CONTINUOUS IMPROVEMENT AND OPERATIONAL PERFORMANCE OF SMALL AND MEDIUM SIZED MANUFACTURING FIRMS IN KENYA

BY

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DECLARATION

This is my original work and has not been presented for a study in any University or college.

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First is to acknowledge God in all this. He has seen me through the entire MBA program.

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DEDICATION

This project is dedicated to my wife (Joy Makena), son (Brian Mwongela), Parents (Mr. and Mrs. Justice David O. Onyancha), Brothers (Bernard and Derrick), Sister (Michelle), Mrs. Gladys Mwite, and Prof. S. Kariuki for their unwavering support and encouragement through life and in my academics. And to you, my friends, a big thank you.

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ABBREVIATIONS AND ACRONYMS

Batch-and-Queue Processing	Producing more than one piece of an item and then moving those items forward to the next operation before they are all actually needed there.
BPIs	Best Practice Interventions.
CI	Continuous Improvement.
COMESA	Common Market for Eastern and Southern Africa.
EAC	East African Community.
FDI	Foreign Direct Investment.
Five S (5S)	Five related terms (each beginning with an S) describing workplace practice conducive to visual control: sort, straighten, scrub, standardize, sustain. It is a method of organizing a work space for efficiency and effectiveness by identifying and storing the items used, maintaining the area and items, and sustaining the new order.
GDP	Gross Domestic Product.
GoK	Government of Kenya.
Kaizen	Japanese for "improvement", or "change for the better". Continuous incremental improvement of an activity to create more value with less waste.
Kanban	Is a simple parts-movement system that depends on cards and boxes/containers to take parts from one workstation to another on a production line.
Lean	Produce more (outputs) with less (inputs).
MSMEs	Micro, Small and Medium Enterprises.
OPT	Optimized Production Technology - Production scheduling and inventory control system that (unlike manufacturing resource planning) recognizes bottlenecks (capacity constraints) and does not aim at full capacity utilization at all times. OPT's objective is to simultaneously raise throughput while reducing inventory and operating costs, and achieve a smooth, continuous flow of work in

	process.
PMSs	Performance Measurement.
Poka-Yoke	A mistake-proofing device or procedure to prevent a defect during order taking or manufacture.
SMEs	Small and Medium Enterprises.
TQC	Total Quality Control.

ABSTRACT

Continuous improvement (CI) as a collection of activities that constitute a process intended to achieve performance improvement. In manufacturing, these activities primarily involve simplification of production processes, chiefly through the elimination of waste. In service industries and the public sector, the focus is on simplification and improved customer service through greater empowerment of individual employees and correspondingly less bureaucracy. Acquisition and use of skills for process analysis and problem solving are seen as fundamental to CI in the private and public sectors. The underpinning principle of KAIZEN (Japanese word for continuous improvement) is the use of various problem-solving tools for the identification and solution of work-based problems. The aim is for improvement to reach new 'benchmarks' with every problem that is solved. To consolidate the new benchmark, the improvement must be standardized. In a competitive environment, the challenge for all businesses is not only to innovate in existing markets to survive and remain profitable, but also to innovate in new markets in order to stay in front of competitors. The purpose of the study was to determine the various continuous improvement approaches adopted by small and medium sized manufacturing firms in Kenya and to determine the relationship between the extent of adoption of continuous improvement approaches and operational performance of small and medium sized manufacturing firms in Kenya. This study adopted exploratory research design. The study focused on 2000 manufacturing SMEs in Nairobi and its environs namely Thika, Athi River and Limuru. Using proportional allocation, 70 agro-based, 60 chemical and mining and 70 engineering and construction enterprises were visited by taking 10% from each stratum. A self-administered questionnaire and observation were the two principal research instruments of data collection. The data collected was analyzed by descriptive statistics and inferential statistics. The study established that there is control over processing of products and the firms encourage new products/services development although they do not have a budget for research & development. The study further deduced that the SMEs always anticipate and manage uncertainty and risk. The study concludes that benchmarking had the highest influence on operational performance, followed by best industry practices, then lean supply chain management while innovative and creativity had the least effect on operational performance. The study recommends that the manufacturing SMEs should practice green procurement practices/green purchasing so as to reduced waste in production and enhance their production efficiency. The firms should also engage in cross functional training of their staff on the best practices in a bid to streamline their operations. There is also need for government intervention strategies to support SMEs in Kenya like establishment of policies that favour SMEs in the manufacturing sector to enhance continuous improvement practices. Further, managers need to evaluate the product design, process choice, and the degree of standardization involved in the organization, and can then decide upon the appropriate methods to use to best implement improvement practices.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In a dynamic business environment, there is the added pressure to be more socially and environmentally responsible and there are risks which need to be mitigated and managed globally (Bititci et al., 2002). The complexity created by ever increasing customer requirements and expectations, globalization, the pressure on cost, and the availability and access to resources, management expectation to improve profitability, increase revenue growth, capture and protect larger market share are key drivers to competitive organizations (Antonelli & Parbonetti, 2002).

In the past decades, several models have gained widespread acceptance as approaches to improve customer satisfaction in production and operations performance (Benner & Tushman, 2003). Among these models are Total Quality Management (TQM) (Bititci, et al., 2002) benchmarking, best practices, six sigma programs, lean six sigma, balanced scorecard, lean thinking, lean manufacturing practices (Antonelli & Parbonetti, 2002). The adoption of these models by firms in different industries has generated positive outcome and are based on the concepts, methods and techniques of improvement and change (Benner & Tushman, 2003). In order to excel, management must recognize that the ultimate success of an organization depends on the ability to integrate the company's network of business relationships based on continuous improvements in all areas of operations to gain competitive edge in the dynamic and competitive market (Beretta, 2002).

Continuous improvement which brings about change in management emphasizes the importance of developing organizational values, capabilities and methods for systematic development and review of progress, based on strategic orientation of improvement and

change actions (Bititci, et al., 2000). It is a collection of activities that constitute processes intended to achieve performance improvement. In manufacturing, these activities primarily involve simplification of production processes mainly through the elimination of waste (Laitinen, 2002). Continuous improvement emphasizes on, amongst other things, reduced waste and improvement in product quality, in comprehensive and systematic methodologies that focus on the entire organization. It generates process-oriented thinking since processes must be enhanced before improved results can be obtained (Carpinetti & Oiko, 2007).

Improvement can be broken down into continuous improvement and innovation. Continuous improvement calls for a substantial management commitment of time and effort. It calls for investment in the human capital. According to Laitinen (2002) all organizations need both continuous and break-through improvement. Continuous improvement is a key driving force behind most effective and efficient organizations while break-through improvements serves to 'jump-start' a few of the critical processes (Bourne, 2001).

Continuous innovation and performance measurement methods and tools have been applied in companies as a means to develop improvement actions related to strategic objectives and to monitor results so as to give feedback for further action (Carpinetti & Oiko, 2007). In service industries and the public sector, the focus is on simplification and improved customer service through greater empowerment of individual employees and correspondingly less bureaucracy (Hudson & Smith, 2000).

In this context, the concepts and techniques of continuous improvement can be of great value in managing collective efficiency and performance improvement of firms (Antonelli & Parbonetti, 2002).

1.1.1 Continuous Improvement

Organizations operate in a dynamic and complex business environment which is constantly changing, and the level of competition is rising all the time. With the advent of global economy, it is necessary for them to identify what their true level of competition is; key priorities' areas that lead to superior performance and how to manage properly to improve their effectiveness, efficiency and ultimately their competitiveness. This dictates that such organizations then, must measure their performance as compared to other players in the industry.

Recent years have seen the emergence of ideas like Total Quality Management, Six Sigma, Just-In-Time, Lean Logistics, Global Sourcing, and Supply Chain Management. Best in class firms are employing these processes and continue to set the pace for new entrants making it very hard for them to compete. The key continuous improvement approaches are; Total quality management (TQM), Six Sigma, Just in time (JIT), Lean manufacturing, Lean Logistics, Global sourcing, Supply chain management (SCM), Benchmarking. Firms that have excelled and are 'best in classes today, employ some of these elements within their operations.

Operational performance is defined as the accomplishment of a given task measured against preset known standards (Hudson & Bourne, 2000). Overall performance determines an organizational survival. Traditionally, performance measurements focused on financial measures i.e. sales turnover, profit, debt and return on investment. Several performance measurement tools have been developed that incorporate aspects in measuring performance. They include; the balance score card, economic value add, 360 degree assessment, cleaner production etc.

The balanced score card proposed by (Kaplan & Norton, 1992) is a framework that is used to measure organizational performance. The model identifies and integrates four different ways of looking at performance; financial, customer, internal business processes and innovation and learning perspectives. A balanced scorecard is generally used to clarify and update the business strategy, link the objectives of the organization to the annual budgets, allow organizational change, and increase the understanding of the company vision and mission statements across the organization. A balanced scorecard can be used to translate a firm's mission and vision statements into a broad set of objectives and performance measures that can be quantified and appraised, and measures whether management is achieving desired results (Cohen & Prusak, 2001).

With an organizations performance being critical for survival in the fiercely contested market, they should focus on continuous improvements in order to prevent waste in terms of time, labor, or material spent producing a product or service that does not add value to it. Effective and efficient operational systems comprise unique tools, techniques, and methods that can help an organization to reduce costs and achieve just-in-time delivery (Hudson & Bourne, 2000).The issues of continuous improvement and operational performance are to be investigated in the context of the manufacturing sector in Kenya.

1.1.2 SME Manufacturing Firms in Kenya

Kenya is the regional hub for trade in Eastern Africa. The country has a market-based economy with a liberalized foreign trade policy. Kenya's trade policy development has evolved through the following distinct policy orientations: import Substitution Policies (1960s -80s); Trade Liberalization through Structural Adjustment Policies (SAPs) (1980s); introduced in the mid 1980's by Sessional Paper No.1 of 1986 on Economic Management

for Renewed Growth. It emphasized a change from reliance on import substitution and protectionism towards a policy that led to industries being encouraged to manufacture for export with reform programmes aimed at improving efficiency, stimulating private investment and increasing the sector's foreign exchange earnings.

It also meant economic liberalization bringing to an end the central role of the public sector institutions which had hitherto managed and coordinated trade distribution networks and related trade facilitation and promotion activities. Export Oriented Policies 1990s. Presently Kenya's Trade regime is guided by market-driven principles of liberalization under the World Trade Organization (WTO), which came into effect in 1995 and the increased efforts in the regional economic integration that has resulted in the establishment of the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA) and the Inter-governmental Authority on Development (IGAD).

The Vision 2030 Strategy aims to transform Kenya into a newly industrialized middle income country, providing high quality of life for its citizens by year 2030. Manufacturing sector is identified as one of the key sectors to support the growth strategy and address incidences of high poverty levels and unemployment in the country. The vision of the sector is the development of a "robust diversified and competitive manufacturing sector" (Kenya Vision 2030).Kenya Association of Manufacturers (KAM) is the representative organization for input value-add industries. It provides an essential link for co-operation, dialogue and understanding with the Government by representing the views and concerns of its members to the relevant authorities (KAM Website, 2012). Manufacturing contributes about 10% of GDP as illustrated in figure 1.

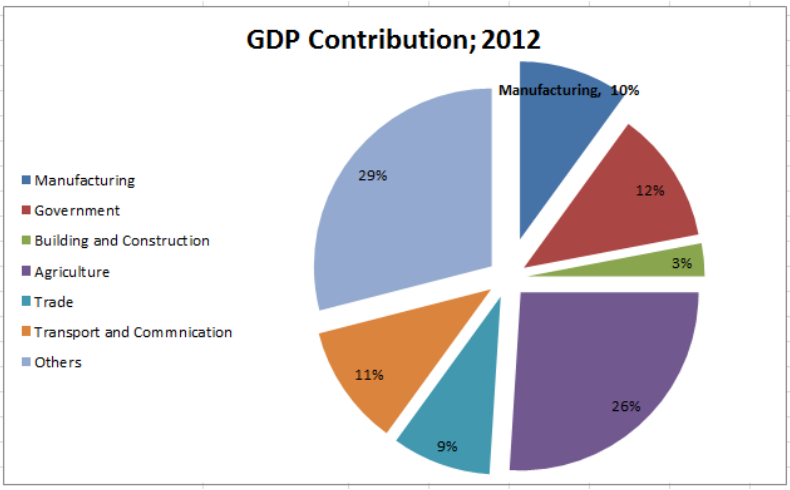

Figure 1.1: GDP Overview

Source: Central Bank of Kenya (CBK) and Kenya Association of Manufacturers (KAM), 2012

Since independence, the industrial sector's share of monetary Gross Domestic Product (GDP) has remained about 15-16% while that of manufacturing sector has remained at a little more than 10% over the last two decades. Manufacturing activities account for the greatest share of industrial production output and form the core of the industry. Manufacturing sector makes an important contribution to the Kenyan economy and currently employs 254,000 people, which represents 13 percent of total employment with an additional 1.4 million people employed in the informal side of the industry. The sector is mainly agro-based and characterized by relatively low value addition, employment, and capacity utilization and export volumes partly due to weak linkages to other sectors (Kenya Bureau of Statistics Report, 2011).

Locally-manufactured goods comprise 25 percent of Kenya's exports. However, the share of Kenyan products in the regional market is only 7 percent of the US $11 billion regional

market. This is an indication that there is a large potential to improve Kenya's competitiveness in the region by replacing external suppliers gradually. The manufacturing sector has continued to rely on old technologies that are inefficient and costly. The above can be attributed to the many multinationals that Kenya plays host to, who use superior technologies and hence take up large market shares leaving the local firms struggling to survive.

Hyland & Boer (2006) defines a small business as "being independently owned and managed, being closely controlled by owners/managers wheals contribute most, if not all, of the operating capital: having the principle decision making functions resting with the owner/managers. Defining a small business in Kenya, according to Micro and Small Enterprises Baseline Survey of 1999, small-scale enterprises are those that employ 11 to 50 workers. Practically in every country, Micro and Small Enterprises (MSEs) constitute almost 90% of all commercial business activity.

The government, aware of the role Small and Medium Sized Enterprises (SMEs) play in the economy, has taken steps to develop a legal and regulatory framework aimed at guiding and accelerating the growth of this sector. Small and Medium Enterprises (SMEs) face unique challenges, which affect their growth and profitability and hence, diminish their ability to contribute effectively to sustainable development. Among them is inability to access long-term credit, use of old technologies that could be costly, lack managerial training and experience, inadequate education and skills, national policy and regulatory environment, licensing, political uncertainty, technological change, poor infrastructure and scanty markets information.

Small and medium manufacturing enterprises in Kenya's manufacturing sector are defined

as enterprises with fulltime employees not exceeding 100 or annual sales turnover not exceeding KES150 million. The development of competitive and resilient small and medium enterprises (SMEs) forms an integral component of Kenya's initiatives to be globally competitive and prosperous nation with a high quality of life by 2030 (GoK, 2012).

Small and medium sized manufacturing firms in Kenya play an important role in modern economy because of their flexibility and ability to innovate. In nearly every country, SMEs play a significant role in providing employment opportunities and supporting large scale manufacturing firms (Carpinetti & Oiko, 2007). SMEs are a major driving force behind interrelated flow of trade, investment and technology; they are actually active instruments for rural and social-economic developments (Opondo, 2010).

The growing competition in the market place, the advance of manufacturing technologies, and shorter product life cycles has exerted strong impacts on the entire manufacturing industry. Under such a dynamic environment, SMEs have deployed various approaches to reposition their competitive priorities such as cost, quality, flexibility and delivery so as to achieve the ultimate goal to customer satisfaction (Chen, 1999). The issues outlined above have affected the competitive structure of the local SMEs in manufacturing sector. The concepts of continuous improvement would probably form part of the operational response to these issues.

A snap shot of Nominal GDP sector composition, 2012 (in percentage and in millions of dollars) for Low, Middle and High Income countries gives an overview of the current state of affairs.

Table 1.1: Nominal GDP sector composition, (2012)

Low Income:					
#	**Country**	**Nominal GDP ($)**	**Agri.**	**Indus.**	**Serv.**
X	Kenya	34,796	19%	16.4%	64.6%
Middle Income:					
#	**Country**	**Nominal GDP ($)**	**Agri.**	**Indus.**	**Serv.**
2	China	8,250,241	9.7%	46.6%	43.7%
27	Argentina	447,644	10%	30.7%	59.2%
29	South Africa	408,074	2.5%	31.6%	65.9%
High Income:					
#	**Country**	**Nominal GDP ($)**	**Agri.**	**Indus.**	**Serv.**
1	United States	15,653,366	1.2%	19.1%	79.7%
3	Japan	5,984,390	1.2%	27.5%	71.4%
4	Germany	3,366,651	0.8%	28.1%	71.1%

Source: Central Bank of Kenya (CBK) and Kenya Association of Manufacturers (KAM), (2012)

1.2 Statement of the Problem

Research has pointed out to the need for continuous improvement and innovation as a key source of competitive advantage for large and small firms (Carpinetti & Oiko, 2007). In a competitive environment, the challenge for all businesses is not only to innovate in existing markets to survive and remain profitable, but also to innovate in new markets in order to stay in front of competitors. Effectiveness and efficiency of the system is one of the drivers of competitive firms globally (Hyland & Boer, 2006).

A study carried out by Wainaina (2009) on supply chain management best practices in large private manufacturing firms in Kenya identified that lean enterprises experience challenges

like; insufficient monitoring and control to the suppliers' delivery time, lack of suppliers engagements, lack of supply chain integration and collaboration especially with trade marketing and distribution teams, lack of close inventory review out of not having periodical checks, lack of clear responsibility line inside supply chain management, lack of understanding and visibility to the desired marketing activities, lack of understanding and recognition to the production constraints and management, as well as capacity planning.

A study by Mile (2008) on the effects of continuous improvement and innovation management practice on small and medium sized manufacturing firms in Kenya, clearly indicated that low capital injection, use of obsolete technologies and high costs of doing business, poor physical infrastructure has contributed to poor operational performance of these firms in developing countries. Another study carried out by Opondo (2010) on the influence of technology on organizational performance indicated that firms are faced by quite a number of challenges when trying to adopt lean operational practices.

Some of the challenges included; resistance from employees, non-commitment by management to support lean practices, inadequate technology to support lean operational practices and inadequate resources allocated to support continuous improvements. However, it is evident from the findings of the study that these studies did not focus on continuous improvement and operational performance of small and medium sized manufacturing firms in Kenya. Also some of the studies conducted focused on different sectors thus ignoring small and medium sized manufacturing firms in Kenya.

The aim of this study was to investigate the link between continuous improvement and operational performance of small and medium sized manufacturing firms in Kenya. Specifically, the study sought to address the questions: What continuous improvement

approaches were adopted by small and medium sized manufacturing firms in Kenya? What was the relationship between the extent of adoption of continuous improvement approaches and operational performance of small and medium sized manufacturing firms in Kenya?

1.3 Research Objectives

The study sought to establish the effect of continuous improvement and operational performance of small and medium sized manufacturing firms in Kenya. The specific objectives of this study were:

i. To determine the various continuous improvement approaches adopted by small and medium sized manufacturing firms in Kenya.
ii. To determine the relationship between the extent of adoption of continuous improvement approaches and operational performance of small and medium sized manufacturing firms in Kenya.

1.4 Value of the Study

The research findings are expected to contribute to a better understanding of continuous improvement and operational performance of small and medium manufacturing firms in Kenya. It will help various shareholders (players) to make strategic lean decisions in order to survive in the competitive industry. SMEs will gain an in-depth understanding of the needs of different customers thus come up with innovative products and services that meet individual needs. This study will be of great benefit to SMEs sector in that it would inform key players more about the integration of modern technology in the value chain activities hence continual improvement of their products and services to customers. The Government will be in a position to formulate policies that are aimed at increasing productivity and safeguarding the interests of SMEs based on training of SMEs. This will enhance their productivity and competitiveness and eventually improve the livelihood of the target

market.

The development partners who are usually interested at helping the SMEs to prosper will have an understanding of a wide variety of factors that hinder growth of the SMEs industry thus sustainability. These partners will be in a position to understand the challenges faced by the SMEs during the adoption of lean practices and most probably come up with the appropriate measures to address challenges of lean operations management strategies. Scholars and Researcher will form a basis upon which further research on the same will be based. It will also be a reference to scholars and researchers who would like to debate or carry out more studies on lean operations management.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter outlines; evolution of continuous improvement and manufacturing in SMEs, continuous improvement concept, value of continuous improvement, continuous improvement and operational performance, the continuous improvement of operational processes, performance measurement in SMEs, balanced scorecard performance model, small and medium sized enterprises (SMEs) and operational performance, empirical study and conceptual framework.

2.2 Theoretical Review

2.2.1 Agency Theory

Sometimes called the principal-agent problem, agency theory is based on a fundamental premise that owners (principals) establish a relationship with managers (agents) and delegate work to them (Alchian & Demsetz, 1972). Principals and agents have different self-interests, which creates an agency problem and requires mechanisms to minimize the problem in each instance.

Eisenhardt (1989) differentiates between two different uses of agency theory – the positivist and the general approach. The positivist approach focuses mainly on the principal-agent relationship between owners and managers of large, public corporations. The more general approach, followed in this paper, is the 'Principal-Agent' relationship that introduces Agency Theory as the theory that can be applied to employer-employee, lawyer-client, buyer-supplier, and other agency relationships. The general Principal-Agent relationship can be applied to all levels in the organization, thus, providing this study a wider and more relevant coverage.

Eisenhardt's (1989) view of agency theory has several implications for CI. First, agency theory assumes that the basis of the organization is 'efficiency' (Eisenhardt, 1988, 1989), which is one of the fundamental drivers of CI. It is in the interest of managers to make sure performance within their organization is efficient. Second, cross-departmental changes, such as those resulting from CI, can have both positive and negative impacts on organizational structures and performances and can be faced with strong opposition. It is therefore suggested that providing strong management involvement for newly introduced changes delivers a sense of obligation and provides incentives for subordinates to accept newly introduced changes.

2.2.2 Resource-Based View of the Firm Theory

RBV focuses on the internal characteristics and performance of the organization (Porter, 1991). The theory suggests that organizations have different types of resources that fall under two categories: (a) cooperative and strategic, and (b) competitive and financial. The theory is based on the assumption that firms have idiosyncratic, not identical strategic resources. Resources are not perfectly mobile and therefore heterogeneous. Thus, organizations are collections of resources, and the scarcer the organizational collection of resources the less the competitive advantage they actually hold.

Moreover, aside from resources, RBV theory also focuses on capabilities. Capabilities are accumulated knowledge in organizations resulting from using its existing resources in an efficient and effective way to achieve its final goals (Idris, Abdullah, Idris, & Hussain, 2003). Capabilities are divided into four main categories: functional differential, positional differential, cultural differential, and regulatory differential. These capabilities develop from existing skills and experience (functional), as preferences of previous actions (positional), as a result of the perceptions of the individual of the organizational

stakeholders (cultural), or from organizational policies and regulations (regulatory) (Hall, 1991). Therefore, in the context of CI, the theory implies that an organization with a culture supportive of CI, with existing process-based change regulations, and with previous experience in conducting CI projects, will attain higher levels of CI capabilities.

CI shares common standpoints with RBV theory. The commonality is embedded in the belief that resources and capabilities of the organization are limited, thus, surviving organizations tend to use their resources in a cost-effective way. Functioning at optimum levels can lead organizations to create competitive advantage. Sustaining competitive advantage, however, may require continual improvements to differentiate themselves from competitors (Attaran & Attaran, 2004). Sustained competitive advantage is achieved when capabilities are able to produce value, are rare, are imperfectly imitable, and are exploited by the organization.

Similarly, CI's fundamental philosophy focuses on improving existing operations within organizations allowing them to use resources more efficiently and effectively (i.e. produce value), and provides tailored solutions to solve specific organizational problems (i.e. unique and imperfectly imitable) (Valiris et al., 2004). Sustaining competitive advantage is specifically related to the human and technical capabilities. Organizational capability in terms of staff with existing CI-related experience and the ownership and exposure to a variety of technical CI tools have a major impact on the final results of the CI project. This accumulated experience has value, is hard to imitate, transfer or substitute and can be exploitable by the organization and thus creates 'sustainable competitive advantage' in accordance with RBV theory. Therefore, RBV theory and its competitive advantage sustainability are tightly related to CI.

2.2.3 Stakeholder Theory

A stakeholder in general as defined by Freeman (1984) is any group or individual who can affect or is affected by the achievement of the organization's objectives. Stakeholder theory helps to improve the value of the outcomes of the stakeholder decisions by identifying the interests of various stakeholder groups and prohibiting them from being disadvantaged (Andriof, Waddock, Husted, & Rahman, 2002), ultimately resulting in greater returns to shareholders.

Modern businesses have become more transparent and accountable in order to meet their new, interactive and responsive relationships with stakeholders. Stakeholders should be defined through their legitimate interests in the organization rather than the organization's interest in them. Therefore, recognizing obligations to stakeholders helps organizations to become successful. This idea is also heavily supported by the agency theory. *Stakeholder focus* is the effort expended by the organization intending to satisfy the majority of the key stakeholders (Idris *et al*., 2003). Key stakeholders in CI are identified in terms of the degree of reliance and interaction with the process to be improved. Thus, the larger the process the higher the number of key stakeholders involved.

Clarkson (1995) affirms that persistence in dissatisfying principal stakeholders may cause the organization to fail. However, building a trust relationship can significantly lower costs, and therefore impact their performance. The impact of key stakeholders is asserted in a variety of fields such as firms' performance, decision-making, and corporate social performance.

Furthermore, this argument does not deal with the moral foundation of the stakeholder theory and the principle of fairness. The theory does not imply either that all stakeholders should be equally involved in processes (Donaldson *et al.*, 1995). The focus of this research

is on the capability of the theory to accomplish multiple purposes although these purposes are not necessarily entirely congruent. Thus, the theory assists in identifying a mechanism to recognize cross points among the different requirements of key stakeholders in a CI project.

While BPR literature recommends that executives and key staff members to be involved in CI, Davenport *et al.* (2004) discovered that less than 30 percent of organizations have achieved even limited information exchange with their suppliers and customers (who are also part of the key stakeholder vision). From the stakeholder theory perspective, CI personnel should consult with affected key people throughout the different phases of the project (i.e. analysis, design, and implementation) and identify middle ground solutions.

In summary, stakeholder theory, in the context of CI, suggests that recognizing and aligning key stakeholders' concerns can have a positive impact on the results of the project in particular and the organizational performance in general. This area is largely neglected in the field of CI. Accordingly, we argue that identifying and aligning with the interests of various key functional based personnel, as well as other external key stakeholder groups, during a business process improvement project has a significant and positive impact on CI projects' final results which is performance.

2.3 Evolution of Continuous Improvement

Continuous improvement in manufacturing sector has received tremendous changes since the industrial period. In developing countries, the concept is slowly penetrating into small and large organization due to increased demand of products and services in the market that necessitate companies to produce them effectively and efficiently based on minimal costs. The roots of modern improvement programs can be traced back to initiatives undertaken in several companies in the 1800s, where management encouraged employee-driven

improvements, and incentive programs were set in place to reward employees that brought about positive changes in the organization.

During the late 1800s and early 1900s, much attention was given to scientific management; this involved developing methods to help managers analyze and solve production problems using scientific methods based on tightly controlled time-trials to achieve proper piece rates and labour standards (Nadia and Amit, 2005). While modern continuous improvement initiatives are customer focus driven, this approach ensures that products or services produced are delivered right with minimum costs incurred from production to consumption.

CIP is not just for nuts and bolts anymore. Today service firms and service functions within almost every sector are also using some sort of continuous improvement methods to boost performance. Companies are using it to shape up such nonmanufacturing work such as accounts receivable, sales, and research and development. Not surprisingly, financial institutions, hotel, restaurant, telecommunications, and health care firms are starting their own CIP initiative. Within the service industry, defining a service problem or defect, where there are no products to return, nothing to inspect, and highly variable processes is one of the most challenging aspects of applying CIP to service delivery systems.

Until you reach agreement on what constitutes a service defect, your CIP effort will likely disappoint (Edward, 1999). To emphasize the core value of CIP, the customer defines quality. Granted, employees affect quality at each point in the system, but it is the customer who remains the final arbiter of the results. Accordingly, most CIP programs for services define a problem or defects a flaw in a task that results in a lower level of customer satisfaction or a lost customer. In short, a service defect means your systems are not delivering on your promise to customers.

The challenges posed by increased liberalization, new entrants to the market, increased standards requirements and technological developments require SMEs to raise efficiency levels, strengthen inter-firm linkages and respond timely to market changes. At the same time, greater integration into the global economy provides opportunities for SMEs to participate in the international continuous improvements to enhance their operational performance. Only SMEs that are capable of harnessing technology and knowledge to develop high value-added products of superior quality will be able to compete globally (GoK, 2012).

2.4 Approaches and Tools for Continuous Improvement

Continuous improvement (CI) is defined as a collection of activities that constitute a process intended to achieve performance improvement. In manufacturing, these activities primarily involve simplification of production processes, chiefly through the elimination of waste (Beretta, 2002). Continuous improvement is gradual never-ending change, whereas continual improvement is incremental change. Both types of improvements are what the Japanese call Kaizen. In service industries and the public sector, the focus is on simplification and improved customer service through greater empowerment of individual employees and correspondingly less bureaucracy (Bessant, 2006).Continuous improvement, as the name implies, adopts an approach to improving organizational performance, with small incremental steps, over time. In this approach, it is not the size of each step which is important but the likelihood that the improvements will be ongoing (Carpinetti & Oiko, 2007).

Among the key approaches to CI in the recent past years include among others; Total Quality Management, Six Sigma, Just-In-Time, Lean Logistics, Global Sourcing, and

Supply Chain Management. Best in class firms are employing these processes and continue to set the pace for new entrants making it very hard for them to compete. Manufacturing and service are often different in terms of what is done but quite similar in terms of how it is done (Carpinetti & Oiko, 2007).

Total quality management (TQM) is an integrative philosophy of management for continuously improving the quality of products and processes. TQM is based on the premise that the quality of products and processes is the responsibility of everyone involved with the creation or consumption of the products or services offered by an organization, requiring the involvement of management, workforce, suppliers, and customers, to meet or exceed customer expectations (Opondo, 2010).

Six Sigma is a set of tools and strategies for process improvement originally developed by Motorola in 1986 and became well known after Jack Welch made it a central focus of his business strategy at General Electric in 1995. Six Sigma seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability in manufacturing and business processes. It uses a set of quality management methods, including statistical methods, and creates a special infrastructure of people within the organization who are experts in these very complex methods (Opondo, 2010).

Each Six Sigma project carried out within an organization follows a defined sequence of steps and has quantified financial targets (cost reduction and/or profit increase). The maturity of a manufacturing process can be described by a sigma rating indicating its yield or the percentage of defect-free products it creates. A six sigma process is one in which 99.99966% of the products manufactured are statistically expected to be free of defects (3.4 defects per million). Motorola set a goal of "six sigma" for all of its manufacturing

operations, and this goal became a byword for management and engineering practices used to achieve it (Opondo, 2010).

Just in time (JIT) is a production strategy that strives to improve a business return on investment by reducing in-process inventory and associated carrying costs. To meet JIT objectives, the process relies on signals or kanban between different points in the process, which tell production when to make the next part. Lean Manufacturing is an approach to production which arose in Toyota between the end of World War II and the seventies. It comes mainly from the ideas of Taiichi Ohno and Toyoda Sakichi which are centered on the complementary notions of Just in Time and Autonomation, all aimed at reducing waste (Nadia, 2005).

A series of tools have been developed mainly with the objective of replicating Toyota success: a very common implementation involves small cards knows as kanbans. Lean manufacturing is a management philosophy derived mostly from the Toyota Production System (TPS) (hence the term Toyotism is also prevalent) and identified as "Lean" only in the 1990s. TPS is renowned for its focus on reduction of the original Toyota seven wastes to improve overall customer value, but there are varying perspectives on how this is best achieved. The steady growth of Toyota, from a small company to the world's largest automaker, has focused attention on how it has achieved this success. It is evident from acronyms like ‘Toyotism’, Lean is centered on preserving value with less work (Oakland, 2004).

Lean Logistics is the continuous improvement of value stream to the customer and continuous elimination of waste in the internal and external logistics through lean practice. The value stream and the elimination of waste include the core idea of Just-in-time:

delivering the right product, at the right quantity, at the right quality, at the right time, at the right place at an affordable cost. Continuous improvement concerns to Kaizen, as the foundation of Lean System (Patrizia et al, 2004).

The internal logistics deals with the movement, storage and handling of materials within the operation and external logistics deals with the supply of materials (inbound) and distribution of products (outbound). "Business logistics covers all handling and storage activities that facilitate the flow of goods from point of origin of raw material to the point of final consumption of product, as well as information flow that put products in motion, with purpose of providing adequate service level to customer at a reasonable cost (Oakland, 2004)." All elements of Lean Systems such as adding value, elimination of waste, inventory reduction, flow, stability, stability and leveling are present in Lean Logistics.

Global sourcing is the practice of sourcing from the global market for goods and services across geopolitical boundaries. It often aims to exploit global efficiencies in the delivery of a product or service (Opondo, 2010).These efficiencies include low cost skilled labor, low cost raw material and other economic factors like tax breaks and low trade tariffs. Common examples of globally sourced products or services include: labor-intensive manufactured products produced using low-cost Chinese labor, call centers staffed with low-cost English speaking workers in the Philippines and India, and IT work performed by low-cost programmers in India and Eastern Europe. While these are examples of low-cost country sourcing, global sourcing is not limited to low-cost countries (Oakland, 2004).

Supply chain management (SCM) is the management of a network of interconnected businesses involved in the provision of product and service packages required by the end customers in a supply chain. It spans all movement and storage of raw materials, work-in-

process inventory, and finished goods from point of origin to point of consumption (Nadia, 2005).Another definition by APICS Dictionary defines SCM as the "design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally." SCM draws heavily from the areas of operations management, logistics, procurement, information technology and strives for an integrated approach.

Firms that have excelled and are ‘best in classes today, employ some of these elements within their operations. Many companies are now complementing continuous improvement with innovation, which is seen as the successful exploitation of new ideas, and there appears to be a clear synergy between these two philosophies when integrated under an appropriate corporate culture (Bessant, 2006). An emergent theme is that success with Continuous Improvement requires a wide array of systems, processes, and orientations to be congruent within the organization. Bourne, et al., (2000) study explains how, despite considerable setbacks and hardship, companies manage to keep continuous improvement ideas and ‘best practice’ beliefs intact.

Continuous improvement is important because it seeks to improve products, services or processes so as to improve competitive position (Cohen & Prusak, 2001). This can be achieved by improving quality, efficiency, innovation or any component that is vital to any system. It is important as it leads to improved quality, utilizing production capacity and controlling costs. This is a process of continually identifying problems, prioritizing these problems by assigning them to the appropriate people to ensure they are removed from the system (Bourne, et al., 2000).

If firms do not continuously improve bad outcomes, customers may stop buying; and thus profitability declines (Cohen & Prusak, 2001). All managerial activity is either directed at control or improvement. Managers are either devoting their efforts at maintaining performance, preventing change or creating change, breakthrough or improvement. If businesses stand still they will lose their competitive edge, so improvements must be made to keep pace and stay in business (Patrizia et al, 2004).

2.5 Continuous Improvement and Operational Performance

Many organizations sole purpose is to perform well key being in the financials. Operations and controls are closely linked. Concern with using manufacturing performance measures for operational control provides the capability to recognize when specific parts of the manufacturing process are moving out of control and signal a need for process adjustment and go to a cycle of continuous improvement by daily operations (Bititci, et al.,2000). The effect of continuous improvement on operational performance may be justified by organization strategic goal setting. Given that continuous improvement on problem solving involves a process control of setting new performance goals; its achievement may favor organizational excellence (Bititci, et al., 2000).

Continuous improvement involves just-in-time production, where, through systematic techniques designed to minimize scrap and inventory, and essentially, all forms of waste, quality and productivity are increased, and costs are reduced. The aim of lean manufacturing is the elimination of waste in every area of production and includes customer relations, product design, supplier networks, and factory management (Bourne, et al., 2000). Lean thinking is seen as the “antidote” to muda, the Japanese term for waste. Its goal is to incorporate less human effort, less inventory, less time to develop products, and less space in order to become highly responsive to customer demand while producing top

quality products in the most efficient and economical manner possible (Bourne, 2001).

Waste is defined as anything for which the customer is not willing to pay. Lean manufacturing, if applied correctly, results in the ability of a firm to learn. Mistakes in the firm are not repeated because this in itself is a form of waste that the lean philosophy seeks to eliminate. The lean toolbox is used to eliminate anything that does not add value to a process (Cohen & Prusak, 2001). Continuous improvement allows production of a wide variety of products or services, efficient and rapid changeover among them as needed, efficient response to fluctuating demand, and increased quality (Schonberger & Richard, 2007).

It encourages the rapid response to customers ever changing demands with focus on mass customizations rather than mass production (Hyland & Boer, 2006). Eliminating waste along the entire value streams, instead of at isolated points, creates processes that need less human effort, space, capital, and time to make products and services at far less costs and with much fewer defects, compared with traditional business systems. Continuous improvement provide a way to do more with less; less human effort, equipment, time, and space while coming closer and closer to providing customers with exactly what they want, when they want it, where they want it, and at a price that meets their value expectations (Benner &Tushman, 2003).

Converting a classic batch-and-queue production system to continuous improvement helps an organization achieve the following results for manufacturing; labor productivity is doubled all the way through the system for direct, managerial, and technical workers and from raw materials to delivered product (Hyland & Boer, 2006). At the same time, production throughput times are cut by up to 90% with a subsequent reduction in inventory

in the system by up to 90% as well. Errors reaching the customer and scrap within the production process are typically cut in half, as are job-related injuries and other undesirable side-effects of a non lean production process (Bititci, et al., 2002).

Operational Performance Management involves the alignment of the various business units within a company in order to ensure the units are helping to achieve a global strategy and a set of centralized goals. Performing organizations achieve their goals by satisfying their customers with superior products and services with minimal costs of production. Manufacturing firms achieve operational effectiveness and efficiency by continuously improving their products and services through improved processes. Firms minimize waste and unnecessary costs within the system by empowering people with appropriate technology and skills to perform (Antonelli & Parbonetti, 2002).

Continuous Improvement Process (CIP or CI) is the ongoing effort of engaged employees and improvement teams to improve information, materials, products, services or processes (Bititci, Turner, Nudurupati & Creighton, 2002). These efforts generally seek small step "incremental" improvement over time or larger quick "breakthrough" improvement and change to improve customer value and reduce non value adding activity thus reducing costs, increasing delivery velocity and remaining competitive or relative in a changing global environment (Antonelli & Parbonetti, 2002).

Continuous improvement has employees constantly questioning and evaluating the current state of work for an improved future state design and improvement implementation. It is essential to keep pace with the changing environment in which we operate today. Some successful implementations use the approach known as Kaizen (the translation of Kai (“change”) Zen (“good”) is “improvement”). The purpose of CIP is the identification,

reduction, and elimination of suboptimal processes (efficiency) and the emphasis of CIP is on incremental, continuous steps rather than giant leaps (Antonelli & Parbonetti, 2002).

According to Bititci, et al., (2000) "…all organizations need both continuous and breakthrough improvement. When breakthrough improvement and continuous process improvement are combined, the result is a 60 per cent improvement per year over continuous improvement alone." However, Harrington concludes, based on empirical evidence, that continuous improvement is the major driving force behind any improvement effort. Breakthrough improvement serves to 'jump-start' a few of the critical processes. Organizations can only be able to rip the benefits of continuous improvement in their operational performance, by measuring the same. There is need to actually ascertain that the CI approaches deployed yield results and actually do support improvement of the operational processes.

2.6 Measurement of Performance in SMEs

Performance involves the accomplishment of a given task measured against preset known standards. It would be expected that overall performance determines an organizational survival. It's a set of metrics used to quantify both the efficiency and effectiveness of actions, (Cohen & Prusak, 2001) performance measures need to be positioned in a strategic context, as they influence what people do.

SMEs key dimensions of manufacturing's performance can be defined in terms of quality, delivery speed, delivery reliability, price (cost), and flexibility (Hudson & Smart, 2001). Time has been described as both a source of competitive advantage and the fundamental measure of manufacturing performance. Under the just-in-time (JIT) manufacturing philosophy the production or delivery of goods just too early or just too late is seen as

waste. Similarly, one of the objectives of Optimized Production Technology (OPT) is the minimization of throughput times (Cohen & Prusak, 2001).

With the increasing use of advanced manufacturing technologies, however, direct labour cost now typically accounts for only 10-20 percent of the full product cost, while overhead constitutes 30-40 per cent (Cohen & Prusak, 2001). Carpinetti & Oiko (2007) observe that very little is known about the implications of flexibility for manufacturing management and suggests that, part of the problem arises from the lack of operational measures of flexibility.

A manufacturing process may handle a small number of different components but they may be very different from each other. Another measure to consider is the ratio of the number of components processed by the equipment to the total number processed by the factory. Modification flexibility can be measured in terms of the number of design changes made in a component per time period. Rerouting flexibility has a long-term aspect which is salient when machines are taken out of production to accommodate major design changes.

There are shortages in performance measurement models and frameworks developed for small and medium enterprises and these companies often implement only some parts of a general model or an altered one. Unfortunately, these modifications are not planned; they are often made by elimination of some dimensions, without a whole analysis of the characteristics of both the model and the company. Consequently, the approach adopted is incomplete and not aligned with SMEs needs (Tenhunen et al., 2001; CIMA, 1993).

Performance measurement systems design a short-term aspect, which arises from the necessity to cope with machine shutdowns due to equipment or quality problems. Perhaps the best known performance measurement framework is Kaplan and Norton's (1992) balanced scorecard which is based on the principle that a performance measurement system

should provide managers with sufficient information to address the questions: how do we look to our shareholders (financial perspective)?, what must we excel at (internal business perspective)?, how do our customers see us (customer perspective)? and how can we continue to improve and create value (innovation and learning perspective)?

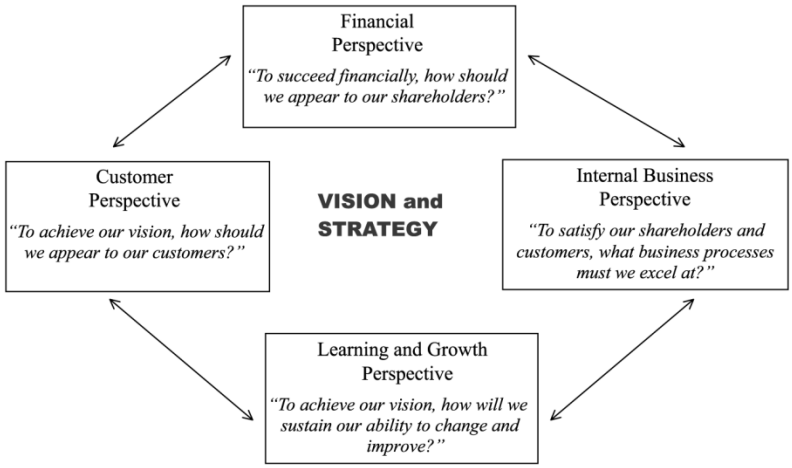

Figure 2.1: Balanced Score Card

Source: Kaplan and Norton (1996a, p.9)

The study of Antonelli and Parbonetti (2002) highlights that the need of balanced models proposed by Kaplan and Norton (1996) are not yet perceived by SMEs, though sometimes SMEs use indicators of customer satisfaction, internal processes and training.

The balanced scorecard helps the organization translate its vision and strategy through the objectives and measures defined rather than stressing on financial measures which provide little guidance. According to Hudson & Smith, 2000, measurable goals and objectives is one of the most important factors to a successful strategy. Innovation of the balanced scorecard has ensured that while the balanced scorecard retains traditional financial measures telling the story of past events, where investments in long-term capabilities and customer relationships were not critical for success, it has factored in, the journey that

information age companies must make to create future value through investment in customers, suppliers, employees, processes, technology, and innovation.

The balanced score card is the performance measurement tool adapted to aid in investigating the effect of continuous improvement and operational performance in SMEs within the manufacturing sector in this study. Focus shall include among other key aspects; manufacturing excellence in cycle time; yield; increase design productivity in engineering efficiency; cost leadership; customer satisfaction; waste reduction; best practices and benchmarking.

Firms that focus on CI usually pay higher wages, produce more output per given level of inputs, are more likely to survive, obtain more patents, and export more than those that don't (Laitinen, 2002). Small firms are less likely to survive than large firms, given that growth is positively related to size, and that smaller firms beginning operations are less likely to survive than firms that are larger at entry. Large firms are more likely to perform well and to export than small firms as firms with greater sales and higher revenue from exporting are better able to cover the fixed costs of entering foreign markets (Jarvis & Curran, 2000).

In the fight against challenging economic conditions, many businesses and organizations are asking themselves how they can "do more with less" by implementing best practices such as Lean (just-in-time) or Six Sigma (total quality management) or similar continuous improvement management methods (Hudson & Smart, 2001). Few have greater need to make such profound changes than the legions of small and medium sized enterprises (SMEs) that constitute over half of the jobs in developed countries(Hudson & Bourne, 2000). Many SMEs turn to best practice interventions (BPIs) as a cost-effective means of improvement. Their hope is that such short focused programs lead to both short-term

success and long-term sustainability of best practices through instilling a culture of continuing capability development (Hudson & Bourne, 2000).

In any given economy, SMEs play several roles. They help grow the economy as aggregate economic growth usually involves both an increase in the number of firms and an increase in the size of some firms (Hudson & Bourne, 2000). In developing countries most successful SMEs have graduated up from the microenterprise category with most large firms graduating up from the SME category (Carpinetti & Oiko, 2007). The success of and hence facilitation of both processes is very important, albeit in different ways. Often artificial barriers stifle some of the potential growth involved in moving between categories. The breadth of the SME category both reflects and helps to create a strong and deep entrepreneurial culture. The situation in Kenya is no different and as the country moves forward, SMEs have been given much needed recognition as they form a strong base for the growth of the economy.

2.7 Conceptual Framework

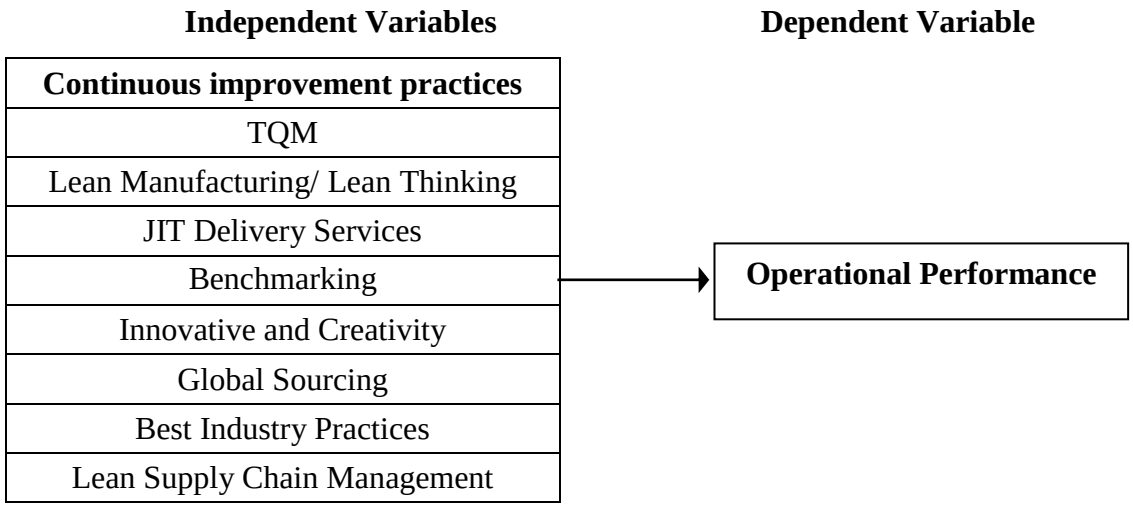

Figure 2. 2: Conceptual Framework

Source: Author, (2013)

2.8 Summary of Literature Review

This study is underpinned in the agency theory, resource-based view of the firm theory and the stakeholder theory. Continuous improvement in manufacturing sector has received tremendous changes since the industrial period. Companies are using it to shape up such nonmanufacturing work such as accounts receivable, sales, and research and development.

Continuous improvement is gradual never-ending change, whereas continual improvement is incremental change and involves aspects such as TQM, lean manufacturing/ lean thinking, JIT delivery services, benchmarking , innovative and creativity, global sourcing, best industry practices and lean supply chain management. Total quality management (TQM) is an integrative philosophy of management for continuously improving the quality of products and processes. Six Sigma seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability in manufacturing and business processes. Just in time (JIT) is a production strategy that strives to improve a business return on investment by reducing in-process inventory and associated carrying costs. Lean Logistics is the continuous improvement of value stream to the customer and continuous elimination of waste in the internal and external logistics through lean practice. Firms that have excelled and are ‘best in classes today, employ some of these elements within their operations. Continuous improvement is important because it seeks to improve products, services or processes so as to improve competitive position. Most of the studies cited in the literature are conducted in developed countries whose strategic approach ad financial footing is different from that of Kenya. There is therefore a literature gap on the effect of continuous improvement and operational performance of small and medium sized manufacturing firms in Kenya which this study seeks to fill.

CHAPTER THREE: RESEARCHMETHODOLOGY

3.1 Introduction

This section discusses the design and the methodology of the research study. The methodology includes; research design, target population of the study, sampling technique, sample size, research instruments, pilot testing and data analysis method.

3.2 Research Design

This study adopted exploratory research design. An exploratory design is conducted about a research problem when there are grey areas, in which much research has not been done. The focus is on gaining insights and familiarity for later investigation or undertaken when problems are in a preliminary stage of investigation. This approach aimed to investigate if the adoption of continuous improvement approaches has a relationship on the operational performance of small and medium sized manufacturing firms in the manufacturing sector in Kenya. Exploratory approach is flexible enough to accommodate unforeseen issues and or new knowledge emerging in the process of conducting an investigation.

3.3 Study Population

Study or target population is a universal set of the study of all members of real or hypothetical set of people, events or objects to which an investigator wishes to generalize the result (Borg and Gall, 1959). The study focused on manufacturing SMEs in Nairobi and its environs namely Thika, Athi River and Limuru. According to Ministry of Industrialization 2012 database, 4,120 manufacturing SMEs are registered as formal enterprises. 2,000 manufacturing SMEs are located in Nairobi and its environs.

This number 2,000 were further divided into sub-sectors, using International Standard Industrial Classification, a United Nations system for classifying economic data. The sub-

sectors are agro-based, chemical and mining and engineering and construction. According to the Ministry of Industrialization, 700 enterprises are in the agro-based sub sector, 600 enterprises are in the chemical and mining sub-sector and 700 enterprises are in the engineering and construction sub-sector all based in Nairobi and its environs. These SMEs have been in operations at least for over one year.

3.4 Sampling and Sample Size

The type of manufacturing industry was used as a parameter for stratification to select the SMEs to be included in each stratum. With ideal stratification, each stratum is homogeneous internally and heterogeneous with other strata (Cooper & Schindler, 2003). This criterion required SMEs only involved in manufacturing products and classified using International Standard Industrial Classification, which will be used as a stratification factor together with the number of employees. Stratification is the process of grouping members of the population into relatively homogeneous subgroups before sampling.

The strata should be mutually exclusive: every element in the population must be assigned to only one stratum. The strata should also be collectively exhaustive: no population element can be excluded. Using proportional allocation, 70 agro-based, 60 chemical and mining and 70 engineering and construction enterprises were visited by taking 10% from each stratum. According to Kothari (2004) a representative sample is one which is at least 10% of the population thus the choice of 10% is considered as representative. Stratification was also called for when different methods of data collection were applied in different parts of the population. The ideal stratification was based on the primary variable under study, that is, continuous improvement and operational performance of small and medium sized manufacturing firms in Kenya.

Table 3. 1: Sampling Frame

	Frequency	Ratio	Sample size
Agro-based	700	0.1	70
Chemical and mining	600	0.1	60
Engineering and construction enterprises	700	0.1	70
Total	**2000**		**200**

3.5 Data Collection

A self-administered questionnaire and observation were the two principal research instruments of data collection. Primary data was collected using these two tools. An observation checklist provided a reliable and valid account of what was happening in various SMEs. Besides observation, questionnaires were used for data collection. It was divided into three sections. Section one contained the demographics i.e. the quantifiable statistics of the given sample. Section two focused on the extent of application of improvement practices (if any) whereas section three addressed aspects of operational performance.

3.6 Data Analysis

Descriptive statistics in form of frequencies, means and standard deviations were utilized to analyze data obtained from the SME observations schedule (pre-test and post-test results) and also from the questionnaires.

In addition, the study conducted a factor analysis to discover simple patterns in the pattern of relationships among variables. This procedure enabled numerous correlated variables to be condensed into fewer dimensions known as factors. In its procedure, rotation is applied

to identify meaningful factor names or descriptions. This is followed by a Karl Pearson's product moment correlation to check for multicollinearity between the variables. Regression analysis was finally conducted to establish the strength of the relationship between the dependent variable and independent variables. The regression model was:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \varepsilon$$

Where: Y = Performance of SMEs in Kenya's Manufacturing Sector;

β_0 = Constant Term;

$\beta_1, \beta_2, \beta_3 \ldots \beta_8$ = Beta coefficients;

X_1= JIT Delivery Services;

X_2= Lean Manufacturing/ Lean Thinking;

X_3= Best Industry Practices;

X_4= Lean Supply Chain Management;

X_5= Innovative and Creativity;

X_6= Global Sourcing;

X_7= Benchmarking;

X_8= TQM;

ε = Error term

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND INTERPRETATIONS

4.1 Introduction

This chapter presents the analysis of the data collected from the respondent and discusses the research findings on the continuous improvement in small and medium sized manufacturing firms in Kenya. All completed questionnaires were edited for accuracy, uniformity, consistency and completeness. The chapter gives summaries of data findings together with their possible interpretations have been presented by use of mean, percentages, frequencies, variances, standard deviation and tables.

4.2 Response Rate

The researcher targeted a sample size of 200 respondents from which 147 filled in and returned the questionnaires making a response rate of 73.5%. This response rate was good and representative and conforms to Babbie (2004) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent.

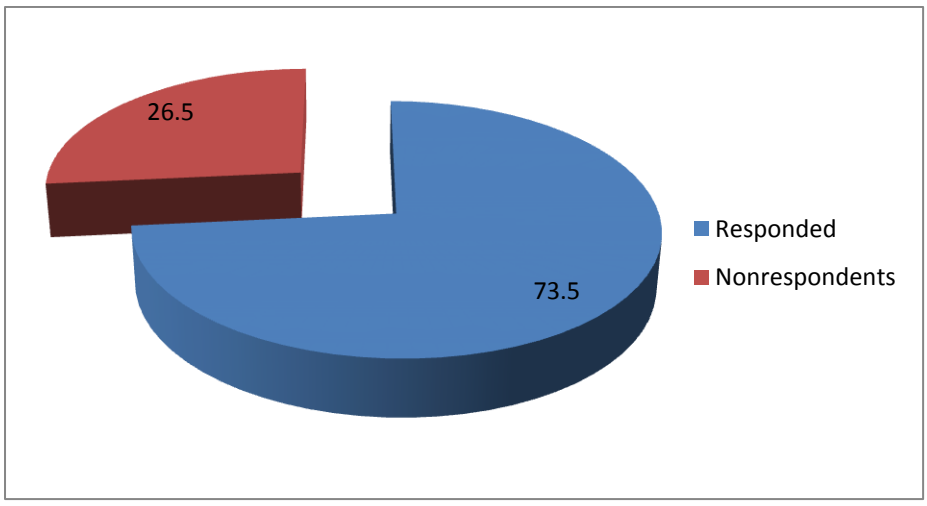

Figure 4. 1: Response Rate

Source: Author, (2013).

4.3 Organizational Demographics

4.3.1 Duration of Manufacturing SME Operation

The respondents were asked to indicate the duration to which their SMEs had operated in the manufacturing industry. The findings were summarized in Table 4.1.2

Table 4. 1: Duration of Manufacturing SME Operation

Duration of Operation	Frequency	Percent
Less than 5 years	29	19.7
5-10 years	75	51.0
11-15 years	31	21.1
16-20 year	6	4.1
Over 20 years	6	4.1
Total	**147**	**100.0**

Source: Author, (2013).

Table 4.1, shows that 51% of the respondents indicated that their SMEs had operated for a period of between 5-10 years, 21.1% said their SMEs had operated for a period of between 11-15 years, 19.7% said the SMEs had operated for a period of less than 5 years while those whose SMEs had operated for a period of between 16-20 year or over 20 years were represented by 4.1%. This result indicates that the majority of SMEs in the manufacturing industries in Kenya (51%) are operating for five to ten years meaning that they have been in business long enough to understand the continuous improvement approaches to adopt. This implies that most of them will transform into large companies in due course. This result is consistent with previous empirical studies on the age of SMEs in South Africa. Rwigema & Karungu (1999), in a study of SMEs in Johannesburg, stipulate that forty seven percent (47%) of enterprises surveyed had operated between one and ten years. The high rate of unemployment in Kenya since 2007 is the primary motivation for starting SMEs.

4.3.2 Size of the SME in the Manufacturing Industry

The respondents were asked to indicate the size of their SMEs in the Manufacturing industry. The findings were summarized in Table 4.2.

Table 4. 2: Size of the SME in the Manufacturing Industry

Size of the SME	Frequency	Percent
Medium size manufacturing SME	68	46.3
Small size manufacturing SME	79	53.7
Total	147	100.0

Source: Author, (2013).

As shown in Table 4.2, 53.7% the respondents indicated that their SMEs were small sized while 46.3% of them indicated that the SMEs were medium sized in the industry based on their manufacturing capacity and market share. This could be attributed to the fact that small scale businesses accommodates mostly require generalized skills and a relatively lower initial investment capital as compared to medium and large manufacturing companies thereby reducing barriers to entry (Moore *et al*., 2008). Due to their capital base and skills limitations, the small sized manufacturing firms are not in a position to adopt majority of the continuous improvement approaches.

4.4 Aspects of Continuous Improvement (CI) in SME Manufacturing Sector

The respondents were asked to indicate continuous improvement (CI) in SME manufacturing sector. The findings were summarized below.

4.4.1 JIT Delivery Services

Continuous improvement involves just-in-time production, where, through systematic techniques designed to minimize scrap and inventory, and essentially, all forms of waste,

quality and productivity are increased, and costs are reduced (Bourne, et al., 2000). In a bid to establish the continuous improvement practices at the companies, the study asked questions on JIT Delivery Services **.**

Table 4. 3: Agreement with statements on JIT Delivery Services

	Mean	SD
We strive to deliver every time at the same cost to business	3.6939	.94805
We increased the physical inventory space lately	3.3537	1.01902
We have optimum level of inventory to save on costs	3.5354	1.02080

Source: Author, (2013).

Just in time (JIT) is a production strategy that strives to improve a business return on investment by reducing in-process inventory and associated carrying costs (Bourne, et al., 2000). On the respondents level of agreement with statements on JIT Delivery Services, majority of the respondents were in agreement that the small and medium sized manufacturing firms in Kenya strive to deliver every time at the same cost to business and have optimum level of inventory to save on costs as shown by a mean score of 3.6939 and 3.5354 respectively while they were neutral on the fact that their firms increased the physical inventory space lately as shown by a mean score of 3.3537. This implies that the small and medium sized manufacturing firms in Kenya adopt JIT Delivery Services as one of the continuous improvement approaches.

4.4.2 Lean Manufacturing/ Lean Thinking

Lean Manufacturing is an approach to production which arose in Toyota between the end of World War II and the seventies. It comes mainly from the ideas of Taiichi Ohno and Toyoda Sakichi which are centered on the complementary notions of Just in Time and Autonomation, all aimed at reducing waste (Nadia, 2005). Lean thinking is seen as the "antidote" to muda, the Japanese term for waste. Its goal is to incorporate less human effort,

less inventory, less time to develop products, and less space in order to become highly responsive to customer demand while producing top quality products in the most efficient and economical manner possible (Bourne, 2001).

Table 4. 4: Agreement with statements on Lean Manufacturing/ Lean Thinking

	Mean	SD
We practice controlled production	3.7687	1.11692
IT is integrated into operations and innovative production processes	3.5918	.96341
We aspire to minimize defects during production	3.8912	1.11729
Overall equipment efficiency during production	3.8367	1.02730

Source: Author, (2013).

The study also sought to establish the respondents' level of agreement with statements on lean manufacturing/ lean thinking. From the study findings, majority of the respondents were in agreement that the firms aspire to minimize defects during production as shown by a mean score of 3.8912, there is overall equipment efficiency during production as shown by a mean score of 3.8367, the firms practice controlled production as shown by a mean score of 3.7687 and that the lean thinking is integrated into operations and innovative production processes as shown by a mean score of 3.5918. This implies that the small and medium sized manufacturing firms in Kenya adopt lean manufacturing as one of the continuous improvement approaches. This concurs with Oakland (2004) who observed that lean manufacturing is a management philosophy derived mostly from the Toyota Production System (TPS) (hence the term Toyotism is also prevalent) and identified as "Lean" only in the 1990s. TPS is renowned for its focus on reduction of the original Toyota seven wastes to improve overall customer value, but there are varying perspectives on how this is best achieved.

4.4.3 Best Industry Practices

Six Sigma seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability in manufacturing and business processes. It uses a set of quality management methods, including statistical methods, and creates a special infrastructure of people within the organization who are experts in these very complex methods (Opondo, 2010).

Table 4. 5: Agreement with statements on Best Industry Practices

	Mean	SD
We strive to operate within the industry's set and agreed upon regulations	3.5782	1.07859
We respect and value other players within the industry	3.8095	.88622
There is minimal movement of materials within floor	3.3401	.98965
We strive to reduce waiting time in operations	3.9864	1.02025
Concerted effort to reduced waste in processing	3.6531	.82473
Management emphasizes on recognition of successes rather than on mistakes	3.8027	.94100

Source: Author, (2013).

Regarding the best industry practices, majority of the respondents indicated that the firms strive to reduce waiting time in operations as shown by a mean score of 3.9864, respect and value other players within the industry as shown by a mean score of 3.8095, management emphasizes on recognition of successes rather than on mistakes as shown by a mean score of 3.8027, there are concerted effort to reduced waste in processing as shown by a mean score of 3.6531, they strive to operate within the industry's set and agreed upon regulations as shown by a mean score of 3.5782 and there is minimal movement of materials within floor as shown by a mean score of 3.3401. This shows that the small and medium sized manufacturing firms in Kenya adopt best industry practices as one of the continuous

improvement approaches. This is consistent with Beretta (2002) who indicated that in manufacturing, CI activities primarily involve simplification of production processes, chiefly through the elimination of waste.

4.4.4 Lean Supply Chain Management

Supply chain management (SCM) is the management of a network of interconnected businesses involved in the provision of product and service packages required by the end customers in a supply chain (Nadia, 2005).

Table 4. 6: Agreement with statements on Lean Supply Chain Management

	Mean	SD
There is control over processing of products	4.4082	4.22931
Mapping process which visually explains flow of materials through production system	3.3878	.80622
We practice reduction and reuse of waste during processing	3.5422	.88464
We practice green procurement practices/Green purchasing	2.9864	1.07261

Source: Author, (2013).

On lean supply chain management, the respondents reported that there is control over processing of products and that the firms practice reduction and reuse of waste during processing as shown by a mean score of 4.4082 and 3.5422 respectively. They were however neutral of the fact that mapping process which visually explains flow of materials through production system and that the firms practice green procurement practices/green purchasing as shown by a mean score of 3.3878 and 2.9864 respectively. This indicates that the small and medium sized manufacturing firms in Kenya adopt lean supply chain management as one of the continuous improvement approaches. This is in line with \Patrizia et al (2004) who opined that lean Logistics is the continuous improvement of value stream to the customer and continuous elimination of waste in the internal and external

logistics through lean practice. All elements of Lean Systems such as adding value, elimination of waste, inventory reduction, flow, stability, stability and leveling are present in Lean Logistics.

4.4.5 Innovation and Creativity

Many companies are now complementing continuous improvement with innovation, which is seen as the successful exploitation of new ideas, and there appears to be a clear synergy between these two philosophies when integrated under an appropriate corporate culture (Bessant, 2006).

Table 4. 7: Agreement with statements on Innovation and Creativity

	Mean	SD
Employees rarely come up with new ideas to improve work processes	2.1905	.97456
We do not have innovation and creativity teams	2.0476	1.23496
We encourage new products/services development	4.3129	.84239
We always encourage creativity and innovation	4.1126	.81764
We don't have a Research & Development team	2.6190	1.18399
We have a budget for Research & Development	3.2177	.91799
We are determined to have cost effective production process	3.8571	.61932

Source: Author, (2013).

The respondents were further requested to indicate their level of agreement with statements on innovation and creativity and majority of them indicated that their firms encourage new products/services development as shown by a mean score of 4.3129, the firms always encourage creativity and innovation as shown by a mean score of 4.1126 and that the firms are determined to have cost effective production process as shown by a mean score of 3.8571. Continuous innovation and performance measurement methods and tools have been

applied in companies as a means to develop improvement actions related to strategic objectives and to monitor results so as to give feedback for further action (Carpinetti & Oiko, 2007).

The respondents were however neutral on the fact that the firms have a budget for research & development and don't have a research & development team as shown by a mean score of 3.2177 and 2.6190 respectively while they disagreed with the fact that employees rarely come up with new ideas to improve work processes and the firms do not have innovation and creativity teams as shown by a mean score of 2.1905 and 2.0476 respectively. This depicts that the small and medium sized manufacturing firms in Kenya adopt innovation and creativity as one of the continuous improvement approaches. Earlier studies had indicated that continuous improvement is important because it seeks to improve products, services or processes so as to improve competitive position (Cohen & Prusak, 2001). This can be achieved by improving quality, efficiency, innovation or any component that is vital to any system.

4.4.6 Global Sourcing

Global sourcing is the practice of sourcing from the global market for goods and services across geopolitical boundaries. It often aims to exploit global efficiencies in the delivery of a product or service (Opondo, 2010).

Table 4. 8: Agreement with statements on Global Sourcing

	Mean	SD
We get our raw materials and services from all over the world	3.1633	1.21656
We exploit global efficiencies in the delivery of a product and services such as low cost skilled labor and low cost raw material	3.5316	.84535
We share information amongst industry peers	3.8027	.79931

Source: Author, (2013).

On global sourcing, the study deduced that the manufacturing SMEs share information amongst industry peers as shown by a mean score of 3.8027 and they exploit global efficiencies in the delivery of a product and services such as low cost skilled labor and low cost raw material as shown by a mean score of 3.5316. However, the respondents were neutral on the fact that the firms get raw materials and services from all over the world as shown by a mean score of 3.1633. This depicts that the small and medium sized manufacturing firms in Kenya adopt global sourcing as one of the continuous improvement approaches. According to Opondo (2010), global sourcing efficiencies include low cost skilled labor, low cost raw material and other economic factors like tax breaks and low trade tariffs.

4.4.7 Benchmarking

Table 4. 9: Agreement with statements on Benchmarking

	Mean	SD
We strive to perform better than our industry peers	3.8912	.89999
We always out-do our peers in terms of new products	3.7755	.82592
Our processes are superior as compared to competition	3.6735	.80379
We do more research and development than our peers	2.9660	1.20168

Source: Author, (2013).

In relation to benchmarking, the results indicate that the firms strive to perform better than their industry peers as shown by a mean score of 3.8912, they always out-do their peers in terms of new products as shown by a mean score of 3.7755 and that their processes are superior as compared to competition as shown by a mean score of 3.6735. However, it was not clear whether the firms do more research and development than their peers as shown by a mean score of 2.9660. This depicts that the small and medium sized manufacturing firms in Kenya adopt benchmarking as one of the continuous improvement approaches. In the

past decades, several models have gained widespread acceptance as approaches to improve customer satisfaction in production and operations performance (Benner & Tushman, 2003). Among these models are Total Quality Management (TQM) and benchmarking. Adoption of these models by firms in different industries has generated positive outcome and are based on the concepts, methods and techniques of improvement and change (Benner & Tushman, 2003).

4.4.8 Total Quality Management (TQM)

Total quality management (TQM) is an integrative philosophy of management for continuously improving the quality of products and processes. TQM is based on the premise that the quality of products and processes is the responsibility of everyone involved with the creation or consumption of the products or services offered by an organization, requiring the involvement of management, workforce, suppliers, and customers, to meet or exceed customer expectations (Opondo, 2010).

Table 4. 10: Agreement with statements on TQM

	Mean	SD
We have integrated technical and managerial procedures for guiding the coordinated actions of the work force	3.3401	1.16158
We target improving joint long-term competitive performance by enhancing our operations/procedures	3.7347	.98847
We always anticipate and manage uncertainty and risk	3.8912	.79493
We are able to align our core competencies	3.7687	.78573
We are able to take advantage of complementary capabilities	3.9320	1.04462

Source: Author, (2013)

On total quality management, majority of the respondents indicated that their firms are able to take advantage of complementary capabilities as shown by a mean score of 3.9320, they always anticipate and manage uncertainty and risk as shown by a mean score of 3.8912,

they are able to align their core competencies as shown by a mean score of 3.7687 and they target improving joint long-term competitive performance by enhancing their operations/procedures as shown by a mean score of 3.7347. They were however neutral on the fact that their firms have integrated technical and managerial procedures for guiding the coordinated actions of the work force as shown by a mean score of 3.3401. According to Carpinetti and Oiko (2007), the key continuous improvement approaches are Total quality management (TQM) and Just in time (JIT). They added that firms that have excelled and are 'best in classes today, employ some of these elements within their operations.

4.5 Operational Performance among SMEs in Manufacturing Sector

Continuous improvement, as the name implies, adopts an approach to improving organizational performance, with small incremental steps, over time. In this approach, it is not the size of each step which is important but the likelihood that the improvements will be ongoing (Carpinetti & Oiko, 2007). The respondents were asked to rate the aspects of operational performance among SME manufacturing sector. The findings were summarized below.

Table 4. 11: Extent that various aspects of operational performance are rated

	Mean	SD
Improved processes quality	4.0204	.62449
Increased operational readiness efficiency	3.8163	.83601
Evidence of increased productivity	3.7483	.78377
There is no improved processes capability	2.5442	1.21199
There is evidence of reduced waste in production	3.3129	1.11529
Lower product and service costs	3.5374	.83807
There are notable operational efficiencies on the floor	3.5170	.92421
There are increased innovations (new ideas, products & services)	3.7483	.80106
Improved Information Technology systems	3.1503	.80541

Evidence of cross functional training	3.4762	.84670
Evidence of open communication	2.6122	.84763
There are minimal customer complaints	3.6463	1.08415
Improved customer relations management	3.8776	.87506
Witnessed better service processes	3.8776	.89057
Better marketing management processes	4.0816	.91044

Source: Author, (2013)

According to Hyland and Boer (2006), converting a classic batch-and-queue production system to continuous improvement helps an organization achieve the following results for manufacturing; labor productivity is doubled all the way through the system for direct, managerial, and technical workers and from raw materials to delivered product. At the same time, production throughput times are cut by up to 90% with a subsequent reduction in inventory in the system by up to 90% as well.

As shown in Table 4.11, the respondents indicated that to a great extent, there was better marketing management processes as shown by a mean score of 4.0816, improved processes quality as shown by a mean score of 4.0204, improved customer relations management as shown by a mean score of 3.8776, witnessed better service processes as shown by a mean score of 3.8776, increased operational readiness efficiency as shown by a mean score of 3.8163, evidence of increased productivity as shown by a mean score of 3.7483, there are increased innovations (new ideas, products & services) as shown by a mean score of 3.7483, there are minimal customer complaints as shown by a mean score of 3.6463, lower product and service costs as shown by a mean score of 3.5374 and there are notable operational efficiencies on the floor as shown by a mean score of 3.5170.

The respondents however indicated that to a moderate extent, there was evidence of cross functional training as shown by a mean score of 3.4762, there is evidence of reduced waste in production as shown by a mean score of 3.3129, improved information technology

systems as shown by a mean score of 3.1503, evidence of open communication as shown by a mean score of 2.6122 and there is no improved processes capability as shown by a mean score of 2.5442. This agrees with Bessant (2006) who observed that CI in service industries and the public sector, the focus is on simplification and improved customer service through greater empowerment of individual employees and correspondingly less bureaucracy.

4.6 Inferential Statistics

The study used inferential statistics to come up with the model explaining the relationship between operational performance of small and medium sized manufacturing firms (dependent variable) and JIT Delivery Services, lean manufacturing/ lean thinking, best industry practices, lean supply chain management, innovative and creativity, global sourcing, benchmarking and TQM (independent variables).

4.6.1 Factor Analysis

Table 4. 12: Communalities

	Initial	Extraction
We strive to deliver every time at the same cost to business	1.000	.839
We increased the physical inventory space lately	1.000	.787
We have optimum level of inventory to save on costs	1.000	.848
We practice controlled production	1.000	.841
IT is integrated into operations and innovative production processes	1.000	.834
We aspire to minimize defects during production	1.000	.847
Overall equipment efficiency during production	1.000	.824
There is minimal movement of materials within floor	1.000	.793
We strive to reduce waiting time in operations	1.000	.927
Concerted effort to reduced waste in processing	1.000	.790

Management emphasizes on recognition of successes rather than on mistakes	1.000	.775
There is control over processing of products	1.000	.831
Mapping process which visually explains flow of materials through production system	1.000	.835
We practice reduction and reuse of waste during processing	1.000	.826
We practice green procurement practices/Green purchasing	1.000	.891
Employees rarely come up with new ideas to improve work processes	1.000	.752
We do not have innovation and creativity teams	1.000	.865
We encourage new products/services development	1.000	.859
We always encourage creativity and innovation	1.000	.756
We don't have a Research & Development team	1.000	.898
We have a budget for Research & Development	1.000	.804
We are determined to have cost effective production process	1.000	.813
We strive to operate within the industry's set and agreed upon regulations	1.000	.900
We get our raw materials and services from all over the world	1.000	.792
We respect and value other players within the industry	1.000	.914
We share information amongst industry peers	1.000	.813
We strive to perform better than our industry peers	1.000	.815
We always out-do our peers in terms of new products	1.000	.886
Our processes are superior as compared to competition	1.000	.798
We do more research and development than our peers	1.000	.761
We have integrated technical and managerial procedures for guiding the coordinated actions of the work force	1.000	.910
We target improving joint long-term competitive performance by enhancing our operations/procedures	1.000	.886
We always anticipate and manage uncertainty and risk	1.000	.911
We are able to align our core competencies	1.000	.809
We are able to take advantage of complementary capabilities	1.000	.897
Improved processes quality	1.000	.895
Increased operational readiness efficiency	1.000	.889

Evidence of increased productivity	1.000	.837
There is no improved processes capability	1.000	.892
There is evidence of reduced waste in production	1.000	.816
Lower product and service costs	1.000	.830
There are notable operational efficiencies on the floor	1.000	.839
There are increased innovations (new ideas, products & services)	1.000	.896
Improved Information Technology systems	1.000	.752
Evidence of cross functional training	1.000	.860
Evidence of open communication	1.000	.835
There are minimal customer complaints	1.000	.897
Improved customer relations management	1.000	.846
Witnessed better service processes	1.000	.813
Better marketing management processes	1.000	.950

Extraction Method: Principal Component Analysis.

Source: Author, (2013).

The table 4.12 helps to estimate the communalities for each variance. This is the proportion of variance that each item has in common with other factors. For example 'We strive to reduce waiting time in operations' has 92.7% communality or shared relationship with other factors. This value has the greatest communality with others, while 'Improved Information Technology systems' has the least communality with others of 75.2%.

Table 4. 13: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.342	22.683	22.683	11.342	22.683	22.683
2	4.010	8.020	30.703	4.010	8.020	30.703
3	3.412	6.824	37.527	3.412	6.824	37.527
4	2.813	5.626	43.153	2.813	5.626	43.153
5	2.673	5.346	48.499	2.673	5.346	48.499
6	2.478	4.956	53.455	2.478	4.956	53.455
7	2.095	4.190	57.645	2.095	4.190	57.645
8	1.954	3.908	61.554	1.954	3.908	61.554
9	1.897	3.794	65.348	1.897	3.794	65.348
10	1.643	3.286	68.633	1.643	3.286	68.633
11	1.546	3.092	71.725	1.546	3.092	71.725
12	1.428	2.856	74.582	1.428	2.856	74.582
13	1.339	2.679	77.260	1.339	2.679	77.260
14	1.291	2.582	79.842	1.291	2.582	79.842
15	1.214	2.429	82.271	1.214	2.429	82.271
16	1.038	2.075	84.347	1.038	2.075	84.347
17	.936	1.872	86.218			
18	.871	1.742	87.960			
19	.803	1.606	89.566			
20	.700	1.400	90.966			
21	.616	1.232	92.198			
22	.600	1.200	93.398			
23	.540	1.081	94.478			
24	.427	.854	95.333			
25	.379	.758	96.090			
26	.326	.653	96.743			
27	.264	.528	97.271			
28	.254	.509	97.779			
29	.212	.424	98.203			
30	.189	.377	98.580			
31	.155	.309	98.890			
32	.143	.287	99.176			
33	.115	.229	99.406			
34	.103	.206	99.612			
35	.080	.161	99.772			
36	.059	.118	99.890			
37	.037	.074	99.964			
38	.018	.036	100.000			
39	1.754E-015	3.509E-015	100.000			
40	1.059E-015	2.118E-015	100.000			
41	9.608E-016	1.922E-015	100.000			
42	6.305E-016	1.261E-015	100.000			

43	3.628E-016	7.256E-016	100.000			
44	1.894E-016	3.789E-016	100.000			
45	-9.507E-019	-1.901E-018	100.000			
46	-2.896E-016	-5.791E-016	100.000			
47	-4.010E-016	-8.021E-016	100.000			
48	-6.383E-016	-1.277E-015	100.000			
49	-9.569E-016	-1.914E-015	100.000			
50	-1.883E-015	-3.765E-015	100.000			

Extraction Method: Principal Component Analysis.
Source: Author, (2013).

In the table 4.13, the Kaiser Normalization Criterion is used, which allows for the extraction of components that have an Eigen value greater than 1. The principal component analysis was used and 16 factors were extracted. As the table below shows, these 16 factors explain 84.347% of the total variation. Factor 1 contributed the highest variation of 22.683%. The contributions decrease as one move from one factor to the other up to factor 16.

The initial component matrix was rotated using Varimax (Variance Maximization) with Kaiser Normalization. The results allowed for the identification of which variables fall under each of the 16 major extracted factors. Each of the 50 variables was looked at and placed to one of the 16 factors depending on the percentage of variability; it explained the total variability of each factor. A variable is said to belong to a factor to which it explains more variation than any other factor. As shown in appendix IV, all items in the 16 factors identified had factor loadings above the *cut-off* value (*0.4*) impressing their importance and meaningfulness to the factors in the light of recommendations by Hair *et al*. (2006).

4.6.2 Correlations Analysis

Table 4. 14: Correlations Matrix

		Performance of SMEs	JIT Delivery Services	Lean Manufacturing/ Lean Thinking	Best Industry Practices	Lean Supply Chain Management	Innovative and Creativity	Global Sourcing	Benchmarking	TQM
Performance of SMEs	Pearson Correlation	1								
	Sig. (2-tailed)									
	N	147								
JIT Delivery Services	Pearson Correlation	.074	1							
	Sig. (2-tailed)	.372								
	N	147	147							
Lean Manufacturing/ Lean Thinking	Pearson Correlation	.396	.012	1						
	Sig. (2-tailed)	.000	.882							
	N	147	147	147						
Best Industry Practices	Pearson Correlation	.200	-.098	.365	1					
	Sig. (2-tailed)	.015	.236	.000						
	N	147	147	147	147					
Lean Supply	Pearson	.226	-.03	.415	.395	1				

Chain Management	Correlation		2							
	Sig. (2-tailed)	.000	.700	.000	.000					
	N	147	147	147	147	147				
Innovative and Creativity	Pearson Correlation	-.108	.080	-.142	.165	-.204	1			
	Sig. (2-tailed)	.193	.334	.087	.045	.013				
	N	147	147	147	147	147	147			
Global Sourcing	Pearson Correlation	.132	.083	.421	.429	.166	.125	.342	1	
	Sig. (2-tailed)	.000	.320	.000	.000	.000	.132	0.342		
	N	147	147	147	147	147	147	147	147	
Benchmarking	Pearson Correlation	.348	-.054	.377	.353	.236	-.129	.311	1	
	Sig. (2-tailed)	.000	.513	.000	.000	.000	.120	.000		
	N	147	147	147	147	147	147	147	147	
TQM	Pearson Correlation	0.123	0.077	0.392	0.399	0.154	0.116	0.330	0.475	1
	Sig. (2-tailed)	0.000	0.298	0.000	0.000	0.000	0.123	0.000	0.000	
	N	147	147	147	147	147	147	147	147	147

Source: Author, (2013).

Pearson's correlations analysis was then conducted at 95% confidence interval and 5%

confidence level 2-tailed. The Pearson correlation in table 4.15 indicates that there is no significant correlation between the independent variables. That is, none of the correlation coefficients are greater than 0.5 hence no problem of multicollinearity. This means that all the eight predictor variables could be used.

4.6.3 Regression

Table 4. 15: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.874[a]	0.764	0.627	0.60441

Source: Author, (2013).

Table 4.16 below is a model fit which establish how fit the model equation fits the data. The adjusted R^2 was used to establish the predictive power of the study model and it was found to be 0.627 implying that 62.7% of the variations in operational performance of small and medium sized manufacturing firms are explained by JIT Delivery Services, lean manufacturing/ lean thinking, best industry practices, lean supply chain management, innovative and creativity, global sourcing, benchmarking and TQM leaving 37.3% percent unexplained. Therefore, further studies should be done to establish the other factors (37.3%) affecting operational performance of small and medium sized manufacturing firms.

Table 4. 16: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.574	8	7.511	16.513	.0001
	Residual	63.221	138	.455		
	Total	115.796	146			

Source: Author, (2013).

The probability value of 0.001 indicates that the regression relationship was highly significant in predicting how JIT Delivery Services, lean manufacturing/ lean thinking, best industry

practices, lean supply chain management, innovative and creativity, global sourcing, benchmarking and TQM influenced operational performance of small and medium sized manufacturing firms.

Table 4. 17: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.201	.443		5.709	.008
	JIT Delivery Services	.089	.058	.103	3.531	.028
	Lean Manufacturing/ Lean Thinking	.037	.064	.039	4.574	.027
	Best Industry Practices	.099	.083	.081	4.081	.022
	Lean Supply Chain Management	.095	.086	.090	6.099	.024
	Innovative and Creativity	.021	.050	.029	3.422	.013
	Global Sourcing	.049	.090	.134	5.654	.005
	Benchmarking	.114	.075	.570	6.887	.013
	TQM	.102	.012	.120	4.099	.021

Source: Author, (2013).

From the findings, the regression model becomes

$Y = 1.201 + 0.089X_1 + 0.037X_2 + 0.099X_3 + 0.095X_4 + 0.021X_5 + 0.049X_6 + 0.114X_7 + 0.102X_8 + \varepsilon$

The regression equation above has established that taking all factors into account (JIT Delivery Services, lean manufacturing/ lean thinking, best industry practices, lean supply chain management, innovative and creativity, global sourcing, benchmarking and TQM) constant at zero operational performance of small and medium sized manufacturing firms will be 1.201. The findings presented also show that in terms of magnitude, benchmarking had the highest influence on operational performance of small and medium sized manufacturing firms (r= 0.114, p = 0.013), followed by TQM (r= 0.102, p =0.021), best industry practices (r= 0.099, p =0.022), lean supply chain management (r= 0.095, p =0.024), JIT delivery services (r= 0.089, p =0.028), global sourcing (r= 0.049, p =0.005), lean manufacturing/ lean thinking (r= 0.037, p =0.037) while innovative and creativity had the least effect on operational performance of small and medium sized manufacturing firms (r= 0.021, p =0.013). All the variables were significant as their P-values were less than 0.05.

According to Carpinetti & Oiko (2007), among the key approaches to CI in the recent past years include among others; Total Quality Management, Six Sigma, Just-In-Time, Lean Logistics, Global Sourcing, and Supply Chain Management. Best in class firms are employing these processes and continue to set the pace for new entrants making it very hard for them to compete. Manufacturing and service are often different in terms of what is done but quite similar in terms of how it is done.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presented the discussion of key data findings, conclusion drawn from the findings highlighted and recommendation made there-to. The conclusions and recommendations drawn were focused on addressing the objective of the study.

5.2 Summary of Findings

This study sought to establish continuous improvement and operational performance of small and medium sized manufacturing firms in Kenya. To achieve objectives like profit maximization, offsetting costs of operations, business survival and gaining competitive advantage in the market, the SMEs in the manufacturing industry adopt continuous improvement practices which include; Total Quality Management (TQM) practices, Lean manufacturing/ Lean Thinking, JIT delivery services, benchmarking innovative and creativity, global sourcing, best industry practices and lean supply chain management. Continuous improvement provide a way to do more with less; less human effort, equipment, time, and space while coming closer and closer to providing customers with exactly what they want, when they want it, where they want it, and at a price that meets their value expectations.

The study established that the small and medium sized manufacturing firms in Kenya strive to deliver every time at the same cost to business and have optimum level of inventory to save on costs. It was clear that the SMEs aspire to minimize defects during production, there is overall equipment efficiency during production, the firms practice controlled production and that the lean thinking is integrated into operations and innovative production processes.

The study further deduced that the SMEs strive to reduce waiting time in operations, respect and value other players within the industry, their management emphasizes on recognition of successes rather than on mistakes, there are concerted efforts to reduced waste in processing and that the SMEs strive to operate within the industry's set and agreed upon regulations. On lean supply chain management, the study revealed that there is control over processing of products and that the firms practice reduction and reuse of waste during processing.

Regarding innovation and creativity, the study established that the firms encourage new products/services development, always encourage creativity and innovation and are determined to have cost effective production process. However, the SMEs do not have a budget for research & development and don't have a research & development team. The study deduced that the manufacturing SMEs share information amongst industry peers and they exploit global efficiencies in the delivery of a product and services such as low cost skilled labor and low cost raw material.

In relation to benchmarking, the study found that the firms strive to perform better than their industry peers, they always out-do their peers in terms of new products and that their processes are superior as compared to competition. The study also revealed that the SMEs are able to take advantage of complementary capabilities, they always anticipate and manage uncertainty and risk, they are able to align their core competencies and they target improving joint long-term competitive performance by enhancing their operations/procedures. However, the firms do not have integrated technical and managerial procedures for guiding the coordinated actions of the work force.

Regarding operational performance among SMEs, the study deduced that as a result of CI, the SMEs had experienced better marketing management processes, improved processes quality, improved customer relations management, better service processes, increased operational readiness efficiency, increased productivity, increased innovations (new ideas, products & services), minimal customer complaints and notable operational efficiencies on the floor.

The study also found that 62.7% of the variations in operational performance of small and medium sized manufacturing firms are explained by JIT Delivery Services, lean manufacturing/ lean thinking, best industry practices, lean supply chain management, innovative and creativity, global sourcing, benchmarking and TQM. This study also established that there was a positive and significant relationship between continuous improvement practices and operational performance in the SME manufacturing sector. This notwithstanding, benchmarking had the highest influence on operational performance, followed by best industry practices, then lean supply chain management, then JIT delivery services, then global sourcing and lean manufacturing/ lean thinking in order of decreasing magnitude while innovative and creativity had the least effect on operational performance of small and medium sized manufacturing firms in Kenya.

5.3 Conclusions

In the modern world of stiff competition, SMEs have been able to keep pace with the rivalry in their respective scenarios by adopting various response strategies such as continuous improvement approaches. From the study findings, the researcher concludes that CI and quality management programs go hand in hand as they seek to achieve excellence through improvement. It was deduced from the findings that the small and medium sized

manufacturing firms in Kenya strive to deliver every time at the same cost to business, reduce waiting time in operations and also strive to perform better than their industry peers. The study also concludes that there is control over processing of products and the firms encourage new products/services development although they do not have a budget for research & development. The study further deduced that the SMEs always anticipate and manage uncertainty and risk.

It was clear from the findings and discussions that the adoption of the CI practices have resulted in better marketing management processes, improved customer relations management, increased productivity and minimal customer complaints. The study infer that benchmarking had the highest influence on operational performance, followed by best industry practices, then lean supply chain management while innovative and creativity had the least effect on operational performance.

5.4 Recommendations

From the discussions and conclusions in this chapter, the study recommends that although the SMEs have been successful in neutralizing the challenges brought about by competition in their respective industry, the manufacturing SMEs should practice green procurement practices/green purchasing so as to reduced waste in production and enhance their production efficiency.

The study established that majority of the employees working in SMEs had inadequate training with regard to modern practices of minimizing costs and maximizing profits by competitive firms in the industry. Therefore, this study recommends adequate organizational development

initiatives to be supported by top level managers of SMEs firms toward CI practices to enable the SMEs realize operational performance. The firms should also engage in cross functional training of their staff on the best practices in a bid to streamline their operations.

It was established that inadequate research in the manufacturing industry was another challenge that hindered the growth of SMEs in the manufacturing industry in Kenya. Therefore, this study recommends adequate funds to be allocated by the Government in research and development activities to promote the SMEs sector in Kenya through the Ministry of Trade. Stiff competition from well established firms locally and internationally posed a challenge to SMEs in the manufacturing sector in Kenya. Therefore, this study recommends adequate training of SMEs staff on modern TQM practices to promote operational performance of SMEs in the manufacturing sector in Kenya.

The study found out that e-concepts in relation to continuous improvement have not been fully utilized by SMEs in the manufacturing sector in Kenya for efficiency and effectiveness. This study therefore recommends that the government to come up with policies that enhance communication technology especially in the advent of recent interconnectivity through the undersea cables which has enabled faster internet services through fiber optic cable among major towns in Kenya and is perceived to be faster and could be of great benefit if connected with rural towns and markets for sufficient market information concerning the SMEs products and services.

Managers need to evaluate the product design, process choice, and the degree of standardization involved in the organization, and can then decide upon the appropriate methods

to use to best implement improvement practices. Managers can evaluate the usefulness of CI programs by monitoring a set of routines and behaviors that are seen as being essential to organizations of all types for CI implementation. It is clear that CI does not come without hardships and struggles; without the active involvement of everyone in the organization, and the required resources and support from top management, CI in any organization cannot be successful.

The study established that inadequate funds to support continuous improvement practices by SMEs were a big challenge regardless of the spirit to adopt the practices fully. Therefore, this study recommends Government intervention strategies to support SMEs in Kenya like establishment of policies that favour SMEs in the manufacturing sector to enhance continuous improvement practices. It was established that technology was the driving force of continuous improvement practices among the SMEs in the manufacturing industry in Kenya. This was a major challenge despite the efforts of some of the SMEs to adopt technology on a small extent in Kenya. Therefore, this study recommends the Government to introduce internet at reasonable cost to SMEs and invest financial resources to develop human resources in the SMEs sector in Kenya.

5.5 Limitations of the Study

The staffs of SMEs manufacturing firms in Kenya were very busy and therefore they required a lot of time in order to fill in the questionnaires. The challenge was overcome by giving the respondents the questionnaires at the right time. Inadequate financial resources affected the results of the study. Accommodation and stationary costs delayed the exercise but early preparation and support from well-wishers and development partners made the study a reality.

Getting accurate information from the respondents was one of the major challenges since some of the workers were threatened that the information may be used against them by the management in the terms of performance hence insecurity of their jobs. The challenge was minimized by assuring the respondents of confidentiality of the information they gave and also indicating that the information was to be used for academic purposes only. The researcher carried an introduction letter from the university to authenticate this.

5.6 Suggestions for Further Research

Future studies should attempt to explore the reasons behind the low adoption of CI practices in the SMEs manufacturing sector in Kenya. Researchers should go ahead and establish the reasons behind the low adoption CI practices among SMEs manufacturing sector in Kenya. A further study should be conducted on the effect of continuous improvement on operational performance of large firms to allow for comparison with the small firms.

Although much research has been conducted on the individual CI methodologies and assessment tools have been developed to determine the progress of the CI initiative, to the author's knowledge, little focus has been directed towards developing a framework or model that would enable an organization to identify the CI methodology that best suits its needs, given a certain budget for such programs. Thus, an interesting topic to pursue in the field of CI is how to determine the appropriate CI methodology for an organization to achieve operational performance. Furthermore, there is also a need for research in the field of the hybrid CI methodologies that have been developed in the recent past and to determine their applicability and to large and small firms in the market.

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APPENDICES

Appendix I: Introductory Letter

MUTETI ARNOLD
C/o University of Nairobi,
P.O. Box 30197-00100,
Nairobi, Kenya.

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

REF: MBA RESEARCH STUDY

I am a student pursuing a Masters' degree in Business Administration at the University of Nairobi. In partial fulfillment of the requirements to the award of the Masters degree, I am required to carry out a research and write on "**Continuous Improvement and Operational Performance of Small and Medium Sized Manufacturing firms in Kenya**"

I kindly request your assistance by availing your time to respond to the questionnaire. The information will be treated with utmost good faith and a copy of the final report will be made available to you at your request.

Thank you.

Yours faithfully,
MUTETI ARNOLD

Sign.....

Appendix II: Questionnaire

SECTION A: ORGANIZATIONAL DEMOGRAPHICS

Please supply the required data by filling in the blanks where space is provided or by ticking [√] against the most appropriate answer.

I respondents name…….. [Optional]

1. **For how long has this firm been operating in Kenya?**
   1. Less than 5 years [ ]
   2. 5 – 10 years [ ]
   3. 11 – 15 years [ ]
   4. 16 – 20 years [ ]
   5. Over 20 years [ ]
2. **What is the size of your firm in terms of market share?**
   a) Medium sized manufacturing SME [ ]
   b) Small sized manufacturing SME [ ]

SECTION B: IMPROVEMENTPRACTICES

3. To what extent do you agree to the following statements in your organization?

Aspects of Improvement Practices	Very Great Extent	Great Extent	Moderate Extent	Little Extent	No Extent
1. We strive to deliver every time at the same cost to business					
2. We increased the physical inventory space lately					
3. We have optimum level of inventory to save on costs					
4. We practice controlled production					
5. IT is integrated into operations and innovative production processes					
6. We aspire to minimize defects during production					
7. Overall equipment efficiency during production					
8. There is minimal movement of materials within floor					
9. We strive to reduce waiting time in operations					

10. Concerted effort to reduced waste in processing					
11. Management emphasizes on recognition of successes rather than on mistakes					
12. There is control over processing of products					
13. Mapping process which visually explains flow of materials through production system					
14. We practice reduction and reuse of waste during processing					
15. We practice green procurement practices/Green purchasing					
16. Employees rarely come up with new ideas to improve work processes					
17. We do not have innovation and creativity teams					
18. We encourage new products/services development					
19. We always encourage creativity and innovation					
20. We don't have a Research & Development team					
21. We have a budget for Research & Development					
22. We are determined to have cost effective production process					
23. We strive to operate within the industry's set and agreed upon regulations					
24. We get our raw materials and services from all over the world					
25. We respect and value other players within the industry					
26. We share information amongst industry peers					
27. We strive to perform better than our industry peers					
28. We always out-do our peers in terms of new products					
29. Our processes are superior as compared to competition					
30. We do more research and development than our peers					
31. We have integrated technical and					

managerial procedures for guiding the coordinated actions of the work force					
32. We target improving joint long-term competitive performance by enhancing our operations/procedures					
33. We always anticipate and manage uncertainty and risk					
34. We are able to align our core competencies					
35. We are able to take advantage of complementary capabilities					

SECTION C: OPERATIONAL PERFORMANCE

4. To what extent have the above aspects affected operational performance in relation to?

Benefits	**Very Great Extent**	**Great Extent**	**Moderate Extent**	**Little Extent**	**No Extent**
1. Improved processes quality					
2. Increased operational readiness efficiency					
3. Evidence of increased productivity					
4. There is no improved processes capability					
5. There is evidence of reduced waste in production					
6. Lower product and service costs					
7. There are notable operational efficiencies on the floor					
8. There are increased innovations (*new ideas, products & services)*					
9. Improved Information Technology systems					
10. Evidence of cross functional training					
11. Evidence of open communication					
12. There are minimal customer complaints					
13. Improved customer relations management					
14. Witnessed better service processes					
15. Better marketing management processes					

Appendix III: List of Manufacturing SMEs

A Gill & Co Ltd
Abrasive & Tools (A) Ltd
Abu Engineering Ltd
Accacia Court Limited
Ace Knit Ltd
Acme Container Ltd
Adhesive Solutions Africa Ltd
Adorn Metal Works
Afri Fashions Ltd
Africa Kaluworks (Aluware) Division K
Afriwide FIshing Flies Co.
Agni Enterprises Ltd
Airoquip (K) Ltd
Ali Glaziers Ltd
Alpha Woollens (K) Ltd
Ambar Enterprises
American Clothing (K) Ltd
Amrutt Timber Products Ltd
Apex Steel Ltd
Arrow Rubber Stamp Company Ltd.
Artech Agencies (KSM) Ltd
Ashut Engineers Ltd
Ashut Quality Products
ASL Ltd – HFD
Atlas Copco Eastern Africa Ltd
Aura Garment Manufacturing Ltd
Auto Cool Kenya Ltd
B P C Industrial Lacquers Ltd
Bhachu Wood Products
Bilco Engineering
Bima Manufacturers Ltd
Blantyre Steel Ltd
Blow plast Limited
Blue Ring Products Ltd
Bobmil Industries Limited
Bogani Industries Ltd
Bosky Industries Ltd
Bunny Industries Ltd
Burns & Blane Engineering
Buzzy-Mart Enterprises
Carousel Ltd
Central Glass Industries Ltd,
Chalange Industries Ltd
Komo Furniture Makers
Kubal Enterprises
Liberty Manufacturers Ltd
Linda Raja Ltd
Lody Autopaints & Hardware
London Adhesives & Paints Ltd
Makiga Engineering Service Limited
Mango Ltd
Manzil Glass & Hardware Ltd
Maroo Polymers Ltd
Mather & Platt Kenya Ltd
Mather & Platt Kenya Ltd
Maweni Limestone Ltd
Mecol Ltd
Metal Crown Ltd
Metlex Industries Ltd
Metsec Ltd.
MGS International (K) Ltd
Mohajan Trade International
Nanak Enterprises Ltd
Nasib Industrial Products Ltd
Nayan Products (Kenya) Ltd (Quick)
Ndugu Transport Co Ltd
New HardTools (K) Ltd
New Market Leather Factory Ltd
Ngecha Industries Ltd
Njoro Canning Factory Ltd
Octagon Express (kenya) Limited
Olympia Capital Holdings Limited
Orbit Chemical Industries Ltd
Orpower 4, Inc
Packhard Ltd
Panesar's Kenya Ltd
Patco Industries Ltd
Pelican Signs Ltd
Pfizer Laboratories Ltd
Print Fast Kenya Ltd.
Professional Tools Ltd
Project Furniture Ltd
Protex Kenya EPZ Ltd.
PZ Cussons East Africa Ltd.
Raghad Enterprises
Raghad Enterprises

Chemplus Holdings LTD
Chevron Kenya Ltd
Chic Fashions Ltd
Chloride Exide Kenya Limited
City Radiators Ltd
Climacento Green Tech Ltd
Collis F B
Color Creation Ltd
Commrecial Motor Spares Ltd
Continental Products Ltd
Corn Products Kenya Ltd
Cosmocare Industries Ltd
Creative Fabric World Co Ltd
Crock of Gold 88 Ltd
Crown Fashions Ltd
Cuma Refrigeration EA Limited
Distinct Garment Factory

Doshi Group of Companies
Eco Consult LTD
Ecolab East Africa (K) Ltd
Ecolab East Africa (K) Ltd
Economic Housing Group Ltd
Ecotech Ltd
Elys Chemical Industries Ltd
Energy Pak (K) Ltd
Excel Chemical Ltd.
Finafurn Ltd
Fine Wood Works Ltd
Fine-Knit (Kenya) Ltd
Fit Tight Fasteners Ltd
Foam Mattress Ltd.
furmart furnishers
Gahir Engineering Works Ltd
Geomatic Services Ltd.
goldrock international enterprises
Heluk International Limited
Hills Converters [K] Ltd
Hydraulic Hose & Pipe Manufacturers Ltd
Imani Workshops
Instyle Furniture Ltd
Intersilk Garment Manufacturers
Ismana Designs Ltd
J D Sharma & Sons
Jak Industries Ltd
Rampel Designs Ltd
Reckitt Benckiser (E A) Ltd
Relac Ltd
Rhino Special Products Ltd
Ritz Enterprises Ltd
Rock Plant Kenya Ltd.
Rock Plant Kenya Ltd.
ROM East Africa Limited
Roofmasters Enterprises Ltd
Ruambuzi Ltd
Rupa Cotton Mills EPZ Ltd
Sadolin Paints (E A) Ltd
Safari Image Ltd
Sahjanand Wood Manufacturers Co Ltd
Sanpac Africa Ltd
Sat Joiners Ltd
Savannah Stitching Co Apex Apparels EPZ Ltd.
Schering - Plough Corporation U S A
Shade Systems(E.A)Ltd
Shadetents And Exquisite Designs
Shamas Motor Spares
Shankan Enterprises Ltd
Shoewind Industries Ltd
Shreeji Enterprises (K) Ltd
Sigma Engineering Co. Ltd
Silentnight (K) Ltd
Simco Auto Parts Ltd
Sincar Ltd
Smart Paint Ltd
South Hill Motor Spares Ltd
Spectra Chemicals Ltd
Stamet Products (K) Ltd
Statpack Industries Limited
Steel Structures Limited
Sudi Chemical Industries Limited
Sula Ltd
Sunflag Spinning Mills (E A) Ltd
Sunrays Solar Ltd
Superfit Steelcon Ltd
Tamoil Africa Holdings Limited
TARPO Industries Limited
Tenacity Locks Ltd
The Kensta Group
Tianjin Haopu Chemical Co. Ltd

Jaydees Knitting Factory Ltd
Jet Garments (K) Ltd
Kazi Kazi Glass Ltd
Kenbro Industries
Kensun Enterprises Toys Wholesalers
Kenya Grange Vehicle Industries Ltd
Kenya malting Ltd
Kenya Solar
Kenya Trading EPZ Ltd.
Kerbrook Garment Manufacturers Ltd
Kiboko Leisure Wear Ltd
Kiesta Industrial Technical Services Ltd
Kim-Fay E.A Limited
Top Tank
Topen Industries Ltd
Tripac Chemical Industries Ltd
Troika Ltd
Unga Farm Care (EA) Ltd
Unighir Ltd.
Warren Concrete Ltd
Wartsila Eastern Africa Ltd
Welfast Kenya Ltd
Welrods Limited
Wigglesworth Exporters Ltd
Wines Of The World Limited
Zena.net Services

Appendix IV: Component Matrix

	Component															
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
We strive to deliver every time at the same cost to business	.271	.141	.317	.018	-.019	-.215	.208	.122	-.501	.165	.026	.244	.213	.361	-.149	-.054
We increased the physical inventory space lately	.228	.297	.081	.111	-.479	-.153	.032	.120	.341	-.157	.269	-.241	-.186	-.086	.041	-.210
We have optimum level of inventory to save on costs	.170	.197	.280	.144	-.600	-.312	.122	-.060	-.092	-.191	-.021	-.131	.228	-.200	-.188	-.124
We practice controlled production	.608	.374	.189	.263	-.095	-.217	-.188	.217	.009	-.034	-.087	.175	-.156	-.146	.028	.038
IT is integrated into operations and innovative production processes	.254	.521	-.180	-.251	.428	.122	-.001	-.002	-.053	-.122	-.164	.024	-.255	-.247	.064	.172
We aspire to minimize defects during production	.717	-.304	-.081	-.209	-.126	-.078	-.058	.001	.054	-.011	-.058	.082	.294	-.138	-.044	-.208
Overall equipment efficiency during production	.595	.300	-.224	.279	.081	-.170	-.071	-.188	-.338	.118	-.053	-.011	.049	-.079	.012	-.190
There is minimal movement of materials within floor	.510	.330	.158	.336	-.160	-.147	.286	.003	-.065	-.043	.061	.233	.034	-.241	.179	.043
We strive to reduce waiting time in operations	.660	-.009	-.226	-.144	.098	-.091	.113	.309	.260	.131	.173	.118	.328	-.138	.131	-.144
Concerted effort to reduced waste in processing	.481	-.003	-.051	-.204	.042	.294	-.357	.135	-.154	-.012	-.071	.186	.269	-.189	.266	-.198

Management emphasizes on recognition of successes rather than on mistakes	.508	.231	-.398	.183	.008	.168	-.250	.230	.283	-.070	-.047	.104	-.066	-.125	-.034	-.093
There is control over processing of products	-.001	.152	.144	-.323	-.076	.277	-.065	.125	.222	-.386	.084	.351	-.116	.447	.129	-.143
Mapping process which visually explains flow of materials through production system	.510	.485	-.420	-.061	.180	.025	-.193	.058	.037	-.035	-.195	-.087	-.143	-.092	-.090	.029
We practice reduction and reuse of waste during processing	.229	-.341	.033	.517	.194	.413	-.061	.039	-.279	.048	.034	-.190	-.098	-.091	.199	.010
We practice green procurement practices/Green purchasing	.199	.453	-.085	.310	-.226	.172	-.170	.033	.279	.384	-.022	-.113	-.124	.162	-.392	.006
Employees rarely come up with new ideas to improve work processes	.026	.404	.503	.200	.041	.410	-.097	-.152	.099	.158	.147	.015	.138	-.124	-.024	.042
We do not have innovation and creativity teams	-.335	.261	.565	.238	.276	.306	.089	-.069	-.015	-.089	-.011	.060	.102	-.240	-.204	-.074
We encourage new products/services development	.633	-.020	-.200	-.069	.359	-.052	.060	-.012	-.028	-.206	.371	-.147	.029	.026	-.268	.048
We always encourage creativity and innovation	.505	-.059	-.378	.009	.144	.194	.032	-.029	-.040	-.048	.377	-.074	.040	.107	-.245	-.264
We don’t have a Research & Development team	.011	-.074	.314	.264	.255	.216	.278	.668	-.004	.185	-.102	-.100	.088	.158	.044	-.023

We have a budget for Research & Development	.494	-.176	.035	.324	.250	-.033	-.037	.361	.111	-.306	-.030	-.032	.154	.000	-.163	.263
We are determined to have cost effective production process	.479	.246	-.389	.146	-.073	.228	.280	-.155	.002	.305	-.157	.185	.130	.039	.094	-.107
We strive to operate within the industry's set and agreed upon regulations	.239	.301	-.157	-.304	-.394	.421	.142	.060	-.388	.172	.114	-.119	-.110	-.142	.114	.162
We get our raw materials and services from all over the world	-.112	.355	-.084	.562	.110	-.360	-.219	-.136	.201	.079	-.225	-.016	.010	.203	.284	.068
We respect and value other players within the industry	.411	.251	-.459	.033	-.410	.226	.066	.051	-.149	.095	.089	-.180	-.063	.134	-.110	.091
We share information amongst industry peers	.069	-.285	.099	.058	-.013	-.437	-.434	-.310	.143	.385	.107	-.086	.180	-.127	-.052	.030
We strive to perform better than our industry peers	.534	.225	.087	-.356	-.225	-.183	-.153	.090	.057	.035	-.139	.360	-.024	.080	-.217	.148
We always out-do our peers in terms of new products	.395	.366	.323	-.558	-.051	.013	-.071	.002	.176	.163	-.107	-.200	.244	.036	.052	-.023
Our processes are superior as compared to competition	.558	.284	-.012	.026	.294	-.208	.253	.022	.128	-.359	-.097	-.196	.088	.060	.072	.027
We do more research and development than our peers	.250	.617	.082	-.028	.095	-.195	.292	-.275	.004	-.134	-.128	-.201	.020	.165	-.001	-.022

We have integrated technical and managerial procedures for guiding the coordinated actions of the work force	.372	-.091	-.402	-.135	.245	-.370	.182	.182	-.121	.343	.219	.051	.115	.060	.090	.334
We target improving joint long-term competitive performance by enhancing our operations/procedures	.657	.097	.247	-.291	.433	.099	.115	-.057	.072	.058	-.161	-.178	.016	.108	-.077	-.044
We always anticipate and manage uncertainty and risk	.454	.178	-.158	-.021	.263	-.004	.201	-.492	.102	-.067	.359	.358	-.024	-.138	.064	-.017
We are able to align our core competencies	.446	.061	.067	.244	-.248	-.162	.147	.223	.276	.168	.253	-.079	-.068	.279	.347	-.073
We are able to take advantage of complementary capabilities	.702	-.309	.139	.238	-.003	.230	-.003	-.302	-.064	-.031	.160	.074	-.129	.088	.119	-.119
Improved processes quality	.608	-.078	.383	-.220	-.017	.260	-.008	-.279	.191	-.147	.046	-.128	.142	.194	.151	.142
Increased operational readiness efficiency	.610	-.111	.430	-.026	.123	.091	-.391	-.212	-.073	.089	.189	-.156	-.044	.143	-.009	-.037
Evidence of increased productivity	.435	.131	.153	.109	-.276	.272	-.109	-.139	.003	-.077	-.039	-.012	.375	.009	.120	.501
There is no improved processes capability	-.154	.390	.435	.201	.397	-.115	-.110	.176	-.047	.176	.456	.097	-.126	-.042	.061	.041

There is evidence of reduced waste in production	.315	-.318	.009	.018	.104	.008	.465	-.276	.404	.240	-.153	-.177	-.144	-.091	-.066	.054
Lower product and service costs	.654	-.285	-.140	.106	-.018	-.252	-.143	-.125	-.141	-.171	.123	.127	-.147	.166	-.138	.205
There are notable operational efficiencies on the floor	.430	-.185	-.046	.540	.027	.111	-.078	-.187	.020	-.120	-.394	.271	.005	.152	-.033	-.070
There are increased innovations (new ideas, products & services)	.578	-.026	-.103	.109	-.032	-.151	-.310	.120	-.393	-.276	-.053	-.371	.135	.066	.028	-.101
Improved Information Technology systems	.584	-.334	-.082	-.088	-.017	.154	-.363	.020	.201	.190	-.096	.038	-.146	.111	.064	.071
Evidence of cross functional training	.514	.149	.486	-.193	-.071	-.107	-.077	.082	-.235	.162	-.044	.175	-.330	.022	-.215	-.020
Evidence of open communication	.472	-.470	.177	.029	-.179	.108	.117	.219	.277	-.090	.063	.168	-.021	-.287	-.194	.124
There are minimal customer complaints	.637	-.339	.079	.169	-.346	.035	.411	-.088	-.095	-.085	-.050	.035	-.103	.041	-.031	.105
Improved customer relations management	.612	-.264	.196	-.224	.116	-.097	.251	.000	-.147	.179	-.282	.005	-.199	-.047	.110	-.200
Witnessed better service processes	.746	-.259	.186	.044	.170	.013	.019	.114	.073	.136	-.186	-.115	-.011	-.071	-.170	-.074
Better marketing management processes	.641	-.173	.282	-.195	-.141	-.224	-.094	.083	-.093	-.090	.027	-.158	-.362	-.204	.293	.057

Extraction Method: Principal Component Analysis.

a. 16 components extracted.

Source: Author, (2013).