EFFECTS OF KAIZEN TOOL ON ORGANIZATION EFFECTIVENESS: A CASE OF DAVIS&SHIRTLIFF LTD.

BY

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A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMNTS FOR THE AWARD OF THE DEGREE OF MASTERS OF ARTS IN PROJECT PLANNING AND MANAGEMENT OF THE UNIVERSITY OF NAIROBI

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DECLARATION

This research project report is my original work and has not been presented for a degree award or any other award in any other university.

Signature…….. Date…….

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Reg. L50/68702/2011

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

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DEDICATION

This research project report is dedicated to my dear wife Florence Wanjiku and my daughter Esther Wanjiru for their continued support during this academic journey.

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I would like to highly appreciate the guidance given to me by my supervisor Professor Christopher Gakuu. It is through his guidance and advice that this research project has been made possible. I cannot forget to appreciate all my lecturers in this Masters program. I would also like to appreciate the University of Nairobi and the department of Extra-Mural Studies for giving me a chance to advance my education, and facilitating this important part of the academic journey. To my fellow students who I cannot mention here by name due to their number; thank you for your continued support and encouragement. Finally, I would like to acknowledge the Davis &Shirtliff Ltd., for allowing me to carry this study at their organization

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ABREVIATIONS AND ACRONYMS

CVF -Conflicting Value Framework

JAICA -Japanese International Co-operation Agency

JIT -Just in Time

KAM -Kenya Association of Manufacturers

TPM -Total Productive Maintenance

WIP -Work in Progress

ABSTRACT

Increased competition calls for organizations to device ways of improving their competitiveness in the ever-changing global market. One of the ways that organization can improve its competitiveness is by improving effectiveness of its systems. Kaizen which originated in Japan in 1950's is one of means that has been used widely especially in Asia, to improve elements associated with organization effectiveness, with benefits already well documented. This study assessed the extent to which kaizen systems namely Strategic Management system, quality circle, Just-In-Time and Total Productive Maintenance had contributed to organization effectiveness at Davis &Shirtliff Ltd. The study was carried out within Manufacturing Department that had been practicing Kaizen for two years and Services Department that had not been practicing Kaizen, both of Davis & Shirtliff Ltd. The study was intended to contribute to existing knowledge on kaizen and organization effectiveness and also help management of the organization to see whether kaizen was achieving the intended objectives. Various approaches for measuring organization effectiveness have been developed by scholars, but this study used the Conflicting Value Framework which is the most popular. This study used research questions. Literature review covered all independent variables and dependent variable both empirical and theoretical. The study used the quantitative approach and Causal-comparative design also known as ex post facto and had two groups, the group practicing kaizen, which was Manufacturing Department, and a comparison group not practicing kaizen, which was the Services Department. Data came from primary and secondary sources. Primary data was collected using questionnaire while secondary data will came from departmental monthly reports covering all months of two years before kaizen and two years after Kaizen. The primary data was analyzed using descriptive statistics and spearman rank order correlation; while the secondary information was analyzed using two-tail t-test at 95% confidence level. The research realized an 88% response rate from respondents who were given questionnaire. Overall, the research found a very high presence of independent variables indicators and very high knowledge levels of kaizen and Kaizen systems. On extent to which Quality circle had affected organization effectiveness, the study realized that despite respondents rating it highly, analysis of secondary data did not support the opinions of the respondents. On extent to which Strategic Management system had system had affected organization effectiveness, the respondents rated it very highly but analysis of secondary data did not support the opinions of the respondents. On the extent to which Just-in-Time had affected organization effectiveness, the respondents rated it very highly but analysis of secondary data did not support the opinions of the respondents. On extent to which Total Productive Maintenance had affected organization effectiveness, the study realized that despite respondents rating it highly, analysis of secondary data did not support the opinions of the respondents. On Kaizen Tool as a whole, the respondents felt it had helped significantly in improving manufacturing department's effectiveness. On comparing Manufacturing and service department on cost, work in progress and productivity, the study found out that, cost did not have statistically significant drop for manufacturing department, but showed a significant drop for service department. On comparing work in progress, manufacturing both departments recorded a statistically significant drop in work in progress for period after kaizen implementation. There was no evidence that Kaizen had an effect on productivity from secondary data, though the respondents were of the opinion that kaizen systems had helped improve productivity.

CHAPTER ONE
INTRODUCTION

1.1. Background to the study

This chapter covers background of the study, Statement of the Problem, Purpose of the Study, Objectives of the Study, Research Question, Significance of the Study, Limitations of the Study, Delimitation of the Study, Assumptions of the Study, Definition of Significant Terms and Organization of the Study

Many organizations are craving to be effective entities to enable them compete effectively in the ever changing Global market. Due to globalization, organizations can no longer purport to be competing locally; they must strive to be in the same league with world best if they are to survive. Continuous improvement is an essential requirement for sustaining and gaining a competitive advantage for any organizations. One such technique that aims at improving the effectiveness, productivity and safety while reducing waste, is Kaizen (Joshi, 2013). Kaizen in Japanese means improvement ("kai" –change, "zen" – good) (Kosieradzka, Kakol, & Krupa, 2011). The word can therefore be said to mean change for the better. It implies improvement that involves everyone both managers and workers and entails relatively little expense. The kaizen philosophy assumes that our way of life be it our working life, our social life, or our home life should focus on constant improvement efforts (Imai, 1997).

Kaizen fosters process oriented thinking, since processes must be improved for results to improve. Failure to achieve planned results indicates a failure in the process. Kaizen is also human effort focused a sharp contrast to the west management which is result focused. Kaizen strategies have failed in many companies simply because they ignored process and lack of commitment and involvement of top management (Imai, 1997). By being process and human effort focused concept, Kaizen can be said to be a holistic way of looking at operations in an organization.

Kaizen originated in Japan in 1950 when the management and government acknowledge that there was a problem in the current confrontational management system and a pending labor

shortage (Singh & Singh, 2009). This was also driven by need for Japan to improve quality of their products, which during this time were regarded as of low quality, and need to reinvigorate its industrial base in order to catch up with the United States in the global market place (Desta, 2011). However according to Ghicajanu (2011) despite its development starting 1950 in Japan, the concept has come to be known as a new discipline of management in the last two decades of the last century, and registered as a trademark in the United States in 1986, following publication of the book *Kaizen: The Key To Japan's Competitive Success* by professor Masaaki Imai of Japan, which was then translated into over 20 languages and published in over 30 countries

Kaizen has now been widely adopted in other countries outside Japan. Through JICA, Japan conducted first kaizen extension program in Singapore for productivity management and it was very successful. Building on the success of this cooperative effort, the Singapore productivity and standard board has subsequently grown to become a major organization with external training programs in other countries and regions, including the Southern African Development Community (SADC) under partnership arrangements with JICA (Desta, 2011) and (Ohno, et al., 2009). In India, kaizen has been extensively applied in industrial sector. Sharma (2012), cites 40 organizations in what he says are just a few that are applying kaizen in India. In America, companies have not been left behind in embracing Kaizen. As noted by Imai (1997) companies like Walt Disney and Sunclipse have applied Kaizen to improve their competitiveness.

In Africa, Kaizen has become a global activity spread by multinational companies and their employees. It has become popular not only in the manufacturing sector but also in the service sector. However, proliferation of Kaizen in Africa is still very small due to the limited number of players who bring in the practice (Ohno, et al., 2009). A study carried by Charles & Chucks (2012) in 27 organizations manufacturing automotive components in eastern cape of south Africa, showed that 25 of these organization practiced kaizen and the study showed that kaizen contributed to organization competitiveness in these organization. Faced with challenges of globalization, a number of Ethiopian firms have been instructed by Ethiopia's ministry of industry to launch a pilot project using the Kaizen management system, in order to internationalize and accomplish the following three objectives. First, to formulate a national plan to enhance both quality and productivity in the industrial sector; second, to produce a manual for

explaining and guiding these activities; third, to transfer relevant skills and techniques to the staff members of the Ethiopia's Kaizen unit (Desta, 2011). It is clear that Kaizen has been accepted as a powerful tool in improving organization holistic performance.

In Kenya, some leading multinational companies operating in Kenya introduced the concept of Kaizen, and they include Toyota East Africa Ltd. and GlaxoSmithKline Kenya ltd. Furthermore, the Kenya Association of Manufacturers (KAM), which has approximately 600 members, has been actively involved in organizing seminars and training to upgrade the capacity of its members. KAM has collaborated with the Kaizen Institute in Mauritius since 2005 and has been inviting experts for seminars and consultations. Because of publicity gained through newspaper articles presented by KAM, kaizen is relatively well recognized in Kenya (Ohno, et al., 2009).As for public initiatives, the Productivity Centre of Kenya (PCK) has organized seminars and provided consultations to model manufactures, in addition to governmental and service institutions (Ohno, et al., 2009).

However according to Ohno, et al. (2009) in spite of the presence of some kaizen activities in Kenya, there are some challenges. Firstly, the beneficiaries of KAM's kaizen activities are so far limited to relatively well-established enterprises, and the majority of manufactures are still not aware of the actual methodology. Secondly, the mandate of PCK does not focus on the manufacturing sector. Therefore, the spread of kaizen activities to manufacturers through the channel of PCK may be slow. Yet, the ministry of industrialization as well as its agencies, which are the key public institutions for the manufacturing sector, are yet to be conversant with the kaizen methodology and cannot guide local manufacturer.

In 2008 KAM reported that Kaizen interventions have often resulted in 50-70% reductions in throughput time, 50-100% increases in productivity, 20-40% savings in manufacturing costs, 40-60% reductions in quality errors, and 50% releases of space, as well as significant improvements in team spirit and morale (Ohno, et al., 2009). All these can easily be looked at from perspective of organization effectiveness. However, despite having these generalized outcome of Kaizen outcome in Kenya, literature on individual firm performance against the measures stated above is very scanty

According to Imai(1997) and Titu, Oprean, & Grecu (2010), there are several kaizen systems that must be put in place in order to achieve kaizen strategy. They are total quality control/total quality management, Just-in-Tim system (JIT), Total Productive Maintenance (TPM), Policy Deployment, a Strategic Management System, and Small groups Activities also known as Quality Circle. This research project will investigate how JIT System, TPM System, Strategic Management System and Quality Circle System help in promoting organization effectiveness.

Organization effectiveness according to Richard, Devinney, George, & Johnson (2009), captures organizational performance plus the plethora of internal performance outcomes, normally associated with more efficient or effective operations and other external measures that relate to considerations that are broader than those simply associated with economic valuation. An examination into effectiveness is to evaluate how well an organization is doing in relation to some set standards. (Nwadukwe & Timinepere, 2012). Therefore, it does not mean an organization that is performing well financially is effective.

Evaluating the effectiveness of organizations requires selecting the appropriate criteria. Unfortunately, researchers have not yet agreed on the most appropriate criteria for making evaluations of effectiveness (Love & Skitmore, 1996). Several models have been put forwards that can be used for evaluating organization effectiveness. However, according to a study carried out by Venkataiah (1993), the Competing Values Framework is the most viable model for measuring organizational effectiveness. The framework has been identified as one of the 40 most important frameworks in the history of business (Cameron K. , 2011).

The Competing Values Framework has four arms through which organization effectiveness can be evaluated. These according to Venkataiah (1993) are (i) Human relation model which sees discussion, openness, and participation as means to achieve Morale and commitment (ii) Internal process model which sees measurements, documentation and information management as a method to achieve stability, control and continuity.(iii) The open system model which relates innovation and adaptation as a path towards external recognition, support and growth (iv) The

rational goal model which seeks productivity and profit through direction and goals. This study will utilize the Competing Value Framework

1.2. Statement of the problem

Early management thinkers believe that effectiveness is the ultimate measure of managerial and organizational performance. Drucker in his own words Said: "Only executive effectiveness can enable this society of ours to harmonize its two needs: the needs of organization to obtain from the individual, the contribution it needs and the need of the individual to have organization serve as his tool for accomplishing his purposes " (Oghojafor, Muo, & Aduloju, 2012). If Kenyan organizations are to be able to compete globally, then they have to match the best in organizational effectiveness globally. It also means that for this country to industrialize, it has to align itself to the best industrial management practices that are driving the leading and upcoming industrial nations like Japan and India. One such management practice that has been very successful in these two countries, but not widely practiced in Kenya is Kaizen.

Davis and Shirtliff Ltd introduced Kaizen in its manufacturing department in the year 2011, with an objective of improving systems effectiveness and therefore enhance organization performance. The management was concerned that work in progress was quite high, going as high as 50% of the month's revenue, and cost of production significantly high. The management was also keen to be able to improve productivity. With these challenges and having heard of great benefits other companies in Kenya like Unga Ltd and Bidco Ltd had reaped from implementing Kaizen, Director of Technical Department at Davis &Shirtliff Ltd., under which manufacturing department falls attended Kaizen trainings organized by Kenya Association of Manufacturers, and subsequently introduced Kaizen at Davis & Shirtliff Ltd Manufacturing Department through rigorous training from experts. However, two years down the line no study had been carried out to determine whether the intervention was achieving the intended objectives. This study therefore sought to assess the extent to which Kaizen systems had an effect on organization effectiveness at Davis &Shirtliff Ltd Manufacturing Department. The study was intended to help the organization make a decision on whether to roll out the concept to other department, and be learning case for other Kenyan organizations that may wish to embrace the concept.

1.3. Purpose of the study

The purpose of this study was to assess the effect of Kaizen Tool on Organization effectiveness at Davis &Shirtliff Ltd Manufacturing department.

1.4. Objectives of the study

The objectives of this study were:

i. To evaluate the effect of Kaizen's Just in Time (JIT) system on Organization effectiveness at Davis & Shirtliff Ltd
ii. To assess the effect of Kaizen's Strategic management system on organization effectiveness at Davis & Shirtliff Ltd.
iii. To evaluate the effect of Kaizen's Quality Circle on organization effectiveness at Davis &Shirtliff Ltd.
iv. To assess the effect of Kaizen's Total Productive maintenance System on organization effectiveness at Davis &Shirtliff Ltd.

1.5. Research questions

The research questions that guided this study were:

i. What is the effect of Kaizen's Just-In-Time system on Organization effectiveness at Davis & Shirtliff Ltd.?
ii. What is the effect of Kaizen's Strategic management system on Organization effectiveness at Davis & Shirtliff Ltd.?
iii. What is the effect of Kaizen's Quality Circle on Organization effectiveness at Davis & Shirtliff Ltd.?
iv. What is the effect of Kaizen's Total Productive maintenance on Organization Effectiveness at Davis &Shirtliff Ltd.?

1.6. Significance of the Study

Kaizen is not widely practiced in Kenya despite its already well-published benefits in many Asian industrial giants like Singapore, Japan and India, where the concept is widely practiced. This study is therefore intended to contribute to knowledge that exists on Kaizen and organization effectiveness in Kenya's perspective. It will also be very important to management

and staff at Davis & Shirtliff Ltd., as it provided the first comprehensive evaluation on what Kaizen had achieved towards improving organization effectiveness.

1.7. Limitations of the Study

The limitation to this study was that there was no baseline study that was carried out before Kaizen was introduced. To overcome this, the questionnaire was designed in a way that made respondents to try to remember how the situation was before. The study design selected was also intended to mitigate against this limitation.

1.8. Delimitation of the study

This study was carried out at Davis &Shirtliff Limited. It was carried out within Manufacturing and Services departments of the organization. Manufacturing department had been practicing Kaizen for two year while the Services department had not been practicing Kaizen. The study covered four Kaizen Systems, which are: Just-In-Time, Quality Circle, Strategic Management System and Total Productive Maintenance.

1.9. Assumptions of the Study

This study had two assumptions. The first one was that the respondent would answer all the questions and answer them truthfully and to the best of their knowledge, and the second one was that the data in organizations records was accurate

1.10. Definition of Significant Terms

Some of the key terms used in this study are defined here;

Just-in Time (JIT): A System whose primary goal of continuously reducing and ultimately eliminating all forms of waste with a focus on minimizing raw material, work-in-process, and finished goods inventory with a view to cutting inventory costs and also helping to expose other more serious inefficiencies in the manufacturing cycle

Kaizen Tool: Kaizen in Japanese means improvement (“kai” –change, “zen” – good) the word can therefore be said to mean change for the better. It implies improvement that involves everyone both managers and workers and entails relatively little expense

Organization effectiveness: Organization effectiveness captures organizational performance plus the plethora of internal performance outcomes, normally associated with more efficient or effective operations and other external measures that relate to considerations that are broader than those that are simply associated with economic valuation

Quality Circle: Quality Circle Small group of employees from all levels of the existing hierarchical structure within an organization voluntarily involved in the process of identifying, analyzing and formulating solutions to various technical, manual and automation related problems encountered in daily work life.

Strategic management: This is a system through which employees are encouraged to suggest better ways of doing things within an organization

Total Productive maintenance (TPM): TPM is an innovative approach to maintenance that optimizes equipment effectiveness, eliminates breakdowns, and promotes autonomous maintenance by operators through day-to-day activities involving the total workforce**.**

1.11. Organization of the study

This research was organized into five Chapters. Chapter one which is the Introduction to the study and encompasses; Background to the Study, Statement of the Study, Purpose of the study, Objective of the Study, Research Questions, Significant of the study, Limitation of the Study, Delimitation of the Study, Assumptions of the Study, Definition of the Significant terms to be used in this study and Organization of the Study. Chapter two reviewed necessary literature for independent and independent variables and their indicators, and also developed the conceptual framework. Chapter Three covered the research design, sampling data collection instrument, and method of data analysis used in the study. Chapter Four covered; Data analysis and findings, interpretation and presentation. Chapter five covered; summary of findings, conclusions made from the findings and recommendations for action and further research.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter reviewed both literature for independent Variables, dependent variables and Kaizen. The first section discusses organization effectiveness and approaches used to measure organization effectiveness. The second Section reviews literature for Kaizen and Kaizen's Just-In-Time system, Kaizen's Quality Circle System, Kaizen's Total Productive Maintenance, and Kaizen's Strategic Management System. A conceptual framework for the study was also be discussed in this chapter and then a summary of the literature review discussed

2.2 The Concept of Organization Effectiveness

Organization is an entity set up for a purpose. The reason for any going concern is to create utility. The satisfaction of customers is by way of creation of goods and delivery of quality service from any enterprise. For enterprises to remain economically viable and virile, they must attain organizational effectiveness particularly in today's turbulent business environment (Uche, 2012). Generally, organizational effectiveness is understood as how quickly an organization responds to the changes, how swiftly organizations launch new product in market, how effectively they acquire resources and how economically the input turns to output. In other words, it is the process of value addition at every step that causes an organization to survive (Bamel, Rangnekar, Rastogi, & Kumar, 2012). To Bamel, Rangnekar, Rastogi, & Kumar(2012), effectiveness of organizations could be a source of strategic advantage and may facilitate their growth. Organizational effectiveness has been serving as sole theme for performance enhancement of organizations since early industrialization era. It is a broad concept and refers to a range of variables at different organizational levels (Malekakhlagh, Hossein, Ramezanineghad, Yosefi, & Sajjadi, 2011)

Although there is no definitive meaning of organizational effectiveness, the majority of authors agree that organizational effectiveness requires measuring multiple criteria and the evaluation of different organizational functions requires using different characteristics. It should also consider both means (processes) and ends (outcomes) (Hossein, Ramezanineghad, Yosefi, Sajjadi, &

Malekakhlagh, 2011). This means that organization effectiveness will be defined differently and measured differently from organization to organization.

2.3 Overview of the Kaizen Concept

The concept of continuous improvement was originally developed in the USA and transferred to Japan (Yokozawa, 2012). The creator of the concept of kaizen, or continuous improvement, was the late Dr. W. Edwards Deming, an American statistician who made many visits to Japan in the years following World War II. Dr. Deming's work was so widely regarded as the driving force behind the resurgence of the Japanese economy (Khan, 2011). At that time, "Made-in-Japan" was perceived as "low-price and low quality," and quality and productivity improvement was high on the national agenda (Ohno, et al., 2009). Kaizen is a system that involves every employee, where every employee is encouraged to come up with small improvement suggestions on regular basis (Daiya, 2012). It is a system of continuous improvement in quality, technology, processes, company culture, productivity, safety and leadership (Mishra, 2010). This means that every system, process, product has an opportunity for improvement and that these opportunities must be sought by all within an organization. The idea does not have to be a ground breaking one since Kaizen is a continuous process.

(Masaaki, 1986) Presents Kaizen as an umbrella as shown in figure two. He asserts that if used correctly, it is a process that humanizes the workplace, eliminates unnecessarily hard work (both mental and physical), teaches people how to do rapid experiments using scientific methods, and how to eliminate waste in business processes.

Figure 1: Kaizen Umbrella courtesy of (Imai, 1986)

2.4 Kaizen's Just-In-Time (JIT) System and organization effectiveness

The Just-In-Time concept was founded in Japan in part due to the contribution of Dr. Shingo Shigeo and Mr. Taichii Ohio of Toyota Motor Co. from 1949 to 1975. During this period, Dr. Shigeo took charge of industrial engineering and factory improvement training at Toyota Motor Corporation. The essential element in developing JIT was the use of the Ford System along with the realization that factory workers had more to contribute than just muscle power (Strategos, 2013). Hitherto, enormous defects existed in the manufacturing systems in Japan that related to inventory problem, product defects, rising cost of production through wastes and production delays (Adeyemi, 2010). In the late 1970s and early 1980s, many non-Japanese firms began adopting the Just-in-Time philosophy and subsequently, many studies dealing with Just-in-Time implementation in several countries have been conducted and reported (Moreira & Alves, 2008)

According to Teeravaraprug, Kitiwanwong, & SaeTong (2011), JIT is a manufacturing system with the primary goal of continuously reducing and ultimately eliminating all forms of waste with a focus on minimizing raw material, work-in-process, and finished goods inventory with a view to cutting inventory costs and helping to expose other more serious inefficiencies in the

manufacturing cycle. (Kisemb, 2007), refers to JIT as a management philosophy, rather than another production technique, composed of collection of concepts and techniques for improving productivity which has widely been implemented in both supply and manufacturing industries as a survival strategy against global market competition with remarkable success

JIT emphasizes waste reduction, continuous improvement and customer responsiveness. There are seven wastes in JIT, which are waste from overproduction, waste of waiting time, transportation

Waste, inventory waste, waste of motion, and waste from product defects (Teeravaraprug, Kitiwanwong, & SaeTong, 2011). It is the elimination of these wastes that make JIT a reality by eliminating bottlenecks in the manufacturing process. According to Gupta(2012) and (Gupta, 2011), JIT focuses on the process and not on the product. It can therefore be applied to any group of processes whether manufacturing or service. The philosophy behind JIT is continuous improvement of processes. The ultimate goal of JIT is to attack waste.JIT is a business approach/philosophy of supplying a product or service when it is needed, how it is needed and in the exact quantity it is needed. however for JIT to work, the following elements need to be put in place as enumerated by (Nameer, 2008) they are 5S, pull system, Leveled Production, Pull System, Continuous Flow Processing, , Flexible Work Force (Shojinka), 5Ss (Sifting, Sorting, Sweeping, Spick-n-Span and Sustenance).

Balakrishnan, Linsmeier, & Venkatachalam, (1996), analyzed a sample of 46 firms that publicly disclosed adoption of JIT production. Using a matched pair sample of non-JIT firms, they found no significant differences in inventory utilization for the two samples prior to JIT adoption. JIT firms, however, showed superior utilization of overall and work in process inventories relative to their control firm counterparts after adopting JIT production.

Another study carried out in Nigeria by Adeyemi (2010) among 16 firms practicing JIT found that 69% of the firms experienced significant reduction in Inventory Cost, 69% of the firms' experienced large space saving while 50% experienced increased flexibility. In Portugal, a study carried out by Moreira & Alves(2008) showed that Portuguese firms have the following basic perspectives about the Just-in-Time system: it is perceived as a tool to reduce inventories, to

increase quality and to eliminate waste, it highly depends on suppliers' performance, it helps improve quality and thus reduce scrap and defectives, and it is a tool for production planning and control.

2.5 Kaizen's Strategic management and organization effectiveness

Employee Strategic Managements (or employee suggestion schemes) are the oldest form of employee involvement. Management about 100 years ago in Scotland first used the practice of soliciting suggestions from workers. William Denny, a Scottish shipbuilder, asked his workers to suggest methods for building ships at low cost to (Cuc & Tripa, 2008), and (Arif M. , Aburas, Al Kuwaiti, & Kulonda, 2010). In the United States, records show that an Easman Kodak employee named William Connors received a price of two dollars in 1898 for suggesting that windows be washed to keep the workplace brighter (Cuc & Tripa, 2008).

One of the main vehicles for involving all employees in kaizen is using the suggestion system, but the suggestion system does not always provide immediate economic payback, but is looked at as more of a morale booster. (Arif M. , Aburas, Al Kuwaiti, & Kulonda, 2010). According to (Verdinejad, Mughari, & Ghasemi, 2010), The best ideas can come from any employee, anytime, anywhere; people naturally think of ways to make their jobs easier, faster, and more productive. Although these words are a truism, few organizations have effective systems to solicit ideas and then implement the best ones. In many Companies when ideas are accepted from employees, it happens because the idea creator was persistent and vocal, and exerted a lot of personal energy. (Neagoe & KLEIN, 2009), argues that when a constant stream of small improvements flows from all the employees, a powerful force is set in motion.

Suggestion system plays an important role on increasing management capabilities on learning through feedback received and improving the entire system. An effective suggestion system could easily unveil any existing shortcomings in the system and helps management team find better solutions to overcome troubles (Nouri & Ahanchi, 2012). In many Japanese companies, the number of suggestions made by each worker is looked at as a reflection of the supervisor's kaizen efforts. It is a goal of managers and supervisors to come up with ways to help generate more suggestions by the personnel (Arif M. , Aburas, Al Kuwaiti, & Kulonda, 2010).

Employees' ideas and innovations are so important in any organization because they are on the shop floor and are experiencing the advantages or disadvantages of what they are doing (Wilson, DuPlessis, & Marx, 2010)

The success factors related to suggestion systems according to (Arif M. , Aburas, Al Kuwaiti, & Kulonda, 2010) can be divided into the following six main areas: 1) Ease of use; 2) Supervisory support; 3) Colleague support; 4) Clarity of scope; 5) Rewards and 6) Feedback. As stated by Charles & Chucks(2012), long term and short-term benefits of adopting suggestion system are customer satisfaction, improved productivity index, attainment of world-class system, improved satisfaction and employees' citizenship and growth in corporate revenue. It is imperative that several key elements of employee suggestion programs include senior staff support, a simple easy process for submitting suggestions, a process for evaluating and implementing them, an effective program for publicizing and communicating the program and a fair and motivating award scheme. (Wilson, DuPlessis, & Marx, 2010)

2.6 Kaizen's Quality Circle System and Organization Effectiveness

A kaizen strategy includes small-group activities informal, voluntary, intra company groups organized to carry out specific tasks in a workshop environment. The most popular type of small group activity is quality circles, designed to address not only quality issues but also such issues as cost, safety, and productivity, quality circles may be regarded as group-oriented *kaizen* activities (Imai, 1997).The origin of Quality Circle can be traced to lectures of J. Juran Starting in 1954, which emphasized participation of middle and top management in the implementation of quality control systems. The Japanese studied these lecturers recommendations and put them into practice on large scale basis from 1955 to 1960, with an important modification: instead of allowing quality control to remain the province of quality control engineers, management made it the responsibility of all rank and file employees as well (Munchus, 1983).

Kannan & Rajan (2011) says that quality circles consists of small group of employees from all levels of the existing hierarchical structure within an organization, voluntarily involved in the process of identifying, analyzing and formulating solutions to various technical, manual and

automation related problems encountered in daily work life. Another definition of Quality Circles by Khond, Devatwal, & Gorade (2012) refers to quality circles as a small group of employees of the same work area, doing similar work that meets voluntarily and regularly to identify, analyze and resolve work related problems. Quality Circle revolves around the principles of voluntary participation and collaborative decision making.

According to Chaudhary & Yadav (2012), the basic principles behind quality circle activities are to contribute for improvement & development of the organization, to exercise human capability fully and to explore hidden capabilities and to respect humanity & build a worthwhile to live in happy positive environment. The main tools used to solve problems using quality circles are brainstorming, collection of data, cause-effect diagram, pareto analysis and cumulative line diagram (Chaudhary & Yadav, 2012)Included among the extensive list of organizational and individual outcomes that are claimed to be affected by the quality circle process are productivity, quality, absenteeism, grievance rates, job satisfaction, organization commitment, and morale. (Barrick & Alexander, 1987). A study carried out by Chaudhary& Yadav(2012) at M/s. Sangam Spinners Ltd., Bhilwara in India to determine the Impact of Quality Circle Towards Employees & Organization reported that practicing quality circle increased productivity by 2%, an outcome benefit totaling Rs**.** 22**.**16million/annum, increasing positive attitude of the employee, morale of the employees was boosted, and job satisfaction boosted. In another unrelated study, done to examine the relationship of organizational effectiveness and employee performance and motivation in the telecommunication and banking sector of Pakistan, A sample of 103 respondents was taken and Pearson correlation was applied. The results showed that there exists significant positive correlation (0.287) between employee motivation and organizational effectiveness (Manzoor, 2012).

2.7 Kaizen's Total Productive Maintenance (TPM) System and organization effectiveness

The concept of TPM was developed in Denso, A tier one automotive supplier in the Toyota group of suppliers, during 1960s and 70s in Japan. The central thrust of the program was the complete elimination of the "six major equipment losses". The key concept behind effective improvements was autonomous maintenance (Dogra, Sharma, Anish, & Dureja, 2011).

Nakajima, a major contributor of TPM, has defined TPM as an innovative approach to maintenance that optimizes equipment effectiveness, eliminates breakdowns, and promotes autonomous maintenance by operators through day-to-day activities involving the total workforce (Ahuja & Khamba, 2008). It focuses on improving equipment quality and seeks to maximize equipment efficiency through a total system of preventive maintenance spanning the lifetime of the equipment (Imai, 1997).

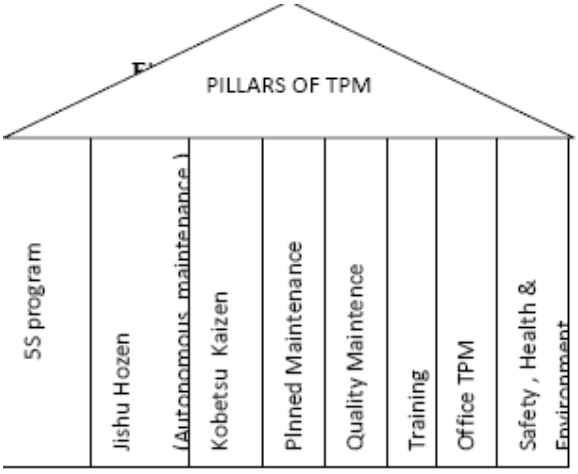

Figure 2: Pillars of Total Productive Maintenance; Source (Ahmed, Ali, Allama, & Parvez, 2010)

TPM concepts involve commitments to long-range planning, especially on the part of senior management. Typically, TPM is initiated as a "top-down" exercise, but only implemented successfully via "bottom-up" participation. (Dogra, Sharma, Anish, & Dureja, 2011).The four key components of TPM are worker training, operator involvement, teams and preventive maintenance (Ahuja & Khamba, 2008).The aim of the program is to markedly increase production while at the same time increasing employee morale and job satisfaction. It brings maintenance into focus as a necessary and vitally important part of the business. It is no longer regarded as a non-profit activity (Ahmed, Ali, Allama, & Parvez, 2010).

2.8 Theoretical Framework

This study is based on the Conflicting Values Framework. The framework was developed by Quinn and Rohrbaugh and it integrates many indicators of effectiveness into a single framework

to produce dimensions of effectiveness criteria that represent competing management values in organizations (Oghojafor, Muo, & Aduloju, 2012). It has been used by hundreds of firms around the world and named as one of the 40 most important frameworks in the history of business, the Competing Values Framework emerged from studies of the factors that account for highly effective organizational performance. It was developed in response to the need for a broadly applicable model that would foster successful leadership, improve organizational effectiveness, and promote value creation. It has been studied and tested in organizations for more than 25 years by a group of thought leaders from leading business schools and corporations (Cameron, Quinn, DeGraff, & Thakor, 2006). For this reason and the fact that this model is able to evaluate different aspects of the organization, this study will utilize this framework. The framework is depicted in figure one.

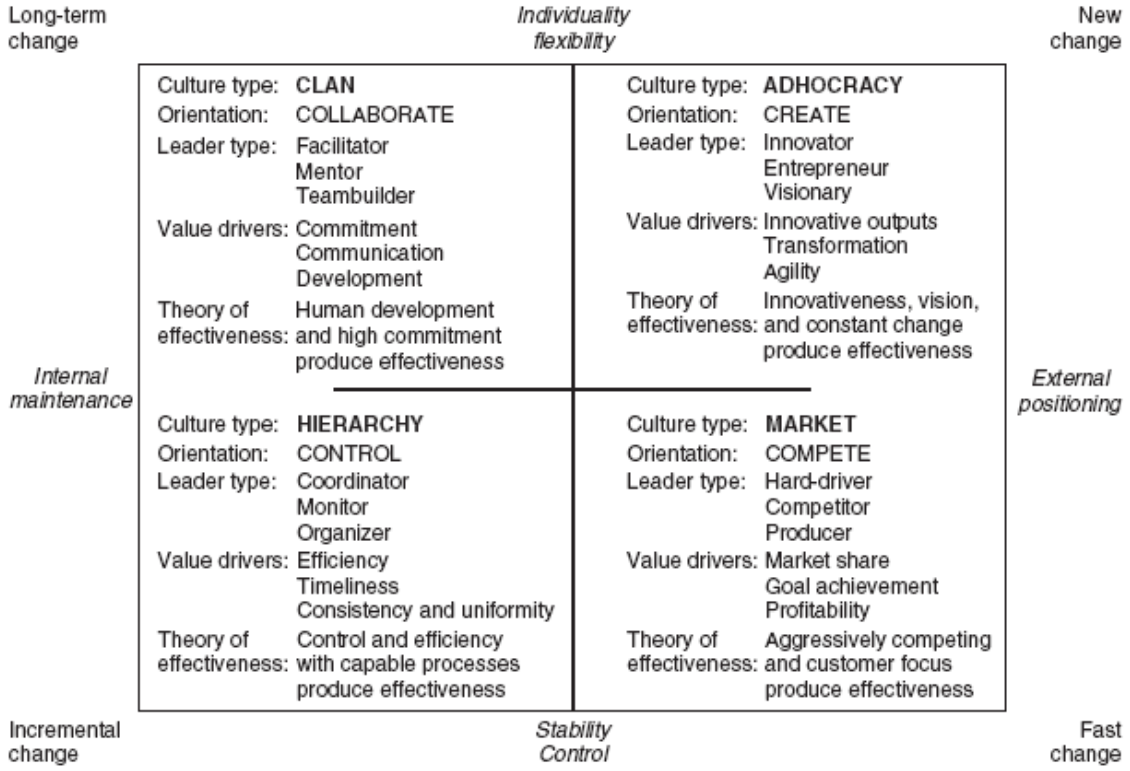

Figure 3: The Competing Values Framework Source: (Cameron, Quinn, DeGraff, & Thakor, 2006)

Each quadrant is labeled with an action verb connoting the kinds of value creating activities that characterize it – Collaborate, Create, Compete, and Control. Leaders and organizations that

create the greatest amount of value have developed high degrees of competency in one or more of these four quadrants. That is, each quadrant represents a way of thinking about opportunities and challenges, an approach to address them, and a set of strategies and tactics that foster value creation in organizations (Cameron, Quinn, DeGraff, & Thakor, 2006).

Examples of activities relating to value creation in the Control quadrant include quality enhancements such as statistical process control and other quality control processes like six-sigma, cost and productivity improvements, reduction in manufacturing cycle time, and efficiency enhancement measures. These activities help make organizations function more smoothly and efficiently (Cameron, Quinn, DeGraff, & Thakor, 2006). Value creating activities belonging to the Compete quadrant include implementing aggressive measures to expand working capital, outsourcing selected aspects of production or services, acquiring other firms, investing in customer acquisition and customer service activities, and attacking competitor organization's market position. The strategies in this quadrant help position the firm to have a strong standing with investors by creating a superior reputation for delivering excellent financial performance in the immediate term (Cameron, Quinn, DeGraff, & Thakor, 2006).

Employee Performance fundamentally depend on many factors like performance appraisals, employee motivation, Employee satisfaction, compensation, Training and development, job security, Organizational structure, joint decision making , empowerment, training , safe working environment among others. A motivated employee is responsive of the definite goals and objectives he/she must achieve, therefore he/she directs its efforts in that direction (Manzoor, 2012) Examples of activities in collaboration quadrant include clarifying and reinforcing organizational values, norms, and expectations; developing employees and cross-functional work groups; implementing programs to enhance employee retention; and fostering teamwork and decentralized decision making (Cameron, Quinn, DeGraff, & Thakor, 2006). Employee empowerment and participation consists of contribution of employees in administration and decision making associated to policies, objectives and strategies of the organization. Empowerment results in motivating employees that leads to constant expansion and organizational growth (Manzoor, 2012)

2.9 Conceptual Framework

The motivation of this study is to find out whether Kaizen Tools can be used to promote organization effectiveness. The conceptual framework for this study is depicted in the Figure 4. It shows Strategic Management, Just-In-Time, Total Productive Maintenance, and Quality Circle as independent variables and organization effectiveness as the dependent variables. Both independent and dependent variables have also been depicted with their indicator. This Study will therefore look at effect of the independent variables on the dependent variables. Two intervening variables have been identified and they are change management and management support. Kaizen being a change process will thrive in an environment where change is managed properly. Kaizen is a participatory process and therefore requires full support of management. Two moderating variables have also been indicated and they are willingness to change and willingness to participate in the Kaizen activities

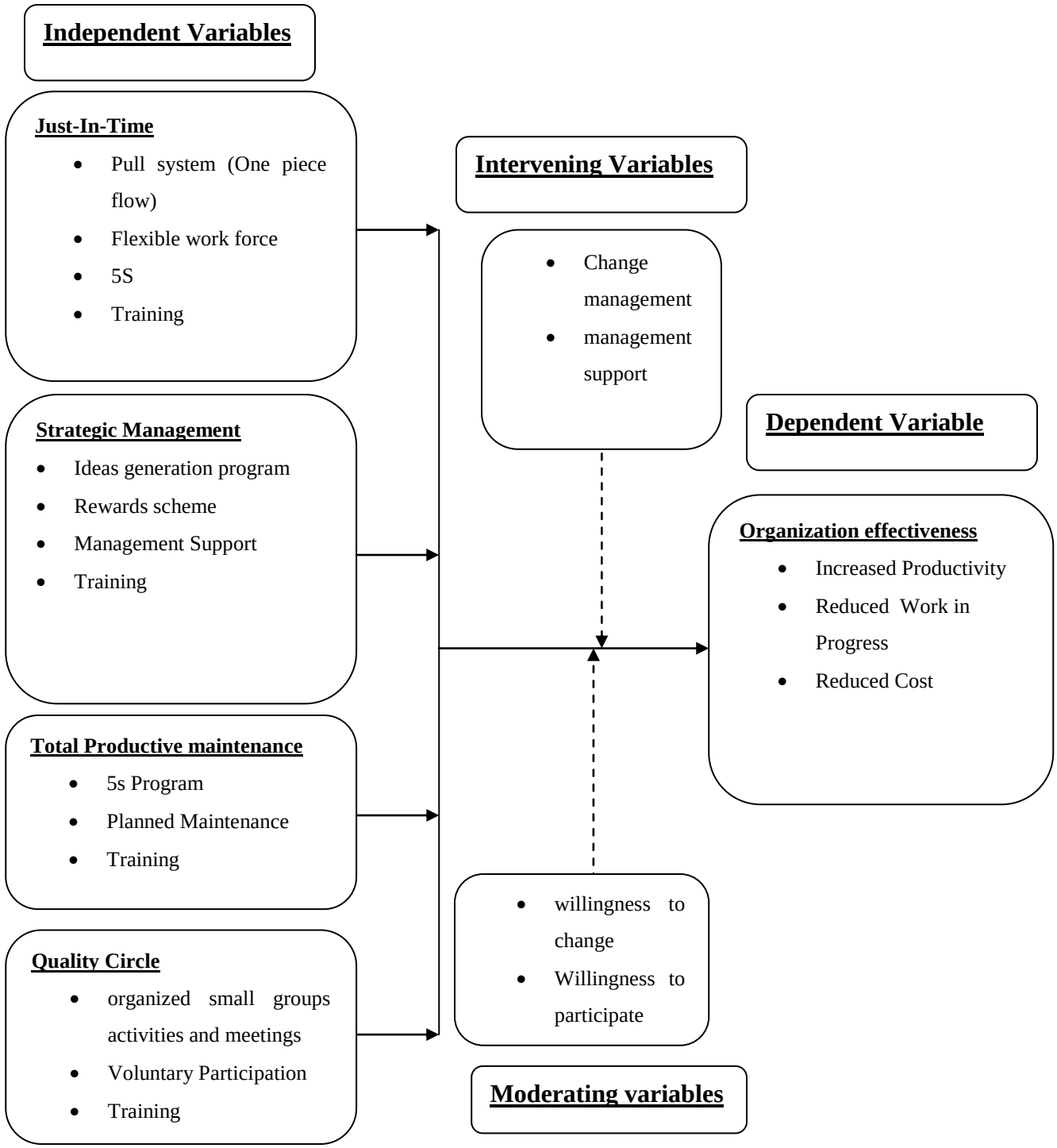

Figure 4: Conceptual Framework

2.10 Chapter Two Summary

From the literature review, there is very scanty literature on Kaizen implementation and accruing benefits especially concerning promotion of organization effectiveness in Kenya. Literature on the use of Conflicting Values Framework to measure organization effectiveness in Kenya is also very scanty, despite the framework being named as one of 40 most important frameworks in the history of business It has been discovered that from the Competing Values Framework, Kaizen activities reside in the Create, Control and Collaborate quadrants with heavy inclination into the control quadrant, indicating that Kaizen is heavily a process improvement endeavor. It has come out benefits derived from various kaizen Systems overlap and that the benefits lie in different quadrants of CVF.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers Research Design, Target Population, Sampling and Sample Size, Data Collection Methods and Instruments, Validity of Research Instruments, Reliability of Research Instruments, Data Analysis, Ethical Consideration and operationalization of Variables.

3.2 Research Design

According to Gray, Williamson, Karp, & Dalphin, (2007), research design is the overall process of using your imagination as well as the strategy and tactics of science to guide the collection and analysis of data. This study used Causal-Comparative design also known as ex post facto design. This design according to Taylor(2005), is aimed at showing cause-effect relationship, where researcher attempts to find how one variable affects another. According to Awofala, Awofala, Fatade, & Nneji (2012), in such a research design, the investigators do not have a direct control of independent variables because their manifestations have already occurred. Causal-comparative research according to Lodico, Spaulding, & Voegtle (2006) involves comparing groups to see if some independent variable has caused a change in a dependent variable. This method utilizes existing data sets according to (Hale & Astolfi, 2011). In this study Kaizen systems which are the independent variables had already occurred and the researcher did not have control over them i.e. was not be able to manipulate them. The groups to be compared were two departments at Davis & Shirtliff Ltd., with one department having implemented Kaizen whereas the other had not. A retrospective causal comparative study was used because the researchers began with potential cause, in this case Kaizen Systems and studied their effects on a variable in this case organization effectiveness.

Causal-Comparative is a quantitative approach. Quantitative approach according to Creswell (2003), primarily uses postpositive claims for developing knowledge, and that if the problem is identifying factors that influence an outcome, the utility of an intervention, or understanding the best predictors in outcomes, then a quantitative approach the is best. This study was investigating utility of an intervention and therefore matched the above description by (Creswell, 2003)

3.3 Target Population

Davis & Shirtliff Ltd as about 300 employees spread over five countries in Africa. This study however targeted two groups that are departments at Davis &Shirtliff Ltd. The two departments were Manufacturing Department that had implemented Kaizen and had a population of 30 employees, and Services Department that had not implemented Kaizen with a population of 28 employees, both located in Nairobi. According to Lodico, Spaulding, & Voegtle (2010), the most important consideration in designing a causal-comparative design is whether the two groups are comparable, except for the independent variable on which they are being compared.The two groups in this study have been chosen because of two reasons. The first reason was comparability of the two groups. The two groups were comparable because the nature of work the two groups do is very comparable, which involves assembly of equipment, disassembly of equipment and testing of equipment. The two groups also served similar group of customers, internal and external customers. The two groups worked under similar organization infrastructure, policies and the organization structure. The second reason is that the two groups had one difference, where one group had implemented Kaizen and the other had not. These two reasons satisfy the requirement for selecting groups for causal comparative as stated above by (Lodico, Spaulding, & Voegtle, 2010).

3.4 Sampling and Sample Size

The two groups of study were selected purposively. This method according to Mugenda & Mugenda (2003), can be used to get locations which the units of observation have the required characteristics. This was the case in this study where the location of units of study selected had the desired characteristics.

Census sampling was used in this study to administer questionnaire to the manufacturing department employees. The questionnaire was administered to 25 employees, with remaining five having been used to pilot test the questionnaire. According to (Dawson, 2002), census is used where the population is small and therefore possible to reach to all units within a population, and this was the case in this study.

3.5 Research Instruments

Data collected was both primary and secondary and was collected with tools discussed here. The instruments used were questionnaire and desktop search. A questionnaire consists of a series of questions that respondents read themselves and answer (Kalof, Dan, & Dietz, 2008). Desktop search involves digging into existing data (secondary) to find relevant data to the study. The two method were used because the research used both primary and secondary data

According to Gray, Williamson, Karp, & Dalphin, (2007), a primary data source is the written or oral report of an eyewitness. Primary data was collected from the manufacturing department through census survey using closed ended questionnaire. The questionnaire covered all the independent variables as well as dependent variable, with sections that covered testing whether the independent variable indicators were present, level of knowledge of Kaizen systems by respondents, level of participation and a section covering effects of each independent variable on dependent variable. The questionnaires were self-dropped and self-picked to and from the respondents respectively.

According to Gray, Williamson, Karp, &Dalphin, (2007), Secondary sources borrow the knowledge they contain from other sources, the evidence contained in them being therefore indirect. Secondary data in this study was collected from monthly reports records that were readily available for the two groups. This covered a period of all months of two years before introduction of Kaizen and two years after implementation of Kaizen in Manufacturing Department. The data was to show whether Kaizen Systems had affected productivity, Work in Progress, revenue growth and cost which are indicators of organization effectiveness in a statistically significant way

3.5.1 Validity of research Instruments

Validity refers to the extent to which a test measures what we actually wish to measure (Kothari, 2004). In this Study content validity was done by experts in the topic as suggested by (Cramer & Dennis, 2011). The expert was a Manager at Davis &Shirtliff Ltd who underwent Kaizen training by Kenya Association of Manufacturers and was part of those who Introduced Kaizen at

Davis &Shirtliff Ltd. This was also done by piloting the questionnaire. According to Cramer& Dennis(2011), many researchers will try out or pilot their materials on a group of individuals similar to the eventual sample. This is done in such a way as to encourage the participants to raise questions and problems that make it difficult to complete the questionnaire (Cramer& Dennis,2011). Piloting in this study was carried out using five randomly selected respondents from group practicing Kaizen. A random of five was selected from the group practicing Kaizen because of lack of similar group.

3.5.2 Reliability of research instruments

According to Cronbach (1951), any research based on measurement must be concerned with reliability of measurement. A reliability coefficient demonstrates whether the test designer was correct in expecting a certain collection of items to yield interpretable statements about individual differences (Cronbach, 1951). This study used Test-Retest method and then calculated Pearson coefficient of correlation between the tests and retest data. According to Lodico, Spaulding, & Voegtle (2006) a period of four weeks should lapse before retest, and that a correlation coefficient of 0.35 to 0.65 are typical and considered acceptable. The scores from the two tests were then correlated giving a Pearson correlation coefficient of 0.82which is above the 0.65 stated above.

3.6 Data Collection Procedure

Data collection began once the department of extra-Mural studies approved the research proposal. The questionnaires were dropped in person by the researcher. The respondents were informed on the date the questionnaire will to be administered and agreed on a sensible date for collecting filled in questionnaires. The Researcher collected secondary Data from the Monthly Management accounts records that were in hard copies filed in box files.

3.7 Data Analysis Techniques

Data was analyzed using descriptive Statistics, and inferential statistics. The analysis was divided into section; primary data analysis and that secondary data analysis. All analyses were carried out using IBM SPSS Statistics19 statistical analysis software.

Primary data was analyzed using descriptive statistics namely; mean and standard deviation, and Spearman rank order correlation, which according to Pallant (2005) is designed for use with ordinal level or ranked data, which was the case for this study. Secondary data analysis involved finding out whether there was any significant difference in Work In Progress, productivity, revenue growth and cost for months of two years before and two years after kaizen systems within each groups. This was done using two-tail t-test at 95% significant level. This technique according to Kothari (2004) is used when sample size is small and variance of the population unknown, which was the case in this study. Descriptive statistics; mean and standard deviation was also used

3.8 Ethical Consideration

The value of research according to Walliman (2006), depends as much on its ethical veracity as on the novelty of its discoveries. To treat participants in your research with respect and due consideration is a basic tenet of civilized behavior. In this study, participants participated on voluntary basis and were treated with respect, and instrument design made to be as relevant as possible

3.9 Operationalization of Variable

Table 3.1 illustrates the operationalization of variables to be used in this study

Table 3.1

Operationalization of Variables

Objective	**Variable**	**Indicators**	**Measuring Scale**	**Data Collection Instrument**	**Data Analysis**
To evaluate the effect of Kaizen's Just in Time (JIT) system on Organization effectiveness at Davis &Shirtliff Ltd	**Independent variable**: Quality Circle **Dependent Variable**: organization effectiveness	organized small groups activities and meetings, Voluntary participation	Ordinal, ratio and Likert	Closed ended Questionnaire, Desk research	Quantitative Techniques; (Descriptive-Mean and Standard Deviation)and inferential, two tail t-test
To assess the effect of Kaizen's Strategic management on organization effectiveness at Davis &Shirtliff Ltd.	**Independent variable**: Total Productive Maintenance **Dependent Variable**: organization effectiveness	• 5s Program • Planned Maintenance • Training	Ordinal, ratio and Likert	Closed ended Questionnaire, Desk research	Quantitative Techniques; (Descriptive-Mean and Standard Deviation)and inferential, t-test
To evaluate the effect of Kaizen's Quality Circle on organization effectiveness at Davis &Shirtliff Ltd.	**Independent variable**: Just in Time **Dependent Variable**: organization effectiveness	• Pull system (One piece flow) • elimination of wastes • standardization	Ordinal, ratio and Likert	Closed ended Questionnaire, Desk research	Quantitative Techniques; (Descriptive-Mean and Standard Deviation)and inferential, t-test
To assess the effect of Kaizen's Total Productive Maintenance System on organization effectiveness at Davis &Shirtliff Ltd.	**Independent variable**: Strategic management **Dependent Variable**: organization effectiveness	• Ideas generation program • Rewards scheme	Ordinal, ratio and Likert	Closed ended Questionnaire, Desk research	Quantitative Techniques; (Descriptive-Mean and Standard Deviation)and inferential, t-test

3.10 Summary of the chapter

In this chapter, the research design appropriate for the study was discussed and target population identified. Sample selection procedure, research instruments and method of analyzing data were also discussed

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This section presents the analysis, presentation and interpretation of data collected. The data is presented using tables, for both primary data collected through questionnaire and secondary Data collected from records in the organization

4.2 Response Return Rate

A total of 25 questionnaires were administered to manufacturing department which had implemented kaizen, and out of which 22 were returned representing an 88% return rate. This is a good response rate. According to (Fowler, 2002) a 75% response rate is considered adequate.

4.3 Demographic Information

This section represents the characteristics of respondents is as summarized in Table 4.1

4.3.1 Characteristic of respondents by their current position in the organization

Table 4.1

Current Position in the Organization

	Frequency	Percentage
Manager	1	4.5
Supervisor	4	18.2
Technician	17	77.3
Total	22	100.0

Table 4.1 shows that 77.3% were technicians, 18.2% supervisors and only 1 manager representing 4.5%. This shows that the department had a pyramid organization structure.

4.3.2 Characteristic by Period Worked in the organization

Table 4.2

Period Worked in the Organization

	Frequency	Percent
Over 10 years	3	13.6
5-9 years	11	50.0
2-5 years	7	31.8
Below 2 years	1	4.5
Total	22	100.0

Table 4.2 shows that majority of respondents had been with the organization for period of more than two years, with only one respondent having worked for a period of less than two years. This shows that 95.5% of the respondents were in the company when Kaizen was introduced

4.4 Kaizen's Just-In-Time Data Analysis, Presentation and Interpretation

The researcher in this section purposed to find out the extent of knowledge of Just-In-Time manufacturing, extent of use of the technique, and effect of the technique on organization effectiveness

Table 4.3

Awareness on Just-In-Time

	Frequency	Percentage
Yes	20	90.9
No	2	9.1
Total	22	100.0

Table 4.3 shows that 90.9% (20) of the respondents were aware that the department was implementing Just-in-Time, with 9.1% (2) of the respondents stating that they were not aware. A cross check of those who were not aware that the department was implementing Just-In-Time revealed that this was due to nature of their work which was not of production in nature. Overall, this is a high level of awareness

Table 4.4

Whether One Practiced Of One Piece Flow

	Frequency	Percentage
Yes	20	90.9
No	2	9.1
Total	22	100.0

From Table 4.4, 90.9% (20) of the respondents said that they practice one-piece flow production, while 9.1% (2) respondents said they did not practice one-piece flow. The two who said they did not practice one-piece flow are the same who said they were not aware that the department was using Just-In-Time technique. As stated in literature review, one-piece flow is one of the indicators of Just-In-Time and from the result; it shows that it was a widely practiced technique

Table 4.5

Whether one participated in 5S Activities

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

5s is an indicator of Just-In-Time, and from Table 4.5, it can be seen that all the respondents participate in 5S activities.

Table 4.6

Extent of Ability to Handle All Work within One's Section

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	4	18.2
Great Extent	7	31.8
Very Great Extent	11	50.0
Total	22	100.0

Ability to handle all work within ones section of work is an indicator of Just-In-Time. Just-In-Time equips workers with this skill. From Table 4.6 it is clear that majority of the respondents felt they could handle all work within their section to a great extent, this representing 50% (11) of the respondents. Another 31.8% (7) of the respondents felt they could handle all work within their section to a great extent, and 18.2% (4) of the respondents felt they could handle all work within their section to a moderate extent.

Table 4.7

Extent of Just-In-Time Understanding

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	1	4.5
Moderate extent	11	50.0
Great Extent	6	27.3
Very Great Extent	4	18.2
Total	22	100.0

From Table 4.7, majority, which is 50% (11) of the respondents, understood Just-In-Time to a moderate extent, 27.3% (6) of the respondents to a great extent, 18.2% (4) of the respondents to a very great extent, and 4.5% (1) of the respondents to a low extent. This indicates that the understanding of Just-In-Time was very diverse.

Table 4.8

Opinion on Whether Just-In-Time Helped Improve Effectiveness

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

On whether Just-In-Time had helped in improving department's effectiveness, it is clear from Table 4.8 that every respondent was of the view that it helped in improving effectiveness of the department

Table 4.9

Extent to which Just-In-Time helped in improving effectiveness

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	10	45.5
Great Extent	10	45.5
Very Great Extent	2	9.1
Total	22	100.0

From Table 4.9, on the extent to which Just-In-Time had helped in improving department's effectiveness, 45.4 % (10) of the respondents rated this at moderate extent, a similar figure at great extent and 9.1% (2) of the respondents at very great extent. This shows a clear division between those who put it at moderate extent and those who put it at great extent, although the result was closely scattered.

Table 4.10

Opinion on whether Just-In-Time helped in reducing Work in progress

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

Reduced work in progress is one of the benefits derived from using the Just-In-Time. The respondents were asked whether they thought Just-In-Time had helped in reducing work in progress and from Table 4.10 All the respondents thought that Just-In-Time had helped reduce work in progress, a very big confidence.

Table 4.11

Extent of help of Just-In-Time in reducing Work in progress

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	7	31.8
Great Extent	10	45.5
Very Great Extent	5	22.7
Total	22	100.0

From Table 4.11 on the question of the extent to which Just-In-Time had helped in reducing Work In Progress, 22.7% (5) of the respondents put it at very great extent, 45.5% (5) of the respondents put it at great extent, while 31.8% (7) respondents put it at moderate extent. This is an even distribution between those who answered very great extent, great extent and moderate extent. This is a very close distribution for all the score showing that the respondents were divided into three opinions groups

Table 4.12

Opinion on whether Just-In-Time helped in improving productivity

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

Just-In-Time has also been proven to contribute to improved productivity. The respondents were asked whether they thought Just-In-Time had helped in improving productivity. From Table 4.12, it can be seen that all the respondents thought that Just-In-Time had helped in improving productivity, which is a very high confidence indicator

Table 4.13

Extent of Help of Just-In-Time in Improving Productivity

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	6	27.3
Great Extent	13	59.1
Very Great Extent	3	13.6
Total	22	100.0

On the question of the extent to which Just-In-Time had helped in improving productivity, it can be seen from Table 4.13 that 13.6% (3) of the respondents put it at very great extent, 59.1% (13) of the respondents put it at great extent, while 27.3% (6) respondents put it at moderate extent. It can be seen that the respondents were divided into three groups in their opinion

Table 4.14

Opinion on Just-In-Time in Reducing Cost

	Frequency	Percentage
Yes	12	54.5
No	10	45.5
Total	22	100.0

Cost reduction is another benefit that has been proven to be derived from using Just-In-Time. The respondents were asked to state whether they thought Just-In-Time had helped in reducing cost, and from Table 4. 14 it can be seen that 54.5 %(12) thought that it had helped while 45.5% (10) of the respondents did not think it had helped. This means that the respondents were much divided on this issue.

Table 4.15

Extent of help of Just-In-Time in reducing cost

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	1	8.3
Great Extent	8	66.7
Very Great Extent	3	25.0
Total	12	100.0

The respondents who had answered that they thought had helped in cost reduction in Table 4.14, were asked to give the extent to which they thought the help was. From Table 4.15, 25.0% (3) of the respondents put it at very great extent, 66.7 % (8) of the respondents put it at great extent, while 8.3% (1) respondent put it at moderate extent. Majority of the respondents on this issue gave a score of between great extent and very great extent

4.5 Kaizen's Strategic Management System Data analysis, presentation and interpretation

The researcher in this section purposed to find out the extent of knowledge of Strategic management System, extent of use of the system, and effect of the system on organization effectiveness

Table 4.16

Awareness on Strategic Management system

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

From Table 4.16 on whether respondents were aware of existence of a strategic management system, all respondents were aware that the system existed and this indicates 100% awareness, which shows good publicizing of this initiative

Table 4.17

Extent of Understanding of Strategic management

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	1	4.5
Moderate extent	7	31.8
Great Extent	8	36.4
Very Great Extent	6	27.3
Total	22	100.0

As to what extent the respondents understood the strategic management system, from Table 4.17 , 27.3% (6) of the respondents put it at very great extent , 36.4% (8) of the respondents at great extent, 31.8% (7) of the respondents at moderate extent and 4.5% (1) respondent at Very low

extent. The findings indicate good understanding of the strategic management and therefore showing good training was taking place.

Table 4.18

Kaizen Suggestion

	Frequency	Percentage
Yes	22	100.0
No	0	0
Total	22	100.0

The respondents were asked whether they had ever given a Kaizen suggestion, and from Table 4.18, it can be seen that every respondents had at some point given a suggestion, another indication of existence of Strategic Management system

Table 4.19

Whether Ones' Suggestion Was Tried

	Frequency	Percentage
Yes	13	59.1
No	9	40.9
Total	22	100.0

As to whether the respondent's idea was tested, Table 4.19 shows that only 59.1% (13) of the respondents had their suggestions tested a very poor performance on part of the department. The data shows that the department was not performing very well in implementing suggestions brought forth.

Table 4.20

Whether One Received Recognition Because Of Giving a Suggestion

	Frequency	Percentage
Yes	2	9.1
No	20	90.9
Total	22	100.0

On the question of whether the respondents had been recognized for giving an suggestion, from Table 4.20 only 9.1% (2) respondents indicated that they had been recognize, which is a very poor performance considering that a reward scheme is an indicator of suggestion scheme.

Table 4.21

Opinion on Strategic Management system in improving Productivity

	Frequency	Percentage
Yes	18	81.8
No	4	18.2
Total	22	100.0

On the question whether the Strategic Management system had helped in improving productivity, From Table 4.20, 81.8% (18) of the respondents were of the opinion that it had helped. This is a very big vote of confidence considering that only 13 of 22 respondents had their ideas tested as found out in Table 4.21. 18.2% (4) of the respondents were of the opinion that it had not help

Table 4.22

Extent of help of Strategic Management System in improving productivity

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	5	27.8
Great Extent	8	44.4
Very Great Extent	5	27.8
Total	18	100.0

The respondents, who had replied that Strategic Management system had helped in improving productivity, were asked the extent of the help, and from Table 4.22, 27.8% (5) of the respondents put it at very great extent, 44.4% (8) of the respondents put it at great extent, while 27.8% (5) of the respondents put it at moderate extent. The scores looks almost evenly distributed between moderate extent and very great extent

Table 4.23

Opinion on Strategic Management System in Improving Effectiveness

	Frequency	Percentage
Yes	13	59.1
No	9	40.9
Total	22	100.0

As to whether Strategic Management system had helped in improving department's effectiveness, Table 4.23 shows that 59.1% (13) of the respondents were of the opinion that it had helped, while 40.9% (9) of the respondents were of the opinion had not helped. This indicates a much-divided opinion

Table 4.24

Extent of Help of Strategic Management System in Improving Effectiveness

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	6	46.2
Great Extent	5	38.5
Very Great Extent	2	15.4
Total	13	100.0

The respondents who answered yes to the question whether Strategic Management system had helped improve departments effectiveness were asked to state the extent of the help, and from Table 4.24, 15.4% (2) of the respondents put it at great extent, 38.5% (5) of the respondents put it at great extent while 46.2% (6) of the respondents put it at moderate extent.

4.6 Kaizen's Quality Circle System data analysis presentation and interpretation

In this section, the researcher sought to find out the extent of knowledge of quality circle, level of participation in quality circle activities, and what respondents thought quality circle had contributed to organization effectiveness

Table 4.25

Participation in Quality Circle

	Frequency	Percentage
Yes	21	95.5
No	1	4.5
Total	22	100.0

Asked whether they had ever participated in a quality circle, from table 4.25, only one respondent had not participated in a quality circle activity amongst all 22 respondents. This is a high level of participation.

Table 4.26

Voluntary of Participation

	Frequency	Percentage
Yes	21	100.0
No	0	0
Total	21	100.0

From table 4.26, of the 21 respondents who had answered to having participated in quality circle activities, all of them admitted to a voluntary participation in the quality circle activities. Voluntary participation is one of the indicators of Quality Circle. This shows that indeed quality circle was in existence

Table 4.27

Opinion on whether Quality Circle had helped improve effectiveness

	Frequency	Percentage
Yes	22	100.0
No	0	0
Total	22	100.0

Table 4.27 shows clearly that all the 22 respondents believed quality circle had helped to improve department's effectiveness. This shows that respondents had a high confidence in quality circle

Table 4.28

Extent of understanding Quality Circle

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	9	40.9
Great Extent	11	50.0
Very Great Extent	2	9.1
Total	22	100.0

Table 4.28 shows that the respondent's knowledge of quality circle is staggered between moderate extent and very great extent with great extent taking lion share at 50%. The understanding level was high from the data

Table 4.29

Extent quality circle had helped in Improving Department's effectiveness

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	4	18.2
Great Extent	13	59.1
Very Great Extent	5	22.7
Total	22	100.0

Of the 22 respondents who believed that quality circle had helped in improving effectiveness, when asked the extent to which quality Circle had helped improve effectiveness, 59.1% (13) of these put the help at great extent, 22.7% (5) of the respondents put it at Very great extent, while 18.2% (4) of the respondents put it at moderate extent as shown in Table 4.29. The data shows that majority ranked on this measure between great extent and very great extent

Table 4.30

Opinion on Whether Quality Circle Helps in Improving Productivity

	Frequency	Percentage
Yes	13	59.1
No	9	40.9
Total	22	100.0

Table 4.30 shows that 59.1% (13) of the respondents believe that quality circle helped in improving productivity. While 40.9% (9) of the respondents were of the view that quality circle had not helped in improving productivity. This shows a divided opinion.

Table 4.31

Extent to Which Quality Circle Helped In Improving Productivity

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	0	0
Great Extent	9	69.2
Very Great Extent	4	30.8
Total	13	100.0

Of the 13 respondents who believed that quality circle had helped in improving productivity, when asked the extent to which quality Circle had helped improve productivity, 69.2% (9) of these put the help at great extent, while 30.8% (4) of the respondents put it at Very great extent as shown in Table 4.31. The result shows respondents agreed on this measure.

4.7 Kaizen's Total Productive Maintenance Data analysis, presentation and interpretation

Table 4.32

Awareness on Total Productive maintenance

	Frequency	Percentage
Yes	19	86.4
No	3	13.6
Total	22	100.0

From Table 4.32 on whether the respondents were aware that Davis &Shirtliff Ltd. was practicing Total Productive Maintenance, 86.4% (19) of the respondents said that they were aware while 13.6% (3) respondents were not aware. This is a very high level of awareness.

Table 4.33

Opinion on whether one was participating in Total Productive Maintenance Planned maintenance

	Frequency	Percentage
Yes	16	72.7
No	6	27.3
Total	22	100.0

Planned machine maintenance is one of the Indicators of Total Productive Maintenance. The respondents were asked whether they participated in planned machine maintenance, and from Table 4.33, 72.7% (16) of the respondents said they were participating in planned machine maintenance, while 27.3% (6) of the respondents said they were not participating. This was not very bad level of participation, showing that Total Productive Maintenance was in place.

Table 4.34

Extent of understanding Total Productive Maintenance

	Frequency	Percentage
Very Low Extent	1	4.5
Low Extent	5	22.7
Moderate extent	7	31.8
Great Extent	6	27.3
Very Great Extent	3	13.6
Total	22	100.0

On the extent of understanding of Total Productive Maintenance by the respondents, Table 4.34 shows the understanding varied considerably with 13.6% (3) of the respondents putting it at very great extent, 27.3% (6) of the respondents putting it at great extent, 31.8% (7) of the respondents putting it at moderate extent, 22.7% (5) of the respondents at low extent and 4.5% (1) of the respondents putting it at very low extent. Here the score cut across all measure levels, showing the opinion was diverse.

Table 4.35

Opinion on Help of Total Productive Maintenance in Improving Productivity

	Frequency	Percentage
Yes	16	72.7
No	6	27.3
Total	22	100.0

The respondents were asked whether, they thought Total Productive Maintenance had helped in improving productivity, and from Table 4.35, 72.7% (16) of the respondents thought it had helped while 27.3% (6) of the respondents said it had not helped.

Table 4.36

Extent of Help of Total Productive Maintenance in Improving Productivity

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	6	37.5
Great Extent	10	62.5
Very Great Extent	0	0
Total	16	100.0

For the respondents who answered yes to the question whether Total Productive Maintenance had helped improve departments effectiveness they were asked to state the extent of the help, and form Table 4.36, 62.5% (10) of the respondents put it at great extent, 37.5% (6) of the respondents put it at moderate extent. The findings show that the respondents agreed on this question with all opinions falling between great extent and moderate extent.

Table 4.37

Opinion on help of Total Productive Maintenance in improving effectiveness

	Frequency	Percentage
Yes	17	77.3
No	5	22.7
Total	22	100.0

As to whether Total Productive Maintenance had helped the department improve on its effectiveness, Table 4.37 shows that 77.3% (17) of the respondents believed it had helped while 22.7% (5) respondents believed it had not helped. This shows that decision opinion was not unanimous, with five respondents putting it at no, though those who said yes were more that 75% which is above average.

Table 4.38

Extent of Help of Total Productive Maintenance in Improving Effectiveness

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	8	47.1
Great Extent	9	52.9
Very Great Extent	0	0
Total	17	100.0

The respondents who answered yes to the question whether Total Productive Maintenance had helped improve department's effectiveness were asked to state the extent of the help. From Table 4.38, 52.9 % (9) of the respondents put it at great extent, while 47.1% (8) of the respondents put it at moderate extent, which is a much divided opinion falling between moderate extent and great extent. Ranks

4.8 Kaizen Tool and organization effectiveness

In this section, the researcher sought to find out the extent of knowledge of Kaizen, level of participation in Kaizen activities, and what respondents thought Kaizen had contributed to organization effectiveness

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Table 4.39

Knowledge of Existence of Kaizen at Davis &Shirtliff Ltd.

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

From table 4.39, it is clear that every respondent was aware that manufacturing department had implemented Kaizen

Table 4.40

Extent of Knowledge of existence of Kaizen at Davis &Shirtliff Ltd.

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	6	27.3
Great Extent	8	36.4
Very Great Extent	8	36.4
Total	22	100.0

From Table 4.40, the extent of knowledge of Kaizen Tool is 36.4% (8) of the respondents very great extent, 36.4% (8) of the respondents great extent and 27.3% (6) the respondents of moderate extent. The results show an almost equal distribution between three consecutive measures.

Table 4.41

Extent of Management Support to Kaizen Implementation

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	5	22.7
Great Extent	9	40.9
Very Great Extent	8	36.4
Total	22	100.0

Table 4.41, shows that 36.4 % (8) of respondent believe that management support kaizen implementation to a very great extent, 40.9% (9) of the respondents believe management support kaizen implementation to a great extent while 22.7% (5) of the respondents believe management supports Kaizen to a moderate extent. This is an above average score.

Table 4.42

Opinion on whether Kaizen has helped Improve effectiveness

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

Table 4.42 show that all respondents believe Kaizen has helped the department become more effective, which is a big confidence vote

Table 4.43

Extent of Kaizen Contribution to organization effectiveness

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	8	36.4
Great Extent	9	40.9
Very Great Extent	5	22.7
Total	22	100.0

From Table 4.43, on extent to which Kaizen has helped improve department's effectiveness, 36.4% (8) of the respondents believe that Kaizen has helped to a Moderate extent, 40.9% (9) of the respondents to a great extent while 22.7% (5) of the respondent believe it is to a very great extent. A score well balanced between moderate extent and very great extent showing a seamless transition in opinion.

Table 4.44

Opinion on Whether Kaizen Had Helped Improve Productivity

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

From the Table 4.44, it is clear that all respondents believe that Kaizen has helped improve productivity of the department. This is a good score for this measure

Table 4.45

Extent to which Kaizen had helped improve Productivity

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	0	0
Great Extent	16	72.7
Very Great Extent	6	27.3
Total	22	100.0

From Table 4.45, on extent to which Kaizen has helped improve productivity, 72.7% (16) of respondents believed it is to a great extent while 27.3% (6) of the respondents believed it is to a very great extent. This was a very high score for Kaizen help in improving productivity and it shows that Kaizen was being felt on the ground

Table 4.46

Opinion on whether Kaizen helped in reducing Cost

	Frequency	Percentage
Yes	21	95.5
No	1	4.5
Total	22	100.0

From Table 4.46, it can be seen that only one respondent did not think that kaizen had contributed to reduction in manufacturing cost, which is big confidence vote.

Table 4.47

Extent of Kaizen Helps in Reducing Manufacturing Cost

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	0	0
Moderate extent	8	38.1
Great Extent	8	38.1
Very Great Extent	5	23.8
Total	21	100.0

From Table 4.47, on the extent to which kaizen had helped in reducing cost. 38.1% (8) of the respondents put it at moderate extent, 38.1% (8) of the respondents put it at great extent while 23.8% (5) of the respondents put it at very great extent. This was an evenly distributed score falling between great extent and very great extent.

Table 4.48

Opinion on Whether Kaizen Helped In Reducing Work In Progress

	Frequency	Percentage
Yes	22	100
No	0	0
Total	22	100.0

From Table 4.48, it can be seen that all respondent were of the opinion that kaizen had contributed to reduction in work in progress.

Table 4.49

Extent of Kaizen Helped In Reducing Work In Progress

	Frequency	Percentage
Very Low Extent	0	0
Low Extent	3	13.6
Moderate extent	10	45.5
Great Extent	8	36.4
Very Great Extent	1	4.5
Total	22	100.0

From Table 4.51, on the extent to which kaizen had helped in reducing work in progress. 45.5% (10) of the respondents put it at moderate extent, 13.6% (3) of the respondents put it at low extent 36.4% (8) of the respondents put it at great extent while 4.5% (1) of the respondents put it at very great extent. This shows a very widespread opinion.

4.9 Spearman's Rank Order Correlation of Independent Variables Measures and Dependent Variable Measures for Survey Data

This section presents the Spearman's Rank Order Correlation coefficient for independent variables and dependent variable.

4.9.1 Spearman Rank Order correlation for Kaizen Tool

This section presents spearman Rank Order correlation for Kaizen Tool and indicators of organization effectiveness

Table 4.50

Spearman's Rank Order Correlation Values Between Organization Effectiveness Measure And Extent Of Understanding Of Kaizen

Measure	1	2	3	4
1. Extent of help of Kaizen in improving productivity				
2. Extent of help of Kaizen in improving organization effectiveness	.250			
3. Extent of Kaizen has help to manufacturing department to reduce work in progress	-.226	-.035		
4. In your opinion, to what extent do you think adoption of Kaizen has helped manufacturing reduce Cost	.288	.080	-.270	
5. Extent of understanding of Kaizen concept	.325	.476*	-.059	.120

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

N=22

From Table 4.50, it can be seen that there was weak positive correlation of 0.325between extent of understanding of Kaizen concept and Extent of help of Kaizen in improving productivity. This shows that, the higher the respondent understood Kaizen, the higher the extent they thought Kaizen helped improve productivity, but the points are dispersed from the best-fit line. There was also a positive correlation of medium strength of .476 between Extent of understanding of Kaizen and Extent of help of Kaizen in improving organization effectiveness, meaning that to the higher the respondent understood Kaizen, the higher the extent they though Kaizen helped improve productivity and vice versa. There was a negative weak correlation of -0.059 between extent of understanding of Kaizen concept and Extent Kaizen had helped the manufacturing department to reduce work in progress, and this shows that there was a negative linear relationship between respondents understanding of Kaizen and their opinion on extent to which they thought Kaizen helped in reducing work in Progress and vice versa, but the points were dispersed from best fit line.

4.9.2 Spearman Rank Order correlation for Kaizen's Just-In-Time

This section presents spearman Rank Order correlation between Just-In-Time and indicators of organization effectiveness

Table 4.51

Spearman's Rank Order Correlation Values Between Organization Effectiveness Measure And Extent Of Understanding Of Just-In-Time

Measure	1	2	3	4
1. Extent of help of Just-In-Time in reducing work in progress	-			
2. Extent of help of Just-In-Time in improving productivity	.595**	-		
3. Extent of help of Just-In-Time in reducing cost	.647*	.268	-	
4. Extent of help of Just-In-Time in improving departments effectiveness	.414	.355 .	.353	-
5. Extent of understanding Just-In-Time system	.766**	.682**	.806**	.344

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

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

N=22

From Table 4.51, it can be seen that there was a strong positive of correlation of 0.766, 0.682, and 0.806 between Extent of understanding Just-In-Time system and Extent of help of Just-In-Time in reducing work in progress, Extent of help of Just-In-Time in improving productivity and Extent of help of Just-In-Time in reducing cost of respectively. This shows that respondent who gave a higher score for extent of understanding of Jus-In-Time, gave a higher score for Extent of help of Just-In-Time in reducing work in progress, Extent of help of Just-In-Time in improving productivity and Extent of help of Just-In-Time in reducing and vice versa. Finally there was a weak positive correlation of 0.344 between Extents of understanding Just-In-Time system and Extent of help of Just-In-Time in improving department's effectiveness, meaning that those with higher level of understanding of Just-In-Time also thought Just-In-Time had helped to a great

extent improve effectiveness of the department and vice versa, but the points were dispersed from best fit line

Table 4. 52

Spearman's Rank Order Correlation Between Organization Effectiveness Measure And Extent One Could Handle All Work Within Their Work Section

Measure	1	2	3	4
1. Extent of help of Just-In-Time in improving departments effectiveness				
2. Extent of help of Just-In-Time in reducing work in progress	.414			
3. Extent of help of Just-In-Time in reducing cost	.353	.647*		
4. Extent of help of Just-In-Time in improving productivity	.355	.595**	.268	
5. Extent one could handle all work within their work section	.425*	.798**	.242	.685**

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

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

N=22

From Table 4.52, it can be seen that there was a strong positive correlation of 0.798 and 0.685between Extent one could handle all work within their work section and Extent of help of Just-In-Time in reducing work in progress and Extent of help of Just-In-Time in improving productivity respectively. This shows that respondent who gave a higher score for Extent one could handle all work within their work section, gave a higher score for Extent of help of Just-In-Time in reducing work in progress and Extent of help of Just-In-Time in improving productivity and vice versa. Finally there was a weak positive correlation of 0.425 and 0.242 between Extent one could handle all work within their work section and extent of help of Just-In-Time in improving departments effectiveness and Extent of help of Just-In-Time in reducing cost, showing that the respondents who gave a higher score on extent they could handle all work within their section also gave a higher score for extent of help of Just-In-Time in improving

departments effectiveness and Extent of help of Just-In-Time in reducing cost and vice versa but the points were dispersed from the best line fit.

4.9.3 Spearman Rank Order correlation for Kaizen's Strategic Management System

This section presents spearman Rank Order correlation between Strategic Management System and indicators of organization effectiveness

Table 4.53

Spearman's Rank Order Correlations between organization effectiveness measure and extent of understanding of Strategic Management system

Measure	1	2
1. Extent of help of Strategic Management system in improving productivity	-	
2. Extent of help of Strategic Management system in improving department's effectiveness	.369	-
3. Extent of understanding of Strategic Management system	.046	.278

From Table 4.53, there was a weak positive correlation between extent of understanding of suggestion system and extent of help of Strategic Management system in improving productivity and extent of help of Strategic Management system in improving department's effectiveness. This shows that respondents who had higher extent of understanding of Just-In-Time also gave higher score for extent of help of Strategic Management system in improving productivity and extent of help of Strategic Management system in improving department's effectiveness, but the point were dispersed from the best fit line.

4.9.4 Spearman Rank Order correlation for Kaizen's Total Productive Maintenance

This section presents spearman Rank Order correlation between Total Productive Maintenance and indicators of organization effectiveness

Table 4. 54:

Spearman's Rank Order Correlations between organization effectiveness measure and extent of understanding of Total Productive Maintenance System

Measure	1	2
1. Extent of help of Strategic Management system in improving productivity	-	
2. Extent of help of Strategic Management system in improving department's effectiveness	.381	-
3. Extent of understanding of Strategic Management system	.102	.037

From Table 4.54, there was a weak positive correlation between measures Extent of understanding of Strategic Management system and Extent of help of Strategic Management system in improving productivity and Extent of help of Strategic Management system in improving department's effectiveness of 0.102 and 0.037 respectively. This shows that the respondent who had higher understanding of Strategic Management system did not necessary gave a higher score for Extent of help of Strategic Management system in improving productivity and Extent of help of Strategic Management system in improving department's effectiveness, but the points were dispersed from the best fit line.

4.9.5 Spearman Rank Order correlation for Kaizen's Quality Circle

Table 4. 55

Spearman's Rank Order Correlations Between Organization Effectiveness Measure And Extent Of Understanding Of Quality Circle

Measure	1	2
1. Extent of help of quality in improving productivity	-	
2. Extent of help of quality Circle in improving department's effectiveness	.801**	-
3. Extent of understanding of quality Circle	.131	-.074

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

Table 4.55 shows the correlation table for extent of understanding of Quality Circle and measures of organization effectiveness. There was a weak positive correlation of 0.131 between extent of understanding of Quality circle and extent of help of quality circle in improving department's productivity. This means that a higher understanding of quality circle, resulted in the respondent rating quality circle on its help to improve productivity higher, but the points on the graph were scattered. There was also very weak negative relationship of -0.074 between extent of understanding of Quality circle and extent of understanding help of quality circle in improving department's effectiveness, meaning that a strong understanding of quality circle resulted in a low rating of extent to which Kaizen helped in improving organization effectiveness but with points scattered away from Best-fit line.

4.10 Comparing Manufacturing and Service department on Key Indicators of organization effectiveness

This section compared cost, revenue growth, and Work in progress before and after kaizen was implemented in manufacturing department for Manufacturing and Services Department

4.10.1 Cost comparison

The researcher sought to know whether there was significant drop in cost for period before and after kaizen for both manufacturing and service department. The values of comparison were the ratio between cost and department's revenue. This ratio was used because higher revenue would have a higher cost value and therefore comparing the cost value directly would not give the true picture.

Table 4.56

Descriptive Statistic of Cost

Paired Samples Statistics				
		Mean	N	Std. Deviation
Pair 1	Before Kaizen Cost in Manufacturing Department	.7722	24	.10156
	After Kaizen Cost in Manufacturing Department	.7915	24	.12274
Pair 2	Before Kaizen Cost in Service Department	.8199	24	.04593
	After Kaizen Cost in Service Department	.7964	24	.04174

From Table 4.56, the manufacturing department did not show any reduction in cost for period before Kaizen and period after Kaizen. Its cost was actually higher for the period after Kaizen. This could be explained by the fact that kaizen implementation uses resources and these resources were factored as a cost for the department. From the records, it was difficult to separate this cost from other costs. On the other hand, the service department, which had not implemented Kaizen, showed reduction in cost for period after Kaizen, was implemented in manufacturing department

Table 4.57

Comparing Cost Before and After Kaizen

Paired Samples Test (Within Group Comparison)									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Before Kaizen Cost In Manufacturing – After Kaizen Cost in Manufacturing	-.0193	.15612	.03187	-.08528	.04656	-.607	23	.549
Pair 2	Before Kaizen Cost in Service Department – After Kaizen Cost in Service	.02350	.04880	.00996	.00289	.04410	2.359	23	.027

From table 4.57, Manufacturing department did not show any significant change in cost after kaizen implementation, at 95% significant level. On the other hand, Service department showed a statistically significant reduction in cost for period after kaizen implementation in manufacturing department, at 95% significant level.

4.10.2 Work In Progress Comparison

This section compared Work in Progress for period of two years before and two years after kaizen was implemented in manufacturing department. The comparison involved within department comparison of ratio of Work In Progress and revenue. The ratio was necessary since a high revenue period is likely to have higher work in progress and therefore taking the ratio would make comparison realistic.

Table 4.58

Work In Progress Descriptive Statistics

		Mean	N	Std. Deviation
Pair 1	Before Kaizen WIP* In Service Department	.1121	24	.01444
	After Kaizen WIP* in Service	.0915	24	.03002
Pair 2	Before Kaizen WIP* in Manufacturing Department	.4669	24	.11870
	After Kaizen WIP* In Manufacturing Department	.1309	24	.19207

*WIP stands for Work In Progress

Table 4.58 shows the descriptive statistics of work in progress for Manufacturing and Service departments for periods before and after Kaizen implementation in manufacturing department. From the table it can be seen that both department reported a drop in Work in Progress.

Table 4.59

Comparing Work In Progress Before and After Kaizen

Paired Samples Test (Within Department Comparison)									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	do	Sig. (2-tailed)
Pair 1	Before Kaizen WIP*In Service Department–After Kaizen WIP* In Service Department	.0206	.03296	.0067	.0066	.0345	3.060	23	.006
Pair 2	Before Kaizen WIP*in Manufacturing Department–After Kaizen WIP* in Manufacturing Department	.3359	.22306	.0455	.2417	.4301	7.378	23	.000

*Work In Progress

Table 4.59 shows 2-tailed t-test of work in progress for period before and after kaizen implementation of in manufacturing department. From the Table it can be seen that at 95% significant both departments had a statistically significant reduction in Work In Progress, with manufacturing department recording a higher drop

4.10.3 Productivity Comparison

This section compared productivity for period of two years before and two years after kaizen was implemented in manufacturing department. The comparison involved within department comparison of revenue generated.

Table 4.60

Descriptive Statistics of Productivity

Paired Samples Statistics				
		Mean	N	Std. Deviation
Pair 1	Before Kaizen Labor Productivity for Service department	667.4167	24	171.72600
	After Kaizen Labor Productivity Service	869.4167	24	95.42031
Pair 2	After Kaizen Labor Productivity Manufacture	745.8750	24	130.65930
	Before Kaizen Labor Productivity Manufacture	452.7500	24	100.06183

From Table 4.60, it can be seen that both groups recorded an increase in productivity for period after Kaizen Implementation, and from Table 4.61, it can be seen that this increase was statistically significant for both groups.

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Table 4.61

Comparing Productivity Before and After Kaizen

Paired Samples Test									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Before Kaizen Labor in Productivity in Service – After Kaizen Labor Productivity in Service department	-202	219	45	-294	-109	-4.50	23	.000
Pair 2	After Kaizen Labor Productivity in Manufacture – Before Kaizen Labor Productivity in Manufacturing Department	293	162	33	224	361	8.84	23	.000

4.11 Summary

In this chapter, data in the retuned questionnaires, and in the secondary data, was processed and analyzed using Statistical Package for Social Scientists. The analyzed data was then tabulated and interpreted

CHAPTER FIVE

SUMMARY OF FINDING, DISCUSSIONS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter is a documentation of the study summary of finding, discussion of findings, conclusions made from the findings, recommendations, and recommendations for further study.

5.2 Summary of findings

This study was carried out to access the effects of Kaizen Tool on organization effectiveness at Davis & Shirtliff Ltd. The study was guided by four objectives which were: To evaluate the effect of Kaizen's Just in Time (JIT) system on Organization effectiveness at Davis &Shirtliff Ltd, to assess the effect of Kaizen's Strategic Management System on organization effectiveness at Davis &Shirtliff Ltd., to evaluate the effect of Kaizen's Quality Circle on organization effectiveness at Davis &Shirtliff Ltd. and To assess the effect of Kaizen's Total Productive Maintenance System on organization effectiveness at Davis &Shirtliff Ltd.

5.2.1 Summary of finding on effect of Kaizen's Just-In-Time system on organization effectiveness at Davis &Shirtliff Ltd

On Kaizen's Just-In-Time and its effect on organization effectiveness; measuring indicators of Just-In-Time, showed that 20 out of 22 respondents were practicing one piece flow production, all the respondents were participating in 5s activities, and to the extent in which the respondents could handle all the work within their section the respondents put it at a mean score of 4.32 out of 5. On the extent Just-In-Time had helped reduce work in progress, the respondents returned a mean score of 3.91 out of 5. On the extent to which Just-In-Time had helped improve productivity, the respondents returned a mean score of 3.86 out of 5. On the extent to which Just-In-Time had helped the department reduce cost, the respondents retuned a mean score of 4.17 out of possible 5. On the extent to which just in time had helped improve departments effectiveness, the respondents returned a mean score of 3.64 out of possible 5. It shows that the employees believed that Just-In-Time system had a positive effect to on organization effectiveness

5.2.2 Summary of finding on effect of Kaizen's Strategic Management system on organization effectiveness at Davis &Shirtliff Ltd

On Kaizen's Strategic Management system and its effect on organization effectiveness, testing indicators Strategic Management system indicators, all the respondents agreed that ideas generation program existed, but reward scheme was not in existence with only 2 out of 22 respondents reporting having been rewarded, although all respondents answered to having given a suggestion. On the extent to which Strategic Management system had helped improve department's effectiveness, the respondents put it at a mean score of 3.69 out 5. On the extent Strategic Management system had helped improve department's productivity; the respondents put it at an average of 4.0 out of possible 5. It shows that the employees believed Strategic Management system had a positive effect to on organization effectiveness

5.2.3 Summary of finding on effect of Kaizen's Quality Circle on organization effectiveness at Davis &Shirtliff Ltd

On Kaizen's Quality Circle and its effects on organization effectiveness, testing of indicators of quality circle showed that there were organized small group activities with all but one respondents saying they participated in the small group activities and all who were participating admitted to a voluntary participation. On the extent to which quality circle had helped the department improve its productivity, the respondents rated it at a mean of 4.3 out of 5. On the extent, quality circle had helped the department improve department's effectiveness; the respondents put it at 4.05 out of 5. It shows that the employees believed quality circle had a positive impact to on organization effectiveness

5.2.4 Summary of finding on effect of Total Productive Maintenance system on organization effectiveness at Davis &Shirtliff Ltd

On Kaizen's Total Productive Maintenance and organization's effectiveness, on measuring indicator of Total Productive maintenance, all respondents said they were participating in 5S activity. On Planned maintenance which is also an indicator of Total Productive maintenance,

only 6 (72.7%) of the 22 respondents were participating. On Training on Total productive maintenance which is another indicator, the researcher found out that 18(81.8%) of the 22 respondents had participated in a training. On the extent to which Total Productive Maintenance had helped improve productivity, the respondent gave it a mean score of 3.62 out of 5. On the extent to which Total productive maintenance had helped the department improve its effectiveness, the respondents gave it a mean score of 3.54 out of 5. It shows that the employees believed that Total Productive Maintenance system had a positive effect to on organization effectiveness

5.2.5 Summary of finding on effect of Kaizen Tool as a whole on organization effectiveness at Davis &Shirtliff Ltd

The researcher also wanted to find out how the respondents scored Kaizen tool as a whole towards promoting organization effectiveness. On the extent to which Kaizen had helped improve productivity, the respondents gave it a mean score 4.27 of out of 5. On the extent to which Kaizen had helped reduce cost, the respondents gave it a mean score of 3.86 out of 5. On the extent to which Kaizen had helped reduce work in progress, the respondents gave it a score of 3.6 out of five. On the extent to which Kaizen had helped the department improve its effectiveness, the respondents gave it a score 3.32 of out of 5. On the extent to which Kaizen had helped the improve effectiveness, the respondents gave it a mean score of 3.86 out of 5.

The correlation analysis showed that only Just-In-Time independent variables showed a strong positive correlation with independent variables with work in progress measure producing the strongest correlation value. The other variables showed correlation weak correlation

On comparing manufacturing department and service department on key indicators of organization effectiveness i.e. cost, work in progress, revenue growth and productivity. Using t-test paired sample at 95% significant; work in progress for both groups showed drop with a significant statistical difference for period after Kaizen implementation, with manufacturing department recording the biggest drop. On cost, there was no statistical difference in cost for manufacturing department for the period after kaizen Implementation although the mean cost had

become higher for period after kaizen implementation. However, for Service department there was a drop in cost with a significant statistical difference for period after Kaizen implementation in manufacturing department. On productivity, both groups showed an increase with a significant statistical increase after kaizen.

5.3 Discussion

From the study, there was great presence of all independent variables indicators, showing that indeed the Kaizen systems i.e. Quality circle, Strategic Management system, Total Productive maintenance and Just-In-Time were in place at Davis &Shirtliff Ltd.

5.3.1 Kaizen's Just-In-Time

On Just-In-Time, the respondents rated several indicators of organization effectiveness. On the extent to which Just-In-Time had helped the department improve productivity the respondents rated it at 3.86 out of 5, which is in between great extent and moderate extent according to the scale used in this study. On the extent to which Just-In-Time had helped the department reduce cost the respondents rated it at 4.17 out of 5, which is a score between great extent and very great extent. On the extent to which Just-In-Time had helped the department reduce Work In Progress, the respondents rated it at 3.91 out of 5, which is a score between great extent and very great extent. On the extent to which Just-In-Time had helped the department improve department effectiveness, the respondents rated it at 3.64 out of 5, which is a score between great extent and very great extent. All the scores for Just-In-Time were above moderate extent, with the help on reduction of cost scoring the highest at above great extent. All these scores matches the findings of (Moreira & Alves, 2008) carried out in Portugal, in which organizations implementing Just-In-Time perceived it a tool for reducing work in progress, reducing waste, improving productivity.

5.3.2 Kaizen's Strategic Management

On Strategic Management system, the respondents rated the extent to which it had helped improve productivity 4.0 out of 5, while on the extent to which it had helped improve effectiveness; the respondents rated it at 3.65 out of 5. The two are in the range of great extent and moderate extent according to the scale used in this study. This is a high score and coincides with assertion by (Charles & Chucks, 2012), which enumerated improved productivity as one of the long-term benefit of implementing Strategic Management system.

5.3.3 Kaizen's Quality Circle

On Quality Circle, this study found the respondents rated its extent of help to improve productivity, which is an indicator of organization effectiveness at 4.05 out of 5 while they rated its extent to which it had helped improve productivity of manufacturing department; the respondents rated it at 4.3 out of 5. This is a very similar score, since both are in the range of between great extent and very great extent according to the scale used his study. The rating on productivity is very high and agrees with (Barrick & Alexander, 1987), who indicated that quality circle contributes to improved productivity.

5.3.4 Kaize's Total Productive Maintenance

On Total productive maintenance, the respondents felt it had helped improve organization productivity to an extent 3.65 out 5 which is a score between moderate extent and great extent according to the measure used in this study, while they felt it had helped in improving effectiveness to an extent of 3.54 out 5 which is also a score between moderate extent and great extent according to the measure used in this study. The two scores are almost similar and they lie between moderate extent and great extent according to the scale used in this study. This finding matches the finding by (Ahmed, Ali, Allama, & Parvez, 2010) which found out that Total productive Maintenance helps in improving productivity.

On the extent to which Kaizen Tool as a whole had helped improve productivity, the respondents gave it a mean score 4.27 of out of 5 On the extent to which Kaizen had helped reduce cost, the respondents gave it a mean score of 3.86 out of 5 which is a score between moderate extent and great extent. On the extent to which Kaizen had helped reduce work in progress, the respondents gave it a score of out of five. On the extent to which Kaizen had helped the department improve its effectiveness, the respondents gave it a mean score of 3.86 out of 5. On the extent to which Kaizen had helped the department grow, the respondents gave it a mean score of 3.72 out of 5. It shows that the respondent's felts kaizen helped more in improving productivity and the score given lie between great extent and very great extent. For help in reducing cost, improving overall effectiveness, the respondents rated with a mean score that is between great extent and moderate extent.

5.3.5 Comparing Indicators of organization effectiveness

On comparing key indicators of organization effectiveness for manufacturing and service department, it was found out that at 95% significant level, Work In Progress for manufacturing department showed a statistically significant drop while that of service department also showed a statistically significant drop for period after kaizen implementation These findings contradicts (Balakrishnan, Linsmeier, & Venkatachalam 1996), who analyzed a sample of 46 firms that publicly disclosed adoption of JIT production and using a matched pair sample of non-JIT firms, where JIT firms, showed superior utilization of overall and work in process inventories relative to their control firm counterparts after adopting JIT production. On cost, manufacturing department showed no statistically significant change in cost, while service department on the showed a significant drop on cost for the period after kaizen was implemented in manufacturing department. The lack of drop for manufacturing department could have been due to the fact in implementing Kaizen, sizeable amount of resources must be spent. The amount of money spent could not be easily segregated because it was captured together with other cost in the records. Overall, secondary data analysis completely contradicts the opinion of the respondents who indicated great effect of the kaizen systems on the organization effectiveness indicator. Finally, both departments showed a statistically significant improvement in productivity.

5.4 Conclusion

The study concludes the following from the research questions.

On respondent's answers, quality circle had the greatest effect on productivity followed by Strategic Management system, Just-in-Time and Total Productive Maintenance in that order. on effectiveness as a whole, quality circle had the greatest impact followed by Kaizen Tool as a whole, Just in Time, Total Productive Maintenance, and Strategic Management system in that order. On Work in progress, Just-In-Time had the greatest effect, and this applied to cost reduction also. Therefore, the respondents believed Kaizen Systems had a positive effect on organization effectiveness.

However based on secondary data analysis and comparison between the two groups, Kaizen systems cannot be said to have had any effect to organization effectiveness, since despite showing statistically significant reduction in Work In Progress and improvement in productivity,

the comparison group, which was not implementing Kaizen, also showed similar statistically significant improvement. This conclusion is further because on cost the group implementing Kaizen did not show statistically significant difference after implementing Kaizen, while the comparison group not implementing kaizen showed a statistically significant reduction in cost

From this study, it can further be concluded that the respondents were of the opinion that there was an effect of the Kaizen tool on organization effectiveness, but this opinion was not correlated by analysis of secondary data, which could not link Kaizen to improvements even where they had occurred. The opinion by respondents could have been caused the mere fact that they had been exposed to the intervention through thorough training and participation, and therefore had in mind possible effects of the intervention, which they thought had occurred. This is a lesson to any one intending to implement Kaizen that they should not be carried away by mere thinking that things are changing, while data does not support that. However, the opinion of the respondents cannot be entirely ignored, especially for productivity because this is a concept that workers can directly feel.

5.5 Recommendations

From the study, the researcher recommends the following:

i. Davis &Shirtliff Ltd. should establish continuous measurement of the effects of Kaizen to make sure that benefits intended are being achieved. This should also be applied by other organization wishing to implement Kaizen. This will make sure that corrective action are taken where expected outcomes are not forthcoming

ii. Davis & Shirtliff Ltd. need to start rewarding employees whose improvement suggestions are implemented successfully. This may trigger great ideas from the work floor because staff are more close to the problems

5.6 Recommendations for further study

This study recommends the following for further studies.

1. Effect of Kaizen tool on employee job satisfaction
2. Barrier to effective implementation of kaizen tool

5.7 Summary

In this chapter, the summary of findings were discussed, conclusions drawn, recommendations made and areas of further research suggested.

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APPENDICES

Appendix I: Letter of Introduction

Alex Mucheru
P. o. Box 113977-00100
Nairobi
12/6/2013

Dear Respondent,

RE: Request for Support on MA Project

I am a Masters student at the University of Nairobi and in my final year of study. As part of the requirement for attainment of the degree, I am undertaking a research to evaluate the Effect of Kaizen Tool on Organization Effectiveness at Davis &Shirtliff Ltd

In this regard, I kindly requesting for your support in terms of time, and by responding to the attached questionnaire. The Information received will be treated with desired confidentiality

Thank you for your time
Yours faithfully
Mucheru Mureithi Alex

Appendix II: Manufacturing Department Questionnaire

Section A: Staff Information

1. How long have you been at Davis & Shirtliff Ltd (Check only once)

   a) ☐ Over 10 Year
   b) ☐ Between 5 and 9 years
   c) ☐ Between 2-5 years
   d) ☐ 2 years
   e) ☐ below 2 years

2. Where does you Position fall in the following categories (Check only once)

   a) ☐ Manager
   b) ☐ Supervisor
   c) ☐ Technician
   d) ☐ Others. Specify…….

Section B: Kaizen

1.

a. Are you aware that Davis &Shirtliff Ltd has implemented Kaizen? (Tick only once)

   i) ☐ Yes

   ii) ☐ No

b. To what extent do you understand the Kaizen concept (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)

2. To what extent does management support Kaizen implementation (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)

3.

a. Do you think Kaizen has helped in improving productivity? (Tick only once)

   i) ☐ Yes

   ii) ☐ No

b. If yes, to what extent do you think Kaizen System has helped in improving productivity on scale of one to five one being lowest and five highest (Tick only once)

   ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)

4.

a. Do you think Kaizen has helped in reducing cost? (Tick only once)

   i) ☐ Yes

   ii) ☐ No

b. If yes, to what extent do you think Kaizen System has helped reducing cost on scale of one to five one being lowest and five highest (Tick only once)

   ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)

5.

a. Do you think Kaizen has helped in reducing work in progress? (Tick only once)

   i) ☐ Yes

   ii) ☐ No

b. If yes, to what extent do you think Kaizen System has helped in reducing work in progress on scale of one to five one being lowest and five highest (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)

Section C: Quality Circle

1. Have you ever participated in a Quality Circle (Tick only once)
   i) ☐ Yes
   ii) ☐ No
2. Do you participate Voluntary (Tick only once)
   i) ☐ Yes
   ii) ☐ No
3. Do you participate in 5S activities (Tick only once)
   i) ☐ Yes
   ii) ☐ No
4. To what extent do you understand Quality Circle? (Tick only once)
   ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐ 2(low extent)
5.
   a. Do you think Quality Circle has helped in improving productivity? (Tick only once)
      iii) ☐ Yes
      iv) ☐ No
   b. If yes, to what extent do you think Quality Circle System has helped in improving productivity on scale of one to five one being lowest and five highest (Tick only once)

      ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low Extent)

6.

a. Do you think Quality Circle has helped in improving department's effectiveness? (Tick only once)

   i) ☐ Yes

   ii) ☐ No

b. If yes, to what extent do you think Quality Circle System has helped in improving department's effectiveness on scale of one to five one being lowest and five highest (Tick only once)

   ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)

Section D: Just-In-Time

1.

a. Are you aware that Davis &Shirtliff Ltd is using one piece flow technique? (Tick only once)

   i) ☐ Yes

   ii) ☐ No

b. If yes, do you practice one piece flow production technique? (Tick only once)

   i) ☐ Yes

   ii) ☐ No

2. Do you participate in 5S activities? (Check □ only once)

   i) ☐ Yes

   ii) ☐ No

3. To What extent can you handle all work within your work section (Tick only once)

   ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)

4. To What extent do you understand one piece flow technique (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)

5.

a. Do you think Just-In-Time has helped in improving effectiveness? (Tick only once)

   i. ☐ Yes

   ii. ☐ No

b. If yes, to what extent do you think Just-In-Time System has helped in improving effectiveness on scale of one to five one being lowest and five highest (Tick only once)

   ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)

6.

a. Do you think Just-In-Time has helped in improving productivity? (Tick only once)

   i) ☐ Yes

   ii) ☐ No

b. If yes, to what extent do you think Just-in-Time System has helped in improving productivity on scale of one to five one being lowest and five highest (Tick only once)

   ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)

7.

a. Do you think Just-In-Time has helped in reducing Work In progress (Tick only once)

   i) ☐ Yes

   ii) ☐ No

b. If yes, to what extent do you think Jus-in-Time System has helped in reducing Work in Progress on scale of one to five one being lowest and five highest (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)

8.

a. Do you think Just-In-Time has helped in reducing cost? (Tick only once)

i) ☐ Yes

ii) ☐ No

b. If yes, to what extent do you think Just-in-Time System has helped in reducing cost on scale of one to five one being lowest and five highest (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)

Section E: Strategic Management System

1. Are you aware there is a Strategic Management System at Davis &Shirtliff Ltd (Tick only once)
   i. ☐ Yes
   ii. ☐ No
2. To what extent do you understand the Strategic Management system (Tick only once)
   ☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)
3. Have you ever given a Kaizen Suggestion? (Tick only once)
   i. ☐ Yes
   ii. ☐ No
4. Was your idea tested? (Tick only once)
   i. ☐ Yes
   ii. ☐ No
5. Have you received any form of recognition as a result of your idea? (Tick only once)

i. ☐ Yes

ii. ☐ No

6.

b. Do you think Strategic Management System has helped in improving effectiveness? (Tick only once)

i. ☐ Yes

ii. ☐ No

c. If yes, to what extent do you think Strategic Management System has helped in improving effectiveness on scale of one to five one being lowest and five highest (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)

7.

a. Do you think Strategic Management System has helped in improving productivity? (Tick only once)

i. ☐ Yes

ii. ☐ No

b. If yes, to what extent do you think Strategic Management System has helped in improving productivity on scale of one to five one being lowest and five highest (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)

Section F: TPM

1.

a. Are you aware TPM is practiced at Davis &Shirtliff Ltd? (Tick only once)

a) ☐ Yes

b) ☐ No

b. If yes, have you ever participated in TPM training? (Tick only once)

i. ☐ Yes

ii. ☐ No

2. Do you participate in planned machine maintenance? (Tick only once)

i. ☐ Yes

ii. ☐ No

a. If yes, to what extent do you understand TPM? (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)

3.

a. Do you think Total Productive Maintenance has helped in improving effectiveness? (Tick only once)

i. ☐ Yes

ii. ☐ No

b. If yes, to what extent do you think Total Productive Maintenance has helped in improving effectiveness on scale of one to five one being lowest and five highest (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent) ☐1(very low extent)

8.

a. Do you think Total Productive Maintenance has helped in improving productivity? (Tick only once)

i) ☐ Yes

ii) ☐ No

b. If yes, to what extent do you Total Productive Maintenance has helped in improving productivity on scale of one to five one being lowest and five highest (Tick only once)

☐5(very great extent) ☐4(Great Extent) ☐3(Moderate Extent) ☐2(low extent)