufficient to show accuracy of the identified items of measurement of infrastructural choices.

To validate construct validity of competitive priorities, both the KMO of sampling adequacy and Bartlett's Test of Sphericity were performed to determine the appropriateness of using factor analysis (Hair *et al.,* 2013), and hence concluded that the factor analysis was appropriate for assessing construct validity of the scale.

Pearson Correlation results showed that supportive leadership style is weakly but had a significant negative correlation with participative leadership style. In addition, supportive leadership styles were found to have a strong and significantly positively relationship with efficiency of sugar manufacturing process. Moreover, the study found approximately moderate and positive correlation between participative leadership style and efficiency, with the relationship being significantly.

At individual level, the study found a weak and an insignificant effect of participative leadership style on performance, while supportive leadership style was found to have a moderate and significant effect on performance. However, the study found a positively and weak but a positively significant relationship between leadership styles and performance.

5.2.6 Leadership Styles on the relationship between Operations and Performance

The sixth study objective was to assess the effect of leadership styles on the relationship between operations strategies and performance of sugar manufacturing firms. The moderation effect was tested using the change in the coefficient of determination (R^2). Following the moderated results, introduction of leadership style in the overall regression model revealed a negative effect. In addition, this reducing effect of leadership styles on the relationship between operations strategies and performance in table 4.54 was found to be overally significant

5.3 Conclusions

By use of descriptive statistics, exploratory factor analyses (EFA) and parametric analysis, the study findings led to a number of conclusions: The study findings indicate that flexibility and delivery are the most frequently utilized competitive priorities, since through exploratory factor analysis; delivery had the most contribution to the common variance. However, the study concluded that competitive priorities, although positively and moderately contribute to performance, its contributions were found to be insignificant hence must be improved.

An assessment of the overall effect of structural decisions on performance revealed a strong but insignificant effect on performance. This implies that even if the manufacturing company did improve their “hardware”, performance is not likely to be significantly improved. Therefore, the sugar manufacturing firms need not to enormously spend funds to develop the structural aspect.

Infrastructural choices, which have been considered as the “software” of the firm have a significant effect on performance of sugar manufacturing firms in Kenya. This implies that these sugar manufacturing firms need to continuously improve and innovate in order to improve their performance

The study confirms various past studies that leadership style has an effect on the performance of sugar manufacturing firms. This shows that leaders, need to understand both the subordinates’’ and work characteristics, so that they may know which style to employ when the situation demands. However, the study concluded that participative and supportive leadership styles are the best in use

Overally, the study found a statistical and positive significant effect of operations strategies on the performance. Contrary to the varied conflicting studies, the current study confirmed that operations have a positive and significant contribution to performance. This shows that the management of these sugar manufacturing firms need to improve the said strategies in order to better their performance for advantage.

On the overall contribution, the study concluded that leadership styles have an enhancing effect on the relationship between the operations strategies and the performance of the sugar manufacturing firms in Kenya. The implication is that the leaders need to improve their leadership skills and styles in order to improve the firm performance.

5.4 Recommendations

Based on the study findings, and where possible, the following recommendations for policy and practice, and recommendations for further research and academia were proposed in relation to each objective of the study:

5.4.1 Policy Recommendations

The study findings indicate that flexibility and delivery are the most frequently utilized competitive priorities. The study therefore recommends that the management of these sugar manufacturing firms, as well as policy makers focus on the flexibility of the manufacturing systems and emphasize speed with which the processes are taken, and that with which the products are delivered to the respective stakeholders. The management is encouraged to foster appropriate leadership styles at all levels in order to improve their overall performance. In addition, the government and policy makers are to initiate programs that could be tailored to facilitate full utilization of operation strategies to improve manufacturing performance.

5.4.2 Entrepreneurial Recommendations

Based on the study analyses and conclusions, the primary recommendation is that the manufacturing firms should give due attention to the competitive priorities in their areas of operations and in the organization in general in particular regards of the flexibility and speed of delivery of their processes. Based on their analyses, these firms should try to align their core priorities especially when designing and implementing suitable operations strategies that can lead to overall improved performance, which is reflected in efficiency.

In order to improve their performance, sugar manufacturing firms should encourage employees' personal growth and development, communication, as well as to improve internal policies regarding the acquisition and utilization of infrastructural choices at the operations areas.

5.4.3 Theoretical Implications

The study supported strategic contingency theory developed by Hickson *et al.* in 1971 that holds that since there is no single best way to manage manufacturing operations in every situation, hence managers need to study individual and situational differences before deciding on a course of action. This is due to differing environmental and organizational needs and structures that affect an organization, coupled with differing resources and capabilities pertaining to individual organization.

In addition, the study equally confirms an "inside – out" RBV process strategy as well as routine – based theory. The RBV model allows a manufacturing firm to have flexible strategic choices and decisions as determined by the ability to trade – off the strategies to gain a competitive advantage. Moreover, these sugar manufacturing firms were found to have identified routines that are embedded in their processes, systems, and practices, which are used as critical drivers to superior performance. Similarly, the study was able to identify both supportive and participative leadership styles which are predominantly used. These leadership styles confirm the path – goal theory of leadership that requires that the leaders continuously remove barriers, manage situations as they arise, as well as offering support needed to ensure that the followers' goals are in tandem with organizational goals, for greater performance.

Strategic choices and decisions of an operations strategy is a contingency – based approach with an emphasis on the need for internal consistency between strategic choices and decisions in manufacturing operations areas. Consequently, the study recommends the need to integrate at least two paradigms together, for instance, competing through competitive priorities, and strategic choices or with best practices approach, coupled with an appropriate leadership style subject to the differing situations. This integration approach shall ensure maximum utilization of the core resources as well as attainment of strategic objectives.

5.4.4 Practice Implications

The management of manufacturing firms especially in Kenya as a developing economy need to identify appropriate operations strategies at their operations areas, contingent of their core and yet scarce resources. These need to be managed well through time, since the study found a statistical positive contribution of operations strategy to performance. The differential advantage of these strategies shall help to separate one firm form another in planning for resources, strategy implementation, and success of the operations strategies.

5.5 Proposed Areas for Further Research

Even though the objectives of the study were clearly and successfully achieved, several gaps emerged that require further research. The study results are as a result of explored factors that contribute to common variance in every operations strategies and leadership styles through EFA. As a result, several constructs of the study variables were dropped from the analysis. There is need for further research on the constructs through confirmatory factor analysis (CFA) to critically examine their significance especially in a manufacturing sector. Further, contrary to literature, the study found an insignificant contribution of structural decisions to performance. Researchers are encouraged to explore these variables so as to test their significance to manufacturing system, and their extent of their contribution.

In this study, the researcher was limited to analyzing the responses of individuals as proxy for the manufacturing plant level strategies and performance. The operations strategies was assessed using perceptual measures (i.e. proxies) owing to the fact that it is difficult of obtaining objective measures of operations strategies and performance from the sugar manufacturing firms. Although the use of proxies and especially perceptual measures is common in literature (Ketema, 2015), potential biases would have been completely avoided had objective measure been used. Hence researchers in the future are encouraged to use objective measures of operations strategies in addition to perceptual measure in their study.

The study focused on sugar manufacturing firms in Kenya. The whole manufacturing sector would have benefitted tremendously if the study is done involving a wider sample, especially the whole manufacturing industry. The current study only targeted the sugar industry; therefore, the study recommends that a further research to be done in the whole manufacturing industry in Kenya.

5.6 Chapter Summary

Chapter five presented the summary, conclusions, as well as recommendations of the study. In addition, the structure of the chapter was guided by the study objectives. The study reviewed the study objectives through summary of various tests. The strategic roles of the theories and practice of operations strategies were implied. The limitations, policy areas and future research perspectives were equally presented. This completes the study and offers an opportunity to understand all the attachments, references, as well as the appendices in the study.

REFERENCES

Aambia, V. M. (2014). *Strategy Implementation at Nzoia Sugar Company Limited, Kenya.* Unpublished MBA Project, Nairobi: University of Nairobi

Abdulkareem, A. A., Adel, A. & Anchor, J. R. (2010). *Competitive Priorities and Competitive Advantage in Jordanian Manufacturing.* Huddersfield, UK.: University of Huddersfield.

Abdulkareem, S. A. (2013). Competitive Priorities and Competitive Advantage in Jordan Manufacturing. *Journal of Service Science and Management, 6*, 69 - 79.

Adebayo, A. V., Villa, C. & Gomez, L. G. (2012). Measuring Competitive Factors: A perspective Of Spanish Manufacturing Firms. *International Conference on Industrial Engineering and Industrial Management. 6TH*, pp. 348 - 355. Vigo: Montilivi.

Adeyemi, S. L. (2010). Just-in-Time Production Systems (JITPS) in Developing Countries: The Nigerian Experience. *Journal of Social Science., 22*(2), 145 - 152.

Adhirjha, P. (2012). India's Sugar Policy and the World Sugar Economy. *FAO International Sugar Conference.* (pp. 1 - 24). Fiji.: FAO.

Alkahtani, H. A. (2016). The Influence of Leadership Styles on Organizational Commitment: TheModerating Effect of Emotional Intelligence. *Business and Management Studies, 2*(1), 23 - 34

Allen, I. E. & Seaman, C. A. (2007). *Likert Scales and Data Analyses.* Retrieved from www.qualityprogress.com: http://asq.org/quality-progress/2007/07/ statistics/ likert-scales-and-data-analyses.html

Amenta, E. & Ramsey, M. (2010). Institutional Theory. In E. a. Amenta, & T. L. Kevin (Ed.), *The Handbook of Politics: State and Civil Society in Global* (pp. 15 - 35). New York.: Springer.

Andersen, T. J. (2001). Information Technology, Strategic Decision Making Approaches and Organization Performance in Different Industrial Settings. *Journal of Strategic Information Systems, 10*, 101 - 119.

Arasa, R. &. Githinji, L.(2014). The Relationship Between Competitive Strategies And Firm Performance: A Case of Mobile Telecommunication Companies in Kenya. *International Journal of Economics, Commerce and Management., II*(9), 1- 15.

Baiyegunhi, L. J. S. & Arnold, C. A.(2011). Economics of sugarcane production on large scale farms in the Eshowe/Entumeni areas of KwaZulu-Natal, South Africa. *African journal of agricultural research., 6*(21), 4960 - 4967.

Barnes, S. (2012). Operations, Strategy and Operations Strategy. In S. Barnes, *Operations Management* (pp. 21 - 43). London: Cengage.

Becker, M. C. (2016). Organizational Routines: Review of Literature. *Industrial and Corporate Change. 13*(4), 643 - 677

Bevan, H. (2016). Leadership: Master The Three Ways to Influence People. *Journal of Leadership, 12,* 1 - 9.

Bhargava, R. K. & Anbazhagan, S. (2014). Education and Work-Experience - Influence on the Performance. *Journal of Business and Management., 16*(5), 104-110.

Bolo, A. Z. (2011). Strategic Management: An Empirical Investigation Of Selected Strategy Variables On Firms Performance: A Study Of Supply Chain Management In Large Private Manufacturing Firms in Kenya. *Business Administration and Management (BAM), 1*(1), 9 - 18.

Boyer, K. &. (2002). Competitive Priorities: Investigating the Need for Trade-Offs in Operations Strategy. *Production and Operations Management., 11*(1), 9 - 19.

Boyer, K. K. (2015, May 5th). Operations Strategy Research in the POMS Journal. *Production and operations Management Society., 14*(4), 442 - 449.

Brown, S. &. Squire, B. (2016). Capabilities And Competencies - Toward Strategic Resonance Between Operations And Strategy Processes Within Firms. (B. Square, Ed.) *International Journal of Operations Management., 7*, 1 - 30.

Brown, T. (2006). *Confirmatory Factor Analysis for Applied Research.* (D. A. Kenny, Ed.) New York., London: The Guilford Press.

Carte, T. A. & Russell, C. J. (2013). In Pursuit of Moderation: Nine Common Errors and their Solutions. (Sambamurthy., Ed.) *MIS Quartely, 27*(3), 479-501.

Churchill, G. A. & Iacobucci, D. (2005). Marketing Research: *Methodological Foundations*. (9th ed.). London: Thomson South-Western Publishers.

Christiansen, T. B., Berry, W. L., Bruun, P. & Ward, P. (2003). A mapping of Competitive Priorities, Manufacturing Practices and Operational Performance in Groups of Danish Manufacturing Companies. *International Journal of Operations & Management., 23*(10), 1163-1183.

Clark, D. (2013). *Big Dog, Little Dog and Knowledge Jump Production.* Retrieved from: http://nwlink.com/~donclark/leader/lead_path_goal.html.

Cooper, D. R. & Schindler, P. S. (2013). *Business Research Methods* (12th ed.). New Delhi.: Mc Graw Hill.

Crawford, G. A. (2010). Information As a Strategic Contingency: Applying the Strategic Contingencies Theory of Intraorganizational Power to Academic Libraries. Heindel Library at Penn State Harrisburg. *College and Research Libraries.*, *1* 11.

Creswell, J. W. (2006). *Research Designs: Quantitative, Qualitative and Mixed Method Approaches.* (2nd ed.). (C. D. Laughton, Ed.) London: Sage Publications, Inc.

Czarnikow, M. (2013). Africa Sugar Industry: A Rising Star. *International Sugar Journal*, *1* 8.

Davidson, M. (2014). *blog.lnsresearch.* Retrieved from: http://blog.lnsresearch.com/blog/bid/Manufacturing-Metrics-that-Actually-Matter-The-Ones-We-Rely-On.

Davis, A. C. (2001). Operations Strategy: Defining How Firms Compete. *Fundamentals of Operations Management.*, 29 - 59.

Doan, D. P. & Seward, L. E. (2011). *Applied Statistics in Business and Economics*. (3rd ed.). Cambridge: Cambridge University Press.

Dung, N. V. (2012). *An Institution - Based View of the Competitive Advantage of Firms in Emerging and Transition Economies: The case of Vietnamese Exporters.* Unpublished PhD. Dissertation, Louvain: Louvain School of Management.

Enrique, M. V. (2012). Key success factors when implementing strategic manufacturing initiatives. *Journal of Operations Management.*, 1-20.

Fairchild, A. J. & Mackinnon, D. P. (2010). A General Model for Testing Mediation and Moderation Effects. *NIH, 10*(2), 87 – 99. Retrieved from www.ncbi.nlm.nih.gov/pmc/articles/PMC2908713/

Felipe, F. &. Marcia, G. (2014). Competitive Priorities and Innovation in SMEs: A Brazil Multi-Case Study. *Journal of Technology, Management and Innovations, 9*(3), 56 - 64.

Field, A. (2003). *Discovering Statistics Using SPSS For Windows.* (B. Wright, Ed.) London: SAGE Publications.

Frazier, P. A. (2014). Testing Moderator and Mediator Effects in Counseling Psychology Research. *Journal of Counseling Psychology., 51*(1), 115 –134.

Frazier, P., Tix, A. P. & Barron K. E. (2014). Testing Moderator and Mediator Effects in Counseling Psychology Research. *Journal of Counseling Psychology, 51*(1), 115

Gachene, C. K., Kathimu, V. M., Gacheru, P. T. & Kariuki, P. C. (2012). Browsing The Sugar Research Institute. *East African agricultural and forestry journal., 78*(1), 23 - 31.

Gagnon, S. (2009). Resource-based competition and the new operations strategy. . *Intemadonai Joumal of Operations and Production Mnagement., 19*(2), 125 - 138.

Gates, L. P. (2010). *Strategic Planning with Critical Success Factors and Future Scenarios: An Integrated Strategic Planning Framework.* Carnegie: Carnegie Mellon University.

Gong, Y. (2013). *Global Operations Strategy: Fundamentals and Practice. Springer Texts in Business and Economics,* . Ecully, France.: Springer.

Group, F. S. (2015). *Guide to Strategy Implementation: Critical Success Factors for Improving Strategy Execution.* Retrieved from: www.fortesolutionsgroup.com

Gujarati, D. N. (2014). *Basic Econometrics.* (4Th. ed.). New York: McGraw-Hill.

Gumusluoglua, L. &. Arzu, I. (2009). Transformational leadership, creativity and organizational Performance. *Journal of Business Research., 62*(14), 461 - 473.

Hair, J. F. Black, W. C., Babin, B. T., & Anderson, R. E. (2010). *Multivariate Data Analysis* . (6^{th} ed.). Upper Saddle River, NJ: Prentice Hall.

Hallgren, M. (2010). Manufacturing Strategy, Capabilities and Performance. (UniTryck, Ed.) *Linköping Studies in Science and Technology, 1*(1), 1 - 33.

Hayes, R. H. (2005). Manufacturing Strategy: At The Intersection of Two Paradigm Shifts. *Production and Operations Management Society., 5*(1), 1 - 17.

Helkiö, P. (2008). International Investigation of Manufacturing Flexibility: Strategies, Contingencies and Antecedents. *Industrial Engeneering and Management.*, 40 - 67.

Hershey, P. A. (2013). *Industrial Engeneering: Concepts, Methodologies, Tools and Applications.* (Vol. 1). (C. Wozniak, Ed.) USA: Information Resources Management Association.

Hickson, D. H. Hinings, C. R., LLee, C. A., Schneck, R. E & Pennings, J. M. (1971). A Strategic Contingencies' Theory of Intraorganizational Power. *Administrative Science Quartely., Johnson Graduate School of Management, Cornell University. 16*(2), 216 - 229.

Hill, T. (1994, April). Manufacturing Strategy: Texts and Cases. *Operations Management., 2*.

Hongo, C. O. (2013). strategic responses to the environmental changes in the sugar industry: Sony sugar Company Limited. *Business Administration and Management., 1*(5), 1 - 4.

Hou, B. C. (2011). A Case Study of Just-In-Time System In the Chinese Automotive Industry. *Proceedings of the World Congress on Engineering. 1*, pp. 1 - 5. London, U.K.: WCE.

Hsieh, H. F. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative health research, 15*(9), 1277-1288.

Inman, R. A. (2015). Operations: Strategy for Business. *Journal of Operations Management*, 1 - 19.

Iyer, A. K., Kaundal, P., Saranga, H. & Seshadrin, S. (2011). *Indian Manufacturing – Strategic and Operational Decisions and Business Performance.* Working Paper no. 338, Karnnert.: Indian Institute of Management Bangalore.

James, T. (2011). *Operations Strategy* (3rd ed.). Book-Boon.Retrieved from: http://bookboon.com/en/operations-strategy-ebook

Jardon, C. M. (2011). *Deployment of Core Competencies to obtain Success in SMEs.* Universidad de Vigo., Departamento de Economía Aplicada. Vigo.: Universidad de Vigo. Retrieved from http://webs.uvigo.es/x06. Working Paper: 11/06

Jenkins, B. B., Baptista, P. & Porth, M. (2015). *Collaborating for Change in Sugar Production: Building Blocks for Sustainability at Scale.* Cambridge, MA: Harvard Kennedy School.

Job, P. A. (2013). Creativity and Innovation for Competitive Excellence in Organizations. *Electronic Journal of Knowledge Management., 9*(2), 53 - 63.

Junttila, M. (2010). Towards a Theory of Manufacturing Strategy. *International Journal of Operations & Production Management.*, 1 - 31.

Kalali, N. S., Anvari, M. R., Ali, A. P. & Davod, K. D. (2011). Why does strategic plans implementation fail? A study in The Health Service Sector of Iran. *African Journal of Business Management, 5*(23), 9831 - 9837.

Karamat, A. U. (2013). Impact of Leadership on Organizational Performance: A Case Study of D&R Cambric Communication. *Business Economics and Tourism*, 30 - 47.

Kariuki, C. M. & Ngugi, P. K. (2014). The effect of table banking on the performance of micro and small enterprises in Nairobi County. *International Journal of Current Business and Social Sciences*, *1*(2), 339-360.

Kasie, F. M. & Belay, A. M. (2013). The impact of multi-criteria performance measurement on business Performance Improvement. *Journal of Industrial Engineering and Management (JIEM).*, *6*(2), 595-625.

Kerlinger. (1986). *Foundations of Behavioural Research* (2^{nd} ed.). Chicago: John Willey and sons..

Ketema, G. B. (2015). *Drivers of Manufacturing Performance in Medium and Large Scale Firms in Ethiopia (Evidence from Addis Ababa and its Periphery).* UNISA, Business Leadership. UNISA. Retrieved from: uir.unisa.ac.za/handle/10500/ 19199

Ketokivi, M. & Schroeder, R. (2004). Manufacturing practices, strategic fit and performance: A routine-based view. *International Journal of Operations & Production Management.*, *24*(2), 171-191.

KIM. (2009). *Fundamentals of Management Research Methods.* Nairobi.: Macmillan Kenya.

Klaus, G. G. & Charlotte, E. (2015). *The concept of Key Success Factors: Theory and Method.* MAPP working paper no 4. Retrieved from https://pure.au.dk/ws/files/32299581/wp04.pdf

Koech, M. P. (2012). The Effect of Leadership Styles on Organizational Performance at State. *International Journal of Business and Commerce, 2*(1), 1 - 12.

Koech, P. &. Namusonge, G. S. (2012). The Effect of Leadership Styles on Organizational Performance at State Corporations in Kenya. *International*

Journal of Business and Commerce., 2(1). Retrieved from www.ijbcnet.com/2-1/IJBC-12-2106.pdf

Kombo, D. K. &. Tromp, D. L. (2009). *Proposal and Thesis Writing: An Introduction.* Nairobi: Paulines Publications Africa.

Kongkiti, P. &. Kachana, R. (2007). Competitive Priorities of Manufactirng Firms in Thailand. *Industrial Management & Data Systems, 107*(7), 979 – 996.

Kotha, S. &. Orne, D. (2011). Generic Manufacturing Strategies: A Conceptual Synthesis. *Strategic Management Journal., 10*, 211 - 231.

Kothari, C. R. (2010). *Research Methodology: Methods and Techniques.* (2nd ed.). New Delhi: New Age International (P) Ltd.

KPMG. (2007). *The India Sugar Industry: Sector Roadmap 2017.* ISMA. Mumbai: KPMG.

Kraft, M. E. & Furlong, S. R. (2007). *Public Policies: Politics, Analysis, and Alternatives.* (2nd ed.). London, Washington, D.C: Eurospan.

Kreitner, R. & Kiniki, A. (2006). *Organizational Behavior: Key Concepts, Skills, and Best practices.* (2nd ed.). New York: McGraw - Hill.

KSB. (2012). *Kenya Sugar Industry Strategic Plan 2010 - 2014.* Nairobi: Kenya Suagr Board. Retrieved from www.kenyasugar.co.ke/downloads/KSI %20Strategic %20plan.pdf

Kwasi, A. G. & Acquaah, M. (2008). Manufacturing strategy, competitive strategy and firm performance: An empirical study in a Developing Economy Environment. *International Journal of Production Economics*, 111, 575 – 592.

Lee, S. P. (2006). *Performance Management Strategies: A Competitive Advantage for High Technology Firms. A study in the Okanagan Valley Region of British Columbia, Canada.* Okanagan Valley: University of Southern Queensland.

Li-Min, C., Yen, C. & Yu, L. (2014). The Strategic Innovation of Taiwan Sugar Corporation- Perspectives toward High Value-added Services. *International Journal of Business and Commerce., 4*(2), 47 – 59.

Littlefield, M. & Shah, M. (2008). *Manufacturing Operations Management: The Next Generation of Manufacturing Systems.* Harte Hanks: Aberdeen Group.

Luger, M. P. Butter, J. & Winch, P. G. (2013). Infrastructure and manufacturing: Their Evolving Relationship. *Foresight, Government Office for Science,* 20, 1 - 34.

Magutu, P. O. Mbeche, I. M., Nyamwange, O., Mwove, M. N., Ndubai, R. E. & Nyaang, R. O. (2010.). Formulation and Implementation of Operation Strategies Used in Solid Waste Management: Case Study of City Council of Nairobi. *Journal of African Research in Business & Technology., 2*(10), 1 - 21.

Malaba, P. N. Ogolla, K., & Mburu, D. K. (2014). Influence Of Green Supply Chain Management Strategy On Procurement Performance Of Sugar Industry In Kenya. *International Journal of Economics, Commerce and Management, 2*(11), 1 - 24.

Malonza, A. M. (2014). *Lean Manufacturing and Operational Performance of Mumias Sugar Company Limited.* Unpublished PhD Thesis, Nairobi University of Nairobi.

Malyadri, G. A., Andara, S. & Sudheer, K. (2013). A study of Financial Performance of Sugar Industry in India. *International Journal of Management and Strategy (IJMS)., 4*(6), 1 - 11.

Marangu W. N., Oyugi, B. & Gongera, E. G. (2014). An analysis of concentric diversification strategy on Organization Competitiveness: A case of Sugar Firms in Kenya. *European Journal of Business and Management, 6*(19), 175 - 181.

Marangu, W. N. (2014). Moderating Effect of Organizational Factors on the Relationship between Diversification Strategies and Competitiveness: Case of Sugar Firms in Kenya. . *European Journal of Business and Management., 6*(8), 95 -103

Mbalwa, P. N., Kombo, H., Chepkoech, L., Koech, S. & Shavulimo, P. M. (2014). Effect of Corporate Governance on Performance of Sugar Manufacturing Firms in Kenya: A Case of Sugar Manufacturing Firms in Western Kenya. *Journal of Business and Management, 16*(11), 86 -112.

Mbithi, B. M., Muturi, W. & Rambo, D. K. (2015). Effect of Market Development Strategy on Performance in Sugar Industry in Kenya. *International Journal of Academic Research in Business and Social Sciences., 5*(12), 311 - 325.

Moller, M. J., Johansen, J. & Boer, H. (2013). Managing Buyer - Supplier Relationshipsand Inter- Orgaizational Competence Development. *Journal of Management, 14*(4), 369-379.

Motaroki, N. J. & Odollo, L. O (2016). An Assessment of Resource Based Competitive Strategy on Operational Performance: *A Case of Mumias Sugar Company, Kenya. European Journal of Business and Management, 8*(15), 53 - 65.

Mutunga, S. L. & Minja, D. (2014). Generic Strategies. *International Journal of Business and Management Review, 2*(6), 1-15.

Mutunga, S. L. (2014). Innovative adaptation and operational efficiency on sustainable competitive advantage of food and beverage firms in Kenya. *European Journal of Business and Innovation Research., 2*(2), 32 - 50.

Nada, R. S. (2013). Definitive Guide to Manufacturing and Service Operations: Master the Strategies and Tactics for Planning, Organizing, and Managing How Products and Services are Produced. (CSCMP, Ed.) *Council of Supply Chain Management Professionals.*

Nagurney, A. (2012). Operations Management and Supply Chain Network Theory. *Virtual Centre for Supernetworks.* Gothenburg, Insenberg, Sweden. Retrieved from: http://supernet.isenberg.umass.edu.

Nassiuma, D. K. (2000). *Survey Sampling: Theory and Methods*. Nakuru: Egerton University Press.

Ngumi, P. M. (2013). *Effect of Bank Innovations on Financial performance of Commercial Banks in Kenya.* Unpublished PhD. Thesis, Juja: Jomo Kenyatta University of Agriculture and Technology.

Northouse, P. G. (2016). *Leadership Theory and Practice* (7th ed.). London: SAGE Publishers.

Nwibere, B. M. & Olu-Daniels, S. O. (2014). Trust and Employees' Commitment to Supervisor: The Nigerian Experience. *Euripean Journal of Business Management., 6*(8), 121 - 133.

Obiwuru, T. C. (2011). Effects of Leadership Style on Organizational Performance: A Survey of Selected Small Scale Enterprises in Ikosi-Ketu Council Development Area of Lagos State, Nigeria. *Australian Journal of Business and Management Research, 1*(7), 100 - 111.

Ocampo, L. (2015). A Sustainable Manufacturing Strategy Decision Framework in the Context of Multi-Criteria Decision-Making. *Jordan Journal of Mechanical and Industrial Engineering., 9*(3), 177 - 186.

O'Connor, T. (2011). Survey Research Design: Mega Links in Criminal Justice. Retrieved from: http://www.drtomoconnor.com/3760/3760lect04.htm

Odollo, L. O. (2015). Leadership Styles and Teacher Discipline in Private Secondary School in Kakamega County, Kenya. *International Journal of Management Science, 6*(2), 49 - 72.

Ogutu, M. (2017). Strategic Planning and Performance of State Corporations in Kenya: The Moderating Effect of Firm Characteristics. *DBA Africa Management Review, 7*(1), 17-39.

Ojokuku, R. M., Odetayo, T. A. & Sajuyigbe, A. S. (2012). Impact of Leadership Style on Organizational Performance: A Case Study of Nigerian Banks. *American Journal of Business and Management., 1*(4), 202-207.

Omolo, M. (2015). *What Ails Sugar Industry In kenya?* Trade Infromation. Nirobi: Institute of Economic Affairs

Ondieki, K. R. (2014). *Management of Strategic Change at Chemili sugar Company Limited. Kenya.* Unpublished MBA published Thesis, Nairobi: University of Nairobi.

Onen, D. & Yuko, W. S. (2009). *Ageneral Guide to Writing Research Proposal and Report: A Handbook for Beginning Researchers.* (2nd ed.). Nairobi., Kenya: JKF.

Onyango, N. G., Wanjere, D. M., Egesa, R. K. W. & Masinde, S.W. (2015). Organizational Capabilities and Performance of Sugar Companies in Kenya. *International Journal of Management Research & Review., 5*(10), 845 - 863.

Ovidijus, J. (2013). What Makes Your Business Unique? The Resource Based View of A Firm. *Strategic Management Insight*. Retrieved from https://www.strategicmanagementinsight.com/topics/resource-based-view.html

Pakistan, B., Raheman, A., Qayyum, A. & Afza, T. (2010). Working Capital Management and Firm Performance. *International Research Journal of Finance and Economics, 47*, 156-169.

Porter, A. (2009). *Operations Management.* London: Ventus Publishing.

Radisic, M. (2006). Just In Time Manufacturing. *Journal of Industrial Engineering and Management.*, 1 - 9. Retrieved from http://geeks-hq.egeste.net/just/just-in-time-concept-and-practices.pdf.

Raduan, C. R. (2009). Management, Strategic Management Theories and theLinkage with Organizational Competitive Advantage from the Rosource - Baseed View. *European Journal of Social Sciences., 11*(3), 402 - 418.

Raheman, A. Q., Afza, T., Qayyum, A. & Bodla, M. A. (2010). Efficiency Dynamics of Sugar Industry of Pakistan. *The Pakistan Development Review, 43*(4), 1-25.

Rahmeyer, F. (2006, May). From A Routine-Based to A Knowledge-Based View: Towards an Evolutionary Theory of the Firm. *Journal of Economics*, 1 - 25.

Ravitch, S. M. & Riggan, J. M. (2012). *Reason & Rigor: How Conceptual Frameworks Guide Research.* Pennsylvania: Thousand Oaks, CA: Sage.

Rein, P. T., Turner, P. & Mathias, K. (2011, May). Good Management Practices Manual For Cane Sugar Industry. (M. Jan., Ed.) *International Finance Corporation (IFC), 1*(1), 1 - 600.

Rodrı´guez, T. F. (2014). The Structural and InfraStructural Decisions of Operations Management in the hotel sector and their impact on Organizational Performance. Retrieved from: www.journals.sagepub.com/doi/full/10.1177/ 14673584 14553 866

Rodrigues, H. S. (2008). Critical Success Factors and Core Competencies. *Journal of Operations and Management.*, 364 - 366.

Rolstadas, A. (2012). Manufacturing Strategies Created Through Decisions. *Manufacturing Outsourcing*, 87 - 91.

Rosenfield, D. (2014). Manufacturing Strategy Concepts. *Production and Operations Management Society, 12*, 1-38.

Rusjan, B. (2005). Model for Manufacturing Strategic - Decision Makaing. *International Journal of Operations & Production Management., 25*(8), 740 - 761.

Sanders, N. (2014). Operations Management. In N. Sanders, *Definitive Guide to Manufacturing and Service Operations, The: Master the Strategies and Tactics for Planning, Organizing, and Managing How Products and Services Are Produced* (pp. 1 - 46). New Delhi: Pearson.

Sanjay, C. C., Gajendra, K. A. & Usha, A. (2013). Configuration of Manufacturing Strategy Decision areas in line Production System: Five case studies. *International Journal of Advanced Manufucturing Technology., 64*, 459 – 474.

Schrettle, S. H. (2014). Turning sustainability into action: Explaining firms' sustainability efforts and their impact on firm performance. *147*(2), 73 - 84.

Schroeder, R. (2011). A resource-based view of manufacturing strategy and the relationship to manufacturing performance. *Strategic Management Journal*, 105 - 117.

Sciuto, J. M., & Filho, A. G. A. (2013). Operation Strategy and Lean Manufacturing: A Study in A Metallurgical Company. *International Conference on Industrial Engeneering and Operations Management.* (pp. 1 - 8). Valladolid, Spain: ICIEOM.

Sekaran, U. (2003). *Research Methods for Business: A Skill-Building Approach*. (4th ed.), New York: John Wiley & Sons.

Sergey, G., Lindsay, J. & Bichara, L. (2013). Quartely Market Outlook. (P. Baron., Ed.) *International Sugar Organization Quartely Market Outlook, 13*(02), 1 - 80.

Slack, N. (2007). *Operations Strategy.* (2nd ed.). Delhi, India: Dorling Kindersley PVT Ltd.

Slack, N. &. Lewis, M. (2011). *Operations Strategy.* (4th. ed.). New Delhi: Prentice Hall.

Söderbom, M. (2011). *Constraints and Opportunities in Kenyan Manufacturing: Report on the Kenyan Manufacturing Enterprise Survey.* Oxford: University of Oxford.

Sohel, A. &. Rogder, G. S. (2013). Dimensions of Competitive Priorities: Are they Clear, Communicated, and Consistent? *The Journal of Applied Business Research., 18*(1), 77 - 87.

Soltan, F. H. (2009). Development of Sugar Industry in Africa. *Sugar Tech Journal., 2*(1).

Sostrin, J. (2017). Who You Are is How You Lead. *Journal of Strategy and Leadership*(13), 1 - 9.

Stoup, M. &. Christensen, L. B. (2000). *Introduction to Statistics for the social and Behavioral Science.* (2nd ed.). California, Pacific Grove: Cole Publishing Co.

SUCDEN. (2013). *World Sugar Production.* SUCDEN. Retrieved from https://www.statista.com/statistics/249679/total-production-of-sugar-worldwide

Suzana, N. R. & Millar, H. H. (2014). Competitive Priorities of Manufacturing firms in the Carbbean. *IOSR Journal of Business and Management, 16*(10), 72 - 82.

Szumbah, M. &. Imbambi, R. M. (2014). Assessment of Relationship Between Plant and Equipment Maintainance Strategies and Factory Performance of the Kenya Sugar Firms. *Asian Journal of Basic and Applied Sciences., 1*(2), 18 - 28.

Timmermans K., H. G. (2013). Providing Innovative Supply Chain And Service Strategies That Drive Top-Line Growth. *OPerations Strategy - Index, 3*(2).

Butler, W. T. (2000, December). The impact of Operations Competitive Priorities on Hospital Performance. *Health Care Management Science., 3*, 227–235.

Tyler, G. (2013). The African Sugar Industry: A frastrated Success Story. *International Sugar Journal, 6*, 1 - 8.

Tolbert, P. S. & Zucker, L. G. (2016). The Institutionalization of Institutional Theory. Organizational Behavior and Theory Commons, 1 - 18. Retrieved from: http://digitalcommons.ilr.cornell.edu/articles

USDA. (2015). *Sugar: World Markets and Trade.* United States Department of Agriculture., Foreign Agricultural Service. Florida: USDA.

Vastag, G. (2009). The theory of performance frontiers. *Journal of Operations Management., 18*, 353–360.

Voss, C. A. (1995). Alternative Paradigms for Manufacturing Strategy. *MCB UP Ltd. International Journal of Operations & Production Management, 15*(4).

Wamalwa, M. S., Onkware, K. & Musiega, D. (2014). Effects of Lean Manufacturing technology strategy Implimentation on Factory Time Efficiency, a case of Mumias Sugar Company Limited in Kakamega County, Kenya. *International Journal of Business and Management Invention., 3*(5), 1 - 10.

Wang, F. J., Shieh, C. T. & Tang, M. L. (2010). Effect of leadership style on organizational performance as viewed from human resource management strategy. *African Journal of Business Management., 4*(18), 3924-3936.

Wanyande, P. (2011). Management Politics in Kenya's Sugar Industry: Towards and Effective Framework. *Africal Journal of Political Science. , 6*(1), 123 - 140.

Ward, P. M., McCreey, J. K., Ritzman, L. P. & Sharma, D. (2008). Competitive Priorities in Operations Management. *Decision Science, 29*(4), 1 - 13.

Wekesa, R. M. (2014). *Effect of Competitive Strategies on Organizational Performance in the Sugar Industry in Kenya.* Unpublished PhD Thesis, Eldoret: Moi University.

Wheelright, S. C. (2001). Reflecting Corporate Strategy in Manufacturing Decisions. *Harvard Business Review*, 57 - 66.

Wheelwright, S. C. (2001). Reflecting Corporate Strategy in Manufacturing Strategy. *Business Horizons*, 57 - 67.

Williams, B., Brown, T. & Onsman, A. (2010). Exploratory factor analysis: A five-step guide for novices. *Journal of Emergency Primary Health Care (JEPHC)*, *8*(3).

Yatundu, F. A., Abuga, G. S., & Olala, G. (2015). The Effect of Branding Strategy on the Performance of Public Sugar Manufacturing Firms in Kenya. *International Journal of Current Advanced Research., 4*(9), 386-391.

Yatundu, F. A., Otiso, K. N. & Nurwin, F. (2016). Brand Awareness and Its Effect on Performance of Public Sugar Manufacturing Firms in Western Kenya. *International Journal of Advances in Management and Economics., 5*(1), 42 - 47.

Yeh S. J., Y. K., Chen, L., Chou, H., & Chui, W. (2016). The moderating effect of leadership on the relationship between personality and performance. *Journal of Nursing Management. 7*(2), 67 - 77.

Yoshida, E. & Xu, Z. (2014). A Classification of Quality/Cost Competitive Priorities in Japanese Manufacturing Firms: *Empirical evidence based on management accounting practices*. *Journal of Operations Management., 2*, 15 - 45.

Zaim, H., Yasar, M. F, & Unal, O. K. (2013). Analyzing the Individual Effect of Competencies on Performance: A field Study in Service Industry in Turkey. *Journal of Global Strategic Management, 4*(1), 47-62.

Zakaria, M., Dahalan, H. & Musaibah, A. S. O. (2012). The Relationship between Competitive Priorities and Performance: *A Study on the tactical approach used by the real estate firms in Dubai to achieve competitive advantage*. *Malaysian Construction Research Journal, 14*(1), 47-62.

Zeithaml, V. A., Varadarajan, P. R. & Zeithaml, C. P. (2012). The Contingency Approach: *Its Foundations and Relevance Approach to Theory Building and Research in Marketing*. *European Journal of Marketing., 22*(7), 37 - 64.

APPENDICES

Appendix I: Study Questionnaire

Part One: Demographic Information.

This section seeks background information about the respondents and the sugar firm. Kindly give the information in the space provided indicating by a tick [√] where applicable.

a) State your department ____

b) State your gender Male [ ] Female [ ]

c) How long have you worked in this organization?

   Less than 1 year [ ] 1 to 5 years [ ] 6 to 10 years [ ] Over 10 years [ ]

d) For how long have you worked at the current position?

   Less than 3 years [ ] Between 4-6 years [ ] Between 7-9 years [ ] Above 10 years [ ]

e) What is the highest level of academic qualifications you have attained so far?

   Certificate [ ] Diploma [ ] Bachelors [ ] Masters [ ] Ph.D. [ ]

   Any other, please specify ………………………………………………….

Part Two: Operations strategies:

Section A: Competitive Priorities

From the statements, tick the option that best describes your feelings on each of the issues stated: Strongly Agree **(SA),** Agree **(A),** Neutral **(N),** Disagree **(D)** or Strongly Disagree **(SD).**

Cost	SA	A	N	D	SD
The company has low manufacturing unit costs					
Operations costs are managed effectively					
firms will put considerable effort into controlling production cost					
The firm is able to control materials supply and product distribution					
Flexibility					
The production system allows for adjustment on the design					
Resources are deployed in response to changes in technology					
manufacturing system is able to perform different processes					
The workforce is able to perform a broad range of tasks effectively					
Delivery					
The system is able to deliver products on-time					
Queuing period is highly reduced					
Short manufacturing cycle time, from raw materials to products					
The system takes a shorter time-to deliver products on demand					
Quality					
The products are produced as per the pre-established standards					
The process ensure consistency in operations					
Customers complaints are effectively dealt with on time					
The manufacturing system meets environmental requirements					

Trade off?

From the above competitive priority dimensions (cost, delivery, flexibility, and quality), which one does your organization give prominence? Indicate with numbers 1 – 4, where 1 indicates least preferred while 4 most preferred:

Quality	Cost	Delivery	Flexibility
[ ]	[ ]	[ ]	[ ]

Section B: Structural Decisions

Please indicate the degree of emphasis the firm places on the following activities over the past five years.

Capacity	SA	A	N	D	SD
The capacity of the firm is adequately utilized					
The scale of production of the system is adequate to meet the demand					
The capacity of stores are adequate to accommodate the production					
The arrangement of floor area allows for free movement					
Process					
Structural enhancements meet current code requirements					
The operations system is able to get the right information real time					
Lots of repeated work is done in the production process					
The capacity of production technology currently in use is adequate					
Structure					
Authorization resides in the high chain of command					
The management structure is decentralized					
The operations is divided into areas of specialization					
The management operates dependent on strict rules and procedures					
Operations Development and Improvements					
The production process continuously make minor improvements of the system					
The management frequently appraise the process					
Key Performance Indicators are frequently communicated to affected parties for real time action					
The management allows for benchmarking of the best practices operations with other competitors					

Section C: Infrastructural Choices

Item	SA	A	N	D	SD
Work force					
The team is empowered to make decisions to meet its goals					
The team is prepared to take responsibilities that help achieve its goals.					
The workforce has the prerequisite competence related to their tasks					
The management facilitates employees' further training in their various areas of specialization					
Policies					
The operations policies and procedures adopted by the management are helpful to achieve the set objectives					
The management involves workers while setting policies					
There exists high formalization of work procedures					
The manufacturing processes follow standard practices					
Communication					
The production system allows easy access					
There exists mechanisms to help employees communicate their innovative ideas					
Objectives are communicated to employees on a one–to–one basis					
The information system provides the necessary performance objective reports timely					
The management takes timely action on information received from all stake-holders					
We have formal mechanisms that ensure transfer of best practices among various areas of work.					
Innovations					
The system and other processes are automated by use of Computer Aided Design (CAD)					
There is continuous improvement of the system to refine the process					
Manufacturing process uses best production method available					
The operations and production process has minimum possible error					

Section D: Leadership Styles

The questionnaire contains questions about different leadership styles. Please indicate how often the statement is true about your leader's practice or behavior. Each type of behavior should be considered separately, and please do not allow your general evaluation of the manager or supervisor to bias your answers about specific behaviors. (**N** – Never**. S** – Seldom**. O** – Occasionally**. U** – Usually**. A** – Always**)**

Leader Behaviour Items	**N**	**S**	**O**	**U**	**A**
Followers are made aware of what is expected of them					
The leader maintains a friendly working relationship with the followers					
The leader consults with the followers whenever there is a problem					
The leader listens receptively to followers' ideas and suggestions					
The leader informs subordinates what needs to be done and how it is to be done					
The followers are made aware of what is expected of them to perform to highest level					
The leader acts without consulting followers					
The leader does little things to make it pleasant for the group					
The followers are asked to follow standard rules and procedures					
The leader sets goals for followers which are quiet challenging					
The leader help the followers overcome problems that stop them from accomplishing their tasks					
The leader encourages continual improvement in followers performance					
The leader shows that he/she doubts the ability of the follower to meet most of their objectives					
The leader consistently set challenging goals to me met					
The leader behaves in a manner which is thoughtful of followers' personal needs					

Part Three: Operations Performance

Efficiency	SA	A	N	D	SD
The process procedures improve efficiency in operations					
Productivity of employees is much higher than industry average.					
The organization regularly undergoes improvement of internal operations processes					
Key performance metrics are reviewed frequently					
Impediments that hold up production progress are resolved in a timely fashion.					
Effectiveness					
The scale of operation is sufficient to produce the required volume of sugar					
Operations maintain flexibility while increasing accountability					
The scheduled activities are undertaken as scheduled					
Sugar products meet prescribed quality standards					

THANK YOU AGAIN!!, for taking your time to complete this questionnaire.

Appendix II: Interview Schedule for Managers

Part One: Demographic Information

1) State your department   Production [ ]   Finance [ ]
2) How long have you worked in this organization?
3) For how long have you worked at the current position?
4) State your highest academic qualification ________________. What is your opinion on relationship between academic qualification and performance at plant level
   …………………………………………………………………………………………
   ……………………………………………………………………………………….

Part Two: Operations strategies

Section A: Competitive Priorities

From the statements below, state the option that best describes your feelings on each of the issues stated: Strongly Agree (**SA**), Agree (**A**), Neutral (**N**), Disagree (**D**) or Strongly Disagree (**SD**).

Cost
The company has low manufacturing unit costs
Operations costs are managed effectively
firms will put considerable effort into controlling production cost
The firm is able to control materials supply
Flexibility
The system allows for adjustment on system design
Resources are deployed in response to changes in technology
manufacturing system is able to perform different processes
The workforce is able to perform a broad range of manufacturing tasks effectively
Delivery
The system is able to deliver products on-time
Queuing period is highly reduced
Short manufacturing cycle time, from raw materials to products
The system takes a shorter time-to deliver products on demand

Quality
The products are produced as per the pre-established standards
The process ensure consistency in operations
Customers complaints are effectively dealt with on time
The manufacturing system meets environmental requirements

Other comments: Please state below:

…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
………………….

From the following competitive priority dimensions (***cost, delivery, flexibility, and quality***), which one does your organization give prominence?

Kindly offer justification for or against:

Section B: Structural Decisions

Capacity
The capacity of the firm is adequately utilized
The scale of production of the system is adequate to meet the demand
The capacity of stores are adequate to accommodate the production
The arrangement of floor area allows for free movement
Process
Structural enhancements meet current code requirements
The operations system is able to get the right information real time
Lots of repeated work is done in the production process
The capacity of production technology currently in use is adequate

Structure
Authorization resides in the high chain of command
The management structure is decentralized
The operations is divided into areas of specialization
The management operates dependent on strict rules and procedures
Operations Development and Improvements
The production process continuously make minor improvements of the system
The management frequently appraise the process
Key Performance Indicators are frequently communicated to affected parties for real time action
The management allows for benchmarking of the best practices operations with other competitors

Other comments on **the four items (capacity, process, structure, Operations Development) on their general emphasis:**

……………………………………………………………………………………………
……………………………………………………………………………………………
……………………………………………………………………………………………
……………………………………………………………………………………………
…………………………………………………………………………………………

Section C: Infrastructural Choices

Work force
The team is empowered to make decisions to meet its goals
The team is prepared to take responsibilities that help achieve its goals.
The workforce has the prerequisite competence related to their tasks
The management facilitates employees' further training in their various areas of specialization
Policies
The policies adopted by the management are helpful to achieve the set objectives
The management involves workers while setting policies
There exists high formalization of work procedures
The manufacturing processes follow standard practices
Communication
The production system allows easy access
There exists mechanisms to help employees communicate their innovative ideas
Objectives are communicated to employees on a one – to – one basis
The information system provides necessary performance objective reports timely
The management takes timely action on information received from all stake-holders
We have formal mechanisms that ensure transfer of best practices among various areas of work (e.g. reward systems based on group performance)
Innovations
The system and other processes are automated by use of Computer Aided Design
There is continuous improvement of the system to refine the process
Manufacturing process uses best production method available
The operations and production process has minimum possible error

Other comments: Please state below:

…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
………………….

Section D: Leadership Styles

Leader Behaviour
Followers are made aware of what is expected of them
The leader maintains a friendly working relationship with the followers
The leader consults with the followers whenever there is a problem
The leader listens receptively to followers' ideas and suggestions
The leader informs subordinates what needs to be done and how it is to be done
The followers are made aware of what is expected of them to perform to highest level
The leader acts without consulting followers
The leader does little things to make it pleasant for the group
The followers are asked to follow standard rules and procedures
The leader sets goals for followers which are quiet challenging
The leader help the followers overcome problems that stop them from accomplishing their tasks
The leader encourages continual improvement in followers performance
The leader shows that he/she doubts the ability of the follower to meet most of their objectives
The leader consistently set challenging goals to me met
The leader behaves in a manner which is thoughtful of followers' personal needs

Other comments: Please state below:

…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………
………………….

Part Three: Operations Performance

Efficiency
Production processes improve efficiency in operations
Productivity of employees is much higher than industry average.
The organization regularly undergoes improvements of internal operations processes
Key performance metrics are captured on time
Impediments that hold up production progress are resolved in a timely fashion.
Effectiveness
The scale of operation is sufficient to produce the required volume of sugar and its allied
Operations maintain flexibility while increasing accountability
The scheduled activities are undertaken as scheduled
Sugar and its allied products meet prescribed quality standards

THANK YOU for taking your time to complete this questionnaire. We may come back to you in case of any clarification.

Appendix III: Map of Kenya Showing the Study Locale

Source: Google Map, 2017

Appendix IV: List of Sugar Manufacturing Firms in Kenya

S/N	Sugar Manufacturing Firm	Physical Company Address
1	Mumias Sugar Co.	BUNGOMA ROAD, PRIVATE BAG, MUMIAS
2	Nzoia Sugar Co.	P. O. BOX, 285 – 50200, BUNGOMA
3	West Kenya Sugar	P O BOX, 21O1 – 50100, KAKAMEGA
4	Miwani Sugar Co.	MAMBO LEO ROAD, PRIVATE BAG, MIWANI, KENYA
5	Chemelil Sugar Co.	P O BOX, 177 – 40107, KISUMU
6	Muhoroni Sugar Co.	OFF – KIBOS ROAD, P O BOX 2, MUHORONI
7	Kibos Sugar Co.	KIBOS. OFF KIBOS ROAD – KISUMU Tel: 057-2028151,
8	Sony Sugar Co.	KISII – MIGORI HIGHWAY. P O BOX 107 – 40405, SARE, AWENDO
9	Butali Sugar Co.	FACTORY ROAD. P O BOX 1400 - 50205, WEBUYE
10	Transmara Sugar Co.	P O BOX 82241, KISII NYANZA
11	Sukari Industries Sugar Co.	P O BOX 237, NDHIWA
12	Kwale International Sugar	LIKONO – LUNGA LUNGA ROAD, MSAMBWENI P O BOX 46279, NAIROBI

Appendix V: Reproduced Correlations for Extracted Competitive Priorities Items

Reproduced Correlations for Extracted Competitive Priorities items

		Production system allows for adjustment on the design	Manufacturing system performs different processes	The system delivers products on time	Queueing period is highly reduced	System takes a shorter time to deliver products on demand
Reproduced Correlation	Production system allows for adjustment on the design	.747[a]	.730	.205	.216	.326
	Manufacturing system performs different processes	.730	.715[a]	.227	.238	.342
	The system delivers products on time	.205	.227	.784[a]	.824	.740
	Queueing period is highly reduced	.216	.238	.824	.867[a]	.778
	System takes a shorter time to deliver products on demand	.326	.342	.740	.778	.723[a]
Residual[b]	Production system allows for adjustment on the design					
	Manufacturing system performs different processes	-.064				
	The system delivers products on time	-.044	.078			
	Queueing period is highly reduced	.042	-.028	-.069		
	System takes a shorter time to deliver products on demand	.010	-.066	-.064	-.077	

Extraction Method: Principal Component Analysis.

a. Reproduced communalities

b. Residuals are computed between observed and reproduced correlations. There are 6 (60.0%) nonredundant residuals with absolute values greater than 0.05.

Appendix VI: Competitive Priorities Extracted Correlation Matrix

Competitive Priorities Extracted Correlation Matrix[a]

		Production system allows for adjustment on the design	Manufacturing system performs different processes	The system delivers products on time	Queueing period is highly reduced	System takes a shorter time to deliver products on demand
Correlation	Production system allows for adjustment on the design	1.000				
	Manufacturing system performs different processes	.467	1.000			
	The system delivers products on time	.161	.305	1.000		
	Queueing period is highly reduced	.258	.210	.755	1.000	
	System takes a shorter time to deliver products on demand	.337	.277	.576	.701	1.000
Sig. (1-tailed)	Production system allows for adjustment on the design					
	Manufacturing system performs different processes	.000				
	The system delivers products on time	.034	.000			
	Queueing period is highly reduced	.002	.008	.000		
	System takes a shorter time to deliver products on demand	.000	.001	.000	.000	

a. Determinant = .135

Appendix VII: Competitive Priorities Correlation Matrix

Competitive Priorities Correlation Matrix[a]

Competitive Priorities Items.		**M. Unit**	**Manage**	**Control**	**Material**	**Adjust**	**Perform**	**Ontime**	**Queue**	**Cycle**	**Demand**	**Standard**	**Consistent**	**Complaint**
Correlation	M. Unit	1.00												
	Managed	.212	1.000											
	Control	.066	.190	1.000										
	Material	.202	.228	.038	1.000									
	Adjust	.159	.043	-.168	.301	1.000								
	Queue	.242	.201	.128	.507	.253	.210	.755	1.000					
	Cycle	.244	.170	.062	.395	.378	.169	.396	.572	1.000				
	Demand	.267	.151	.087	.327	.323	.277	.576	.701	.619	1.000			
	Standards	.352	.141	.044	.413	.353	.310	.396	.364	.348	.274	1.000		
	Consistent	-.086	-.177	-.097	-.040	-.007	.046	.088	.111	.012	.141	-.095	1.000	
	Complaints	.245	.059	.094	.180	.209	.200	.168	.270	.132	.209	.264	.013	1.000
	Demand	.161	.250	.197	.241	.148	.305	1.000	.755	.396	.576	.396	.088	.168
	Perform	.239	.163	-.058	.186	.462	1.000	.305	.210	.169	.277	.310	.046	.200
Sig. (1-tailed)	Unit		.008	.227	.010	.035	.003	.033	.003	.002	.001	.000	.164	.002
	Manage	.008		.015	.004	.313	.031	.002	.011	.026	.043	.054	.021	.250
	Control	.227	.015		.334	.028	.256	.012	.073	.239	.162	.309	.136	.141
	Materials	.010	.004	.334		.000	.017	.003	.000	.000	.000	.000	.325	.020
	Adjust	.035	.313	.028	.000		.000	.046	.002	.000	.000	.000	.470	.008
	Queue	.003	.011	.073	.000	.002	.008	.000		.000	.000	.000	.104	.001
	Cycle	.002	.026	.239	.000	.000	.027	.000	.000		.000	.000	.446	.066
	Demand	.001	.043	.162	.000	.000	.001	.000	.000	.000		.001	.054	.008
	Standards	.000	.054	.309	.000	.000	.000	.000	.000	.000	.001		.140	.001
	Consistent	.164	.021	.136	.325	.470	.301	.159	.104	.446	.054	.140		.440
	Complaints	.002	.250	.141	.020	.008	.011	.027	.001	.066	.008	.001	.440	
	Demand	.033	.002	.012	.003	.046	.000		.000	.000	.000	.000	.159	.027
	Perform	.003	.031	.256	.017	.000		.000	.008	.027	.001	.000	.301	.011

a. Determinant = .015

Appendix VIII: Structural Decisions Correlations Matrix

Structural Decisions Correlation Matrix[a]

Structural Decisions measurement items		Capacity of stores accommodates production	Structural enhancements meet current code requirements	Technology currently in use is adequate	Operations is divided into specialized areas	Management frequently appraise the system	KPI are communicated real time	Management benchmarks with competitors
Correlation	Capacity of stores accommodates production	1.000	-.016	.025	.353	.098	.350	.203
	Structural enhancements meet current code requirements	-.016	1.000	.358	.048	.290	.125	.233
	Technology currently in use is adequate	.025	.358	1.000	.131	.189	.080	.317
	Operations is divided into specialized areas	.353	.048	.131	1.000	-.062	.078	.013
	Management frequently appraise the system	.098	.290	.189	-.062	1.000	.500	.553
	KPI are communicated real time	.350	.125	.080	.078	.500	1.000	.484
	Management benchmarks with competitors	.203	.233	.317	.013	.553	.484	1.000
Sig. (1-tailed)	Capacity of stores accommodates production		.427	.389	.000	.132	.000	.010
	Structural enhancements meet code requirements	.427		.000	.294	.000	.078	.004
	Technology currently in use is adequate	.389	.000		.067	.015	.182	.000
	Operations is divided into specialized areas	.000	.294	.067		.240	.189	.442
	Management frequently appraise the system	.132	.000	.015	.240		.000	.000
	KPI are communicated real time	.000	.078	.182	.189	.000		.000
	Management benchmarks with competitors	.010	.004	.000	.442	.000	.000	

a. Determinant = .252

Appendix IX: Operations Strategies Correlations

Operations Strategies Correlations

		Delivery	**Flexibility**	**Operations Dev**	**Process**	**Structure**	**Policy**	**Communication**	**Workforce**
Delivery	Pearson Correlation	1							
Flexibility	Pearson Correlation	.393**	1						
	Sig. (2-tailed)	.009							
Operations development	Pearson Correlation	.491	.508*	1					
	Sig. (2-tailed)	.281	.012						
Process	Pearson Correlation	.505**	-.268**	-.034**	1				
	Sig. (2-tailed)	.001	.003	.					
Structure	Pearson Correlation	.306**	-.312**	-.070**	.374	1			
	Sig. (2-tailed)	.000	.002	.009	.209				
Policy	Pearson Correlation	.761	-.664	-.412	-.151*	.732*	1		
	Sig. (2-tailed)	.449	.538	.730	.043	.021			
Communication	Pearson Correlation	.282	-.146	.154	.423*	.609	.837	1	
	Sig. (2-tailed)	.818	.907	.902	.014	.415	.369		
Workforce	Pearson Correlation	-.082	-.338**	.015	.401**	.189*	.561	.609	1
	Sig. (2-tailed)	.041	.003	.147	.000	.002	.431	.398	

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

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix X: Operations Performance Correlations Matrix

Operations Performance Correlation Matrix[a]

		Production process improves efficiency	Employees' productivity is higher	Regular improvement of internal operations	Key perf metrics are reviewed frequently	Impediments are resolved timely	Operations maintain flexibility	Activities are taken as scheduled
Correlation	Production process improves efficiency	1.000	.222	.223	.417	.385	.211	.324
	Productivity of employees is higher	.222	1.000	.428	.429	.356	.309	.431
	Regular improvement of internal operations	.223	.428	1.000	.571	.276	.122	.596
	Key performance metrics are reviewed frequently	.417	.429	.571	1.000	.523	.275	.694
	Impediments are resolved timely	.385	.356	.276	.523	1.000	.116	.422
	Operations maintain flexibility	.211	.309	.122	.275	.116	1.000	.322
	Activities are taken as scheduled	.324	.431	.596	.694	.422	.322	1.000
Sig. (1-tailed)	Production process improves efficiency		.005	.005	.000	.000	.008	.000
	Productivity of employees is higher	.005		.000	.000	.000	.000	.000
	Regular improvement of internal operations	.005	.000		.000	.001	.083	.000
	Key performance metrics are reviewed frequently	.000	.000	.000		.000	.001	.000
	Impediments are resolved timely	.000	.000	.001	.000		.094	.000
	Operations maintain flexibility	.008	.000	.083	.001	.094		.000
	Activities are taken as scheduled	.000	.000	.000	.000	.000	.000	

a. Determinant = .104

Appendix XI: Reproduced Correlations for Extracted Performance Items

Reproduced Correlations for extracted performance items

		Regular improvement of internal operations	Key performance metrics are reviewed frequently	Activities are taken as scheduled
Reproduced Correlation	Regular improvement of internal operations	.687[a]	.726	.735
	Key performance metrics are reviewed frequently	.726	.769[a]	.778
	Activities are taken as scheduled	.735	.778	.787[a]
Residual[b]	Regular improvement of internal operations		-.155	-.139
	Key performance metrics are reviewed frequently	-.155		-.084
	Activities are taken as scheduled	-.139	-.084	

Extraction Method: Principal Component Analysis.

a. Reproduced communalities

b. Residuals are computed between observed and reproduced correlations. There are 3 (100.0%) nonredundant residuals with absolute values greater than 0.05.

Appendix XII: Correlation Matrix[a] for the Extracted Performance Items

Correlation Matrix[a] for the extracted performance items

		Regular improvement of internal operations	Key performance metrics are reviewed frequently	Activities are taken as scheduled
Correlation	Regular improvement of internal operations	1.000	.571	.596
	Key performance metrics are reviewed frequently	.571	1.000	.694
	Activities are taken as scheduled	.596	.694	1.000
Sig. (1-tailed)	Regular improvement of internal operations		.000	.000
	Key performance metrics are reviewed frequently	.000		.000
	Activities are taken as scheduled	.000	.000	

a. Determinant = .309

Appendix XIII: Correlations Coefficients of Leadership Styles Measurement Items

Correlations coefficients of Leadership Styles measurement items

		Leader maintains friendly relationship	Leaders consult with followers	Leaders listen to followers ideas	Leaders inform what to be done	Followers are helped to overcome problems	Followers' performance is encouraged	Leaders' are thoughtful of followers' needs
Leader maintains friendly relationship	Pearson Correlation	1						
	Sig. (2-tailed)							
Leaders consult with followers	Pearson Correlation	.601**	1					
	Sig. (2-tailed)	.000						
Leaders listen to followers ideas	Pearson Correlation	.437**	.725**	1				
	Sig. (2-tailed)	.000	.000					
Leaders inform what to be done and how	Pearson Correlation	.562**	.652**	.725**	1			
	Sig. (2-tailed)	.000	.000	.000				
Followers are helped to overcome problems	Pearson Correlation	.293**	.297**	.216*	.360**	1		
	Sig. (2-tailed)	.001	.001	.013	.000			
Leaders encourage improvement	Pearson Correlation	.213*	.231**	.271**	.384**	.815**	1	
	Sig. (2-tailed)	.015	.008	.002	.000	.000		
Leaders' are thoughtful of followers' needs	Pearson Correlation	.122	-.053	-.056	.063	.513**	.628**	1
	Sig. (2-tailed)	.164	.550	.523	.473	.000	.000	

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

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix XIV: Research Authorization Letter

NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471, 2241349,3310571,2219420
Fax:+254-20-318245,318249
Email:dg@nacosti.go.ke
Website: www.nacosti.go.ke
when replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/16/70245/15239**

Date: **21st December, 2016**

Lawrence Okoth Odollo
Jomo Kenyatta University of Agriculture
And Technology
P.O. Box 62000-00200
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "***Effect of operations strategies on performance of sugar manufacturing firms in Kenya,***" I am pleased to inform you that you have been authorized to undertake research in **all Counties** for the period ending **21st December, 2017.**

You are advised to report to **the County Commissioners and the County Directors of Education, all Counties** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. M. K. RUGUTT, PhD, HSC.
DIRECTOR-GENERAL/CEO

Appendix XV: Research Permit

THIS IS TO CERTIFY THAT:
MR. LAWRENCE OKOTH ODOLLO
of JKUAT, 315-50102 MUMIAS,has been permitted to conduct research in *All Counties*

on the topic: *EFFECT OF OPERATIONS STRATEGIES ON PERFORMANCE OF SUGAR MANUFACTURING FIRMS IN KENYA*

for the period ending:
21st December,2017

Permit No : NACOSTI/P/16/70245/15239
Date Of Issue : 21st December,2016
Fee Recieved :Ksh 2000

Applicant's Signature

Director General
National Commission for Science, Technology & Innovation