BUSINESS PROCESS IMPROVEMENT APPROACHES USED BY MANUFACTURING SMEs IN NAIROBI, KENYA

BY

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Declaration

This research proposal is my original work and has not been presented for a degree in any other University.

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This research proposal has been submitted for examination with our approval.

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Acknowledgement

I am deeply indebted to my SupervisorsMr. Ernest Akeloand Mr. Lazarus Mulwafor their outstanding professional guidance and encouragement they provided to me throughout the duration of my work in this proposal.

Dedication

This research proposal is dedicated to my dear children Ian Kibet and TomnoTagi.

Abstract

Across the globe, the contribution of SMEs to economic development is now well recognized. However, the advent of globalization and the rapidly changing technologies has raised the level of competition for SMEs who now have to compete with multinationals offering similar, and often, better quality products. Thus the need to adopt practices that enhance productquality is no longer an option for businesses of all levels. This study examines the awareness, implementation levels and challenges facing SMEs in the adoption and use of three key business process improvement approaches. The approaches include: six sigma, benchmarking and business process reengineering. The study adopted a descriptive research methodology with target population being SMEs registered with Kebs and operating in the Kariobangi light industries area. Sixty firms were randomly selected proportionately according to products manufactured. Data analysis was done using SPSS. It was found that there exists a huge knowledge gap on the three BPI approaches with Benchmarking being the only approach that showed some moderate level of understanding. It was also found that SMEs tended to shun away from the costly and time demanding approaches such as BPR and Six Sigma and tended to apply, to a limited extent, benchmarking. Chi square test revealed that the level of implementation of BPI was not dependent on subsectors. The key challenge identified was the scarcity of funds to finance continuous business process improvement. It was recommended that government of Kenya, in conjunction with key stakeholders, should come up with affordable short term courses on business process improvement. It was also suggested that future studies should consider examining the influence of level of implementation of business process improvement on firm performance.

List of acronyms

AIM Australian Institute of Management

BPI Business Process Improvement

BPR Business Process Reengineering

CI Continuous Improvement

DMAIC Define-Measure -Analyse - Improve-Control

DPMO Defects Per Million Opportunities

DMSED Department of Micro- and Small-Enterprise Development

GoK Government of Kenya

KEBS Kenya Bureau of Standards

PDCA Plan Do Check Act control cycle

PI Process Improvement

SME Small and Medium Size Enterprises

TQM Total Quality Management

Contents

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The importance of Small and Medium size Enterprises (SMEs) as key economic development agents can never be gainsaid. Across the globe, the contribution of SMEs to various aspects of the economy including creation of employment opportunities as well as general economic growth is well recognized (Morris and Brennan, 2000). The environment wherein SMEs exist itself poses a significant challenge as it is quite dynamic and subject to radical changes within short periods of time. This often leads to very short SME lifespans as they start and fail within a short time.

A variety of reasons have been advanced as key reasons for SMEs' failure. These include: lack of forward planning, cash flow problems, inability to capture and manage innovation, lack of investment at the right time, lack of business experience, and little or no external help. The aforementioned points can be stated as the weaknesses of SMEs. On the other hand, SMEs do have some strengths such as effective and open communication channels, low resistance to change, people orientation company-wide awareness, functional integration, and employees adopting a natural responsibility for quality (Ghobadian and Gallear, 1997).

1.1.1 Business Process Improvement

Globally, businesses are striving to gain market share in the face of increasing competition due to globalization. SMEs have not been left out in this regard as they face even greater competition from global multinationals. In the face of this challenging

environment, companies are continuously seeking for ways to gain and sustain competitive advantage. Quality and customer satisfaction have become critical in every company's agenda, but so is profitability. In this quest, the effort has to start internally, by continuously improving their business processes in every area. It has however been observed that, not all process improvement (PI) efforts lead to profitability increase. On the other hand, many companies have experienced impressive improvement in an individual process, where the bottom line improvement was next to none (Hall et al., 1993).

In order to make SMEs competitive, numerous quality models or approaches have been proposed by quality practitioners (e.g. Q-Base, Business Growth through Quality, and Core Program among others). Even with these models, there is little or no evidence to support the success or otherwise of these models as they apply to SMEs. There is also a disconcerting lack of evidence regarding the specific input of SMEs in the development of these models. Therefore, the net benefit of these models is not known. Questions related to the implication of quality methods in SMEs, including inspection, quality control, quality management, quality improvement, continuous improvement among others, remain largely indeterminate.

Performance Improvement (PI) has been defined as a structured approach to performance improvement that centers on the disciplined design and careful execution of a company's end-to-end business process (Hammer, 2002). However, it has been observed that not all PI efforts are successful. 50-70 percent of the PI initiatives fail to achieve their objectives (Hammer and Champy, 1993).Reasons for failure of PI effort include a focus on the

tactical issues not on the issues that affect the entire business, and the lack of knowledge transferability of PI projects. Lapre´ and Van Wassenhove (2002) performed an extensive study of a European manufacturer and found that both the operational and conceptual learning are important for knowledge transferability, and consequently, for both productivity and "bottom line" improvement.

To enhance their competitiveness, service firms now imbed systems within their organizations that ensure continual quality and productivity improvement. Such systems must be capable of providing individual providers with the opportunity to meet and then surpass the challenge of competitors. A philosophy of continuous improvement enables a service firm to cultivate "a process-oriented way of thinking and developing strategies that assure continuous improvement involving people at all levels of the organizational hierarchy" (Imai, 1986). Such a system requires a new organizational culture that considers change, rather than stability, the norm. Under this ethic, complacency with the current "way of doing things" is banished from the firm.

In regard to organizational quality and performance, PI focuses on improving customer satisfaction through continuous and incremental improvements to processes, including by removing unnecessary activities and variations.Yusof and Aspinwall (2000) as well as Powell (1995) single out continuous improvement as an element of Total Quality Management - a concept which is now widely applied to manage quality by many organizations.

Various approaches to PI have been developed and applied both in the manufacturing and service sector. Some of these approaches are statistically oriented (e.g. six sigma), and

others utilize creativity and innovation (e.g. business process reengineering (BPR)). This paper focuses on the application of four major approaches among Kenyan manufacturing SMEs namely: Six sigma, benchmarkingand BPR. These approaches are briefly explained below.

Six sigma can be considered both a business strategy and a science that has the aim ofreducing manufacturing and service costs, and creating significant improvements in customer satisfaction and bottom-line savings through combining statistical and business process methodologies into an integrated model of process, product andservice improvement. With six sigma, customer focus becomes the top priority and anyimprovements are defined by their impact on customer satisfaction and value (Pandeand Holpp, 2002). From an internal perspective, six sigma provides a way of improvingprocesses so that the company can more efficiently and predictably produceworld-class products and services. Traditionally under the six sigma approach, afive-phased DMAIC methodology is applied which tackle specific problems to reach sixsigma levels of performance (Breyfogle, 1999).

Benchmarking has been defined as a continuous, systematic process for evaluating the products, services, and work process of organizations that are recognised as representing the best practice, for the purpose of organizational improvement (Sarkis, 2001). Benchmarking is thusa technique used to understand and evaluate the current position of a business or organization in relation to the "best practice" and to identify areas and means of performance improvement. Since benchmarkingfocuses on continuous improvement of specific product characteristics or processes,which are critical to the

success of a firm's business strategy, it is recognized as acost-and time-effective method in meeting competition (Watson, 1992). Furthermore,benchmarking can also be described as a structured process where the structure of thebenchmarking process is often developed by the development of a step-by-step processmodel, which provides a common language within organizations (Spendolini, 1992).

Business process re-engineering is the analysis and design of workflows and processes within an organization. According to Davenport (1990) a business process is a set of logically related tasks performed to achieve a defined business outcome. Re-engineering is the basis for many recent developments in management. The cross-functional team, for example, has become popular because of the desire to re-engineer separate functional tasks into complete cross-functional processes. Also, many recent managementinformation systems developments aim to integrate a wide number of businessfunctions. Business process re-engineering is also known as business process redesign, business transformation, or business process change management.

1.1.2 Small and Medium Size Enterprises (SMEs) in Kenya

SMEs are defined as businesses operating in both the informal and formal sectors of the economy and employing between 5 and less than 20 employees (GOK, 2005). This definition is in agreement with Stevenson et al. (2005), who defined SMEs in terms of the "very-small" enterprises with 6-10 employees operating "in-the-open" and the "small-scale" enterprises with 11-50 employees operating from legitimate business premises. In Kenya, the MSME Bill 2009 has used two criteria to define MSMEs in general: Number of people/employees and the company's annual turnover. For enterprises in the

manufacturing sector, the definition takes into account the investment in plant and machinery as well as the registered capital.

Kenya, like many other developing countries, has realized that the Micro,Small and Medium Enterprise (MSME) sector which includes the Micro-enterprises, plays a major role in reducing many socio-economic challenges that face the society. According to the Department of Micro- and Small-Enterprise Development (DMSED) of the Ministry of Labour and Human Resource Development, in 2002 there were about 2.8 million MSMEs employing 5.1 million people. The Kenyan government in its Economic Strategy Paper 1999, and the Vision 2030 recognized entrepreneurship as a tool for economic development. In this regard several initiatives are being undertaken to foster entrepreneurship in the country.

Starting and operating a small business includes a possibility of success as well as failure. Despite their significance, past statistics indicate that three out of five businesses fail within the first few months of operation (Kenya National Bureau of Statistics, 2007). Because of their small size, a simple management mistake is likely to lead to sure collapse of a small enterprise hence no opportunity to learn from its past mistakes. Lack of planning and poor management has been posited as the main causes of failure of small enterprises (Longenecker, et al., 2006). It is generally recognized that SMEs (Small and Medium Enterprises) face unique challenges, which affect their growth and profitability and hence, diminish their ability to contribute effectively to sustainable development.

According to Amyx (2005), one of the most significant challenges is the negative perception towards SMEs. Potential clients perceive small businesses as lacking the

ability to provide quality services and are unable to satisfy more than one critical project simultaneously. Often larger companies are selected and given business for their clout in the industry and name recognition alone. As such the management problems facing SMEs are further compounded by the perception issues owing to their size. For these SMEs to survive, effective tools have to be developed that will enhance their competitive advantage.

In a bid to overcome some of the challenges, some SMEs have sought to improve their business processes by implementing process improvement and quality management programs. However, Husband (1997), questions and declares as uncertain the effectiveness of use of quality management programmesby SMEs. The Advanced Engineering Centre for Manufacturing (1995), contends that some SMEs have adopted certain commonly used quality models, for instance certification and quality systems, yet remarkable differences in rates of implementation between SMEs and large enterprises have been noted with the SME rate of implementation being lower.

Other studies have also noted that other quality management initiatives for instance total quality management (TQM), which is considered more holistic, also appear to show signs of low implementation rates (Ghobadian and Gallear, 1996; Van der Weile and Brown, 1998). Research has demonstrated the possibility of the existence of multiple complex factors, in addition to the often cited factors including cost and time, which inform the adoption of quality standards by SMEs (Gome, 1996). It has also been suggested that

failure to treat quality programs as an integral part of business operations impacts on the rate of implementation

A number of programs for Continuous Improvement including Six Sigma pose significant challenges to SMEs due to their complexity which make them difficult to be easily understood. These factors have also been suggested as possible explanation to the low implementation rates of quality programs by SMEs. Empirical evidence has been adduced to support various other possible explanations to low implementation of quality programs. These include: The difficulty faced by SMEs in distinguishing between different quality programmesavailable to them like TQM, EFQM,Six Sigma and ISO.

Besides these, SMEs face the problem of choosing specific quality systems that best conforms to their needs.SMEs do not fully understand the merits that arise from the acquisition of quality systems as well as the comparative merits among several systems (Brown and Van der Weile, 1995; Husband, 1997; Husband and Mandal, 1999; Yusof and Aspinwall, 1999; Andrews, 2004). Due to the aforementioned inadequacy of knowledge, most SMEs hold a firm belief that their cultural setup and existing quality systems suffice for all their needs, a belief which does not necessarily hold in reality (Andrews, 2004). Further, the purpose of adopting a quality standard is sometimes lost to most SME managers when they view Quality System such as ISO 9000 as the end in itself rather than a means to an end.

1.2 Problem Statement

The role of small and medium scale enterprises as agents for building a resilient economic system have long been identified. This is shown in their flexibility, innovative and good relationship with other sectors of the economy especially large scale industries. However, the sector is plagued with numerous problems which see most of the SME start-ups going out of business within three years of operation (Amyx, 2005). The situation is made more acute for the SMEs by the high level of competition from large firms they have to reckon with. Because of their small size, a simple management mistake is likely to lead to sure collapse of a small enterprise hence no opportunity to learn from its past mistakes. Lack of planning and poor management has been posited as the main causes of failure of small enterprises (Longenecker, et al., 2006).

In recent years, large scale industries have undergone many changes in their production environment by implementing various manufacturing techniques such as JIT, TQM, Six Sigma, Value methods and Lean manufacturing(Gunasekaran*et al,*. 2008). These techniques are generally accepted as process improvement approaches for achieving exceptional results in areas like quality, cost, reliability and good value. A critical review of SMEs in both developed and developing countries indicates little application of these techniques (Odedairo et al., 2006).

A number of studies have been conducted by various researchers on application of process improvement approaches to SMEs.Lapre´ and Van Wassenhove (2002) performed an extensive study of a European manufacturer and found that both the

operational and conceptual learning are important for knowledge transferability, and consequently, for both productivity and "bottom line" improvement.Husband and Mandal (1999) also identify the uniqueness of an SME's manufacturingoperations as being a limiting factor to quality enhancement implementation andprovide a series of dimensions that are unique to SMEs. These dimensions includeamongst others: SME core dimensions, structural dimensions,fundamentaldimensions, sustainability dimensions, integrative dimensions and externaldimensions. They suggest that if these dimensions are not integrated into themodel then an SMEs ability to achieve significant outputs from the application of themodel will be compromised.Furthermore, Deleryd et al. (1999) identify that SMEs need to make decisions andimprove their processes based on accurate and timely information relating to theperformance of their manufacturing process. The studies suggest a lack of application of statistical theory to identify and solve problems within a manufacturing context. Other studies have also noted that other quality management initiatives for instance total quality management (TQM), which is considered more holistic, also appear to show signs of low implementation rates (Ghobadian and Gallear, 1996; Van der Weile and Brown, 1998). The past studies have, however, been conducted mainly in the developed world. This leaves a knowledge gap as to the application of the PI approaches among SMEs in the developing world, and more so, in the Kenyan context.

To bridge this knowledge gap, this study will examine the Process Improvement approaches that are used by manufacturing SMEs in Kenya. It will answer the questions: To what extent are Manufacturing SMEs in Kenya aware of various process improvement approaches? To what extent have manufacturing SMEs implemented performance

improvement approaches? What challenges have SMEs faced in implementing the process improvement approaches?

1.3 Objectivesof the study

The study will be supported by the following specific objectives:

1. To determine awareness of improvement approaches among SMEs
2. To determine the extent of implementation of each approach among the SMEs
3. To establish the challenges of improving through each of the approaches

1.4 Value of the study

To the manufacturing SMEs, the study will identify the challenges that are faced in implementation of business process improvement approaches by the SME manufacturing sector in Kenya. This can in turn facilitate informed industry interventions to resolve the challenges identified.

The results of the study will also be useful to the government in formulating policies and developing regulatory frameworks for manufacturing SMEs, especially where quality standardization is concerned.

Additionally, the study will benefit the academia as it will add to the literature on business process improvement and identify areas for further study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents theboth the theoretical and empirical literature which covers an overview of Process improvement among SMEs, then the Process improvement approaches namely six sigma and bench-marking. Finally, this chapter culminates in a summary and identification of gaps in knowledge.

2.2 Process Improvement Best Practices

Across the world today, industrial firms have been forced to cope with competitive challenges related to innovation,dynamic responses, knowledgesharing and globalization by means of effective and dynamic strategy formulation. The environmental conditions facing manyfirms have and continue to change rapidly. Today'sglobal competitive environment is complex, dynamic, and largely unpredictable. This demand a lot of thinking into the issue ofhow strategies are best formulated and implemented. Additionally, since much of the competition stems from cost and quality, firms have been forced to explore new ways of improving their business processes so as to achieve cost reduction and better quality of products.

The traditional method to process improvement has been accomplished in many industries is the classic plan-do-check-act (PDCA) cycle developed by Shewhart and popularized by Deming. Briefly, the plan stage asks three questions: What should happen? What did happen? Why? Seven classic tools of quality are applied to answer

those questions (flowcharts and checklists answer what should; histograms, scatter plots and statistical process control charts answer what did; Ishikawa fishbone diagrams and Pareto charts explore why) (Birnbaum et al., 2010).

Variations of the PDCA have been applied variously by different companies. For instance, while some companies do not apply PDCA using pilot roll-out, the do-check part of the PDCA cycle in some companies involves doing studies or pilot projects and checking the results. However, despite extensive research on these approaches, there is little empirical evidence on how much these techniques have been applied among SMEs (Birnbaum et al., 2006).

Improving quality tends to be a most cost-effective path, since initial improvement tends to result from streamlining processes and empowering workers rather than buying more equipment or hiring more staff. Reducing scrap, rework and other consequences of poor quality save money, so much reduction often is possible without spending more to achieve better quality. However, with time, the path toward zero defects starts costing and potentially at a rising rate as one moves ever closer toward tolerating zero defects (Birnbaum et al., 2010). In the manufacturing context, some of the most common approaches to quality improvement include: TQM, six-sigma, Business Process Reengineering, Benchmarking and Lean manufacturing.

Womack et al. (1990) describe lean manufacturing as a philosophy focused on usingless of everything – less material, less labor, less time, and less space than traditionalmass production. There is evidence in the literature to suggest that lean manufacturingis associated with improvements in business performance measures (Fullerton et al.,2003).

Empirical research indicates that lean practices are used in avariety of contemporary organizations (Kollberg and Dahlgaard, 2007), however, researchers have also noted the need for additional study tounderstand the impact of lean manufacturing practices on organizational performance(Cua et al., 2001).

One lean manufacturing mechanism used to improve organizational performance isthe kaizen event (Bradley and Willett, 2004). A kaizen event is a focused and structured continuous improvementproject, using a dedicated cross-functional team to address a targeted work area, toachieve specific goals in an accelerated timeframe (usually one week or shorter). Kaizenevents are characterized by several features including their focus on low capital investment, their degree of action orientation andautonomy, their use of a cross-functional team structure, and their application ofwell-established quality and process analysis tools, such as time observations,cause-and-effect diagrams, and other lean tools, such as standard work,single-minute-exchange-of-die (SMED), etc. Cross-functional teams improve a workarea by applying structured improvement processes and human creativity (Bicheno,2001). The intended impact of kaizen events is twofold: first, to substantially improvethe performance of the targeted work area and second to create positive human resource outcomes. Such outcomes arepurported to create an organizational culture focused on longer-term continuousimprovement (Bicheno, 2001).

While anecdotal evidence of theimpact of kaizen events seems impressive, Laraia et al. (1999) propose that less than halfof these improvements are sustained in the long-term. kaizen events that do generateshort-term performance improvements may provide impetus that the organizationalchange literature purports is necessary for creating

employee commitment to a givenperformance improvement strategy (Keating et al., 1999).

In contrast to BPR and kaizen events, TQM typically focuses on incremental process improvement to improve customer focus and results through teamwork (Nissen, 1996).

Although the targeted level of process improvement is different, the TQM literature stresses the need for employee involvement in driving and sustaining performance improvement (Anderson, 1999). While many organizations appear to have achieved substantial process improvement through TQM, the literature also suggests that many firms experience difficulty sustaining their TQM programs to drive long-term performance improvement (Repenning and Sterman, 2002). Keating et al. (1999) suggest such failures are due to poor program management.

The BPR and TQM literature both suggest that process improvement initiatives impact the organization in two key subsystems: the technical system, which produces the core outputs of the organization, and the social system, which provides for the coordination of human resources and processes within the overall work system (Fox, 1995).

Six sigma can be considered both a business strategy and a science that has the aim ofreducing manufacturing and service costs, and creating significant improvements incustomer satisfaction and bottom-line savings through combining statistical and business process methodologies into an integrated model of process, product andservice improvement. In six sigma, customer focus becomes the top priority and anyimprovements are defined by their impact on customer satisfaction and value

(Pandeand Holpp, 2002). From an internal perspective, six sigma provides a way of improvingprocesses so that the company can more efficiently and predictably produceworld-class products and services. Traditionally under the six sigma approach afive-phased DMAIC methodology is applied which tackle specific problems to reach sixsigma levels of performance (Breyfogle, 1999).

The "lean" concept has often successfully allowed companies to deliver bottom-linesavings in production through improvement in process efficiency. Lean is aimed at reducingwaste and adding value to production systems so that systems performance issignificantly improved and a company "does more with less"(Jostes and Helms, 1994). Maintenance procedures and systemsare designed so that they are easier to accomplish and this is achieved throughmachine redesign and modifications in order to facilitate this process.

While several approaches to process improvement have been developed and implemented in various sectors, there are some key factors that inform successful implementation. AIM (2010) examined some of the key determinants of successful implementation of business process improvement methods. They found that organizational readiness which include elements such as having a process view, developing a culture focused on improvement and, an understanding of the customer and the 'value' within the organisation was one major determinant. These elements of readiness arecritical as the foundation for process improvement as they provide a basis which the tools can be applied.

Further, AIM (2010) established that the key success factor is strong leadership and visible support from management. Other success factors include an effective communication strategy, appropriate training and development, giving resource and timefor the improvements to take place and, using external expertise and support.

2.2.1 Business Process Improvement approaches among SMEs

The contribution of SMEs to various aspects of the economy including: creation of employment opportunities as well as general economic growth is well recognized (Morris and Brennan, 2000). The environments wherein SMEs exist itself pose a significant challenge as it is very dynamic and subject to radical changes within short periods of time. This often leads to very short SME lifespans as they start and fail within a short time.

A variety of reasons have been put forward as key reasons for SME failure. These include: lack of forward planning, cash flow problems, inability to capture and manage innovation, lack of investment at the right time, lack of business experience, and little or no external help. The aforementioned points can be stated as the weaknesses of SMEs. On the other hand, SMEs do have some strengths such as effective and open communication channels, low resistance to change, people orientation company-wide awareness, functional integration, and employees adopting a natural responsibility for quality (Ghobadian and Gallear, 1997).

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Besides these, SMEs face the problem of choosing specific quality systems that best conforms to their needs. Further, SMEs do not fully understand the merits that arise from the acquisition of quality systems as well as the comparative merits among several systems (Brown and Van der Weile, 1995; Husband, 1997; Husband and Mandal, 1999; Yusof and Aspinwall, 1999; Andrews, 2004).Secondly, due to the aforementioned inadequacy of knowledge, most SMEs hold a firm belief that their cultural setup and existing quality systems suffice for all their needs, a belief which does not necessarily hold in reality (Andrews, 2004). Further, the purpose of adopting a quality standard is sometimes lost to most SME managers when they view Quality System such as ISO 9000 as the end in itself rather than a means to an end.

2.3 Six sigma

Six Sigma is one of the key PI approaches that have been formulated for quality management in the manufacturing sector. According to Antony and Banuelas (2002), Six Sigma is an improvement framework for processes that employboth statistical and non-statistical tools and techniques to remove process variation and thereby improve process performance and capability. It seeks to keep the distance between the process average and the nearest tolerance limit to at least six standard deviations and thus reduce variability in products and processes in order to prevent defects (Wiklund and Wiklund, 2002). Six Sigma aims at achieving 3.4 defects per million opportunities (DPMO) with an assumption that the processes mean shifts by 1.5 standard deviation off the target value.

Linderman et al.(2003) defines a defect opportunity as a process failure that is critical to the customer.

Six sigma has four distinguishing characteristics which are not emphasized in other business improvement methodologies as well as in TQM. Firstly, Six Sigma places aemphasis on bottom-line impact in hard dollar savings. Six Sigma projects are only approved once the team demonstrates the savings that the project will yield. Secondly, Six Sigma integrates both human aspects (culture change, training, customer focus, etc) and process aspects (process stability, variation reduction, capability, etc) of continuous improvement. Thirdly, Six Sigma methodology (Define-Measure -Analyse - Improve-Control or DMAIC) provides a sequential linkage of the tools and techniques. Finally, Six Sigma creates a powerful infrastructure for training of Champions, Master Black Belts, Black Belts, Green Belts and Yellow Belts (Harry and Schroeder, 2000). The Belt system (Black, Green, White, and Yellow) has been identified as a unique distinguishing feature of Six Sigma that creates an infrastructure to assure that performance improvement activities have the necessary resources. These are the change agents that act as a catalyst in institutionalizing cultural change in organization.

The success of six sigma could be attributed to many factors including: managementinvolvement, adjustment of culture and employees' attitude, organizationinfrastructure, training on six sigma methodology and tools, project management skills, and linking six sigma to business strategy, human resources, customers andsuppliers (Antony and Banuelas, 2002). Moreover, it is important to use structuredmethods, select the process for six sigma improvement strategically, employ

full timespecialists and relate the financial and business results to the bottom-line (Schroeder,2003). In a research which highlights six sigma as a goal setting and goal achievement,Linderman et al. (2002) accentuate the importance of the explicit challenging goals, thestructured methods of six sigma, the employees' rewards, incentives and training.

Although six sigma was first used to reduce the variations and the defects inmanufacturing processes, it has been extended and well received by many serviceindustries; particularly financial institutions and healthcare. Despite of all the promises of six sigma programs and its great success reported byseveral companies like GE, Motorola and Allied Signal; many other companies aredissatisfied with the results from their six sigma projects. Velocci (2002) related this tolack of direct impact on customer, failing to involve both suppliers and customers, needof linkage to overall business objectives, in addition to viewing six sigma as just a tooland not as a complete PI approach.

Another problem with six sigma PI projects is their concentration on functionalareas, which does not necessary lead to an improvement in the profit margin.Furthermore, applying six sigma, on a process to improve it, implies that the process issound, while, sometimes, the process needs to be redesigned. Yet, six sigma with itsanalytical instead of creative orientation is not equipped for this task (Hammer, 2002).

2.4 Benchmarking

Interest in benchmarking has increased significantly since 1979 when Xerox firstintroduced it (Camp, 1989). Recently, benchmarking as a tool is widely used by

manycompanies. The concept of benchmarking has spread geographically to large partsof the world and implemented in a variety of manufacturing and service businesses,including health care, government, and education organizations (Camp, 1995).

A lot of emphasis is on the importance of benchmarking today as a way to improvebusiness. However, many people, especially those in small businesses, simply do notknow enough about benchmarking. Benchmarking is a technique that is all aboutidentifying, capturing, and implementing best practices and this type of benchmarkingis usually referred to as best practice benchmarking (Gunasekaran, 1998).

Benchmarking is the process of continuously measuring and comparing one's businessprocesses against comparable processes in leading organizations to obtain informationthat will help the organization identify and implement improvements (Watson, 1993).The American Productivity & Quality Centre has defined benchmarking as:"a systematic and continuous measurement process; a process of continuously measuring andcomparing an organization's business process against business process leaders anywhere inthe world to gain information which will help the organization take action to improve itsperformance".

Benchmarking has evolved from reverse engineering of competitive product, toprocess benchmarking, to strategic benchmarking, and then to global benchmarking.There are different types and scopes of benchmarking: internal benchmarking, externalbenchmarking, competitive benchmarking, and generic benchmarking (Watson, 1993).

Xerox is credited for starting the use of benchmarking in late 1970s and early 1980s whenit benchmarked its partner in Japan. Although benchmarking was originated in the USandAmerican companies led the implementation,manyEuropean companies have caughtup. Many initiatives have been growing in the UK for example UK benchmarking index, Inside UKEnterprise and Cranfield Best Factory (Zairi and Ahmed, 1999). At the core ofbenchmarking is the comparison between the organization and the best practice.

When anorganization benchmarks the best practice, it is actually performing a gap analysis toaccess the difference between the two. This gap analysis is usually one-dimensional.Although, it is easier to monitor one dimension, organizations may miss on thecomplexity of the trade-off that exists within each company and among companies.A more comprehensive multi-dimensional gap analysis is captured in spider-webdiagrams. The spider-web diagram can show at a glance multiple targets for variousstakeholders (Ahmed and Rafiq, 1998).

Benchmarking as stated by Voss et al. (1994) has evolved from an approach that focuses mainly on measures of performance to that which focuses on the management activities and practices that lead to superior performance. More recently, the practice of benchmarking is being widely used for organizations seeking ISO 9000 certifications (Meybodi, 2006). "Benchmarking is simply the process of measuring the performance of one's company against the best in the same or another industry" (Stevenson, 1996). Following this definition, Stevenson (1996), further argues that benchmarking is not a complex concept but it should include knowledge and the experience of others to improve the organization. It is analyzing the performance and noting the strengths and

weaknesses of the organization and assessing how to improve performance. The knowledge that is available for comparing operations and processes is vast (Boxwell, 1994).

However, despite the tools and scope used in benchmarking, it has been accused of itslimitation to ambition, since the aspiration is to be as good as the best in industry. Eventhe definition of the best in industry is not clear since the best this year may not be thebest next year. Another issue is the management of proprietary information andantitrust laws (Pulat, 1994). Nevertheless, many companies attributed a great deal ofimprovement in their processes to benchmarking.

2.5 Business Process Reengineering (BPR)

BPR is a term that was coined by Hammer and Champy (1993) todescribe a mean of radical process redesign in order to achieve large-scale improvementin business performance. They defined reengineering as: "The fundamental rethinkingand radical redesign of business processes to achieve dramatic improvements in critical,contemporary measures such as cost, quality, service, and speed."

Reengineering is different from most other PI approaches because it does not focuson what is, but rather on what should be. It does not seek to alter or fix existingprocesses; yet, it forces companies to ask, whether or not a process is necessary, andthen seeks to find a better way to do it. Peppard (1999) summarizes the key principlesof BPR as: ambition, process focus, questioning fundamental assumptions of theprocess, and that information is used as an enabler and measurement of results, not asactivities. He also

emphasized the importance of integrating the business processredesign and the corporate strategy of the underlying business.

Many companies have implemented reengineering projects, and some achievedgreat success, and others failed. BPR has been implemented by both service (Hall et al.,1993, Attaran and Wood, 1999, Shin and Jemella, 2002) and manufacturing companies(Hall et al., 1993, Zinser et al., 1998, Tonnessen, 2000) in the USA and Europe. Whilethere are many published success stories, the failure can only be deducted or found inpublished statistics and large studies (Hammer and Champy, 1993 and Hall et al., 1993).

Theimproper choice of the reengineering process can lead to failure of recognizing itsglobal benefits. The process should have enough breadth and depth. A broadly definedprocess should include more activities so the improvement is more likely to extendthroughout the entire business. The depth is measured by the change in six elements:role and responsibilities, measurements and incentives, organizational structure,information technology, shared values, and skills (Hall et al., 1993). Moreover, thesuitability of the reengineering method to the organizational context is of greatsignificance. While process reengineering could benefits manufacturing and servicefirms, there should be distinction in its implementation to suit the unique situation ofthe firm (Shin and Jemella, 2002).

2.7 Empirical Literature Review

Several studies have been conducted on the application of PI techniques for quality management in both small and large enterprises. It is obvious that these techniques have contributed immensely to productivity improvement, quality of products and services in

large industries; but of little application in SMEs. Gunasegaram (2000) supported the claim that the implementation of these manufacturing approaches has not received due attention from SMEs.

Some studies (Brown and Van der Weile, 1995; Husband, 1997; Husband and Mandal, 1999; Yusof and Aspinwall, 1999; Andrews, 2004) have indicated low application of these techniques among SMEs. There are several reasons for the relatively low application of statistical methods in SMEs. Management in small companies, in general, do not have the sufficient theoretical knowledge to see the potential of using statistical tools. In many cases they, and their employees, even become frightened when statistical tools are discussed.Small companies also lack resources in the form of time and personnel. These organisations tend to have a lean organisation and therefore they find it difficult to appoint a facilitator or co-ordinator for the implementation process. In addition, they also have limited resources to provide internal training. Lack of resources in these aspects leads to a need for a careful analysis of which strategy to use when implementing statistical methods in order to succeed (Six Sigma Qualtec, 2002).

A review of Lean manufacturing indicate that itencompasses a wide range of managementpractices, including just-in-time, quality systems,work teams, supplier management, value streammapping, 5s, SMED, etc in an integrated system.Ettkinet al. (1990) found that most small enterpriseswho claimed to be using lean manufacturingactually did not adopt some of the majorcomponents of lean management system while Brown & Inman (1993) identified lack of topmanagement commitment, investment inspecialized equipment, education, training andlimited financial resources as

reasons for SMEsnot adopting the lean system. Furthermore, theneed for continual improvement and methodsinvolved in implementing Lean manufacturingrequire that the area needing improvement beselected followed by developing a theoreticalframework which creates an understanding of thelean philosophy.

However, Gunasekaran et al. (2000)contendsthat the manufacturing practices used to achieveexcellence in large-scale industries can besuccessfully implemented in SMEs for quality andproductivity improvement. However, despite allthe known contradiction and limitation faced bySMEs, Yeb-Yun Lin (1999) believed that a team orientedtool and method can be successful in a smallcompany. Nelder&Willcock (2000) furtherstressed that most SMEs usually consideropportunity that offer instant remedy to a widerange of problems. This means that smallenterprises are known to prefer short-term goals,benefits and strategy. These features of SMEsmake the sector an ideal target for improvementopportunities in business, production, andcooperation with large and other smallerenterprises.

Prajogo and Sohal (2003, 2004) contend that most previous empirical studies support the belief that quality management has a significant impact on a firm's success. The belief that quality impacts on performance is based on the assumption that most quality initiatives often lead to reductions in costs by means of process improvements. A study by Hendricks and Singhal (1997) based on a sample of 600 publicly traded companies that won quality awards either from their customers or through Baldrige and state and local award programmes, established that firms which had effectively implemented a TQM environment outperformed non-TQM firms on measures such as profitability.

A number of common issues have been identified by past studies as crucial for successful implementation of continuous quality improvement. These include production and work process control techniques, which include among others process design, the Just in time philosophy, the ISO 9000 norm (Evans and Lindsay, 2002). These are geared towards ensuring the correct functioning of such processes. The studies also identified behavioral aspects in management as crucial to successful quality management (Rahman, 2004).

Shrewd exploitation of customer perceptions of quality as well as effective transformation of these perceptions into product offerings constitutes the key to quality management. More precisely, quality improvement is never an end in itself. Until the quality improvement reflects in customers' improved perception of quality, quality improvement has not achieved its goal. Most quality programs often fall short on this account as they fail to integrate with the consumer so as to utilize consumer feedback as a key input in the improvement processes (Kordupleski*et al.*, 1993).

In their analysis of 400 certified firms,Terziovski et al. (2003) established that quality culture significantly affected business performance. They also established that theindividual factor found to contribute the most this item was customer focus. Rahman and Bullock (2005) examined quality management among manufacturing companies with the aid of regressionanalysis. They established that a number of quality management elements which include peoplemanagement, supplier relations, customer focus and shared vision significantly affected firmperformance.

Research on quality management has brought out significant relations between quality improvement and firm performance (Deming, 1982; Juran, 1982). Quality

improvementpractices have been found to positively impact on the firm's competitive position in terms of costs anddifferentiation. Quality is a pervasive concept that can be applied at all firm levels. This means that costs can then bereduced and levels of differentiation increased across the enterprise.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section gives a description of the design of the study, the population, sampling techniques, data collectionand data analysis procedure.

3.2 Research design:

Descriptive research design was adopted for the study. According to Donald and Pamela (2006), a descriptive study deals with the what, how and who of a phenomenon which is the concern for this study. This research design is therefore appropriate for this study since the objective is to examine the aspects of continuous improvement in the Manufacturing SMEs in Nairobi.

3.3 Target population:

The population of the study consisted of Manufacturing SMEs in Kariobangi, Nairobi. Kariobangi was selected in this study because it has a large concentration of light industries in Nairobi which are categorized as SME's by Kenya Bureau of Standards (Kebs). It also contains nearly all types of manufacturing companies which are represented in the stated population.

The population is estimated at 210 according toKebs records. The unit of study was SMEs and the respondents were surveillance and quality inspection officers in each of these companies.

3.4 Sampling and Sampling Procedure:

The study concentrated on SMEs in light industries in Kariobangi. Stratified random sampling technique was employed to select respondents. A random sample of 60 SMEs was drawn proportionately from the KEBS database. This sample represented 29% of the target population. Follow-up phone reminders will be made to each non-responding firm in an attempt to increase the response rate. All firms within the population operating in the manufacturing sector (textile, shoes, wood and furniture, electronics/electronic equipment, graphic arts and publications, food and machinery), having fewer than 250 employees will be considered qualified to be defined as SMEs (96/280/EC Directive).

The respondents werequality control managers ortop level executives where there is no quality control manager. The choice of quality control managers and top-level executives has been justified as they are likely to be heavily involved in the strategic decisions of the firms, particularly those related to implementation of Continuous Improvement. The sample frame is as shown in the table below.

Table 3.1: Sample frame

Category	Population	Sample
Foodstuff	37	11
Textile	11	3
Electronics	29	8
Machinery	27	8
Chemicals	17	5

Stationery	16	5
Furniture	9	3
Plastic ware	24	7
Assorted metallic items	21	6
Cutlery and crockery	19	5
	210	**60**

3.5 Data Collection

Primary data was used. A questionnaire was employed as the principal data collection instrument. It contained both structured and semi-structured questions. The respondents were assured about confidentiality of their feedback. A Likert scale with the range 1-5 was used. This was appropriate because it allows a participant to provide feedback that is slightly more expansive than a simple close-ended question, but that is much easier to quantify than a completely open-ended response (Cooper, 2009).

The questionnaires were administered from the SME premises or mailed depending on their convenience.

3.6 Data Analysis

Once the questionnaires were received, they were coded and checked for completeness. They were then entered into SPSS Version17. Multiple likert scale items were subjected to reliability test using Cronbach's alpha. Data analysis was done using descriptives (mean, standard deviation and frequencies). The section on challenges affecting implementation of business process improvement methods was subjected to a factor analysis to reduce the number of variables and identify the underlying factors. Results were then summarized and presented using tables.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of the data analysis conducted with the aid of SPSS and Excel. The chapter is organized as follows: It first presents the response rate then the respondent firm profiles. This is followed by analysis of awareness of business process improvement methods; followed by examination of level of application of each of the three methods. The chapter concludes with analysis of challenges facing implementation of business process improvements.

4.2 Background information

4.2.1 Response rate

The study targeted sixty (60) SMEs in the manufacturing sector. Out of these, only 47 managed to fill and return the questionnaires. This represents an overall response rateof 78%; each subsector yielded a response rate of at least 60% with majority of the sectors having more than 70% response rate. The responses were distributed by sector as shown below.

Table 4.1: Response rate

Sector	Desired sample	Achieved	Percent
Foodstuff	10	8	80%
Cutlery & crockery	3	3	100%
Textile	8	6	75%
Electronics	8	6	75%
Machinery	5	4	80%
Chemicals	5	3	60%
Stationery	3	3	100%
Furniture	7	5	71%
Plastic ware	6	5	83%
Assorted metallic items	5	4	80%
Total	**60**	**47**	**78%**

4.2.2 Number of employees

The study sought to determine how many permanent employees the respondent organizations retained. The table below shows the distribution.

Table 4.2: Distribution of employees among SMEs

Number of employees	Frequency	Percent
1 – 10	40	85.1
11 - 20	6	12.8
21 - 30	1	2.1
31 - 40	0	0
41 and over	0	0
Total	**47**	**100.0**

From table 4.2 above, an overwhelming majority of the firms (85.1%) had between 1 and 10 employees. This was followed by 12.8% who had between 11 and 20 employees. Only 2.1% of the firms retained 21 to 30 employees.

4.2.3 Length of operation

The survey further sought to determine how long the firms had been running their manufacturing concerns. The table below shows the results.

Table 4.3: Length of operation of the SMEs

	Frequency	Percent
1 - 3 years	7	14.9
4 - 7 years	20	42.6
8 - 10 years	10	21.3
Over 10 years	10	21.3
Total	**47**	**100.0**

From table 4.3 above, majority (42.6%) had been in operation for between 4-7 years. A cumulative percentage of 85.1% had been in existence for more than 3 years. This shows

that majority had passed the test of time since it has been established that most SMEs collapse within three years of being established (Ghobadian et al., 1997).

4.3 Awareness of business process improvement approaches

4.3.1 Reliability analysis

The survey sought to find the level of awareness of business process improvement approaches among the quality control managers of respondent firms. The respondents were required to rate their level of awareness on a five-point likert scale with 1 being very small extent and 5 being very great extent.Cronbach's alpha was used to test for reliability of the instrument. The results were as shown in the table below.

Table 4.4: Reliability analysis

	Cronbach's alpha
Six sigma	0.758
Benchmarking	0.852
Business process reengineering	0.748

From the table above, all the alpha coefficients were greater than 0.70. This indicates a high level of internal consistency among the three major items. A Cronbach's alpha above 0.7 is generally accepted as the threshold for reliability (Nunally, 1978).

4.3.2 Awareness levels

For purposes of interpretation, a mean rating between 1 and 2.5 is considered small extent; mean between 2.51 – 3.5 is considered moderate; while a mean ranging between 3.51 – 5.0 is considered great extent.

Descriptive statistics were computed for each of the three variables as shown in table 4.4 below.

Table 4.4: Mean ratings for levels of awareness

	Minimum	Maximum	Mean	Std. Deviation
Six Sigma				
Continuously improving processes by measuring defects	1.00	4.00	2.6206	.71846
Training of a section of staff to champion reduction of defects	1.00	4.00	2.5745	.65091
The Define-Measure -Analyze - Improve-Control cycle of business process	1.00	4.00	2.4106	.58504
Human & Process aspects of continuous improvement	1.00	5.00	2.7021	.88256
Grand mean			**2.5770**	
Benchmarking				
Benchmarks	1.00	4.00	2.9674	.85865
Use of internal standards to gauge performance	1.00	5.00	2.9587	.87201
Comparison of business process performance against best in class	1.00	4.00	3.1851	.77543
Adoption of best practices as a means of improving business processes	1.00	5.00	3.2979	.90686
Grand mean			**3.0798**	
Business process reengineering				
fundamental rethinking of business processes	1.00	4.00	1.9574	.72103
Radical redesign of business processes	1.00	5.00	1.9574	1.04168
questioning fundamental assumptions of the process	1.00	4.00	2.8723	.94678
Focus on what should be, rather than what is	1.00	5.00	2.1064	1.08816
Grand mean			**2.2234**	

From table 4.4 above, it was established that among the three business process improvement approaches examined, six sigma and benchmarking were understood to a moderate extent (mean ratings between 2.51 and 3.5) with Benchmarking being the most widely understood (mean = 3.07). Business process reengineering was least understood by respondents (mean 2.22<2.51). This demonstrates that the level of awareness of the various improvement methods is average among SMEs. This supports Andrews' (2004)

finding which indicated absence of sufficient theoretical knowledge among MSMEs to support implementation of quality management processes. However, AIM (2010) suggests that where a firm lacks internal expertise, and if its resources allow, it can used external expertise and support in its quality control systems. Thus, while the present results indicate just about average level of awareness of quality improvement approaches, all is not lost for SMEs which have discovered value in quality.

4.4 Application of Business Process Improvement methods among SMEs

4.4.1 Applicability of methods

The study sought to establish the opinions of the respondents on the applicability of the three business process improvement approaches. All (100%) of the respondents believed that at least one of the three approaches was applicable to SMEs.

4.4.2 Ease of understanding

The study sought to examine the ease with which employees could understand each of the three approaches. The results were as shown in the table below:

Table 4.5: Ease of understanding of business process improvement approaches

	Yes	No
Six sigma	30%	70%
Benchmarking	89%	11%
Business process reengineering	19%	81%

From the table above, an overwhelming majority (89%) found benchmarking to be the easiest for employees to learn and use. On the other hand, majority (81%) stated that business process reengineering was not easy to learn and use. Similarly, majority (70%) stated that six sigma was also not easy to learn and use. Thus benchmarking stands out as the only approach which the respondents felt was easy to understand. It is to be noted that

benchmarking does not involve complex mathematical computations as done in six sigma and may be much cheaper especially when internal benchmarking is used. This is of use therefore renders benchmarking much more preferable than the more complex time-consuming alternatives.This supports Husband's et al., (1999) finding that SMEs tend to prefer quality improvement that are not very technical and less costly.

4.4.3 Extent of application of BPI approaches

The study also sought to establish the extent to which the three business process improvement approaches had been implemented by respondent firms. The table below shows the results.

Table 4.6: Extent of implementation of BPI approaches

	Minimum	Maximum	Mean	Std. Deviation
Six Sigma				
Continuously improving processes by measuring defects	1.00	4.00	2.5206	.71846
Training of a section of staff to champion reduction of defects	1.00	4.00	2.5745	.65091
The Define-Measure -Analyze - Improve-Control cycle of business process	1.00	4.00	2.5106	.58504
Human & Process aspects of continuous improvement	1.00	5.00	2.7021	.88256
Grand mean			**2.5770**	
Benchmarking				
Benchmarks	1.00	4.00	2.9574	.85865
Use of internal standards to gauge performance	1.00	5.00	2.9787	.87201
Comparison of business process performance against best in class	1.00	4.00	3.0851	.77543
Adoption of best practices as a means of improving business processes	1.00	5.00	3.2979	.90686
Grand mean			**3.0798**	
Business process reengineering				
fundamental rethinking of business processes	1.00	4.00	1.8471	.72103
Radical redesign of business processes	1.00	5.00	1.9676	1.04168
questioning fundamental assumptions of the process	1.00	4.00	2.9723	.94678
Focus on what should be, rather than what is	1.00	5.00	2.1064	1.08816
Grand mean			**2.2234**	

From table 4.6 above, it was established that benchmarking has been implemented to a moderate extent (mean 3.08) as well as six sigma (mean 2.58). Business Process Reengineering has been implemented to a small extent (mean 2.22). It is important to note that SMEs seem to prefer benchmarking especially adoption of already laid out best practices due to ease of implementation. Besides this, it is worth noting, as Ettkin (1993) does, that partial implementation of improvement programs may not yield much results since the simpler sections are often implemented leaving out the core aspects of the improvement approach. Thus as Terziovski et al. (2003) states, business improvement processes need to be woven into the organizational culture so that the efforts are sustained and implemented to the later.

4.4.4 Comparative levels of implementation of BPI approaches in different sub-sectors

The study sought to examine whether there was a difference in levels of implementation between the different manufacturing sub-sectors. A chi-square test was performed to determine whether there was any significant difference in the levels of implementation of the BPI approaches by the different subsectors. The results were as shown in the table below.

Table 4.7: Chi square test results for implementation of BPI approaches in different sub-sectors

Approach	Chi-square test p-value
Six sigma	0.250
Benchmarking	0.382
Business process re-engineering	0.582

From the above table, none of the approaches showed any reliance on subsector (P-value>0.05). Thus it was concluded that implementation level was not dependent on the various subsectors. This conforms to AIM (2010) where differences in implementation levels of BPI were not found to be dependent on sector. AIM (2010) found that organizational readiness which include elements such as having a process view, developing a culture focused on improvement and, an understanding of the customer and the 'value' within the organisationconstituted the major determinants.

4.5 Challenges of implementation of BPI approaches

The study sought to determine the challenges that SMEs face when implementing business process improvement approaches. 17 likert scale items were used to evaluate the challenges. All the items were negatively framed statements for which the respondent was to indicate their level of agreement. The data was subjected to factor analysis with varimax rotation so as to reduce the number of variables. The analysis yielded four components as shown in the table below:

Table 4.8: Factor analysis

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
Top management rarely utilizes symbolic acts to underscore the importance of continuous improvement in the minds of all employees	.939			
A culture that encourages and rewards continuous process improvement is not in place	.939			
Managers seldom demonstrate constancy of purpose	.913			
Frontline employees are not empowered to make decisions	.948			
Employees are not sufficiently trained in all areas being focused for continuous improvement	.933			
There is no fair reward and recognition scheme is in place	.921			
All employees in the organization do not know how their jobs affect the total satisfaction of both internal and external customers		.803		
Perceptions of service quality are not properly aligned throughout the firm		.853		
Top management has no shared vision of how to organize and manage for change		.830		
Top management does not foster consensus for the continuous improvement vision, supplies competence to enact it, and provides cohesion to move it along.		.890		
Incentive and pay structures for motivating behavior and performance under continuous process improvement systems are not purposely designed to encourage group team-building behavior and performance			.974	
There is no sufficient funding set aside for process improvement under quality management			.917	
Funds are rarely provided for training employees on quality management			.943	
Quality management is not placed as atop item in the annual budget of the firm			.852	
There is little employee involvement in all aspects of continuous improvement				.770
Employee involvement is not voluntary, collaborative, and non-threatening				.743
Employee involvement is never objective, relaxed, dynamic, flexible, and allow ample opportunities for creativity.				.877

Four components were extracted. These included poor leadership and inadequate top management support, absence of proper embedded culture, inadequate employee involvement in quality processes and insufficient funding for quality management. The four factors map quite well to Husband etals' dimensions. Husband and Mandal (1999) identified the uniqueness of an SME's manufacturing operations as being a limiting factor to quality enhancement implementation and provided a series of dimensions that are unique to SMEs. These dimensions include: SME core dimensions, structural dimensions, fundamental dimensions, sustainability dimensions, integrative dimensions and external dimensions. Furthermore, Deleryd et al. (1999) identify that SMEs need to make decisions and improve their processes based on accurate and timely information relating to the performance of their manufacturing process. The studies suggest a lack of application of statistical theory to identify and solve problems within a manufacturing context. The descriptives for each of the components highlighted above are as shown below.

Table 4.9: Descriptive statistics – challenges in implementation of BPI approaches

	Minimum	Maximum	Mean	Std. Deviation
Poor Leadership and inadequate top management support				
All employees in the organization do not know how their jobs affect the total satisfaction of both internal and external customers	1.00	5.00	2.1489	1.04213
Perceptions of service quality are not properly aligned throughout the firm	1.00	5.00	2.1702	1.02828
Top management has no shared vision of how to organize and manage for change	1.00	5.00	2.2766	1.05711
Grand mean			**2.1986**	
Absence of proper embedded quality culture				
Top management does not foster consensus for the continuous improvement vision, supplies competence to enact it, and provides cohesion to move it along.	1.00	5.00	2.1702	1.06972
Top management rarely utilizes symbolic acts to underscore the importance of continuous improvement in the minds of all employees	1.00	4.00	1.9362	.73438
A culture that encourages and rewards continuous process improvement is not in place	1.00	4.00	1.9787	.73690
Managers seldom demonstrate constancy of purpose	1.00	5.00	2.0851	.90481
Frontline employees are not empowered to make decisions	1.00	4.00	1.9787	.76583
Employees are not sufficiently trained in all areas being focused for continuous improvement	1.00	4.00	2.0426	.83295
There is no fair reward and recognition scheme is in place	1.00	5.00	2.0638	.89453
Grand mean			**2.0365**	
Inadequate employee involvement in quality processes				
There is little employee involvement in all aspects of continuous improvement	1.00	5.00	2.4468	1.07962
Employee involvement is not voluntary, collaborative, and non-threatening	1.00	5.00	2.4468	1.09958
Employee involvement is never objective, relaxed, dynamic, flexible, and allow ample opportunities for creativity.	1.00	4.00	2.5106	1.10084
Grand mean			**2.4681**	
Insufficient funding for quality management				
Incentive and pay structures for motivating behavior and performance under continuous process improvement systems are not purposely designed to encourage group team-building behavior and performance	1.00	4.00	2.8723	.89969
There is no sufficient funding set aside for process improvement under quality management	1.00	4.00	2.8085	.82458
Funds are rarely provided for training employees on quality management	1.00	5.00	3.1049	.90481
Quality management is not placed as atop item in the annual budget of the firm	1.00	5.00	2.7185	.94727
Grand mean			**2.8511**	

From the table above, it was found that Poor Leadership and inadequate top management support (mean = 2.2); Absence of proper embedded quality culture (Mean = 2.0); and Inadequate employee involvement in quality processes (mean = 2.5) all applied to a small extent (mean range lie between 1.0 and 2.5). On the other hand insufficient funding for quality management was found to apply to a moderate extent (mean = 2.9). Thus insufficient funding for quality processes emerged to be the top most challenge facing SMEs followed by inadequate employee involvement. These findings correspond with those of Brown& Inman (1993) who identified lack of top management commitment, absence of investment in specialized equipment, education, training and limited financial resources as reasons for SMEs not adopting the lean system.Other studies have also noted that other quality management initiatives for instance total quality management (TQM), which is considered more holistic, also appear to show signs of low implementation rates due poor management and focus on short and medium term results as opposed to the long-term goals (Ghobadian and Gallear, 1996; Van der Weileet al., 1998).

The SMEs may not set aside sufficient funding for quality management because of the time it takes to realize gains. However, this is ill informed since past studies have demonstrated that sustained implementation of process improvement leads to improved performance in the long-term. Hendricks and Singhal (1997) based on a sample of 600 publicly traded companies that won quality awards either from their customers or through Baldrige and state and local award programmes, established that firms which had effectively implemented a TQM environment outperformed non-TQM firms on measures such as profitability.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, conclusions and recommendations.

5.2 Summary of findings

The study sought to measure awareness of improvement approaches among SMEs, check the extent of implementation of each approach among the SMEs, and to establish the challenges of improving through the approaches.

Regarding awareness levels of the various BPI approaches, it was established that the SMEs do not fully understand the three methods presented to them. Benchmarking was found to be the most understood BPI approach, perhaps because it does not involve very complicated steps unlike the other two. Six sigma, though expected to be most preferable in the manufacturing sector, was found to be understood to a small extent. Business Process Reengineering seems to be a foreign concept among the SMEs as most of them rated their awareness to be low.

Though all the SMEs admitted that one or more of the approaches under examination were applicable to them, none had implemented any to a great extent. The most preferred, benchmarking was found to have been implemented to a moderate extent. Both Six sigma and BPR had been implemented to a small extent.

Four challenges were identified has hindering the implementation of business process improvement. These included: Poor Leadership and inadequate top management support,

absence of proper embedded quality culture and inadequate employee involvement in quality processes all of which applied to a small extent. The greatest challenge emerged to be insufficient funding for quality managementwhich was found to apply to a moderate extent

5.3 Conclusions

From the findings it can be concluded that:

There exists a huge knowledge gap on business process improvement approaches among SMEs in the manufacturing sector in Kenya. This knowledge gap is more pronounced in the more technical approaches like six sigma and business process reengineering.

Manufacturing SMEs in Kenya have not fully implemented business process improvement approaches with most favoring the easy to implement aspects of processes thus ending up with a mix of poorly implemented quality improvement strategies. As past studies have observed, many SMEs tend to adopt strategies that yield results in the short term. This explains the poor uptake of Six sigma which is an iterative process requiring concerted sustained effort to continue minimizing defects until acceptable levels are reached.

The greatest hindrance to adoption and implementation of business process improvement approaches is the inadequate funding availed for the various quality management processes. The second challenge is the failure to incorporate employees in quality planning. This eventually leads to lack of ownership of strategies, and, coupled with

absence of a proper compensation scheme that reinforces the value of quality, the strategies end upbearing little fruit.

5.4 Recommendations

From the conclusions above the following recommendations were arrived at.

5.4.1 Policy recommendations

To address the knowledge gap that exists on BPI approaches, the government in conjunction with colleges should devise appropriate short courses that address business process improvement approaches. This courses should be subsidized to increase uptake since most SMEs have limited resources and may shy away if they deem the fees too high.

SMEs should recognize the importance of continuous improvement and assign adequate resources for the same. Every SME should base their quality policies on a proper cost-benefit analysis that examines the best strategies that can be conclusively implemented within available resource limits.

5.4.2 Limitations and Recommendations for further study

The study made no attempt to examine the impact of BPI implementation levels on firm performance. Future studies should consider expanding the study to examine how implementation of specific approaches of BPI influences performance.

The study was confined to manufacturing SMEs in Kariobangi, Nairobi alone. Thus there is need to expand the study to cover other parts of the country.

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APPENDIX I: QUESTIONNAIRE.

This questionnaire is meant to collect information on process improvement techniques among manufacturing SMEs in Kenya. This information is being sought solely for academic purposes and will be treated with strict confidence. Kindly answer the questions by writing a brief statement or ticking the boxes provided as will be applicable.

SECTION 1: BACKGROUND INFORMATION

1. Which type of commodities do you manufacture?
   - i) Foodstuff [ ]
   - ii) Textile [ ]
   - iii) Electronics [ ]
   - iv) Machinery [ ]
   - v) Chemicals [ ]
   - vi) Stationery [ ]
   - vii) Furniture [ ]
   - viii) Plastic ware [ ]
   - ix) Assorted metallic items [ ]
   - x) Cutlery and crockery [ ]
   - xi) Other Specify_____
2. How many employees do you have in your company?
   - i) 1 - 10 [ ]
   - ii) 11 - 20 [ ]
   - iii) 21 - 30 [ ]
   - iv) 31 – 40 [ ]
   - v) 41 and above
   - vi) Other (specify)_____
3. How long have you been in the manufacturing business (years)?
   - i) Below 1 year [ ]
   - ii) 1-3 years [ ]
   - iii) 4-7 years [ ]

iv) 8 – 10 years [ ]

v) Above 10 years [ ]

4. What is your current capital level? .....

5. What is your average annual sales for the last two years .....

SECTION 2: AWAENESS OF PROCESS IMPROVEMENT APPROACHES

6. To what extent do you understand the following aspects of process improvement approaches? Give your ratings in the scale of 1-5 (Where 1 = Very small extent 2 = Small extent 3 = Moderate extent 4 = Great extent 5 = Very great extent)

	Respondent's rating				
	1	2	3	4	5
Six sigma					
Continuously improving processes by measuring defects					
Training of a section of staff to champion reduction of defects					
The Define-Measure -Analyze - Improve-Control cycle of business process					
Human & Process aspects of continuous improvement					
Benchmarking					
Benchmarks					
Use of internal standards to gauge performance					
Comparison of business process performance against best in class					
Adoption of best practices as a means of improving business processes					
Business Process Reengineering					
fundamental rethinking of business processes					
Radical redesign of business processes					
questioning fundamental assumptions of the process					
Focus on what should be, rather than what is					

7. Do you believe the above approaches are applicable to manufacturing SMEs?

Yes [ ] No [ ]

If No, Please explain .....

.....

8. Which of the four stated approaches (whose aspects are as shown in 6 above) do you believe employees in your firm can easily understand and use?

		Yes	No
1	Six sigma		
2	Benchmarking		
3	Business Process Reengineering		

SECTION 3: IMPLEMENTATION OF PROCESS IMPROVEMENT APPROACHES

9. Have you adopted any of the stated techniques towards process improvement of your systems and processes?

   Yes [ ] No [ ]

10. To what extent have you implemented the following process improvement approaches in your firm?Give your ratings in the scale of 0-5 (Where1 = Very small extent 2 = Small extent 3 = Moderate extent 4 = Great extent 5 = Very great extent)

	Respondent's rating				
	1	2	3	4	5
Six sigma					
Continuously improving processes by measuring defects					
Training of a section of staff to champion reduction of defects					
Process changes are done based on the number of defects					
Increased focus of human & Process aspects of continuous improvement					
Benchmarking					
Define benchmarking objectives					
Identify organizations to benchmark with					
Collect information and compare against existing processes					
Make continuous improvement on processes based on benchmarking gaps					
Business Process Reengineering					

Fundamental rethinking of business processes					
Radical redesign of business processes					
Questioning fundamental assumptions of the process					
Focus on what should be, rather than what is					

11. Other than the process improvement approaches listed, which other approaches are used by your firm to manage quality?

.....

.....

SECTION 4: CHALLENGES IN THE IMPLEMENTATION OF PROCESSS IMPROVEMENT

12. What problems do you experience in the implementation of process improvement to your systems and processes?

.....

.....

13. To what extent do you agree with the following statements concerning implementation of Process Improvement in your firm? Give your ratings in the scale of 1-5 (Where 1 = Strongly disagree 2 = Relatively disagree 3 = Disagree 4 = Agree 5 = Strongly Agree)

	Respondent's rating				
	1	2	3	4	5
1. All employees in the organization do not know how their jobs affect the total satisfaction of both internal and external customers					
2. Perceptions of service quality are not properly aligned throughout the firm					
3. Top management has no shared vision of how to organize and manage for change					

	Respondent's rating				
	1	2	3	4	5
4. Top management does not foster consensus for the continuous improvement vision, supplies competence to enact it, and provides cohesion to move it along.					
5. Top management rarely utilizes symbolic acts to underscore the importance of continuous improvement in the minds of all employees					
6. A culture that encourages and rewards continuous process improvement is not in place					
7. Managers seldom demonstrate constancy of purpose					
8. Frontline employees are not empowered to make decisions					
9. Employees are not sufficiently trained in all areas being focused for continuous improvement					
10. There is no fair reward and recognition scheme is in place					
11. There is little employee involvement in all aspects of continuous improvement					
12. Employee involvement is not voluntary, collaborative, and non-threatening					
13. Employee involvement is never objective, relaxed, dynamic, flexible, and allow ample opportunities for creativity.					
14. Incentive and pay structures for motivating behavior and performance under continuous process improvement systems are not purposely designed to encourage group team-building behavior and performance					
15. There is no sufficient funding set aside for process improvement under quality management					
16. Funds are rarely provided for training employees on quality management					

	Respondent's rating				
	1	2	3	4	5
17. Quality management is not placed as atop item in the annual budget of the firm					
18. Which other factor do you think affects the effectiveness of process improvement strategies in manufacturing firms? Please state					