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**Determinants of Effective Kaizen Implementation
The Case of Kadisco Paints and Adhesive
Share Company**

By

Esubalew Kelkay Assaye

Advisor:

Solomon Markos (PhD)

December, 2016

Addis Ababa, Ethiopia

ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES

Determinants of Effective Kaizen Implementation
The Case of Kadisco Paints and Adhesive
Share Company

**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL
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APPROVED BY BOARD OF EXAMINERS

Dean, School of Business Temesgen Belayneh (PhD) Signature -----

Advisor Solomon Markos (PhD) Signature-----

External Examiner Mesfin Workneh (PhD) Signature-----

Internal Examiner Temesgen Belayneh (PhD) Signature-----

DECLARATION

I hereby declare that the work which is being presented in this thesis entitled, “Determinants of Effective Kaizen Implementation the Case of Kadisco Paints and Adhesive Share Company” is original work of my own, has not been presented for a degree of any other university and all the resource of materials used for this thesis have been duly acknowledged.

Esubalew Kelkay Assaye

Date

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

Solomon Markos (PhD)

(Advisor)

Date

DEDICATION

This research paper is dedicated to my mother late Mum **Zewditu Assaye** for her being the reason of my coming to this world and getting this level, Mum you are the rock of my life and hero. Mum I will never put out of my mind.

*Good is never good enough, kaizen is a
never ending Journey to excellence.*

“どうもありがとう”

DOMO ARIGATO!!!!

Thanks a lot

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Acronyms

JMS:	Japanese Management System
JICA:	Japanese International Cooperation Agency
TQC:	Total Quality Control
QCC:	Quality Control Circle
QC:	Quality Circle
TQM:	Total Quality Management
CI:	Continuous Improvement
JIT:	Just In Time
R&R:	Reward and recognition
PDCA:	Plan-Do-Check and Action
BPR:	Business Process Reengineering
SPSS:	Statistical Package for Social Science
5S:	Sort, Set in order, Shine, Standardize, Sustain
DF:	Degree of Freedom
VIF:	Variance Inflation Factor
Tole.	Tolerance
EKI	effective implementation of kaizen
TMF	Top management factor
MTF	Methodologies or tools factor
PCF	Program coordination factor
PEKI	Perception towards effectiveness kaizen implementation

Abstract

Kaizen has become global activity spread to multi companies and their employees including manufacturing sector. It is a continuous development in quality of products or services, continuous improvement in productivity, cost/waste reduction, better safety and employee's satisfaction. However proliferation of kaizen in Africa is still very small due to the limited number of players who bring in the practice. Thus, this research examined the determinants for effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company. To achieve the aim of this study, data was collected through questionnaire from a sample of 117 employees of the company selected using simple random sampling method. The study employed the statistical methods mean, standard deviation, correlation, and multiple regression analysis to analyze the data. The regression results showed all independent factors significantly explain 82% of the variations in effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company. It was found that top management, methodological or tools and perception towards kaizen implementation factors were found to be the determinants for effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company with p -value <0.01 . The study also confirmed that top management factor was the most important factor with the beta value 0.396 to have positive effect on effectiveness of kaizen implementation, followed by perception towards kaizen implementation factor with the beta value 0.336. Therefore, the study concluded that that top management, methodologies or tools and perception towards kaizen implementation factors have positive and significant effect on for effectiveness of kaizen implementation. Thus, result show the company shall revise all top management commitment and performance, methodologies or tools and perception of employees towards kaizen implementation for effectiveness of kaizen implementation.

Keywords: Kaizen, Top management, Methodologies or tools, program coordination, multiple regressions.

1. INTRODUCTION

1.1. Background of the Study

Around 1950s and 60s, Japan developed the foundation for a Japanese management system. The originally American technique which was adopted and adjusted became a Japanese Management System (JMS) better known as Kaizen, which have helped Japan to lift up productivity and overcome economic difficulties after world war two (Becker & snow,1997). Kaizen is defined as continuous improvement involving employees in all level of organization (Imai, 1986). The three characteristics of the kaizen system generally requirements are: Continuous, nature that is a never-ending journey for quality and efficiency; usually incremental in nature, always improving instead of reorganizing or reinstalling; Participative, requiring workforce involvement and intelligence (Burnet & New, 2003).

In the 1970s, as the kaizen management system revealed potential for never ending effort for improvement in production value, it defused its new management system throughout Japanese companies. With the globalization of Japanese business in the 1980s Kaizen became a global activity. Kaizen was originally developed in Toyota and spread among other Japanese manufacturer as they gained fame in the international market for higher quality products (Imai, 1986). That is, as Japans multinational manufacturing companies expanded abroad. They tried to duplicate the quality management methods with their new factories. When Japanese firm endeavored to increase local procurement of intermediate inputs, local suppliers were requested to confirm Japanese quality standards.

Thus Japanese companies often assisted their local partners in learning the Kaizen philosophy and practices. Based on its competitive success in the 1990s in its aid package to support growth for these countries coming late to industrialization, Japan included kaizen as an additional means for enhancing their human potential and industrial enterprise capability (Becker & snow, 1997).

Kaizen has become global activity spread by multi companies and their employees. It has become a 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. The First country in Africa which adopts kaizen is Tunisia it has been

practicing the system since august, 2006 and Egypt also adopted October 2007 by the full assistance of JICA (GRIP Development Forum, 2009).

The Ethiopian Kaizen Institute (2012:36&39) defines Kaizen as follows: Kaizen is “continuous improvement”. It use using common sense and is both a rigorous, scientific method using statistical quality control and an adaptive framework of organizational values and belief that keep workers and management focused on Zero defects. It is a philosophy of never being satisfied with what was accomplished last week or last year. The business lessen of 1980 was that Japanese firms, in their quest for global competitiveness, demonstrated a greater commitment to the philosophy of continuous improvement than western companies did. As Kaizen is a collective term of productivity improvement, creative idea and innovation is expected from entire workers by following a bottom- up management; it has a procedure and problem solving mechanism suggestion system.

As part of Ethiopian modernization program, the government is looking for various options that would improve the management of both public and private sector enterprises. The government has been supporting private and public sector enterprises to adopt internationally approved management philosophies. In addition the government of Ethiopia is by now lured by the process and product quality enhancement of countries as a result of their implementation of kaizen. Hence the government of Ethiopia decided to adopt kaizen and its claims that this management philosophy will also help the country in achieving the vision (EKI, 2011).

Prior to introduction of kaizen in Ethiopia, the Ethiopian government discussed with JICA about kaizen and on its success in Africa particularly its success in Tunisia. Eventually JICA agreed to carry out a pilot project on 30 companies in Ethiopia since 2009 (EKI, 2011).The introduction of kaizen as a management tool in Ethiopia has been launched with the assistance of JICA in response to the request of the government of Ethiopia to the government of Japan for kaizen technology transfer to Ethiopia. The kaizen project was officially launched with the first National Kaizen Seminar in the presence of high level officials from both sides. With the project pilot companies, kaizen is selected as one of management tools to improve and enhance managerial capability to implement Growth and Transformation Plan (GRIPS, 2011).

Asayehgn (2013) further argues that, the Ethiopian manufacturers are currently at a drawback about getting human capital and asset. As the manufacturing sector contributing less than 5.0 percent to the Gross Domestic Product (GDP) due to lack of highly skilled human resources,

they are applying different managerial tools within a single organization which, in turn, highlight a technological gap. Thus, kaizen implementation in private firm and in the context of the Ethiopian Government show that there is a paradox and, therefore, seems strange. There is no conclusive empirical evidence which clearly show whether or not the kaizen implementations in different contexts have brought about positive outcomes. Like all organizations Kadisco Paints and Adhesive Share Company also face with various challenges due to turbulent environment. To curve down these challenges and to achieve its organizational objective the company adopted Kaizen since 2012. A better understanding of kaizen implementation and the factors that influence its implementation could help to better manage the kaizen implementation and reduce the likelihood of kaizen implementation failures in the industry. Thus the main aim of this study was to investigate the determinants of effective implementation of kaizen in the Kadisco Paints and Adhesive Share Company.

1.2. Statement of the Problem

Kaizen is a never-ending journey to excellence and it continuously improved productivity, improved quality, better safety, lower costs, and greater customer and employee satisfaction (Imai, 1986). Given that kaizen is a vital approach to cost effectiveness, improving productivity and quality of products or services, better safety, greater customer and employee's satisfaction measuring its effectiveness requires investigation in the organization through formal research and helps to correct problems observed in the company.

Despite several benefits obtainable from kaizen, difficulties in the implementation of kaizen are also widely reported in Brunet (2003) and (Imai 1997). Furthermore, due to their origin in Japanese organizations, and their prevalence in Japanese context, applicability of kaizen to countries with different cultures and different management styles still remains to be understood. This problem is further highlighted in the context of internationalization of Japanese companies and the increasing popularity of kaizen. As kaizen is implemented by many companies, need rises for better understanding of kaizen process and the factors that are critical to kaizen implementation.

To implement Kaizen successfully in any organization, it needs top management commitment, performance measurement, communication of results, recognition and rewards, good training

program, good deployment, good program coordination and methodology or tools. Hence, failure to carry out these activities and put an organization structure in place, leads to the collapse of the implementation of kaizen (Fermento et.al, 2013; Farris, 2006; Hirata, 2001). According to Farris (2006), top management commitment, performance measurement, communication of results, recognition & rewards and training are grouped under top management factor and the others are program coordination factor and methodologies or tools factor. The continuous implementation of kaizen improvement program is expected to yield increased benefits. However, studies done on companies have revealed that the majority of the companies drop the program after the second year of their inauguration (American Quality Digest/AQD, cited in Tangwa, I., & Gilbert, N., 2008).

The manufacturing sector in Ethiopia is least developed in many aspects, including volume of production, quality of products, technology status, labor skill, export capacity, etc. The contribution of industry, particularly manufacturing, to the overall national income of the country is lowest in the world. Moreover, throughout the decade its share remained stagnant or declining. Thus, the manufacturing sector in Ethiopia is the least developed even by African standard.

The pilot project conducted on 30 companies proved the transferability of kaizen to Ethiopian context. Kaizen has been found suitable to the economic and social development policy and strategy of Ethiopia. As a result, Ethiopian Kaizen Institute (EKI) was established in 2011 by the Council of Ministers Regulation No.256/2011 with objective of carrying out a broad based activity of ongoing quality and productivity improvement and thereby enhancing expansion of competitive organization and industries (EKI, 2011).

Many manufacturing companies are plagued by problems like high quality rejects, high inventories, long lead time of production, high costs of production, and inability to cope with customer orders. Given these problems and appreciating that kaizen, the manufacturing process used in Japan, has revolutionized the way enterprises deliver products to their customers, retain market share, and satisfy their domestic market and expand into the international market, Kadisco Paints and Adhesive S.C are attempting to develop the habits of kaizen to focus on a customer-driven strategy to improve productivity and the quality of products and services by continuously amassing marginal improvements over time.

Even though the adoption of kaizen project was vital to the manufacturing sector of Ethiopia, a lot of factors need to be studied and considered in the project design phase before directly going into implementation of kaizen. The implementation of kaizen is new to the Ethiopian manufacturing sector including Kadisco Paints and Adhesive Share Company and it is not possible to predict what would happen when executing the project. As far as organizations use kaizen program as change efforts and having a purpose of quality improvement, augmenting productivity, cost effectiveness of products or services, better safety to employees, increase customers and employees satisfaction, its outcome become immense. Kadisco expanded its distribution activities to the manufacturing of Adhesives with a projection to begin in the sector of coatings. After technological tie-ups and support with several large international corporations, for both the product developments and raw material supply, Kadisco continued to be at the forefront in the Ethiopian market, for further expansion of its industry through foreign partnerships.

To continue being competent in the country and for further improvement, the company has implemented kaizen. But due to the fact that the concept of kaizen is new and negative perception of employees there are challenges in implementation of kaizen in the company. The challenges that the company faced during implementation are that the working culture was not conducive to support kaizen philosophy and the factory layout is not appropriately rearranged before kaizen implementation as well as the working environment kaizen needs clean and simple production process. In addition at the starting time of kaizen implementation there were no enough supporting materials and there were no sharing experiences in other similar companies. Moreover, as the philosophy is new in nationwide, the company employees had communication gap (language barrier) and lack of data and supporting information to assist kaizen practice.

So, this study focuses to identify the determinants of effective implementation of kaizen and to suggest suitable measures for improving the existing conditions in Kadisco Paints and Adhesive Share Company as a case study.

1.3. Basic Research questions

The study addressed the following research questions:

- ✓ What is the perception of employees towards effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company?
- ✓ What is the effect of top management factor on effectiveness of kaizen implementation of in Kadisco Paints and Adhesive Share Company?
- ✓ How do program coordination factors affect the successful implementation of kaizen in Kadisco Paints and Adhesive Share Company?
- ✓ To what extent do methodology or tool factors affect effective implementation of Kaizen in Kadisco Paints and Adhesive Share Company?

1.4. Objectives of the Study

1.4.1. General Objective

The main objective of this research is to investigate the determinants for effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company.

1.4.2. Specific Objectives

The specific objectives of this study are:

- To measure the perception of employees on effectiveness of Kaizen implementation
- To examine the top management factor influencing in effective implementation of Kaizen in Kadisco Paints and Adhesive Share Company.
- To investigate program coordination factors affecting the successful implementation of kaizen in Kadisco Paints and Adhesive Share Company.
- To examine methodology or tool factors affecting effective implementation of Kaizen in Kadisco Paints and Adhesive Share Company.

1.5. Significance of the Study

The research outcome would be an important input to the Kadisco Paints and Adhesive Share Company to make the necessary adjustment and improvement based on the recommendation of the study. The research would open the door for other researchers who want to study further on this area or other similar issues.

1.6. Scope of the Study

The study covered a section of the determinants of effective kaizen implementations in Kadisco paint & adhesive company. Only the four factors which are- top management factors, perception of employees factors, program coordination factors and methodologies or tools factors were considered.

1.7. Limitation of the Study

Some of the limitations that the researcher faced in carrying out the research are listed as follows:

- ✚ The result and recommendations of this research will be based on the findings from a case study and theoretical literature; therefore the finding of this study would be more empirically relevant to Kadisco paint & adhesive company.
- ✚ The research paper did not cover all the necessary factors that have to be covered like education level of workers.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Definition of Kaizen and major concepts

Manufacturing practices have been adapted into new principles to maintain the competitiveness within global industry. These new principles include Kaizen, just-in-time, lean thinking, six sigma, total quality management, and process improvement. The main target for using these new techniques is better meet customer needs by eliminating practices that do not add product value. Kaizen is the Japanese term (“Kai” meaning “change” and “Zen” meaning “good”) used to define continuous improvement (Palmer, 2001). According to Terziovski and Sohal (2000, p. 540), “Kaizen means ongoing improvement involving everyone, including both managers and workers” with the underlying principle of serving customer needs.

The authors cite improvements in product quality, cost, and delivery as main outcomes of Kaizen implementation. Palmer (2001) cites Kaizen implementation as a way to maintain low cost and less inventory, as well as a practice to reduce waste in processes and obtain continuous change in systems when compared to lean implementation. Unlike other traditional methods, Kaizen is a determined technique to achieve quality, functionality, and prices to sustain product competitiveness (Modarress, Ansari, and Lockwood, 2005). Kaizen also distinguishes itself from other continuous improvement practices by allowing for team members to implement changes and see the effects of their efforts (Farris et al., 2008), as well as encouraging active participation of company workers in industrial engineering and job design (Wood, 1989).

The implementation of Kaizen methods and activities is sometimes referred to as a “Kaizen event” (Doolen et al., 2007). Figure 1 provides an illustration of some of the key features of Kaizen. Kaizen refers to improvement of both process and people. In fact effective Kaizen practice aims at improving all aspect of the organization all the time. Good is never good enough; Kaizen is a never- ending journey to excellence. Kaizen means making change for the better on a continual, never ending basis. Kaizen can change the way of thinking of your

people and the culture and make a difference (Imai, 1986).

Kaizen means improvement, continuous improvement involving everyone in the organization from top management, to managers then to supervisors, and to workers. In Japan, the concept of kaizen is so deeply engrained in the minds of both managers and workers that they often do not even realize. They are thinking kaizen as a customer – driven strategy for improvement. This philosophy assumes that “our way of life- be it our working life, our social life or our home life-deserves to be constantly improved (Imai, 1986). Kaizen means continuous improvement of productivity and quality, based on a participatory process involving the entire workforce. With no requirement for huge investment, it is a low-cost approach to productivity and quality improvement.

Management must learn to implement certain basic concepts and systems in order to realize kaizen strategy:

- ❖ Kaizen and management
- ❖ Process versus result
- ❖ Following the plan - do -check-act (PDCA)/standardize-do-check-act (SDCA) Cycles
- ❖ Putting quality first Speak with data.
- ❖ The next process is the customer

Way of introduction, top management must put forth a very careful and very clear policy statement. It then must establish an implementation schedule and demonstrate leadership by practicing a kaizen procedure within its own ranks.

2.2. Kaizen Principles

The two key features of kaizen are incremental and involvement of the entire workforce in that process. The workforce needs to participate in producing small but frequent changes by making suggestions for improvement in both process and product. Beyond that, the logical structure of the concept of kaizen, the precise relationship among its tools, and concrete measures and sequences adopted on the factory floor, are difficult to pin down since there are many different schools of teaching that emphasize different aspects and tools of kaizen relative to others. Even among excellent companies, Toyota's way is different from Honda's way, and the Panasonic philosophy is quite distinct from Canon's (Imai, 1986).

According to Masaaki Imai (1986), who introduced kaizen to the international audience with his seminar book, *Kaizen: "The Key to Japan's Competitive Success"*, kaizen is an umbrella concept for a large number of Japanese business practices. It could even be argued that, like Zen Buddhism, it is not just a management technique but a philosophy which instructs how a human should conduct his or her life. Kaizen focuses on the way people approach work. It shows how management and workers can change their mindset together to improve their productivity. There are many strategies for management success, kaizen is different since it helps focus in a very basic way on how people conduct their work (Imai, 1997).

These are:

- ❖ Customer orientation
- ❖ TQC (Total Quality Control)
- ❖ Robotics
- ❖ QC circus
- ❖ Suggestion system
- ❖ Automation
- ❖ Discipline in the work place
- ❖ Quality improvement
- ❖ Zero defect
- ❖ Productivity improvement

There are a large number of related and often overlapped components that belongs to the kaizen toolkit 5s, suggestion system, quality control circle (QCC) or Quality circle (QC), total quality control (TQC), Total quality management (TQM)), just in time (JIT) system and so on. Among these, 5s is generally considered to be the most basic step for improving quality and productivity (GRRIP Development forum, 2009).

2.3. Kaizen and Management

In the context of kaizen, management has two major functions: maintenance and improvement (see Figure 2.1). Maintenance refers to activities directed toward maintaining Current technological, managerial, and operating standards and upholding such standards through training and discipline. Under its maintenance function, management performs its assigned tasks so that everybody can follow standard operating procedures (SOPs). Improvement, meanwhile, refers to activities directed toward elevating current standards.

The Japanese view of management thus boils down to one precept: Maintain and improve standards. As Figure 2.2 Shows, improvement can be classified as either kaizen or innovation. Kaizen signifies small improvements as a result of ongoing efforts. Innovation involves a drastic improvement as a result of a large investment of resources in new technology or equipment. (Whenever money is a key factor, innovation is expensive.) Because of their fascination with innovation, Western managers tend to be impatient and overlook the long term benefits kaizen can bring to a company. Kaizen, on the other hand, emphasizes human efforts, morale, communication, training, teamwork, involvement, and self-discipline a commonsense, low cost approach to improvement.

Figure.2.1. Japanese perceptions of job functions

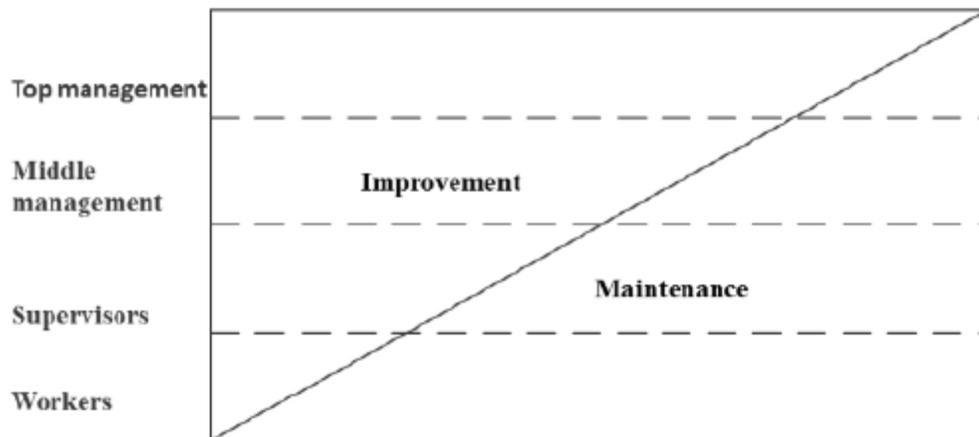
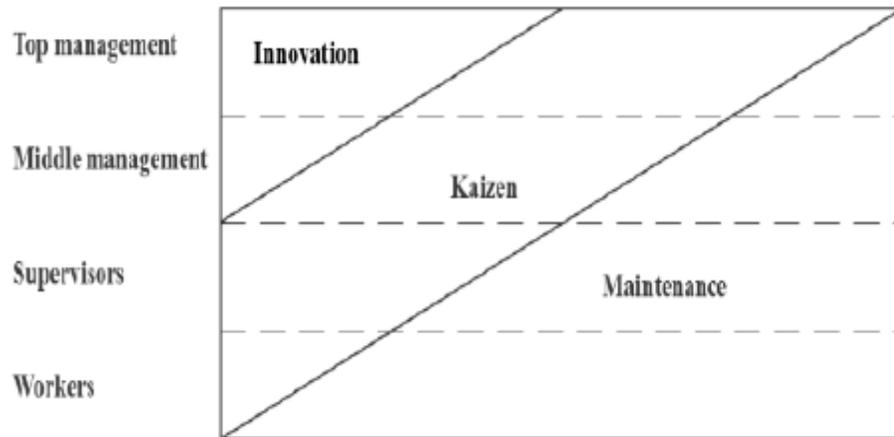


Figure .2.2. Improvement broken down into innovation and kaizen



Putting kaizen into practice

- **Role of top management** --- top management is responsible for establishing Kaizen as the overriding corporate strategy and communicating this commitment to all levels of the organization and allocating the resources necessary for Kaizen to work.
- **Role of middle management** --- responsible for implementing the Kaizen policies established by top management; establishing, maintaining and improving work standards; ensuring that employees receive the training necessary to understand and implement Kaizen, and ensuring that employees learn how to use problem solving and improvement tools.
- **Role of supervisors** --- responsible for applying the Kaizen approach in their functional roles; developing plans for carrying out the Kaizen approach at the functional level; improving communication at the workplace; maintaining morale; providing coaching for teamwork activities; soliciting Kaizen suggestions from employees and making Kaizen suggestions.
- **Role of employees** --- responsible for participating in Kaizen through teamwork activities, making Kaizen suggestions, engaging in continuous self-improvement activities, continually enhancing job skills through education and training, and continually broadening job skills through cross-functional training.

2.4 The System, Technique and Implementation of Kaizen Family

Indeed an integral part of Total Quality Management (TQM) is Kaizen therefore the term is reciprocally related. When an organization/company want to maintain a level of

quality that satisfy their customers at the appropriate time and price then that organization must follow some quality management techniques to fulfill those principles and planning. According to Imai (1986) the techniques associated with Kaizen included are, total quality control (TQC)/TQM, just in time (JIT), total productivity maintenance (TPM), five's' (5s), Benchmarking, skill gap analysis, six sigma the information about it found under TQM, Policy Deployment, a Suggestion System, Small-group activity, etc. For this research only use some of them than all organizational performance and effectiveness.

Under Organizational performance and effectiveness also it has, TQM/Kaizen, Six Sigma and BPR are the meager ones according to (Mullines, 2010). These are generally expressed in terms of a way of life for an organization as a whole, committed in total customer satisfaction through continues process of improvement or an application of radical change, and the Contribution and involvement of people. This topic also emphasize on explanation about the features of TQM and kaizen in detail

2.4.1 Total Quality Management (TQM)

One particular approach to improved organizational performance and effectiveness is the concept of the Japanese inspired total quality management (TQM). There are numerous definitions about TQM. These are generally expressed in terms of a way of life for an organization as a whole, committed to total customer satisfaction through a continuous process of improvement and the contribution and involvement of people according to (Mullines,2010) A major influence on the establishment and development of TQM was the work of Deming, who emphasized the importance of visionary leadership and the responsibility of top management for initiating change.

A mathematician by training, he was interested in statistical measurement of industrial processes and attempted to persuade the American manufacturing industry to improve quality, and to create constancy of purpose for improvement of products and service. Deming cited in, (Ibid), drew attention to the importance of pride in work and process control, and made constant reference to the importance of 'good management' including the human side of quality improvement and how employees should be treated. the successful organization should perform effectively with organizational matter on policy issues it is constantly seeking opportunities to improve the quality of its products and/or services and processes. The organization must also couple quality with a required level of productivity. The chartered management institute gives the following definition: (Ibid: 782.)

2.4.2 Implementation of TQM and Kaizen

If TQM is to be implemented successfully it must be seen as a total process involving all operations of the organization and the active participation including top management. It demands a supportive organizational culture and a programmer of management change. TQM Places emphasis on the involvement of people as the key to improved quality It involves changes to the traditional structure with greater emphasis on natural work groups, multi-discipline working and team-based management. Attention must be given to effective education and training, empowerment and the motivation to take ownership of quality, and systems of communications at all levels of the organization. A related strategy to achieve a long-term aim, hence, management authors' and researchers agreed that the successor of TQM is the balanced scorecard. According to Drummond cited in, Ibid, puts forward an interesting debate on comparing the philosophies and ideas of Deming with Taylor's Scientific Management, and questions whether Deming's ideas are as radical as they seem. Drummond suggests: cited in (Mullins, 2010)

The theme Kaizen is integral part of a total quality approach is the Japanese concept of Kaizen, which literally means 'improvement' or is often interpreted as gradual progress or incremental change. Kaizen was introduced in several Japanese organizations after the Second World War and is particularly associated with Toyota. The approach analyses every part of a process down to the smallest detail; Sees how every part of the process can be improved; Looks at how employees' actions, equipment and materials can be improved; and Looks at ways of saving time and reducing waste it includes social life outside the working environment according to (Mullins, 2010).

2.4.3 The Just- In-Time Production System

Originating at Toyota Motor Company under the leadership of (Taiichi Ohno, 1988) the just-in-time (JIT) production system aims at eliminating non value-adding activities of all kinds and achieves a lean production system that is flexible enough to accommodate fluctuations in customer orders. Just-in-time principles are to produce only the units in the right quantities, at the right time, and with the right resources, Applicable. "This production system is supported by such concepts as take time (the time it takes to produce one unit) versus cycle time, one -piece flow, pull production, jidoka("automation"), U-shaped cells, and setup reduction" according to (Imai, 1986:9). To realize the ideal JIT production system, a series of kaizen activities must be carried out continuously to eliminate non-value- adding

work in Gemba. JIT dramatically reduces cost, delivers the product in time, and greatly enhances company profits.

2.4.4 ORGANISATION DEVELOPMENT

The origins of OD can be traced back to the 1940s when a team of researchers, led by Kurt Lewin, experimented with T-groups (Cummings & Worley 1997; French & Bell 1995). These were small, unstructured groups where the participants learnt various aspects of group behavior from their own experiences. The researchers who initially facilitated the T-groups discussed the processes and outcomes of the sessions amongst themselves at the conclusion of each session. Eventually the participants asked the researchers if they could be included in the review process. These review and feedback sessions were a rich learning resource for the participants (French & Bell 1995).

OD has moved on since this experimental phase. The term OD is now considered to be an umbrella term that includes many programmes and techniques for bringing about change (Burnes 1996). There is some contention as to which of these programmes and techniques come under the OD banner. However, it is commonly recognized that action research and process consultation are central to the philosophy and methodology of OD (Cummings & Worley 1997; French & Bell 1995).

OD incorporates a planned approach to change that aims to improve the performance of organizations through the people in them. It is important to note that not all change that occurs within organizations is planned. Many of the changes that occur are emergent — that is, they are unplanned, minor changes that occur during the natural course of doing business. While OD promotes a planned approach to organisational change, it is traditionally considered to be concerned with incremental change and orderly transitions rather than drastic and sudden changes (Dunphy & Stace 1988). While many authors would still argue that this is the case, others (such as Cummings & Worley 1997) would argue that transformational change is now considered to be under the OD banner

2.4.5 Kaizen Method

Kaizen methods for work process improvement that include making the improvements originated in the World War II Job Methods training program. It was developed by the Training within Industry (TWI) organization, a component of the U.S. War Manpower Commission during World War II. Kaizen methods that suggest improvements also originated

in the work TWI. As suggestion rather than action improvement programs, Imai points out that, "Less well known is the fact that the suggestion system was brought to Japan...by Training within Industry (TWI) (Imai, 1986:112).Huntzinger, (2002) also traces Kaizen back to the Training within Industry (TWI) program. TWI was established to maximize industrial productivity from 1940 through 1945.

One of the improvement tools it developed, tested, and disseminated was labeled. It taught supervisors the skill of improving work processes. This program's name was changed to "How to Improve Job Methods" (Production Board, 1945:191) and is most often referred to as Job Methods training. It taught supervisors how to uncover opportunities for improving work processes and implement improvements. It incorporated a job aid that reminded the person of the improvement process.

2.4.6 Kaizen/TQM Vs BPR

An integral part of a total quality approach is the Japanese concept of Kaizen, Business process Re- Engineering (BPR) and Total Quality Management (TQM) both are organizational performances and effectiveness it has also a debate between the two. Some commentators appear to suggest that TQM has been taken over by BPR although others argue that it can be seen as complementary to and/or a forerunner for BPR (Mullins, 2010).

Table 2.1: Kaizen versus BPR

FEATURE	KAIZEN/TQM	BPR
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Management, culture and innovation the Applicability globally	It's Focused on demands timeliness (JIT) Kaizen consistent to innovation all workers, skill, motivation, a Kaizen is applicable across different Cultural setting This is so because the most important defining factors Kaizen are workers' skills, motivation, and management commitment .Kaizen helps enterprise become several times as competitive as they are now.	BPR is focused on expensive technology or Innovation hence has almost nothing to do with cultural differences. The management system of applying innovation is concerned only top management than workers
Appropriate development And learning environment	Suitable for developing countries whose MSEs perform along traditional lines and works well for slow-growth in costly match. It support lifelong learning adaptability flexibility the organizational response also paradigm shift. Focused on lifelong employment	BPR is better suited for developed nation, fast changing. Economies that can invest in new technologies and innovations. Since it is time bounded no longer emphasis for learning but assign the worker after full implementation Right person at the right place.
Pace of change	Incremental gain may often take a number of years to complete. Focused on minor, slow incremental improvement	Re-engineering as opposed to no-room incremental change. It is abrupt once and for large step. Radical design of business process achieve breakthrough results.
measurement and Stability	It is easy to assess the overall success or failure of the enterprise. Changes are Highly stable, predictable and keep going over time sustain the business	Difficult to measure and the overall success of the enterprise Changes are spontaneous and less predictable, failed change program
Investment orientation	Kaizen directly works on workers and managers and makes them several times as competent as they are now	BPR focuses customer satisfaction alone such as cost, quality, service and speed.
Bureaucratic business system	It is fully decentralized (bottom up) management system non-judgmental, non-blaming .both friendly for customers and employees ,supports Collectivism business environment like Toyota car	Centralized It is exposed to Downsize and staff for restructuring layoffs happens during implementation it is exposed to personal Atta and revenge, it is the support individual business environment like Hammer car
Cost	Without or less costly i.e. with current resources Kaizen can be implemented even start with zero initial	Fundamental rethinking and radical design business process to achieve dramatic improvement Requires huge investment Outlays.
Everyday application	It focused on prevention not cure. Kaizen is practiced every time. This continuous application nature of Kaizen helps solve whenever flaws arise in the process.	It focused on cure not prevention. BPR can't be used on every day basis. Hence, it Can't be used whenever flaws are detected in the process.

Source: Faculty of Financial Accounting Management Craiova (Amended by the researcher 2010/2014)⁷

Indeed, all organizational performance and effectiveness have its own strength and weakness but the researcher paying attention on KAIZEN/TQM. Certainly the originators of TQM did it in the Japan with Deming but properly applied in their almost entire Japanese industry. It can be concluding that the main differences between

Kaizen and BPR as follows. MacDonald and Dale (1999) indicated firstly, large step changes (BPR) are riskier, more complex and more expensive than continuous improvement (Kaizen). This implies that Kaizen may be preferable for developing countries for certainty cost and simplicity reasons. Secondly, BPR places more emphasis on equipment and technology rather than people; Kaizen is the opposite. Given that developing countries are relatively technology scarce and labor abundant though workers in developing countries may not be highly skilled, their comparative advantage appears to lie in implementing Kaizen. Thirdly, re-engineering tends to concentrate on one process at a time using a project planning methodology, whereas Kaizen takes a more holistic view of the organization, building improvement in to all aspects of business operation. As observed in the above table Kaizen may be preferable for developing countries for certainty, cost and simplicity reasons. BPR places more emphasis on equipment and technology rather than people; Kaizen is the opposite one.

2.4.7 BUSINESS PROCESS RE-ENGINEERING

Business Process Re-engineering (BPR) can be defined as:

... a radical scrutiny, questioning, redefinition and redesign of business processes with the aim of eliminating all activities not central to the process goals ... and automating all activities not requiring human judgmental input, or facilitating that judgment at reduced cost (Thomas 1994, p.28).

BPR was championed by Michael Hammer and James Champy (1994) in the book *Re-engineering the Corporation* in which they advocated that old systems be discarded and replaced with new, more innovative and effective processes. BPR demands lateral thinking that extends beyond the current boundaries in order to achieve a more effective organization. BPR has been heavily criticized in the literature. One criticism is that BPR is focused on the implementation of new technology, rather than the improvement of business processes.

Information technology companies are selling 'solutions' to business problems and are promoting the existence of problems merely to enhance sales of their own products and services (Thomas, 1994). BPR has also been criticized as being associated with downsizing and cost-cutting, with little regard for quality or long-term business objectives (Mumford &

Hendricks 1996). However, Hammer has defended BPR, stating that it was not intended as a way to simply slash labor costs, but to streamline work processes, remove bureaucratic procedures and increase efficiency (cited in Mumford & Hendricks 1996).

BPR starts with a vision or idea. However, ideas only come from three sources — they can be copied from other companies (benchmarking), bought (from an IT company or consultant), or they can be original ideas (Thomas 1994). Benchmarking does not allow competitive advantage and buying the idea is expensive and often results in the purchase of a ‘solution’ which is not relevant to the business to which it is sold.

While original ideas seem to be the only way to develop unique and relevant solutions, they are often developed within existing and constricting frameworks to maximize the chances of them being accepted. Indeed, original ideas are criticized by Thomas who believes that the acceptance of an idea is ‘inversely related to its radicalness, especially when associated, as it is so often, with significant downsizing’ (1994, p. 30)

2.4.8 COMPARATIVE ANALYSIS

Table 1 provides an outline of the similarities and differences between each of the three approaches under investigation. The subsequent paragraphs explain these comparisons.

Table 2:2 Comparison between OD, TQM and BPR

	OD	TQM	BPR
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Description:	A long-term, system wide application of behavioral science	Concerned with improving work processes and methods in order to maximize the quality of goods	Particular approach concerned with rethinking current
Type of Change:	Planned, incremental	Planned, continuous	Planned, frame-braking
Aim:	Increase organizational efficiency and problem solving ability.	Keep existing customers by meeting or exceeding their expectations concerning	To redefine existing work methods and processes to improve
Key Driver:	Often triggered by a problem such as a communication or culture breakdown.	Increasingly competitive market and the need to compete for specific customer demands. May also be driven by specific	Competitive pressures and intense need to cut costs.
Change Agent:	External or internal	External or internal	External consultant
Learning	Single or double loop	Single or double loop	Double loop
Nature of culture change:	Fundamental focus on core values and people	Customer focused values	Values objectivity, control, consistency and
Change to team based work:	Assumption that Organizations are complex social systems based on groups.	Often requires a shift to team based work	Yes. Requires a shift to team based work because the work is process based rather Than task based.

Developed from: Cummings & Worley 1997; Harvey & Brown 1996; Moosbruker & Loftin 1998; O'Neill & Sohal 1997.

2.5. Determinants of effective kaizen implementation

To implement Kaizen successfully in any organization needs top management commitment, performance measurement, communication of results, recognition and rewards, good training program, good program coordination and methodology or tools. Hence, failure to carry out these activities and put in place an organizational structure, leads to the collapse of the implementation of kaizen (Fermento et.al, 2013; Farris, 2006; Hirata, 2001). According to Farris (2006) top management commitment, performance measurement, communication of results, R&R and training are grouped under top management factor and the others are program coordination factor and methodologies or tools factor.

2.5.1. Top Management Factor

A. Top Management commitment

Management commitment is needed so that participation and teamwork become part of the organizational culture (Terziovski et. al, 2002). It is not possible to develop a continuous improvement program without a strong commitment from top and senior management. Directors must agree to commit the required resources; align activities with strategic objectives; establish systems, procedures, and policies; and, most importantly, generate a culture of continuous improvement (Fermento et.al, 2013).

Despite these glaring and challenging problems, in order to stay competitive in an increasingly global market place and with an increase in customer demands, a number of foreign companies are forced to rethink their manufacturing and management approach to lower costs of production, minimize waste, improve productivity, boost quality, and achieve sustainability. Thus, if top management of kaizen companies in other cultures has the desire to thrive for a healthy long term, before starting on a kaizen transition, management needs to be passionately committed to undertaking an assessment of its own internal and external conditions. Also, it needs to see if it has tailored its activities to meet domestic and global customers. In addition, when transferred to other cultures, companies need to use dedicated cross functional teams to improve a targeted manufacturing work area (Kirby and Greene, 2003, and Heizer & Render, 2010). Since the benefits of Kaizen principles come gradually and its effects are felt usually on a long-term basis, it is obvious that Kaizen can thrive only under top management that has a genuine concern for the long-term health of the company. It has often been pointed out that one of the major differences between Japanese and Western management styles is their timeframes. In general, Japanese managers have a long-term perspective, while Western managers tend to look more for short-term results. This difference is also reflected in the way each management style approaches improvement.

Western management is usually reluctant to introduce improvement gradually and tends to favor innovation, which is more visible and provides an immediate return. If management makes positive use of the process-oriented way of thinking to support innovation and further reinforces it with a Kaizen approach, it will find that the company's overall competitiveness will be improved in the long run (Thessaloniki, 2006).

Successful implementation of Kaizen requires a significant change in values, attitudes and roles of management levels of the organization. The appropriate and complete development of Kaizen program is basically executed by top management members that eagerly support and facilitate

their teams. This is because the management's role in encouraging and supporting their employees is critical to ensure successful implementation and ongoing application of the Kaizen concept (Wakhlu, B., 2007).

B. Performance Measurement

One of the main aims of Kaizen is to improve business and worker productivity. Productivity can be measured in several ways. For example, Czapke (2007) identified cost savings as a measurement of productivity improvement when surveying wood products companies. Czapke's (2007) research also relates productivity improvement to a company's competitiveness, lead time, and labor productivity. The development of continuous improvement capacities requires a process of monitoring and measuring results against the strategic objectives of the firm (Bessant & Francis, 1999).

In addition, Continuous improvement is based on continuous assessment techniques applied to systems, processes, and key results (Das et.al, 2013). Improving on-time delivery of products is another measure of performance that can be used to evaluate the implementation of Kaizen (Gunasekaran et. al., 2004).

C. Communication of Results, Recognition and Rewards

The experiences feedback within a continuous improvement program allows the building, analyzing, and facilitating of the exchange of knowledge between experts in problems solving. When teams show their results for internal events, the knowledge they have developed is deployed beyond their own team members and applied to the whole organization. Additionally, in cases of external events, showing the successful results of a project operates as a motivational factor. Significant contributions measured in terms of their impact on results are usually rewarded. These recognition programs can take different forms but always attempt to reinforce and spread positive attitudes (Buch et.al, 2013).

Reward and recognition (R&R) have various functions and can be valuable tool at organizations on their road for TQM as for example:

- ✚ They improve the reinforcement of quality-related behavior and achievements.

- ✚ They show organizational values, and they show how the organization appreciates efforts.

They indicate achievement, and R&R activities provide feedback which is an element of continuous improvement (Thessaloniki, 2006).

Recognition is also a form of feedback about the result of individual or team efforts. It shows the individuals or the teams that they are on the right track toward continuous improvement. Recognition as feedback can come from supervisors, other teams, internal customers in the organization, or external customers in the marketplace. Kaizen philosophy demand empowered employees, team players and cross-functional activities. R&R can motivate these individuals and groups to continue their active participation in the organization. It will also create a positive environment for various teams to compete against each other and these give a 'win-win' situation between the organization and employees. Employees can also be motivated to utilize various TQM tools, solve problems, and to interact with internal and external customers (Thessaloniki, 2006).

According to Deming's views, R&R can help transform the organization toward a philosophy of quality. Some forms of recognition, such as awards and plaques, show publicly that the individual or team has achieved some degree of success within TQM frame. They are a visible indicator, both to the team and to outsiders, of a job well done. So recognition highlights employees and teams who make a definite contribution to the continuous improvement or TQM effort. Such recognition stimulates additional effort in employees (Thessaloniki, 2006).

D. Training

Modifying the classic structure of problem-solving using trial and error based on individual experience to the scientific method using teams requires specific training in methodologies and tools for analysis. In addition to the need of large-scale training, it is reasonable to start with upper management and focus on the agents of change, which will generate a big impact on the process (Spear, 2004). Several studies highlight the importance of implementing training in basic tools and of moving toward new tools as soon as more complex problems make them necessary (Bacdayan, 2001; Wood, 2003). Van Aken et al. (2010) further detailed the importance of having an internal facilitator or other individual coach small Kaizen team members in the PDSA

problem solving cycle, including how to effectively gather data needed to make informed decisions.

Most companies fall prey of training all their employees at the same time for a quality program that may take months or years before the employees can be opportune to implement what they had learned. Due to this long waiting, most of the employees may forget some critical points they did learned. Some companies don't bother to commit all the employees to be affected hence those who are not involve will criticize the program and show reluctant to implement any recommendation. All of the organizations insist that with the initial project that practitioner not be able to shortcut the process and rush to analyze and improve stages. One of the hardest things to do is train people to follow the process and not their intuition. Kaizen has been proven to work, with countless companies experiencing sustainable gains, but only when the complete process is followed without any shortcuts (Bacdayan, 2001; Wood, 2003).

2.5.2. Program Coordination Factors

If continuous improvement is inadequately deployed and poorly coordinated, the process becomes less effective, even after achieving some initial results(Choo, A.; Linderman, K.; Schroeder, R., 2007)

i. Deployment: The systemic approach (Deming, 1993) requires that different processes are viewed as part of a global system where the final result depends on the quality of the interactions between them. In this sense, it is unthinkable for continuous improvement to work without the integration of all sectors and processes

ii. Coordination: The promotion of continuous improvement within the organizational routine requires actors which facilitate this within day-to-day activities. This role goes beyond specific team leaders and refers to the figure of one or more internal coordinators who support activities, facilitating access to resources and to providing methodological advice to team members (Fermento et.al, 2013). Furthermore, regular forums to share knowledge and ideas between the company and the broader community can be maintained through dissemination of publications and postings about productivity that may provide the company with a benchmark as it improves its productivity, skills and techniques when compared with similar companies (GRIPS, 2011).

2.5.3. Methodology and Tools Factor

The existence of a common scientific method is vital, and should include a predetermined routine of steps for the development of improvement projects (Forrester, 2000; Garvin, 1993). A formalized methodology enables a common working basis on which to developing changes. This systematic analysis process replaces the traditional trial-and-error approach to problem-solving (Bateman, 2005).

A previous study of Australian firms by Terziovski, M.; Sohal, A. S. (2000) shows that these companies still prefer the seven basic tools over more advanced ones such as Failure Mode and Effect Analysis and Quality Function Deployment. Another study conducted in Argentina demonstrates the ongoing use of the PDCA cycle and methods derived from it in a high percentage of improvement projects.

2.5.4 Perception of employee's factors

Perception is the attitude towards policies concerned with pay, recognition, promotion and quality of working life, and the influence of the group with whom they identify (Armstrong, 2006). As Arnold *et al* (1991) comment, research evidence has shown that people's avowed feelings and beliefs about someone or something seemed only loosely related to how they behaved towards it and thus the study of perception is critical toward formulation and management of policies in an organization. Dash et al. (2008) report that the factors of recognition for performing well, chances of promotion, professional growth, compensation and incentive schemes, are perceived as motivating factors for employees. The introduction and implementation of a performance management system carries profound implications for both employees and organizations. For employees, performance appraisals have direct implications for rewards and recognition.

Organizations invest huge amounts of financial and non-financial resources on performance management systems, and it is important that such systems are owned and used effectively by all concerned. Therefore, employees' perceptions of the system are vital (Fletcher 2004).

According to Messer and White (2006), employee's perceptions of fairness affect their likelihood to demonstrate organizational citizenship behaviors'. In this case, perceived unfairness and ineffectiveness of the performance management system can result in counterproductive and sometimes detrimental behavior from employees. When individuals perceive that they are treated fairly, they express greater satisfaction with social relationships (Clay-Warner, Hegvedt & Roman, 2005, p.89). This is an indication that organizations and their systems and processes are susceptible to the power of human perceptions. Bretz, Milkovich and Read (2002) indicate that the most important performance appraisal issue faced by organizations is the perceived fairness of the performance review and the performance appraisal system. Their findings suggested that most employees perceive their performance appraisal system as neither accurate nor fair. Skarlicki and Folger(1997) suggest that the appraisal process can become a source of extreme dissatisfaction when employees believe the system is biased, political, or irrelevant. In general, research indicates that perceptions of fairness arise from consideration of the outcomes received (outcome fairness); the procedures used to determine those outcomes (procedural fairness); and the way in which the decision- making procedures were implemented and explained (interpersonal fairness) (Smither,1998).

Process versus result

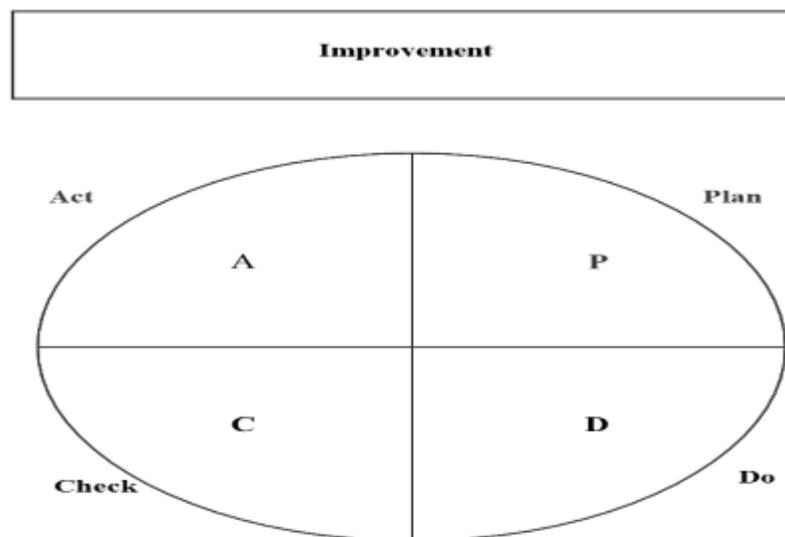
Kaizen fosters process oriented thinking because processes must be improved for results to improve. Failure to achieve planned results indicates a failure in the process. Management must identify and correct such process based errors. Kaizen focuses on human efforts an orientation that contrasts sharply with the results- based thinking in the West. A process-oriented approach also should be applied in the introduction of the various kaizen strategies: the plan- do-check-act (PDCA) cycle; the standardize-do-check-act (SDCA) cycle; quality, cost, and delivery (QCD); total quality management (TQM); just- in-time (JIT); and total productive maintenance (TPM). Kaizen strategies have failed many companies simply because they ignored process. The most crucial element in the kaizen Process is the commitment and involvement of top

management. It must be demonstrated immediately and consistently to ensure success in the kaizen process.

Following the PDCA/SDCA cycles

The first step in the kaizen process establishes the plan- do- check-act (PDCA) cycle as a vehicle that ensures the continuity of kaizen in pursuing a policy of maintaining and improving standards.

Figure.2.3.The plan- do- check- act (PDCA) cycle.

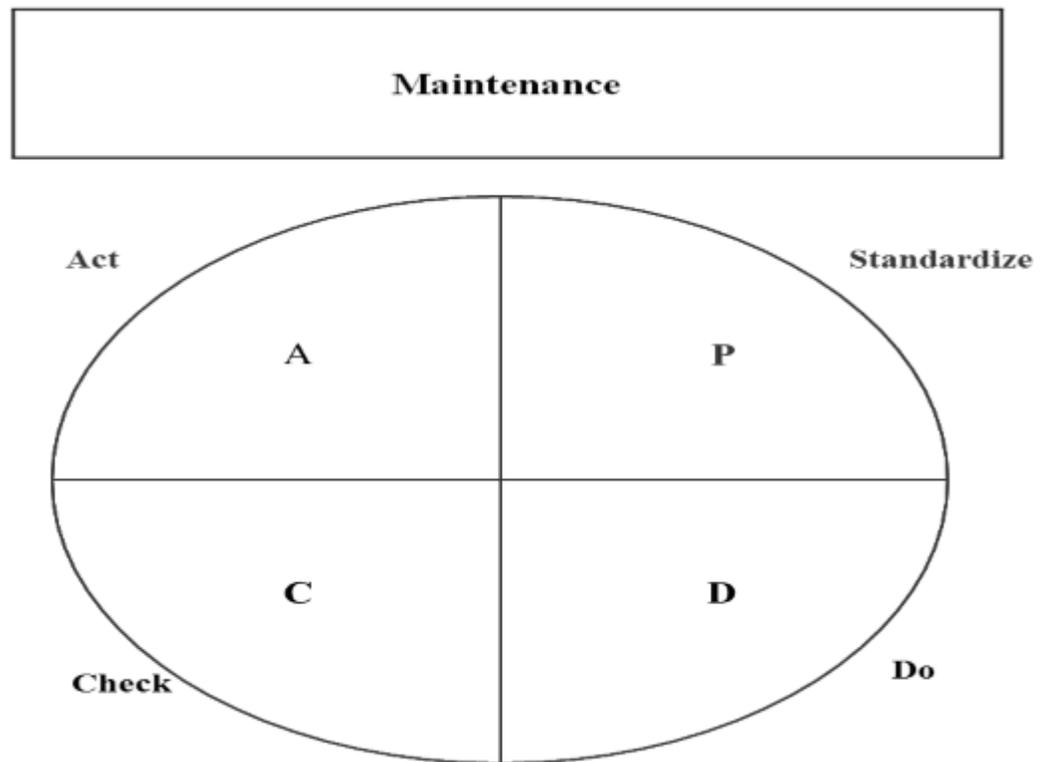


It is one of the most important concepts of the process (see Figure 2. 3). Plan refers to establishing a target for improvement (since kaizen is a way of life, there always should be a target for improvement in any area) and devising action plans to achieve that target. Do refer to implementing the plan. Check refers to determining whether the implementation remains on track and has brought about the planned improvement. Act refers to performing and standardizing the new procedures to prevent recurrence of the original problem or to set goals for the new improvements.

The PDCA cycle revolves continuously; no sooner is an improvement made than the resulting status quo becomes the target for further Improvement. PDCA means never being satisfied with the status quo. Because employees prefer the status quo and frequently do not have initiative to improve conditions, management must initiate PDCA by establishing

continuously challenging goals. In the beginning, any new work process is unstable. Before one starts working on PDCA, any current process must be stabilized in a process often referred to as the standardize- do- check- act (SDCA) cycle (see Figure 2. 4). Every time an abnormality occurs in the current process, the following questions must be asked: Did it happen because we did not have a standard?

Figure 2.4 the standardize do-check-act (SDCA) cycle



Did it happen because the standard was not followed? Or did it happen because the standard was not adequate? Only after a standard has been established and followed, stabilizing the current process, should one move on to the PDCA cycle. Thus the SDCA cycle standardizes and stabilizes the current processes, whereas the PDCA cycle improves them. SDCA refers to maintenance, and PDCA refers to improvement; these become the two major responsibilities of management.

Waste (Muda) elimination

Muda in Japanese means waste. The resources at each process people and machines either add value or do not add value and therefore, any non-value adding activity is classified as muda in Japan. Work is a series of value-adding activities, from raw materials, ending to a final product. Muda is any non-value-added task. In Kaizen philosophy, the aim is to eliminate the seven types of waste (7 deadly wastes) caused by overproduction, waiting, transportation, unnecessary stock, over processing, motion, and a defective part (Thessaloniki, 2006).

These aims to reduce the following common types of waste that occur during the production process (Quesada and Buehlmann, 2011):

- **Overproduction:** producing more or a product than is needed, which must be addressed to avoid excess inventory and holding costs;
- **Waiting:** equipment or operators taking too much time and delaying progress;
- **Unnecessary transportation:** using more than an optimized rate of transportation might cause waste and also increase transportation costs;
- **Over processing or incorrect processing:** project orders should be well defined and accurate to implement in order to avoid wrong outputs. As a result of accumulated costs customers would be unsatisfied with the service;
- **Excess inventories:** excess inventories will cause most of other shortages, such as long waiting times, damaged products, and unnecessary transportation, which adds to holding and production costs;
- **Unnecessary movement:** employee-related movements that are not urgent or necessary for the process;
- **Defective products:** since it is a customer-oriented project, the products that are not improved towards customer demand will lead costs; and
- **Unused employee creativity:** not listening to employees will decrease the knowledge shared between people within the company.

Five- S (5s)

The 5S system was developed in Japan after World War II as part of a country-wide push to improve quality efficiency (Becker, 2001). Conceptually, 5S can be defined as one of the quality tools that is used to reduce waste and optimize productivity through maintaining an orderly workplace and using visual cues to achieve more consistent operational results (Janakiraman & Gopal, 2007).

According to Thessaloniki (2006), 5s described as the acronym of five Japanese words which means 'housekeeping'. The concept of 5S stands for seiri (sorting out), seiton (neatness), seiso (cleanliness), seiketsu (standardization) and shitsuke (discipline).

The five s approach is presented briefly as follows for each one from the five activities:

- SEIRI – Sorting – The first state of 5s is to organize the work area, leaving only the tools and materials necessary to perform daily activities. When “sorting” is well implemented, communication between workers is improved and product quality and productivity are increased. It is making the difference between necessary and useless things in GEMBA (working place), giving up the useless ones.
- SEITON- Ordering Arrangement – the second stage of 5S involves the orderly arrangement of needed items to they are easy to use and accessible for “anyone” to find. Orderliness eliminates waste in production and clerical activities. The ordering of all the items after SEIRI.
- SEISO- SHINE the third stage of 5S is keeping everything clean and swept. This maintains a safer work area and problem areas are quickly identified. An important part of “shining” is “Mess Prevention”. In other words, do not allow litter, scrap, shavings, cuttings, etc., to land on the floor in the first place cleaning and disturbance detection, the working areas/equipments will be clean.
- SEIKETSU – Standardizing – The fourth stage of 5S involves creating a consistent approach for carrying out tasks and procedures. Orderliness is the core of “standardization” and is maintained by visual controls. The extension of the cleaning concept to each individual alongside with the continuous practice of the three steps 3S.
- SHITSUKE – Disciplining – this last stage of 5S is the discipline and commitment of all other stages. Without “sustaining” your workplace can easily revert back to being dirty and chaotic. That is why it is so crucial for your team to be empowered to improve and

maintain their workplace. When employees take pride in their work and workplace it can lead to greater job satisfaction and higher productivity.

Getting self-discipline and getting used to be each involved in the 5S actions through standard application (Imai 1986). Benefits of 5s are-Improve safety, decrease down time, raise employee morale identify problems more quickly, develop control through visibility establish convenient work practices, increase product and process quality strengthen employees' pride in their work, promote stronger communication among staff and empower employees to sustain their work area (Imai 1986).

Quality Circle (QC) in Kaizen

A kaizen strategy includes small-group activities formal, 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)

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(Kannan & Rajan ,2011). Another definition of Quality Circles is 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 (Khond et.al, 2013).

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 (Chaudhary & Yadav, 2012).

The main methods used to solve problems using quality circles are brainstorming, collection of data, cause-effect diagram and cumulative line diagram (Chaudhary & Yadav, 2012). 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).

Objectives of Quality Circle: The perception of Quality Circles today is appropriateness for use and the tactic implemented is to avert imperfections in services rather than verification and elimination. Hence the attitudes of employees influence the quality; it encourages employee participation as well as promotes teamwork. Thus it motivates people to contribute towards organizational effectiveness through group processes (Vishal, & Gaikwad, 2009).

The following could be grouped as broad intentions of Quality Circles:

1. To contribute towards the improvement and development of the organization or a department.
2. To overcome the barriers that may exist within the prevailing organizational structure so as to foster an open exchange of ideas.
3. To develop a positive attitude and feel a sense of involvement in the decision making processes of the services offered.
4. To respect humanity and to build a happy work place worthwhile to work.
5. To display human capabilities totally and in a long run to draw out the infinite possibilities.
6. To improve the quality of products and services.
7. To improve competence, this is one of the goals of all organizations.
8. To reduce cost and redundant efforts in the long run.
9. With improved efficiency, the lead time on convene of information and its subassemblies is reduced, resulting in an improvement in meeting customers due dates.
10. Customer satisfaction is the fundamental goal of any library. It will ultimately be achieved by Quality Circle and will also help to be competitive for a long time (Vishal & Gaikwad, 2009).

2.5.4 Conceptual framework

The leading factors in effective implementation of Kaizen (continuous improvement) are management commitment performance measurement communication of results, rewards and

recognition, training, program coordination and methodologies or tools (Fermento et.al, 2013; Farris, 2006; Hirata, 2001)

According to Farris (2006) Management commitment, performance measurement, communication of results, recognition and rewards and training are grouped under top management commitment factors. The following conceptual framework in figure shows relationship between factors of kaizen implementation and effective kaizen implementation.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Research Design

A research design is a master plan that specifies the methods and procedures for collecting and analyzing the needed information. A research design provides a framework or plan of action for the research. A mixed research approach which employed quantitative analysis supported by qualitative from interview results were used. The study was employee explanatory research design to assess the determinants of effectiveness of Kaizen in Kadisco Paints and Adhesive Share Company.

3.2. Data Sources

The study aims to determine the determinant factors of effective kaizen implementation in Kadisco Paints and Adhesive Share Company. In order to do the research, the researcher used both primary and secondary sources of data. The primary source of data had to obtain through questionnaires from the employees and managers of the company. Secondary data was obtained from company reports and records about kaizen and related concepts in order to support the investigation through different academic and empirical literatures.

3.3. Data Collection Instruments

The primary data was collected by using structured questionnaire. According to Voss et al., (2002) questionnaires can increase the efficiency of data collection, and makes it easier to reach a broader sample of persons to collect the data from many respondents; it saves cost of collecting information and saves time. The questionnaire contains Four Sections: The first section consists of background information of the respondents; the second section gathers data on factors of effective kaizen implementation (top management commitment, program coordination factor and methodologies or tools factor). The third section gathers data about effectiveness of kaizen and finally the fourth section consists of questions related perception of employees towards effective

kaizen implementation. The questionnaires was structured based on the 5- point Likert scales, strongly agree, agree, neutral, disagree and strongly disagree, which is commonly used tool for collecting standard response from respondents.

3.4. Reliability and Validity

Pre-testing questionnaire is essential to increase the reliability, validity and practicability of the questionnaires. Thus, to check validity of the questionnaire, before the questionnaires had to administered by the researcher, some useless, repeated or redundant and ambiguous items had to omitted and items was checked according to standards in terms of adequacy, structuring and sequencing of ideas. Based on comments from different experts, the items were reduced and then, the final drafted questionnaire for 12 items of top management factor questionnaire, 11 items for methodologies and tools factor, 2 items for program coordination factor questionnaire, 5 items perception towards kaizen implementation and 5 items of effective kaizen implementation were structured in to five point scales. In order to determine the internal consistency of items, questionnaires were tested before the actual data distribution for the respondents. The questionnaire was distributed to 20 employees of Kadisco Paints and Adhesive Share Company and Cronbach's alpha was found to be above 0.7 which shows the questionnaire is reliable (Table 3.1).

Table 3.1: Pretest results on internal consistency of items of factors in the questionnaire

Questionnaire	Cronbach's alpha
top management factor	0.856
methodologies and tools factor	0.862
program coordination factor	0.782
perception towards kaizen implementation	0.824
effective kaizen implementation questionnaire	0.894

3.5. Variables in Research

The leading factors in effective implementation of Kaizen (continuous improvement) are management commitment performance measurement communication of results, rewards and recognition, training formalization, continuity deployment, good program coordination and

methodologies and tools (Fermento et al., 2013; Farris, 2006; Kularachchi, 2009; and Hirata, 2001).

3.5.1. Dependent variable:

The dependent variable of the study is effective implementation of Kaizen: means continuous improvement in quality of products or services, productivity, cost/waste reduction, better safety and employee's satisfaction in the company. The dependent variable implementation of effective Kaizen was measured using a likert scale.

3.5.2. Independent Variables

The independent variables of the study are:

Top management factors: These are top management commitment, performance measurement, communication of results, reward and recognition, training program.

Program coordination factor: These are deployment and coordination of the program

Methodologies and tool: This consists PDCA cycle, 5s, waste elimination & quality circle.

3.6. Research Population and Sampling Techniques

The target populations of this study comprised of all employees in Kadisco Paints and Adhesive Share Company, who have two years of work experience and above, except the top management of the company.

Kadisco Paints and Adhesive Share Company is a leading Paints and Adhesives manufacturer in Addis Ababa, Ethiopia, established in 1968 for the distribution of automotive spare parts, Paints, Adhesives and other Chemical products. In 1979, Kadisco expanded its distribution activities to the manufacturing of Adhesives with a projection to begin in the sector of coatings. Now Kadisco holds a major market share in the construction, automotive, industrial, wood, adhesives sectors of industry, where at present a few players (up to 10 factories) have entered. The company has a total of 167 employees who work in a permanent basis.

The study use simple random sampling technique (every member of the population must have an equal chance of being chosen), large enough to satisfy the need of the investigation being under taken and unbiased (Collis and Roger Hussey, 2003). Sampling frame for this study was all staff in Kadisco Paints and Adhesive Share Company except the top management who has worked for at least two years in the Company.

This sample size is calculated based on the sample size determination formula developed by (Kothari, 2004). The formula is given as:

$$n = \frac{Z^2 \cdot p \cdot q \cdot N}{E^2 (N-1) + Z^2 \cdot P \cdot q}$$

Where

n=sample size

Z=values of the standard variation at 95% confidence interval (1.96)

p=sample proportion (0.5)

q=1-p

E=the estimate should be within 5% Of the truth value (sampling error)

N= the total population

Based on the above formula, the sample that was taken in Kadisco Paints and Adhesive Share Company is 117 workers. The sample members were selected through the use of simple random sampling technique (lottery method) specifically by ticking them from the list of the employees.

3.7. Data Analysis

All the data in the answered questionnaire were coded and entered into a Statistical Package for Social Science (SPSS), version 20.0 before analyses.

Descriptive analysis

The study used descriptive statistics through frequency tables, percentages, mean and standard deviation in order to compare and contrast different categories of sample units with respect to the desired characters so as to draw some important conclusions.

Pearson Correlation Analysis

In this study Pearson's correlation coefficient was used to determine the relationships between factors (top Management factor, program coordination factor and methodology or tools factor) and effective implementation of Kaizen. The Pearson correlation coefficient, denoted by the symbol (r), is calculated in order to establish whether a relationship existed between the independent variables and the dependent variable.

Multiple Regression Model

The inferential statistics that use employed in this study is multiple linear regression analysis which was used to determine the effect of independent variables (top Management factor, program coordination factor and methodology or tools factor) on the dependent variable effective implementation of Kaizen.

The model of multiple regressions on this study was based on two sets of variables, namely dependent variables (effective implementation of Kaizen) and independent variables (top Management factor, program coordination factor and methodology or tools factor). The basic objective of using regression equation on this study is to make the researcher more effective at describing, understanding, predicting, and controlling the stated variables. The study runs regression analysis of the independent variables on effective implementation of Kaizen.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

Where Y is the dependent variable- effective implementation of Kaizen

X_1 , X_2 , X_3 , and X_4 are the explanatory variables top Management factor, program

Coordination factor and methodology or tools factor

β_0 , β_1 , β_2 , β_3 and β_4 are the regression coefficients to the respective independent variables which measure the change in the mean value of Y, per unit change in their respective independent variables.

3.8. Ethical Considerations

As this research is conducted by using quantitative method approach, the ethics in collecting and gathering the quantitative information also discussed. In order to seek permission to conduct

this study quantitatively in the targeted organization, a letter of permission was obtained from school of graduate studies of St.Mary's University.

The consent letter sent out to the targeted company. This helped the respondents to have clear information about their rights and consequences in giving the data. On top of that, the issue of honesty and integrity when collecting the respondent's information quantitatively also need attention from the researcher. In this case, the researcher gave a respect to the respondent's views and answer given in the questionnaire. In addition, the confidentiality of the information of the respondents was also kept in an appropriate manner. Similar with the ethical issue in conducting the quantitative method, the issue of honesty and integrity also crucial in ensuring the validity of the data collected. In this case, the researcher gave respect to the informants' views and response about anonymity on the questions asked.

CHAPTER FOUR

4. DATA PESENTATION ANALYSIS AND DISCUSSION

This chapter deals with the data presentation, analysis and interpretation of the responses of the

factory Kaizen Steering Committee members, Kaizen Officers, Kaizen Facilitators and Kaizen Production Team Leaders of Kadisco Paints and Adhesive Share Company. The questionnaires were distributed to employees of the company. The data thus obtained were interpreted quantitatively in order to investigate the determinants for effectiveness of kaizen implementation. In addition, the findings from data collected from Main Division heads (management staff) through interviews were presented qualitatively to support the quantitative analysis. In this study out of 117 questionnaires distributed to employees of Kadisco Paints and Adhesive Share Company, 110 responses were returned. Total returned responses are completed and employed in the analysis, which represents the response rate 94.02%.

4.1. Demographic Characteristics of Respondents

This portion of the survey is concerned with background of the respondents to understand the respondents who participated in completing the questionnaire for this research. Respondents were requested to fill their demographic characteristics such as sex, age, level of education, work experience and their position in the company. The profile of respondents is presented in table 4.1. When we look the respondents' gender wise, about 68.2% of the employees were males. This is an indication of a high male composition of the respondent staff of Kadisco Paints and Adhesive Share Company.

When we see respondent's age range majority 40.9% of the employees of the factory had age of 29-39 years and 31.8% in the age range between 40– 50 years and only 11.8% of the respondents are found in the age range of 50-60. This shows most of the employees of the company are adults. The majority of the respondents are certificate holders which accounts 30.9% as the nature of the factory demands technical personnel whereas 26.4% and 16.4% of the participants are diploma and degree holders respectively. About 23.6 % of the samples are from Grade 10 and below and only 2.7% of the samples are masters holders and above. In addition, most (84.5%) of samples are employees (Table 4.1).

As shown in Table 4.2 the work experience of the respondents shows that the majority had an experience of 2-5 years (69.1%) followed by 6-10 years (20.9%).The remaining 11% of the respondents had served 11 to 15 years. This shows that majority (90%) of the respondents had a work experience of less than 10 years.

Table 4.1: Demographic characteristics of the respondents in Kadisco Paints and Adhesive Share Company

Measures		Frequency	Percentage (%)
Gender	Female	35	31.8
	Male	75	68.2
	Sub total	110	100
Age	18-28	17	15.5
	29-39	45	40.9
	40-50	35	31.8
	50-60	13	11.8
	Sub total	110	100
Level of Education	Grade 10 and below	26	23.6
	Certificate	34	30.9
	Diploma	29	26.4
	Degree	18	16.4
	Masters and above	3	2.7
	Sub total	110	100
position in the factory	case team leader (manager)	7	6.4
	Supervisor	10	9.1
	Employee	93	84.5
	Sub total	110	100
Work Experience	2-5 years	76	69.1
	6-10 years	23	20.9
	11-15 years	11	10.0
	Sub total	110	100

Source: Field survey, 2016

4.2. Descriptive Analysis

In this analysis the response for each specific statement are compared using the mean and standard deviation score. The degree of agreement or disagreements of the respondent for each statement are also analyzed.

To measure the level of effectiveness of kaizen implementation, the items of the instrument were analyzed with the help of descriptive statistics. The higher the mean score, more than the respondent employee agreed with the statement and vice versa. The figures for standard deviation (SD) also indicate the degree to which responses varied from each other; the higher the figure for SD, the more variation in the responses.

As presented in Table 4.2, top management factor had a mean score of 4.07 with standard deviation of 0.579 followed by methodologies or tools factor with mean score of 4.03 and standard deviation 0.515 respectively. On the other hand the mean score of perception of employees towards effectiveness of kaizen implementation was 3.98 with standard deviation 0.572 and lastly program coordination factor had mean score of 3.89 and standard deviation 0.592. This implies the mean score of program coordination factor is lower compared to other factors. Besides there is high variation in terms of program coordination related matters among employees of the company.

The results also showed that the mean score of effective kaizen implementation of the factory was 4.03 and its standard deviation is 0.559. According to Zaidatol & Bagheri (2009) the mean score below 3.39 was considered as low. Thus the medium mean score of factors in this study showed that in the factory the top management factor, program coordination, methodologies or tools and perception towards effectiveness of kaizen implementation factors were in a medium status and the effectiveness of kaizen implementation in the company can be taken as good. This indicates that there is unified commitment and involvement of both top level management and workers in different activities including decision making regarding different issues. This shows the kaizen implementation in Kadisco Paints and Adhesive Share Company is above the average performance.

On the other hand, from the interview held with management staff in different work units, the commitment of level has, no doubt, increased and the involvement of most top level management has been high. However, for this to be taken as a certain outcome, it needs further continuous assessment for its sustainability.

Table 4.2 Descriptive statistics of Relationship of independent variables to effectiveness of kaizen implementation

	N	Mean	Std.Deviation
Top management factor	110	4.07	0.579
Methodological and tools factor	110	4.03	0.515
Program coordination factor	110	3.89	0.592
Perception towards effectiveness of kaizen implementation	110	3.98	0.572
Effectiveness of kaizen implementation	110	4.03	0.559

Source: Field survey, 2016

4.3. Factors affecting Effective kaizen implementation

Even though, all the top management factor, methodological and tools factor, program coordination factor and perception towards implementation factor affect the kaizen implementation, this does not necessarily mean that all have equal impact. This can be further investigated by the correlation analysis.

4.3.1. Correlation Analysis

The following section presents the results of Pearson's Product Moment Correlation on the relationship between top management, methodological or tools, program coordination and perception towards implementation factors with effectiveness of kaizen implementation. Higher correlation value indicates stronger relationship between both sets of data. When the correlation is 1 or -1, a perfectly linear positive or negative relationship exists; when the correlation is 0, there is no relationship between the two sets of data (Vignaswaran, 2005). According to Yalew Endawek (2011) the interpretation of strength of correlation coefficient is shown in table 4.3

.Table 4.3 Interpretations of strength of correlation coefficient

Value of coefficient	Relation between variables
.00 – .19	Very low relationship
.20 – .39	Low relationship
.40 –.59	Moderate relationship
.60 – .79	High relationship
.80 – 1.00	Very High relationship

Source: Yalew Endawek (2011)

Table 4:4 below, indicates that the correlation coefficients for the relationships between effectiveness of kaizen implementation and its independent variables are positive and strong. That is a bivariate correlation analysis of the factors affecting Effectiveness of kaizen implementation was done to see the strength of the relationship and all the factors were found to be highly and significantly correlated with the dependent variable effectiveness of kaizen implementation. As it can be seen in table 4.3 a strong positive significant relationship was found between top management factor, employees perception towards implementation factor and methodologies or tools factor with effectiveness of kaizen implementation with a p-value of $p < .001$. However, the study showed a moderate positive and significant correlation between program coordination factors and effectiveness of kaizen implementation with a p-value of $p < .001$.

Table 4.4 Bivariate correlation analysis of factors affecting effectiveness of kaizen implementation.

		Top management factor	Methodological and tools factor	Program coordination factor	Effective kaizen implementation	Perception towards implementation
Top management factor	Pearson Correlation	1				
	Sig.					
	N	110				
Methodologies or tools factor	Pearson Correlation	.886**	1			
	Sig.	.000				
	N	110	110			
Program coordination factor	Pearson Correlation	.679**	.729**	1		
	Sig.	.000	.000			
	N	110	110	110		
Effective kaizen implementation	Pearson Correlation	.875**	.855**	.622**	1	
	Sig.	.000	.000	.000		
	N	110	110	110	110	
Perception towards implementation	Pearson Correlation	.834**	.824**	.631**	.852**	1
	Sig.	.000	.000	.000	.000	
	N	110	110	110	110	110

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

Source: Field survey, 2016

4.3.2 Multiple Regression Analysis of determinants of Effective kaizen implementation

Correlations can be a very useful research tool but they tell us nothing about the predictive power of variables. In regression analysis we fit a predictive model to our data and use that model to predict values of the dependant variable from one or more independent variables.

In this study, multiple linear regression analysis has been carried out to show the effect between the four factors that affect effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company. Multiple regression models should be tested by using major assumptions. We have tested the major assumptions such as linearity assumption, multi co linearity and the normality assumption as follows.

The researcher conducts a test of linearity assumption. Regression assumes that variables have a linear relationship (Berry and Feldman, 1985). There are several pieces of information that are useful to the researcher in testing this assumption: among those visual inspection of the scatter plot was used by the researcher to have information about linearity. The researcher observes the figure of linearity and there are no outliers from the regression line. This implies as the linearity assumption is satisfied (fig 4.1 in Appendix A)

The researcher also conducts a test of normality assumption, the results exhibit that the histogram in which the normal curve overlaid on it was examined to check the normality of the dependent variable effectiveness of kaizen implementation of is found normally distributed. This showed that the normality assumption is satisfied (fig 4.2 in Appendix A)

The researcher also carries out a test of homoscedasticity assumption; Homoscedasticity means that the variance of errors is the same across all levels of the independent variables. When the variance of errors differs at different values of the independent variable, heteroscedasticity is indicated. According to Berry and Feldman (1985) and Tabachnick and Fidell (1996) slight heteroscedasticity has little effect on significance tests; however, when heteroscedasticity is marked it can lead to serious distortion of findings. This assumption can be checked by visual examination of a plot of the standardized residuals (the errors) by the regression standardized predicted value. The researcher visually examines homocedasticity test and as it shows that, there is no problem of hetrocedasticity and the assumption of homocedasticity is satisfied (fig 4.1 in Appendix A).The objective of the study is to investigate the determinants for effectiveness of

kaizen implementation in Kadisco Paints and Adhesive Share Company. Multiple linear regression analysis was used to examine these factors. The dependent variable for the linear regression analysis is effectiveness of kaizen implementation of in Kadisco Paints and Adhesive Share Company. Based on table 4.5 below, the adjusted R square for this research was 0.820, which indicates 82.0% of the variation for the factor affecting effectiveness of kaizen implementation by the optimal linear combination of the independent variables tested (top management, methodologies or tools, perception towards implementation and program coordination factors). The coefficient of determination R^2 is 0.827. This shows that the variation in the considered factors used in the study explained 82.7% of the variation in the effectiveness of kaizen implementation. The remaining 17.3% of the variance is explained by other variables not included in this study.

Table 4.5: Model Summary for Multiple Linear Regressions

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.909	.827	.820	.24259

Source: Field survey, 2016

The results of multiple linear regression in table 4.6, displayed the Omnibus test of ANOVA showed that the fitted regression model was significant with F-value (4, 109) =125.307 and p-value < 0.001

Table 4.6: Analysis of variance (ANOVA) of the multiple linear regression for the factors on effective implementation of kaizen in Kadisco Paints and Adhesive Share Company.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.497	4	7.374	125.307	.000
	Residual	6.179	105	.059		
	Total	35.676	109			

Source: Field survey, 2016

The result of multiple linear regression analysis displayed in Table 4.7, revealed that top management factor

had significantly and positively related to effectiveness of kaizen implementation with a regression coefficient ($\beta = 0.391$), at 99 % confidence level ($p < 0.01$). This means that higher commitment and better performance of the top management in providing the required resource, establishing systems, procedure and policy, generating culture and changing in their values and attitudes towards continuous improvement had been associated with increased in effectiveness of kaizen implementation. Similarly the better the top management monitors and measure results against the strategic objective of the company, gives feedback to employees of the company, gives reward and recognition for individuals or teams to continue their active participation and good effort, providing sufficient orientation session or training was conducted prior to kaizen implementation and sufficient on the job training was conducted about kaizen during the implementation period for the kaizen program had been associated with increased effectiveness of kaizen implementation. Similarly, the interview also supported that there is encouraging management support and economic constraints in implementation of kaizen. They also added that successful implementation of kaizen is dependent on how well an organization is able to manage capabilities concerning employee attitudes, misconceptions about kaizen, and ensuring sufficient participation by employees in kaizen activities.

The study also showed that the methodologies or tools factor had a significant positive relationship with effectiveness of kaizen implementation with a regression coefficient of ($\beta = 0.294$), at 99 % confidence level ($p < 0.01$). This indicates that establishing quality circle team voluntarily, conducting meetings to solve work related problems like quality and productivity regularly, having highly disciplined and committed employees who follow and obey for the standard set, giving adequate autonomy, making an effort to gate all team members' opinion and ideas before making decisions and use of employees or teams a Plan- Do- Check- Act cycle to do their task and eliminating seven deadly wastes associated with effectiveness of kaizen implementation. Similarly using 5S to create Safe, healthy and attractive work environment, implementing of 5S to reduce the amount of time wasted in searching for files, tools and equipments had associated with effectiveness of kaizen implementation.

Moreover, the results of the study indicated that the perception of employees towards kaizen implementation factor had a significant positive relationship with effectiveness of kaizen implementation with a regression coefficient of ($\beta = .344$), at 99 % confidence level ($p < 0.01$). This implies that, having a positive perception on kaizen provides opportunity to participation in

decision making, improves process cycle time and productivities, brings quality products and services had increased the effectiveness of kaizen implementation. Besides, perceiving positively that kaizen creates organizational attitudes and values for change and traditional hierarchical work trends are still the obstacles for kaizen implementation had been associated with effectiveness of kaizen implementation.

Furthermore, the study showed that, the program coordination factor had a negative relationship with effectiveness of kaizen implementation. However, this relationship is not significant with 95% confidence level ($p > 0.05$). That is continuous improvement program in the company which work with the integration of all departments and process and availability of internal coordinator had not properly implemented to support effectiveness of kaizen implementation (Table 4.7). In line with this, the interview results showed the pitfalls and difficulties are still more resistant and unsolved cases like lack of continuous follow up from the company management as it is a new philosophy. In addition, it is not widely practiced in the country level and due to this there is not benchmark Company, supporting materials, skilled and experienced experts.

Table 4.7 Multiple linear regression analysis for factors on the effective implementation of kaizen in Kadisco Paints and Adhesive Share Company.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.010	.188		.054	.957		
Top Management Factor	.391	.095	.396	4.137	.000	.180	5.544
Methodologies and tools factor	.294	.110	.265	2.675	.009	.168	5.936
Program coordination factor	-.050	.058	-.052	-.871	.386	.462	2.163
Perception towards EKI	.344	.080	.336	4.304	.000	.270	3.704

Source: Field survey, 2016

Finally, the standardized beta coefficient in table 4.7 showed the contribution that an individual factor makes to the model. As the beta weights are standardized we can compare them. Thus, the

largest influence on the effectiveness of kaizen implementation is from the top management factor with a beta value (beta= 0.396) followed by perception towards kaizen implementation factor with a beta value (beta=0.336). This implies the commitment and performance of the top management had highly impacted on effectiveness of kaizen implementation. The study also indicated positive perception that kaizen provides opportunity to participation in decision making and improves productivities of the company had impacted the effectiveness of kaizen implementation.

The interview of managers also indicated that kaizen is a low cost approach to productivity improvement for two reasons. First it does not require a huge capital investment, expensive technology or costly research and development since it seeks to use existing equipment and human resources in a more efficient and less wasteful. Second, the key goal of kaizen is to generate the internal capability of the targeted firm and to let it ultimately adjusted from the guidance of skilled kaizen experts and conduct continuous improvement by itself while a large sum of capital is not needed. However, other things, must be invested in, order to gather the benefit of kaizen. They include strong commitment by executives, long term orientation, a sense of ones, thrust and team work among all levels of personnel, and willing cooperation of workers this is as today our company assets.

The estimated multiple regression models which used to predict effectiveness of kaizen implementation from independent variables were:

$$EKI = 0.010 + 0.391TMF + 0.294MTF + 0.344PEKI$$

EKI= effective implementation of kaizen

TMF= Top management factor

MTF= Methodologies or tools factor

PEKI= Perception towards effectiveness kaizen implementation

CHAPTER FIVE

5. Summary, Conclusion and Recommendations

This chapter presents, conclusions, and recommendations of the study.

This chapter deals with summary, conclusions and recommendations of the research. Accordingly, the first part gives brief discussions of the findings of the study. The second part presents the major conclusions drawn. The last part presents potential recommendations that could be good for improvement of the effectiveness of kaizen implementation in the company and any other beneficiaries for further research.

5.1 Summary of Major Findings

The main purpose of this research project is to investigate the determinants for effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company. To achieve this, a survey was conducted using a questionnaire with structured questions that assess respondents' demographic information and items related to the effectiveness of implementation of kaizen in the company.

A total number of one hundred seventeen (117) staffs were selected to complete the structured questionnaire by simple randomly sampling techniques with lottery techniques by taking their names from the company. In addition, data were collected through personal interviews with 2 staff members on management members of the company. Data was collected through pre-tested survey structured questionnaires. The study employed quantitative research approach with descriptive and multiple regression methods supported by interview results.

The results of demographic information of respondents indicated that majority of the respondents (68.2%) were males, (40.9%) aged in the range of 29-39 years, (30.9%) are certificate holders, and (84.5%) of the respondents were employees.

The results of the descriptive analysis also showed that in the company top management, methodologies, program coordination or tools and perception towards kaizen implementation factors had better treatment and the effectiveness of kaizen implementation in the company was good which is above the average performance. The study indicated that top management, methodological or tools and perception towards kaizen implementation had shown a positive and significant correlation with effectiveness of kaizen implementation in the company. The findings also revealed there is moderate relationship between program coordination factors and effectiveness of kaizen implementation.

Furthermore, the findings from regression showed that top management, methodological or tools and perception towards kaizen implementation factors were found to be the determinants for effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company. The study also confirmed that top management factor was the most important factor with the beta value 0.396 to have positive effect on effectiveness of kaizen implementation, followed by perception towards kaizen implementation factor with the beta value 0.336 and methodological or tools factor with the beta value of 0.265. The interview results also supported this. However; program coordination factor was not found a determinant factor for effectiveness of kaizen implementation in the company.

5.2. Conclusions

The research investigated the determinants of effectiveness of kaizen implementation in Kadisco Paints and Adhesive Share Company. Based on the findings the following conclusions were drawn. In this study four factors were taken as independent factors, namely top management factor, methodological and tools factor, program coordination factor and perception towards kaizen implementation factor in order to determine the contribution of each factor in effectiveness of kaizen implementation in the company. The study concluded that top management, methodologies or tools and perception towards kaizen implementation factors were the most important determinants for effectiveness of kaizen implementation. But program coordination factor was not found as an important determinant for effectiveness of kaizen implementation. This was also supported by the interview results

5.3. Recommendations

Based on the conclusions of the present study, the following recommendations are forwarded to the company and other concerned bodies.

- The study concluded that top management as the most important determinant for effectiveness of kaizen implementation. Thus, the company should focus on increasing the commitment and performance of the top management in generating culture of continuous improvement and providing solutions raised by employees or teams which are

beyond their capacity, give reward and recognition for teams or employees based on their best performance and give both on the job and off the job training to make successful implementation of kaizen.

- Furthermore, methodological or tools factor was found one of the most important determinants influencing for effectiveness of kaizen implementation. Thus the company should strengthen quality circle teams and their productivity by establishing teams voluntarily with highly disciplined and committed employees, by giving adequate autonomy to teams in order to take actions when necessary. Furthermore, the company should develop a method of Plan- Do- Check-Act cycle and use 5s and waste elimination methods or tools continuously.
- Perception of employees towards kaizen implementation is the second important factor in influencing for effectiveness of kaizen implementation. So Kadisco Share Company should improve employees to develop a positive perception that implementation of kaizen on decision making, improvement process cycle time and productivities, bringing quality products and services.

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Appendix-A

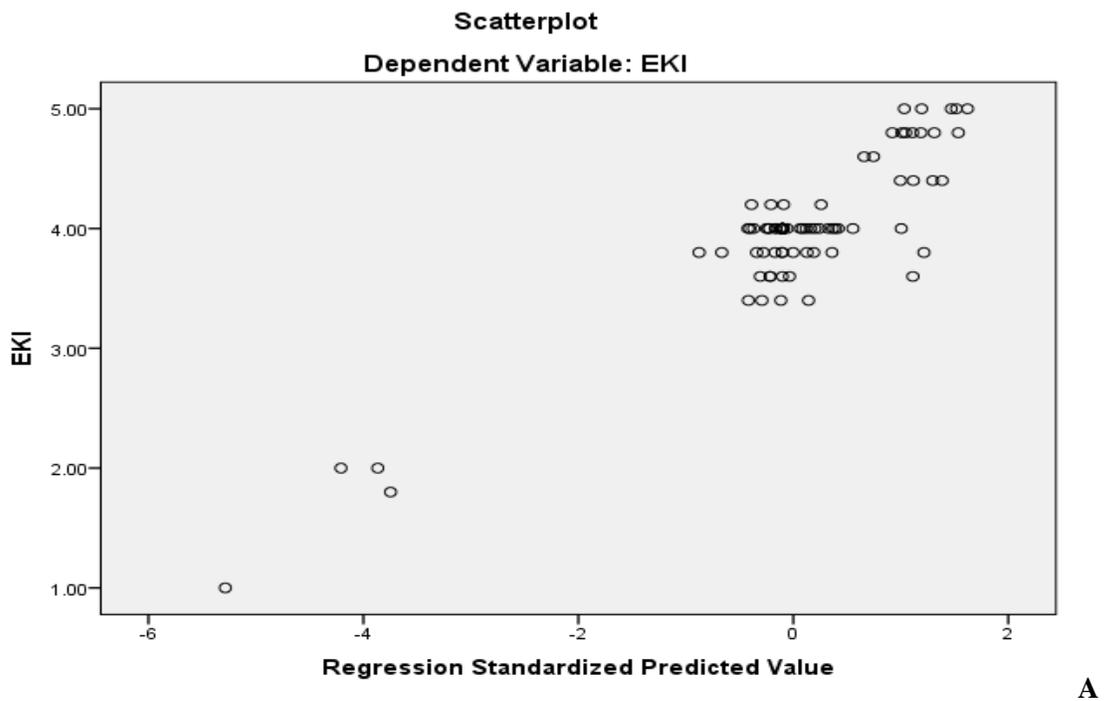


Fig 4.1. Scatter plot effective implementation of kaizen residuals versus predicted values

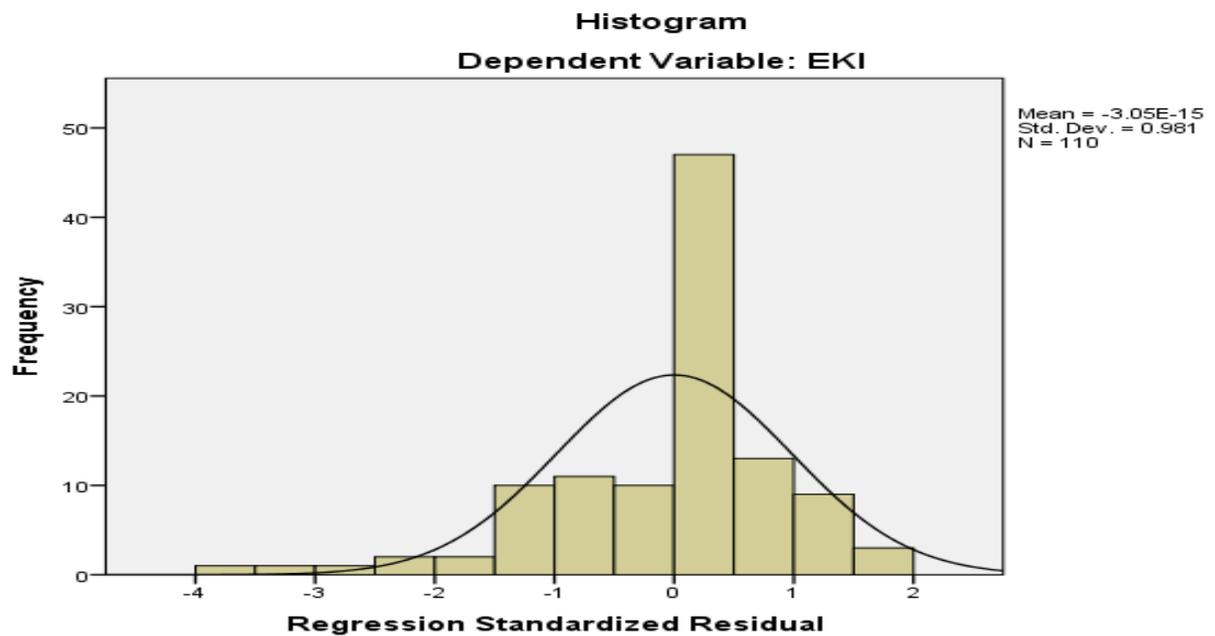


Fig 4.2. Histogram of effective implementation of kaizen

Appendix B: Questionnaires (English)

St. Mary's University

School of Graduate Studies

A Survey Questionnaire to be filled by.....

Dear Respondent:

I would like to thank in advance for your cooperation, time and effort to fill this questionnaire. The purpose of this questionnaire is to study the factors that affect the effectiveness of Kaizen implementation in Kadisco Paints and Adhesive Share Company. This study is conducted in partial fulfillment of the requirements for the award of an MBA degree. The researcher assures that the information you provide will strictly be used only for research purpose and your answers will be kept confidential. Should you have any enquiries and concerns, please feel free to contact the researcher at the following address:

Email: mamizkelkay@gmail.com

Phone: 0911-44-32-19/0911-51-56-93

Section A: Demographic information

Please put a tick mark “√” in the provided box that best suits your answer.

1. Sex

Male Female

2. Age

18– 28 29- 39 40-50 51 and above

3. Educational Level

Up to 10 complete Certificate diploma degree Masters and above

4. Position in the company work structure

Leader/ process owner case team leader (supervisor) ordinary employee

5. Work experience

0-2 years 3-5 years 6-10 years 11 and above

Section B: question related to factors affecting effective kaizen implementation

Please put tick mark “√” the response that best suits your answer

5=strongly agree, 4=Agree, 3=Neutral, 2=Disagree, 1=strongly disagree

No	Description	Level of agreement				
		1	2	3	4	5
	Top management factor					
1	In the company top management provides the required resource for the Kaizen program					
2	Top management establishes systems, procedure and policy to the kaizen program.					
3	The company top management themselves significantly change in their values and attitudes towards continuous improvement program					
4	Top management establishes suggestion system to use suggestion of employees as feedback for kaizen					
5	In the company top management generates culture of continuous improvement.					
6	Top management eagerly supports and facilitates their teams.					
7	Top management is ready to provide solutions to problems raised by quality circle teams which are beyond their capacity.					
8	Top management monitors and measure results against the strategic objective of the collage in the kaizen program					

9	Top management gives feedback to employees of the company about gain result					
10	Management gives reward and recognition for individuals or teams to continue their active participation and good effort.					
11	Sufficient orientation session or training was conducted prior to kaizen implementation.					
12	Sufficient on the job training was conducted about kaizen during the implementation period.					

No	Description	Level of agreement				
		1	2	3	4	5
	Methodologies or tools					
13	In the company quality circle team are established voluntarily and usually they are run by their internal motivation.					
14	Quality circle teams regularly conducting meetings to solve work related problems like quality and productivity.					
15	Quality circle teams are a collection of highly disciplined and committed employees who follow and obey for the standard set.					
16	Adequate autonomy is given to quality circle teams in order to take action when necessary					
17	During quality circle meeting We make an effort to gate all team members' opinion and ideas before making decisions.					
18	In the company's working in quality circle enhances employees to cooperate with other employees and with managers					
19	In the company's employees/teams use Plan- Do- Check-Act cycle to do their task					
20	The company's employees tries to eliminate seven deadly wastes caused by over production, waiting, transportation, un necessary stock, over					

	processing, motion and a defective part.					
21	5S helps to create healthy and attractive work environment					
22	Implementation of 5S has helped the employee to reduce the amount of time in searching for files, tools and equipments.					
23	I always implement and follow all contents of 5S (sort, set in order, shine, standardize and sustain) in my work place without the initiation of any body.					
	Program coordination (Team leader)					
24	The continuous improvement program in the Factory work with the integration of all departments and process.					
25	In the company's there is one or more qualified internal coordinator who supports activities, facilitating access to resource and providing methodological advice to teams or members of the organization					

Section c: Questions related effective kaizen implementation.

No	Description of areas	Level of agreement				
		1	2	3	4	5
26	In the company's there is a continuous improvement in product or service quality.					
27	In the company's productivity is continuously improved.					
28	In the company's wastes are continuously reduced during kaizen implementation period.					
29	In the company's safety of working environment continuously improved					
30	The satisfaction of the company's employees continuously improved after implementation of kaizen.					

Section D: Questions related perception of employees towards effective kaizen implementation

Description of areas	Level of agreement				
	1	2	3	4	5
31. Kaizen provides opportunity to					
32. Over all, Kaizen improved process cycle time, on time delivery and floor space usage,					
33. Kaizen implementation brought quality Products and services in terms of effectiveness.					
34.. Kaizen has been creating organizational					
35. The traditional hierarchical work trends					

Thank you for your cooperation!

St. Mary's University
School of Graduate Studies

Interview guiding **questions for (Management)**

Please write your personal opinion in spaces provided based on company kaizen implementation activity result

1. What were the biggest challenges during kaizen implementation in your company?
If so, how did you overcome the challenge?
2. Which pitfalls and difficulties are still influencing your kaizen implementation today?
3. What were the biggest successes? What helped you to success?
4. What types of measurable result have you achieved?
5. By your view, what seemed most important during Kaizen implementation in your Company?

Thank you for your cooperation!

If you have any other comment about your experience with kaizen implementations please include them in the back of this page.

Appendix C: Questionnaires (Amharic)

ቅድስተ ማርያም ዩንቨርሲቲ

ድህረ ምረቃ ትምህርት ክፍል

የመመሪያ ማሟያ የጥናት ወረቀት ጥያቄ

ውድ የጥያቄ ተሳታፊ

በቅድሚያ ውድ ጊዜዎት ሰውተው ለዚህ ጥያቄ መልስ ለመስጠት በመተባበርዎ ከልብ አመሰግናለሁ። የዚህ ጥያቄ ዓላማ በፋብሪካችሁ ውስጥ የካይዘን ትግበራ ወቅት ወሳኝና ውጤታማ የሆኑትን ጉዳዮች ለማወቅ ነው። የጥናቱ ተግባር የ2ኛ ዲግሪ የመመሪያ ማሟያ ነው። ለዚህ ጥናት ወረቀት የሚሰጡት ማንኛውም መረጃ ለዚሁ ብቻ የሚያገለግል ሲሆን ከዚህ ውጭ ለማንኛውም አገልግሎት አይውልም። ስለሆነም የሚሰጡት መረጃ ሚስጥራዊነቱ የተጠበቀ ነው። ከዚህ በተረፈ በዚህ ጉዳይ ተጨማሪ ጥያቄና ማብራሪያ ከፈለጉ ያለምንም ችግር በነፃነት በሚከታተሉት አድራሻዎች ሊያገኙኝ ይችላሉ።

ተንቀሳቃሽ ስልክ(ሞባይል) – 0911443219 / 0911515693/

ኢሜል mamizkelkay@gmail.com

ክፍል ሀ የግል ሁኔታ መረጃ (Demographic information)

ከዚህ በታች ለቀረበት ጥያቄዎች ‘ ‘ ✓ ‘ ‘ ምልክት በተስማሚው ቦታ ያድርጉ

1. ያታ

ወንድ ሴት

2. እድሜ

18 – 28 29 – 39 40 - 50 ከ51 በላይ

3. የትምህርት ደረጃ

እስከ 10ኛ ክፍል ያለው ስርተፍርኬት ዲፕሎማ የመጀመሪያ ድግሪ ሁለተኛ ድግሪና ከዚያበላይ

4. በድርጅቱ ውስጥ ያልዎት የሥራ ኃላፊነት

የሥራ መሪ የክፍል ተቆጣጣሪ (ሱፐርቫይዘር) ቡድን መሪ ተራ ሰራተኛ

5. በድርጅቱ ውስጥ ያገልግሎት ዘመን

0 – 2 ዓመት 3 – 5 ዓመት 6- 10 ዓመት 11 ዓመት በላይ

ለ. ከካይዘን አፈፃፀም ጋር ተያያዥነት ያላቸው ዋና ዋና ዎችና ውጤታማ ተግባራት መለኪያ ጥያቄዎች

እባክዎት ከተስማሙበት ቁጥር ላይ ‘ ‘ ✓ ‘ ‘ ያድርጉበት

1 በጣም አልሰማምም 2 አልሰማምም 3 መረጃው የለኝም 4 እስማማለሁ 5 በጣም እስማማለሁ

የአፈፃፀሙ ዝርዝር	የተስማሙበትን ነጥብ ምልክት ያድርጉ				
	1	2	3	4	5
ለካይዘን ትግበራ የከፍተኛው አመራር ድርሻ					
1. የድርጅቱ ከፍተኛ የሥራ አመራር ለካይዘን ፕሮግራም ትግበራ ተገቢውን አቅርቦት ያቀርባል።					
2. የድርጅቱ ከፍተኛ ሥራ አመራር ለካይዘን ፕሮግራም ማስፈፀሚያ የሆነ ደንብና መመሪያ አለው።					
3. የድርጅቱ ከፍተኛ ሥራ አመራር በተካሄደው ተከታታይ የማሻሻያ ፕሮግራም መሰረት ካይዘን ትግበራ ውስጥ ያገኘው የእሴትና አመለካከት የግንዛቤ ለውጥ ታይቷል።					
4. የድርጅቱ ከፍተኛ ሥራ አመራር ለካይዘን ትግበራ ከሰራተኛው ግብረ መልስ መለኪያ ያዘጋጃል።					
5. የድርጅቱ ከፍተኛ ሥራ አመራር የማያቋርጥ የሥራ ባህል ለውጥ እንዲፈጠር አድርጓል።					
6. የድርጅቱ ከፍተኛ ሥራ አመራሮች የካይዘን ተግባሪ ቡድን ድጋፍና እገዛ ሁኔታውን ያመቻቻል።					
7. የድርጅቱ ከፍተኛ ሥራ አመራር የጥራት ክትትል ቡድን ከአቅሙ በላይ ለሚያቀርበው ለካይዘን አፈፃፀም ችግር መፈትሔ ለመስጠት ዝግጁ ነው።					
8. የድርጅቱ ከፍተኛ ሥራ አመራር ከድርጅቱ ስልታዊ ግብና አላማ አኳያ የካይዘን አፈፃፀም ክትትልና ቁጥጥር ያደርጋል					
9. የሥራ አመራሩ ድርጅቱ ያገኛቸውን ውጤቶች ለሰራተኛው ግብረ መልስ ይሰጣል					

የአፈፃፀም ዝርዝር	የተስማሙበትን ነጥብ ምልክት ያድርጉ				
	1	2	3	4	5
10. የሥራ አመራሩ በግልጽ በቡድን ተሳትፎአቸውን ለማሳደግ ውጤታማና ንቁ ተሳትፎ ለሚያደርጉ ስራተኞች ሽልማትና እውቅና ይሰጣል።					
11. ከካይዘን ትግበራ በፊት በቂ የግንዛቤ ስልጠና ተሰጥቷል።					
12. በካይዘን ትግበራ ላይ በቂ የስራ ላይ ስልጠና ተሰጥቷል።					
የአፈፃፀም ስልት(ዘዴ) እና የመፈፀሚያ መሣሪያዎች					
13. የካይዘን ፈፃሚ የተደራጁት ቡድን አባላት በፈቃደኝነት ከልብ በሚመነጭ ፍላጎት ይንቀሳቀሳሉ።					
14. የካይዘን ፈፃሚ ቡድን አባላት በመደበኛነት በመገናኘት በካይዘን ትግበራ ጋር በተያያዘ የሚገጥሟቸውን የምርታማነትና የጥራት ችግር ለመፈታት ይጥራሉ።					
15. የካይዘን ፈፃሚ ቡድን አባላት ስብሰብ ከፍተኛ የስነ ምግባር እና የቁርጠኝነት ባህሪ ለጥራት ደረጃ መመስረት ግዴታቸው ተዋጥተዋል።					
16. የካይዘን ፈፃሚ ቡድን አባላት አስፈላጊውን እርምጃ መውሰድ እንዲያስችላቸው በቂ ነፃነት ተሰጥቷቸዋል።					
17. በካይዘን ፈፃሚ ቡድን ስብሰባ ወቅት ከወሳኔ በፊት የሁሉንም የቡድን አባላት አስተያየትና ሃሳብ ይሰጥበታል።					
18. ድርጅቱ በሚያከናውኑ ስራዎች ቡድን ውስጥ መስራት የሰራተኞች እርስ በርስ ሳቸውም ሆነ ከሥራ አመራር ጋር ያላቸውን ትብብር ያሳድጋል።					
19. የድርጅቱ ሰራተኞች ወይም የካይዘን ፈፃሚ ቡድን አባላት ስራቸውን በማቀድ በመተግበር ትክክለኛነቱ በማረጋገጥ ወደ መላ ትግበራ በመግባት ይሰራሉ።					
20. የድርጅቱ ሰራተኞች ሰባት ከፍተኛ የብክነት ምክንያት የሆኑትን ማለትም ትርፍ ምርት ማምረት፣ በክትትል ማነስ የሚፈጠር ጥንቃቄ የጎደለው ማጓጓዝ፣ ተገቢ					

<p>ያለሆነ ክምችት፣ ምልልሶሽ (ኡደት) የበዛበት የምርት ሂደት ጥራት የጉደለው መለዋወጫ ምክንያት የሚከሰት ከፍተኛ ብክነቶችን ያስቀራሉ፡፡</p>					
<p>የአፈፃፀም መዘር ዝርዝር</p>	<p>የተስማሚነትን ነጥብ ምልክት ያድርጉ</p>				
	<p>1</p>	<p>2</p>	<p>3</p>	<p>4</p>	<p>5</p>
<p>21. አምስቱ የ''S'' መተግበር ጠና ማና ማራኪ የሥራ አካባቢ ለመፍጠር ያግዛል (Sorting, Ordering, Prevention, Standardizing, and Sustain)</p>					
<p>22. የአምስቱ ''S'' መተግበር ለፋይሎች ፍለጋ፣ ለመፍቻዎች እና ለመሣሪያዎች በቀላሉ ፈልጎ ለማግኘት ይወስድ የነበረው ጊዜ ለመቀነስ ያግዛል፡፡</p>					
<p>ለካይዘን አስተባባሪዎችና የቡድን መሪዎች</p>					
<p>23. ማንም አካል ሳያነሳ ሳላኝ ሁልጊዜ አምስቱን ''S'' ማለትም (ማጣራት፣ ማስቀመጥ፣ ማፅዳት፣ ማደራጀትና ማስቀጠል) ሁሉንም አፈፃፀም ማቸው እከታተላለሁ፡፡</p>					
<p>24. ፋብሪካው ወሰን ያለው የማያቋርጥ ማሻሻያ ፕሮግራም ከሁሉም መምሪያዎችና የሥራ ክፍሎች ጋር የተቀናጀ ነው፡፡</p>					
<p>25. ለድርጅቱ የካይዘን ከመተግበር በላይ የወሰነ አቅም አጠቃቀምን የካይዘን አፈፃፀም የሚያግዝ ሪሶርስ የሚያመቻች የአስራር ስልት/ዘዴ ምክር የሚሰጥ አንድ ወይም ከአንድ በላይ የሆነ ብቃት ያለው የወሰነ አስተባባሪ አለው፡፡</p>					
<p>ጥያቄ ከወጣታማ አኳያ የካይዘን አፈፃፀም</p>					
<p>26. እንደ ድርጅት በምርትም ሆነ በአገልግሎት ጥራት የማያቋርጥ ማሻሻል አለ፡፡</p>					

27. እንደ ድርጅት በምርታማነት የማያቋርጥ ማሻሻል አለ፡፡					
28. እንደ ድርጅት በብክነት ቅነሳ በካይዘን ትግበራ ወቅት የማያቋርጥ ማሻሻል አለ፡፡					
29. እንደ ድርጅት የሥራ ላይ ደህንነት የማያቋርጥ ማሻሻል አለ					
30. ከካይዘን ትግበራ በኋላ የድርጅቱ ስራተኞች የማያቋርጥ ማሻሻል አላቸው፡፡					
የአፈፃፀም ሙዝርዝር	የተስማሚነትን ነጥብ ምልክት ያድርጉ				
	1	2	3	4	5
የካይዘን ትግበራ በአመለካከት ላይ የፈጠረው ለውጥ					
31. ካይዘን በወሳኔ አሰጣጥ ላይ ተሳትፎ እንዲኖር ዕድል ይሰጣል፡፡					
32. በአጠቃላይ የካይዘን የሥራ ኡድት ጊዜ፣ በወቅቱ የማስረከቢያ ጊዜያት እንደሁም የማምረቻን አከባቢ ንፁህና ግልፅ ያደርጋል፡፡					
33. ከወጤታማነት አኳያ የካይዘን ትግበራ የምርትና የአገልግሎት ጥራትን አስገኝቷል፡፡					
34. የካይዘን ትግበራ ድርጅታዊ የአመለካከት እና የእሴት ለውጥ እየፈጠረ ነው፡፡					
35. ልማዳዊ ወና ዕዛዊ አሰራር እስከ አሁን ድረስ ካይዘንን ለመተግበር እንቅፋት ናቸው፡፡					