ST. MARY'S UNIVERSITY

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ASSESSMENT OF EFFECTIVENESS OF KAIZEN IMPLEMENTATION: THE CASE OF NA METAL INDUSTRY & ENGINEERING

BY: SELAMAWIT SHEMEALASH

A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF REQUIREMENTS FOR DEGREE OF MASTER IN BUSINESS ADMINISTRATION

Addis Abeba

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External Examiner	**Signature**	**Date**

Addis Abeba

Declaration

I, the undersigned graduate student, hereby declare that this thesis is my work, and it has not been presented for a degree in any other university and all sources of the materials used for this thesis have been duly acknowledged.

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Abstract

Kaizen originated in Japan to be applied in the improvement of productivity, quality, efficiency and, all in all, business excellence. Though it has been an internationally recognized tool for continuous improvement, it is of a short age to be practiced in Africa, in general, and in Ethiopia, in particular. The Government of Ethiopia introduced Kaizen as one of the change tools and directed organizations to apply it. However, not much has been done to assess its effectiveness and challenges encountered in the implementation process. The purpose of this paper was to find out the effectiveness of kaizen implementation in NA Metal industries and provide the factory and other interested party with the result of the study and improve and/apply its implementation process. It has, therefore, studied the achievement of Kaizen, the linkage between Kaizen implementation with the Top management, change managements, IT support, Five s and organizational factors, the technical and social outcomes, productivity improvement and the social system outcomes with continuous improvement, , as a purposive sample technique survey questionnaire, interviews and direct observations have been applied based on different performance indicators related to inputs, outputs and process of Kaizen implementation techniques. The respondents for the questionnaires have been involved from different departments of the factory. Interviews were made with management as well as supervisors and observations were also done the researcher through paying visits to the factory. Accordingly, Results of this studies show that kaizen implemented between 11 to 40 percent at company and to implement the entire processes, the implementation believed to take more than three years. Results also identified company support processes (administrative) less challenging to implement compare to core processes. it has been found that Kaizen implementation in the company Factory has been found less successful in terms of minimization of waste and, as a result production cost reduction, increasing efficiency, creation of good relationship between employees and management, increasing employees' attitude towards teamwork, facilitation of the factory's conducive working environment and improving work commitment. However, teams' problem-solving cultivate and intra - team relationship has been observed to require further improvement.

Key Words: *kaizen implementation, Kaizen, NA Metal Industries*

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ACRONYM

EKI   Ethiopia Kaizen Institute

JICA   Japanese International and Cooperation Agency

JIT   Just in time

KAB   Know about Business

CI   Continuous Improvement

PDCA   Plan-Do-Check-Act

QCC   Quality Control Cycle

R&R   Reward and Recognitions

SPSS   Statistical Package for the Social Sciences

TPM   Total Production Management

TQC   Total Quality Control

5S   Five (Sort, Set in Order, Shine, Standardize, and Sustain)

BPR   Business process Reengineering

GDP   Gross Domestic products

Chapter one
Introduction

1.1 Background of the study

Many methods of improving manufacturing operations performance have been developed over the years and range from work study through operations research, lean manufacturing, kaizen, benchmarking and Business Process Reengineering (BPR).These methods differ from each other in how they are implemented, how the improvement should be achieved and what is to be improved. Imai (1986) introduced kaizen to the international audience and asserted that kaizen is an umbrella concept for a large number of Japanese business practices that focuses on the way people approach work. It shows how management and workers can change their mindset together to improve their productivity. While 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, 1986; 1997). The manufacturing sector in Ethiopia is a major sector of growth, with its share in GDP having risen.

GDP from Manufacturing in Ethiopia increased to 464.40 ETB Billion in 2017 from 404.30 ETB Billion in 2016. GDP From Manufacturing in Ethiopia averaged 88.26 ETB Billion from 1999 until 2017, reaching an all-time high of 464.40 ETB Billion in 2017 and a record low of 17.70 ETB Billion in 1999.(Tradingeconomics.com\National Bank of Ethiopia,2017). The manufacturing sector comprises established enterprises and employed more people in the country. The products from the sector comprises of both industrial and consumer goods from diverse industries such as agro- processing, vegetable oil refining, iron and steel manufacturing, cement, plastics manufacturing, apparel industry and medicinal and pharmaceutical products.

The sector operates in a largely unfavorable business operating environment characterized by high operations cost, poor infrastructure, inadequate and expensive financing and inadequate managerial and technical skills ministry of trade & Industries (MOI, 2010). To overcome these challenges it is prudent that manufacturing firms adopt non costly continuous improvement methodologies so as to improve their competitiveness.

In Japanese management, kaizen means "continuous improvement" involving the entire Work force from the top management to middle managers and workers. 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. Kaizen is applicable not only to the manufacturing sector but also to the service sector, public organizations, and non-profit organizations. The origin of Japan's Kaizen movement was the quality control method imported from the USA in the post-world war II period. Japan assimilated and developed this as its own management practice method which later even surpassed performance in the USA. This adapted method, which became known as Kaizen, spread rapidly among Japanese companies including a large number of small and Medium-sized enterprises. It subsequently spread overseas as Japanese business activities Expanded abroad and Japanese companies began to build production networks with local Companies (Schroeder & Robinson, 1991).

The kaizen methodology is often contrasted to the western management styles in that kaizen Attaches importance to the workplace where actual activities are carried out and the workers in the workplace are the center of kaizen activities. Although the owner and the managers are Responsible for making decisions and providing guidance, the workers are the key people who Make proposals for improvement and implementation thus adopting a bottom –up management Style which empowers the workers. A key characteristic of kaizen is that improvements come with minimum investment, since the emphasis is on minimizing waste. Generally, kaizen is a Low-cost approach to productivity improvement because it does not require 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, and the key goal Of kaizen is to generate the internal capability of the targeted firm (Imai, 1986; 1997). Thus, Kaizen is particularly suited for enterprises in low-income countries which face financial access Problems (Ohno et al., 2009).

Although manufacturing companies in Ethiopia's number and their production capacity increased rapidly, " way of doing businesses criticized being as old-fashioned designed. That in turn resulted to dissatisfy both the customers and all stalk holders. Above all, those old- fashioned work practices lack to enhance the Ethiopian manufacturing industries for effective, efficient and economic performances. Accordingly, the former Ethiopian Ministry of Capacity Building tried to introduce transformation in Ethiopia in the ways in which works have to be done through kaizen. (MOI, 2010).

To carry out Kaizens project at manufacturing organization, each company needs to identify processes and assign design team members. According to Hammer and Champy (1993) estimate indicated that 50% to 70% of change management's initiatives failed to achieve their objectives.

Studies on the key success and failure factors of kaizen implementation attempted to identify different sets of factors (Grover et al., 1995). These factors include management commitment, skilled human resource, technology, enterprise capacity capability and financial resources. Besides, Attaran (2000) attempted to identify barriers to successful implementation of Kaizen; however, the author claimed that the difference between success and failure did not depend on company size or resources, but on appropriate planning and avoidance of pitfalls.

In the case of Ethiopia, though some private companies have started to implement kaizen previously, most companies have begun the kaizen events as of the beginning of the National Movement for Quality and Productivity Improvement (*Kaizen*), based on the Ethiopia-Japan Industrial Policy Dialogue (2009-2011). It is believed that considerable improvements have been observed in Ethiopian organizations which have implemented kaizen. As some individuals who work for organizations which have implemented kaizen informally say, it is one of the tools that have enabled their organizations to attain considerable positive changes in different attributes (working practice, workforce attitude, productivity, etc). Furthermore, several people have been heard to give explanations on different media about what benefits organizations have obtained using kaizen.

In the case of Ethiopia, though private companies as well as public enterprise have started to implement kaizen , most companies have begun the kaizen events as of the beginning of the National Movement for Quality and Productivity Improvement (*Kaizen*), based on the Ethiopia-Japan Industrial Policy Dialogue (2009-2011). It is believed that considerable improvements have been observed in Ethiopian organizations which have implemented kaizen. As kaizen institution of Ethiopia published in magazen state that kaizen after organization used kaizen tools that have enabled their organizations to attain considerable positive changes in different attributes (working practice, workforce attitude, productivity, etc). Furthermore, several people have been heard to give explanations on different media about what benefits organizations have obtained using kaizen.

However, this has to be justified by such researches as this one so that the government as well as company executives get a confidence in using kaizen as a change tool. The researcher has been a graduate MBA student of St. Mary University, School of Graduate Studies and it has been an

opportunity to choose to study the effectiveness of kaizen at this specific point in time, where sufficient information is required for further decisions to be made by organizations.

The researcher has, therefore, selected NA Metal Industries, which started to implement Kaizen in order to study the steps it has used, the improvement results that it has achieved, the challenges that it has encountered and the lessons learned for other organizations and/or other researchers to either decide to implement kaizen or advise others to do so.

Therefore, this study could have implications to take corrective actions before kaizen project of NA Metal Industry & Engineering manufacturing organization completely fail. As well as, the study will attempt to contribute to the literature body by studying the issue through a mixed method research design

Definition of terms

Kaizen:- , Japanese for "good change". Philosophy of ongoing improvement**:** a Japanese business philosophy advocating the need for continuous improvement in somebody's personal and professional life". (Thessaloniki, 2006)

5S –"...is a philosophy and checklist for good housekeeping to achieve greater order, efficiency and discipline in the workplace. "Forum (2009))

Change management: - that involves all human- and social-related changes and cultural adjustment techniques needed by management to facilitate the insertion of newly designed processes and structures into working practice and to deal effectively with resistance (Ahmad et al., 1999).

Core processes:- are those that end up touching an external customers; they occur when an employee fills a customer‟s order, responds to a customer‟s complaint, or develops a new program or product (Linden, 1998, pp.8)

Design team members: - refers to individuals participated to design the way work is done. The members take the current process, analyze it and come up with a fundamentally new design (Linden, 1998, pp.25).

Implementation team members:- individuals who actually implement the designed processes. They can be design team members or others, but not necessarily design team members (Linden, 1998, pp.151).

Process:- is a set of interrelated steps that begins with an input or trigger and end with an outcome that satisfies the end user (Linden, 1998, pp.8)

designed processes: - means those processes newly designed by disregarding all existing structures and procedures, and inventing completely new ways of accomplishing work (Tanoglu, 2004).

Support processes:- are internally focused, such as the process of recruiting, hiring, and training new employees (Linden, 1998, pp.8)

1.2 Statement of the Problem

The concept of kaizen has received much attention as a key to Japan's competitive success (Imai, 1986). In contrast to the worldwide diffusion of the concept of kaizen, many researchers have illustrated the difficulties for many companies outside Japan to have kaizen activities take root in organizations (Bateman and David, 2002). The transfer of Japanese kaizen activities to plants overseas has been researched as a component of the studies on transfer of Japanese management practices to overseas plants. These studies suggest that the Implementation and influence of Japanese kaizen activities in overseas plants is situated in the social, economic and cultural contexts.

According to Hong et al. (2006b) explained that it is difficult to get active participation from frontline workers in kaizen activities in China, and suggests that great management efforts are needed to create well suited contexts for Japanese kaizen activities, such as introducing an open - plan plant and office layout as well as import daily Communal rituals from Japan. In fact, as the comparison of key performance indicators between Japanese, UK and USA auto-parts manufacturers by Oliver et al. (2002) shows, there is still a Large gap in terms of the influences of kaizen activities between Japanese and western companies. This highlights the necessity to understand not only the types of kaizen activities in countries outside Japan, but also the extent of implementation of these kaizen activities in more depth and their influence on organizational performance when the social, economic and cultural aspects are put into perspective.

The manufacturing sector is expected to play a critical role in propelling the economy to 8 per cent growth rate, in line with the aspirations of Ethiopia and in supporting the country's social development agenda through the creation of jobs, the generation of foreign exchange, and by attracting foreign direct investment. To meet those goals, the sector has to become more efficiency driven, raising productivity per unit of input especially of labor and capital closer to those of external competitors (National Bureau of Statistics, 2017). To achieve these targets manufacturing firms have resorted to adoption of methodologies that aim at improving operations performance. These methodologies comprise of either continuous improvement methods such as kaizen or radical methods like BPR.

Although studies of the kaizen implementation and practice on countries outside Japan such as Australia (Chapman et al, 1997), Sweden (Lindeberg and Berger, 1997) and the UK (Oliver and Wilkinson, 1992) have been conducted, little is known on why there exist differences in the kaizen implementation challenges & practice between Japanese companies and Companies in Africa and Ethiopia in particular. With respect to kaizen implementation challenges & practice traced to various factors that were identified by different authors (Grover et al., 1995; Attaran and Wood, 1999; Allen and Fifield, 1999), such as management commitment, skilled human resource, technology, enterprise capacity capability and financial resources.

Kaizen has become a global activity spread by multinational companies and their employees. It has become popular not only in the manufacturing sector but also in the service sector. However, proliferation of kaizen in Africa is still very small due to the limited number of players and the philosophy the Government who bring in the practice. Due to this situation the responsible Government body received the best practice of the Japans KAIZEN in their premises.

For the effectiveness of the KAIZEN they commence it as institute. Kaizen Institute is an international private consultant group that specializes in the kaizen method. It has licensed networks throughout 24 countries from which consultants provide services globally. In Africa, its subsidiary institute opened in several African countries including Ethiopia. Their performance has proved that the kaizen method is much needed and commercially viable. There are also other unlicensed consultancies firms, which can provide training on kaizen.

When we observe in the Japanese context all of KAIZEN consultants are private company. Yet, these private services are still the domain of medium and large-scale companies, and their services are not affordable for most micro and small enterprises in Africa according to (Ibid.)

Kaizen activities are often found project titles such as "productivity improvement. "In Africa, are on-going be efficacies from the kaizen projects assisted by JICA (Ohno, I., Ohno, K., Uesu, S., Ishiwata, A., Hosono, A., Kikuchi, T., et al, 2009).Application of kaizen activities to African manufacturers are not only disadvantaged by the technological   Gap but also by the lack of knowledge in key managerial .Kaizen is more to do with a philosophy, discipline by positive changing of the manager and daily practices rather than techniques. For example, 5S can be taught in manufacturing company since the philosophy is Sort, Straighten, Shine, Systematize, and Standardize. The beauty of kaizen is that it can realize productivity improvements with little additional investments. Simplicity and cost effectiveness are the major reasons why kaizen is well appreciated globally (Ohno, I., Ohno, K., Uesu, S., Ishiwata, A., Hosono, A., Kikuchi, T., et al, 2009).

According to Asayehgn Desta (2014), a number of manufacturing industries in Ethiopia currently are not using methods that will achieve high productivity and excellent quality standards to make them more competitive in the globalized, international markets. Most of the initiatives taken for quality and productivity improvement are through top-down approaches without the best management skills. Many manufacturing companies are plagued by such problems as 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, a number of enterprises in Ethiopia 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.

The implementation of the kaizen practice could enable enterprises in Ethiopia to identify and solve their current manufacturing problems without employing high-tech approaches, only involving people on the shop floor in kaizen activities. However, the specific challenging factors that faced manufacturing company of Ethiopia to implement kaizen and magnitudes of various factors on the implementation phase of Kaizen not addressed on prior studies. Therefore, this study attempted to identify the following factors include management commitment, skilled human resource, technology, enterprise capacity capability and financial resources that affect kaizen implementation and their magnitude in case of NA Metal Industry & Engineering. In this study the

researcher tried to explore kaizen practice of NA Metal Industry & Engineering, which have implemented the kaizen management system to revitalize their management system.

Although studies had been done on the effectiveness of Kaizen practices in manufacturing firms respectively, these studies have not covered the extent to which Kaizen is implemented and its effectiveness in Metal manufacturing firms in Ethiopia. Consequently this research sought to find out the level of implementation and effectiveness of Kaizen practice on NA Metal industries Manufacturing firms in Ethiopia. Therefore this study strived to respond to this research question: Thus, the central question of the study is: How effective the current kaizen implementation practice of NA Metal Industries & Engineering?

1.3 Research questions

This research has been carried out on NA Metal industries in order to find out the effectiveness of kaizen implementation. In light of the above problem statement the study provides possible solutions to the following basic research questions: Therefore, to achieve the intended objectives of the study and to address the research problem, the following research questions developed:

1. How effective the current kaizen implementation practice of NA Metal Industries & Engineering?

2. How do those factors affect kaizen practice effectiveness of NA Metal Industries & Engineering?

1.4 Objectives of the study

The broad objective of the thesis was to study Effectiveness of Kaizen implementation practice on Case of NA Metal Industry & Engineering .

Specifically, the objectives of this study:

- ✓ To evaluate the effectiveness of current kaizen implementation practice of NA Metal Industries & Engineering
- ✓ To investigate factors affecting kaizen practice effectiveness of NA Metal Industry & Engineering.

1.5 The scope of the study

Delimiting a research using specific location, population, time frame, or issue to be investigated helps the researcher to focus the center of attention and address the research problem in a resource and time efficient manner (Creswell, 2009). Accordingly, the scope of this study is framed as follows:

Geographic Scope

This study delimited to NA Metal Industry & Engineering and because of time and budget constraints focusing only this company that have been Implements KAIZEN

Methodological Scope

The population under study would be company managers, employees currently working in the organization, Trainers and KAIZEN coordinators.

Conceptual Scope

For the reason that, its achievements and full implementation of Kaizen management philosophy and only look into the phases implemented by the case company. In this research, Kaizen implementation process, challenges, constraints and employee attitude towards kaizen were assessed.

1.6 Organization of the thesis

The overarching theme of the thesis focused on Kaizen implementation to identify challenging factors that impeded the implementation of designed processes in company. The study report structured as follows. Chapter one Explained about backgrounds of the study, statements of the problems, objective of the study & Research question. Chapter two presents literature review with respect to the theoretical perspective of Kaizen and empirical studies on Kaizen. Chapter three provides the research design part of the study, in which it encumbrances the main principles of research methodology and the adopted research design for the study. Chapter four presents both the quantitative and qualitative features of mixed method results and analysis of findings. Finally, chapter five presents study's conclusions part that encompasses summaries of major findings, conclusions,

Chapter Two
Literature Reviews

2.1 Conceptual Overview of Kaizen

Kaizen is a Japanese word that has become common in many Western companies. Kaizen culture an organizational culture based on the three super ordinate principles namely process and results, systemic thinking, nonjudgmental and non-blaming (Mullins, 2010). The word indicates a process of continuous improvement of the standard way of work. It is a compound word involving two concepts: Kai (mean change) and Zen (mean for the better). The term also comes from 'Gemba Kaizen' meaning 'continuous improvement' (CI). Continuous Improvement is one of the core strategies for excellence in production, and is considered vital in today's competitive environment (Robinson, 1991). It calls for endless effort for improvement involving everyone in the organization.

The ideas of kaizen philosophy implement as continuous improvement of organizational attitude the approach on the purpose of doing business. It is the key thrust to maintaining or achieving competitive advantage through a well-managed, dynamic change process. It is customer focused, ever changing, and maximized when all associates use Kaizen to achieve the primary quality, cost, delivery, safety, and morale goals. Its assumption lies in the Buddhist understanding of life to be inherently the experience of suffering. (According to this school of thought, humans undergo suffering because everything is the result of ever- changing and interrelated conditions and causes. Our confusion and suffering will come to an end, when the causes of our suffering are identified and extinguished. (Gembutsu Consulting, 2008).

"The Kaizen philosophy assumes that our way of life—be it our working life, our social life, or our home life should focus on constant-improvement efforts.....In my opinion, Kaizen has contributed greatly to Japan's competitive success" (Imai, 1997, p.1).Kaizen is the main pillar of TQM (Total Quality Management) or TPM (Total Productive Maintenance), and its emphasis lies with continuous process improvement. The most effective way to achieve Kaizen is for worker themselves to be highly motivated to implement to improvement production methods and products. Suggestion systems, QC circle and self- management are typical methods to motivate workers to achieve Kaizen according to (Ethiopian Kaizen Institute, 2013).

Kaizen means "continuous improvement" involving the entire workforce from the top management to middle managers and workers. Imai (1986) argued that, it is not just a management technique but a philosophy which instructs how a person should conduct his or her life. Kaizen shows how management and workers can change their mindsets together to improve their productivity. Imai farther argues that kaizen is an umbrella concept for a large number of Japanese business practices, such as 5S, including suggestion system, Quality Control Circle (QCC), Total Quality Management (TQM), the Toyota Production System, the Just-in-Time System, and the Kamban System.

2.2 The Objectives of Kaizen

The benefits of kaizen include increasing number of private enterprises and implement quality and productivity improvement. The success of the kaizen implementation also established to disseminate kaizen to private enterprise in sustainable manner (EKI and JICA, 2013). Kaizen aims for improvements in productivity, effectiveness, safety, and waste reduction. Those who follow the approach often find a whole lot more in return: less waste – inventory is used more efficiently as are employee skills; People are more satisfied – they have a direct impact on the way things are done; Improved commitment – team members have more of a stake (a share or interest in business) in their job and are more inclined to commit to doing a good job; Improved retention – satisfied and engaged people are more likely to stay; Improved competitiveness – increases in efficiency tend to contribute to lower costs and higher quality products; Improved consumer satisfaction – coming from higher quality products with fewer faults; Improved problem solving – looking at processes from a solutions perspective allows employees to solve problems continuously; Improved teams – working together to solve problems helps build and strengthen existing teams .

2.3 Historical Overview of Kaizen

Henry Ford first developed a manufacturing concept of continuously moving assembly line – the first approach for mass production. The Ford Model of a worker performance in simpler and repetitive tasks has been replaced by job rotation and teamwork, which mainly improve employee morality but also yield substantial benefits in terms of higher quality and employee suggestions for improvements in the process (Kovacheva, 2010).

The philosophy of kaizen has kindled considerable interest among researchers because it increases productivity of the company and helps produce high-quality products with minimum efforts. Several authors have discussed the concept of Kaizen including Doolen, T. L. (2005)that were made experience of kaizen in Ethiopia. According to Imai (1986), kaizen is a continuous improvement process involving everyone, managers and workers alike. Broadly defined, kaizen is a strategy to include concepts, systems and tools within the bigger picture of leadership involving and people culture, all driven by the customer. William, H. (1992) stated that the origin of Plan-Do-Check-Act (PDCA) cycle or Deming cycle can be traced back to the eminent statistics expert Shewart in the 1920s.

2.4 The Kaizen Philosophy

Improvement has become an integral part of theories and models of change, such as Structure Theory (Pettigrew, 1990), ideal types of change (Van de Ven and Poole, 1995), and cycles of organizational changes within revolutionary, piecemeal, focused, isolated and incremental changes. Imai (1986) introduced kaizen into the Western world when outlined its core values and principles in relation to other concepts and the practices involving the improvement process in organizations (Berger, 1997). Framed as Continuous Improvement (Lillrank and Kano, 1989; Robinson, 1991), the Kaizen philosophy gained recognition and importance when it was treated as an overarching concept for Total Quality Management (TQM) (Imai, 1986; Tanner and Roncarti, 1994; Elbo, 2000), Total Quality Control (TQC) or Company Wide Quality Control (CWQC) citing practices such as Toyota Production Systems (TPS) and Just in time (JIT) Response systems (Dahlgaard and Dahlgaard-Park, 2006) aimed at satisfying customer expectations regarding quality, cost, delivery and service (Carpinettiet etal., 2003). With the focus on improvement, the Kaizen philosophy reached notoriety in organizational development and change processes and has been explained as the "missing link" in Western Business Models (Sheridan, 1997) and one of the reasons why Western firms have not fully benefited from Japanese management concepts (Ghondalekaret et al. 1995).

2.5 Kaizen Implementation

Kaizen implementation is not once in a month or once in a year activity. It is continuous. Imai (1997) expressed that the rate of the worker participation in terms of providing important suggestion for their organization and Japanese companies, (such as Toyota and Canon, a total of 60

to 70 suggestions per employee per year are written down, shared and implemented). In most cases these are not ideas for major changes. Kaizen is however, based on making little changes on a regular basis namely, always improving productivity, safety and effectiveness while reducing waste. Suggestions are not limited to a specific area such as production or marketing. Kaizen is generally based on making changes anywhere that improvements can be made.

A Many scholars in the field believe that there are certain minimal conditions which have to be met for successful implementation of kaizen. This includes conducive political framework, harmonious social relations, compassionate and sympathetic attitude, and capacity to take individual, as well as collective responsibility, and ability to work collectively or high social capital (Ohno, I., Ohno, K., Uesu, S., Ishiwata, A., Hosono, A., Kikuchi, T., et al., 2009)

2.5.1 Techniques for Implementation of Kaizen

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 fulfil 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.

I. Total Productivities maintenance

TPM or being known as Total Productive Maintenance has been originated in Japan in 1971. It is being design as a method to improve the availability of machines through the utilization of maintenance. Some people might think that TPM is "deterioration prevention", which means is what happens naturally to anything that is not "taken care of". For this reason many people refer to TPM as "total productive manufacturing" or "total process management" (Joel Levitt, 2010). TPM is a proactive approach that essentially aims to identify issues as soon as possible and plan to prevent any issues before occurrence. One motto is "zero error, zero work-related accident, and zero loss" (Wireman, T., 2004).

In the other hand, TPM also need to make sure that the setting and maintenance of the machine are being frequently done by the machine operator that has be well-trained to handle that machines (Peter Wilmott et. al., 2001). In this setting the operators are enabled to understand the machinery and identify potential problems, righting them before they can impact production and by so doing, decrease downtime and reduce costs of production. TPM is a critical adjunct to lean manufacturing. If machine uptime is not predictable and if process capability is not sustained (Ralph Bernstein, 2005), the process must keep extra stocks to buffer against this uncertainty and flow through the process will be interrupted. Unreliable uptime is caused by breakdowns or badly performed maintenance. Correct maintenance will allow uptime to improve and speed production through a given area allowing a machine to run at its designed capacity of production.

II.   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.

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 programme 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. (Mullins, 2010)

III.   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.

IV.   The 5s Formwork Place Organization

5s is not only the basic technologies to promote Kaizen, but also a prerequisite for KAIZEN implementation. The word 5s brought from five Japanese equivalent meaning with English terms is presented as follows: 5s originally stands for Sort=Seiri, Set-In-Order=Seiton, Shine=Seisou, Standardize=Seiketsu, Sustain=Shitsuke. It is well-known but difficult to practice. But if you can install it successfully, you realize the cost effectiveness of 5s. (Imai, 1997)

Once the root causes of problems in the process or value stream are identified during the pre kaizen process, the team uses the following four pillars of kaizen activities to implement greater operational efficiency (the cost) and effectiveness (the extent to which customers' requirements are met). These are: a) housekeeping activities, b) waste elimination or elimination of non-value added materials, c) standardization of workplace environment, and d) mapping out Socio-economic and environmental effects of the company, and e) conducting follow-up action plans to evaluate the end results of the kaizen activities (Ministry of Industry, 2011). a) Housekeeping Activities: The beginning of the kaizen housekeeping journey of management starts by displaying a level of orderliness and clarity of the work area using the following Five Steps (5S). As stated by Imai, 5S is a set of techniques that provide a standard approach to good housekeeping and fosters an increase in quality and productivity (Imai, 1997 as quoted in Juhari et al (2011).

Therefore, to effectively apply the 5S System, Juhari, Abidin, and Omar (2011) suggest that communication for 5S, training for 5S, reward and recognition for 5S and top management support for 5S are vital factors that influence employees' motivation in the implementation of the 5S System. Given this, they suggest that management needs to pay attention and invent effective strategies to motivate their employees on a consistent basis. In their study they have ascertained that the four independent variables that influence employees' motivation for environmental improvement and the implementation of the 5S systems include, knowing the goals of the firm, management support, employee involvement and experiential training, and employees' reward and recognition.

Waste Elimination: Muda or elimination of non-value adding activities includes removing unnecessary wastes caused by people and machine. Muda or waste can accumulate because a company may have more than necessary equipment, materials or people for quantity production. The way to eliminate waste in any company is therefore to make employees aware in advance which steps add value to the product, and which steps do not. Generally, the seven types of deadly wastes (muda) as identified by the Toyota Production System (TPS) that accumulate in a company's production system are caused by overproduction, waiting, transportation, inventory, over processing, motion, and production of defective parts. In addition, in the sugar plantation and production process, extra wastage is accumulated as a result of the infiltration of excessive nutrients into ground water or surface waters that naturally contribute to greenhouse-gas emissions (Lean in Government Series, November 2007).

➢ **Muda from overproduction**

It occurs when a company produces too soon or too much product in order to be on the safe side in case of a machine's failure and/or employee absenteeism. As a result, trying to produce more than needed products creates misuse of raw materials, wasteful inputs of manpower, utilities, an increased burden on interest payments, added transportation, additional space needed to store excess inventory and administrative costs (See, Thawani, 2003 and Thessaloniki, 2006). As stated by Mezgebe, Asgedom, and Desta (2013) any company can minimize overproduction by trying to be consistent in understanding the heartbeat of the consumer, making demand assessments for the particular product even if the product has been commercialized for a long period of time. Demand is dynamic and tuning the production scheme accordingly is important, so continuous communication with customers is one way of reducing overproduction.

➢ **Waiting Waste:**

This occurs when the hands of the operator are idle, or when an operator's work is put on hold because of a lack of parts, waiting for the next piece to arrive. It can also happen when another worker slows up the line, anything that lengthens the lead time of the product from start to finish. As narrated by Thessaloniki, (2006) ―Lead time begins when the company pays for its raw materials and supplies, and ends when the company receives payment from customers for products sold. Since lead time represents the turnover of money, a shorter lead time means better use of resources, more flexibility in meeting customer needs, and of course contributes to the lowering of operation costs.

➢ **Transportation:**

This is a non-essential part of operations. A company might use trucks, forklifts, or conveyors as a means of transportation. Unnecessary transport of damaged materials (muda) contributes to waste because transportation does not add value to the finished product. As stated by Thawani

(2003) one way of minimizing waste is by incorporating the act of any process into the main line.

➢ **Inventory:**

An excess of final product, semi-finished product, raw materials and spare parts kept in inventory contributes to Muda of inventory. They do not add value. Instead, they add to the cost of operations by occupying space, requiring additional equipment and facilities such as warehouses and forklifts. As the products stored deteriorate over time they could eventually become obsolete. Excess items staying in inventor gather dust and their quality deteriorates over time. They are even at risk of damage through fire or production systems help to solve the Muda of inventory.

➢ **Over-processing:**

This type of Muda uses more resources, utilities, and materials, or uses the wrong set of tools, procedures or systems. Producing more quantity ahead of schedule creates waste because in manufacturing a longer line requires more workers, more working-process and a longer lead-time to produce outputs. As suggested by Thessaloniki (2006), many unneeded workers are likely to make a greater number of mistakes ―…which leads to quality problems. More workers also mean that a longer lead-time will increase cost of operations‖ As Suggested by Thawani, (2003) elimination of Muda in processing can frequently be avoided by combining operations/steps.

➢ **Motion:**

Excessive movements by workers like walking, lifting, or carrying heavy objects, searching for lost items create waste. In short, Muda of motion is unproductive because it involves movements by workers not directly related to the job. Such as poor workplace organization, resulting in poor ergonomics for example excessive bending or stretching (Mezgebe, Asgedom, and Desta, 2013). Thus, ―Workers should avoid walking, lifting, or carrying heavy objects that require great physical exertion because it is difficult, risky, and represents non-value added activities‖ (Thessaloniki 2006). Rearranging the workplace would eliminate unnecessary human movement and eliminate the requirement of having another operator to do his/her work more efficiently.

➢ **Production of Defective Parts:**

Muda of repairs/rejects interrupts production. It contributes to a great waste of resources and effort. In addition, rejects increase inspection work, require expensive rework or additional time to repair (Thessaloniki, 2006). The production of defective parts can cause dissatisfied consumers to complain about their defective product but also might create a skeptical attitude about other products the company may be producing in the future. In order to eliminate non-value added defective products, companies could retrain and redirect staff-time to higher priority activities related to their core mission.

In general, it was suggested by Thawani (2003) that unlike many western approaches such as Business Process Re-engineering, Six Sigma which calls for massive investments, the golden rules of Workplace Management (Gemba kaizen) is group effort for continuous incremental improvement that can be standardized by requiring each worker to: go to work place first (like a detective) when problems arise;

Investigate or check the object carefully (e.g. a customer complaint or defective item produced/pile loads of inventory); Take temporary counter-measures promptly; Find the root cause of the problem (e.g. if excess inventory check the purchasing system or the production management); and Develop/amend an existing procedure/system to prevent its recurrence. Thus, the adoption of a ―zero defect‖ mindset in the employees of an organization is vital for spontaneously and automatically improving the operations of the firm. Standards are set by management and engineers. Companies with employee suggestions can bring about improvement as they are called to review the set standards periodically, collecting information and analyzing defects, and

encouraging teams to conduct problem-solving activities to optimize performance, comfort, and safety to meet the company's goals. Thessaloniki (2006)

V.   Policy Deployment

Although kaizen strategy aims at making improvements, its impact may be limited if everybody is engaged in kaizen for sake without any aim. Management should establish clear targets to guide everyone and make certain to provide leadership for all kaizen activities directed toward achieving the targets. Real kaizen strategy at work requires closely supervised implementation.

This process is called Policy Deployment, or in Japanese, Hoshin Kanri cited in (Imai, 1986). First, top management must devise a long- term strategy, broken down into medium- term and annual strategies. Top management must have a plan-to- deploy strategy, passing it down through subsequent levels of management until it reaches the organization. As the strategy cascades down to the lower echelons, the plan should include increasingly specific action plans and activities. According to (Imai, 1986:10), farther explain a policy statement along the lines of "We must reduce our cost by 10 percent to stay competitive" may be translated on the shop floor to such activities as increasing productivity, reducing inventory and rejects, and improving line configurations. Major Kaizen Systems Kaizen without a target would resemble a trip without a destination. Kaizen is most effective when everybody works to achieve a target, and management should set that target (Imai, 1986).

VI.   The Suggestion System

Functions as an integral part of individual-oriented kaizen and emphasizes the morale- boosting benefits of positive employee participation. Japanese managers see its primary role as that of sparking employee interest in kaizen by encouraging them to provide many suggestions, no matter how small. Japanese employees are often encouraged to discuss their suggestions verbally with supervisors and put them into action right away, even before submitting suggestion forms. They do not expect to reap great economic benefits from each suggestion. Developing kaizen -minded and self-disciplined employees is the primary goal. This outlook contrasts sharply with that of Western management's emphasis on the economic benefits and financial incentives of suggestion systems (Ibid).

A kaizen strategy includes small-group activities—informal, voluntary, intra-company groups organized to carry out specific tasks in a workshop environment. The most popular type of small-

group activity is quality circles. Designed to address not only quality issues but also such issues as cost, safety, and productivity, quality circles may be regarded as group oriented kaizen activities. Quality circles have played an important part in improving product quality and productivity in Japan. However, their role often has been blown out of proportion by overseas observers, who believe that these groups are the mainstay of quality activities in Japan. Management plays a leading role in realizing quality—in ways that include building quality-

Assurance systems, providing employee training, establishing and deploying policies, and building cross- functional systems for QCD. Successful quality-circle activities indicate that management plays an invisible but vital role in supporting such activities (Ibid).

2.5.2 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 labelled. 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.

2.5.3 Success and failure factors of kaizen implementation

Studies on the key success and failure factors of kaizen implementation attempted to identify different sets of factors (Grover et al., 1995; Attaran and Wood, 1999; Allen and Fifield, 1999; Al-Mashari and Zairi, 1999; Ahmad et al., 2007). These factors include change management, management competency and support, organizational culture, project planning and management, information technology (IT) infrastructure and financial resources. Besides, Attaran (2000)

attempted to identify barriers to successful implementation of kaizen; however, the author claimed that the difference between success and failure did not depend on company size or resources, but on appropriate planning and avoidance of pitfalls.

A. Top management support factors

According to Brad Power (2017), the biggest challenge to sustaining process improvement in an organization is getting and retaining the attention of top executives. Without it, investments in process design, training, and systems changes won't get funded. Worse, turf issues between departments and functions — critical to cross-functional process improvement — won't get resolved.

B. Information technology (IT) factors

According to Tim Monahan (2018), that IT should, first and foremost, enable and support the objectives of the business and one of the crucial objectives any business needs is to be fixated on is **continuous Improvement**. Ultimately, this means to delight the customers - which makes perfect sense as they are the ones who pay for the products and services the business provides.

Despite these insights, traditional **IT focuses internally** on software, infrastructure, and even on what is commonly referred to as the 'internal customer' or 'business users' productivity. But does this inward focus translate into increased revenue or increased reach to more customers? Does it make the firm easier to do business with? Does it lower costs and increase profits? Will it mean better cash flow, speed to market or better products and services which gives a competitive edge?

This is precisely where Continuous Improvement for IT (CIIT) comes in. CIIT is a **philosophy based in Lean** which focuses IT away from the internal and towards the external customer. It is a culture shift whereby technology professionals understand the **key business drivers first**, and then apply technology to meet those drivers if you would like to learn about Triaster's continual improvement approach, please read our blog: The 4 Essential pillars of Continual Improvement, to find out how to facilitate lasting change in an organization. CIIT aims to continuously eliminate waste and deliver customer value by applying the following Lean Manufacturing principles to IT: Using Lean Manufacturing Principles and Their Application to Facilitate Continuous Improvement Value: Value can be described as "anything for which the customer is willing to pay". To define customer value in terms of IT, you need to look at it from a strategic perspective: How do IT

services or projects align with the company's services and products directly? Which of these has a significant effect at enabling better value delivery of others outside of IT to the customer? Consider the following examples which could arguably increase the value of a company's products and services to the customer: (Tim Monahan , 2018)

- Linking the customer's inventory and purchasing systems with your ERP to automate the ordering, invoicing, and advanced shipping notice of frequently ordered products
- Providing tailored analytics which helps your customer see how changes to their ordering patterns may save them money

C. Change managements

The importance of change management to successful continuous improvement initiatives cannot be expressed enough. Anytime there is a change it needs to be managed. Otherwise the transformation initiative is bound to fail. Studies have shown that more than 60 percent of transformational initiatives fail, not due to the lack of technical or resources, but rather due to the lack of proper change management. (Lean six stigma Experts, 2018)

Any leader who wants to drive a successful continuous improvement program should keep in mind that the soft stuff is the hard stuff. Just hiring a Black Belt or Lean Expert with the right credentials is not going to ensure the success of the initiative. We have always seen that continuous improvement programs have been successful only when there was visible senior leadership support and commitment to the program as well as a planned change management initiative tied to the program to ensure that all employees are moving from the current state to the expected future state with the program. (Lean six stigma Experts, 2018)

In fact, we have observed that putting a program management office in place to start with the program management in itself is a change management initiative. This becomes more important when an organization has an existing Enterprise PMO and a separate Enterprise Quality never motivated enough to support his Six Sigma initiative. (Lean six stigma Experts, 2018)

Another telling comment in the same article mentioned that, "He seemed less concerned about people being friendly." Probably not the right change management for a team in who believed that

customers came to Home Depot not because the products were necessarily cheaper, but rather because they can discuss and get advice from a real and hopefully friendly representative.

As per a Price Waterhouse Cooper study that was carried out a few years ago, 75 percent of all transformation initiatives fail or do not meet the intended goal. In fact, more than half of the failures are attributable to poor change management related to people issues, communication issues, and the culture of the organization.

2.6 Conclusion and gap in literature

Organizations required responding to changing environments through various management tools. In response, organizations use appropriate management tools to alleviate the changing environment and to increase their performance. Among the various management tools, kaizen is one of the management tool undertaken by organizations.

Various organization employed kaizen in pursuit of improved performances. Since manufacturing institutions function like other types of business organizations, it also used by various countries as a change tools.

2.6.1 Empirical studies on Kaizen

As indicated previously, organizations use kaizen for better performance improvement; and the driving factors to undertake kaizen accounted to the three C‟s‟ that are change, competition and customers (Hammer and Champy, 1993). Starting from the introduction of kaizen, issues on kaizen many researchers' undertaken studies on it, to date. Thus, in order to highlight literature gaps, this section first reviewed selected empirical studies on kaizen implementation factors and then empirical studies conducted in Ethiopian context reviewed.

The study conducted by Imai (1986) on the research area of kaizen implementation attempt to identify numerous challenging factors of implementation. As the authors indicated, their research empirically sought to explore implementation problems and the severities of problems how relates to implementation success. To carry out this study, they have identified implementation problems based on past theories and research related to the implementation of organizational change as well as field experience of experts. Further, the authors categorized the identified problems main groups, namely management support problems, technological competence problems, process

delineation problems, project- planning problems, change-management problems, and project management problems. Then, the authors used the identified problems in the survey instrument to generate responses from individuals who have participated in kaizen projects in organizations.

Imai (1986) analysis of the results showed the importance of change management in implementation success. As result also showed, addressing problems in technological competence and project planning are necessary, but not sufficient, conditions for success. Further, problems related to project management and training personnel for the designed process are highly related to project success. In General, the findings of Imai (1986) noted that kaizen implementation as complex. Thus, to succeed with implementation, the authors suggest that organizational change to be essentially managed and balanced attention to be paid to those that are contextual factors (e.g., management support and technological competence) as well as factors that pertain directly to the conduct of the project (e.g., Training & Awareness, Top Managements role & Commitment, Participation, Effective communication, Culture & positive mind set).

A study by Muthengi and Soni (2005) on effectiveness of KAZIEN System in enhancing financial performances of Baba Dogo Metal fabricators found that Kaizen is not a procedure effectively aced. Despite the fact that the standards can be just characterized, taking in their viable application through cross-useful kaizen groups requires study, duty and determination. Direction by experienced professionals, frequently on a drawn out premise, is referred to on numerous occasions as a basic central of progress, and as with most business change forms, the prizes are proportionate with the venture.

With respect to Kaizen implementation in education institutions, Allen and Fiefield (1999) studied the applicability in higher education institutions of UK along with factors that affect the change managements of Kaizen. In doing so, the researchers adopted case study approach on five selected universities of UK and gathered data through seven structured interviews from project stakeholders in the universities undergoing kaizen programs. At the first glance, the researchers identified a range of factors that make implementation in this company a difficult process. The factors are senior management approval, complex information requirements, institutional policies and entrenched values, academic freedom, inertia, business process improvement (conservative change programs), IT driven change, maintaining the status quo, failure to reengineer human resources, and organizational transformation. The findings drawn from the study (Allen and Fiefield, 1999) are that the organizational culture and structure of higher education institutions limit the degree of

change sought from kaizen and insufficient attention given to the human resources side of change management. As the authors claimed, the selected company for the most part of implementing the project represent a limited approximation of techniques. In other words, the project was not about radically changing the organization by obliterating existing processes, instead, it was process improvement. Thus, the radical change of kaizen conflicted with the factors previously mentioned. Particularly, as Allen and Fiefield (1999) indicated, the power of academic departments, the professional status of academics and inertia within the company made radical change unlikely.

Hammer et al. (1993) explain that Kaizen generates process-oriented thinking since processes must be improved before better results are obtained. Improvement can be divided into continuous improvement and innovation. Kaizen signifies small improvements that have been made in the status quo as a result of ongoing efforts. On the other hand innovation involves a step improvements in the status quo as a result of large investments in a new technology and equipment's or a continuous improvement using Kaizen concept.

Doolen et al. (2003) describe the variables that are used to measure the impact of Kaizen activities on human resource. These variables include attitude toward Kaizen events, skills gained from event participation, understanding the need for Kaizen, impact of these events on employee, impact of these events on the work area, and the overall impression of the relative successfulness of these events.

To this point, empirical studies on kaizen implementation with respect to manufacturing company reviewed. Although Kaizen is a recent phenomenon used to organizations of Ethiopia, some researchers have been engaged to study kaizen practice in a context of Ethiopian organizations. For instance, using mixed method research design, Eden (2017), Asayehgn Desta (2014), and Berhanu (2014) studied kaizen implementation on selected organizations of Ethiopia. However, based on the researcher knowledge, there was no empirical study conducted on Ethiopia on assessment of effectiveness (success/failure factors) of kaizen. Hereunder, the aforementioned empirical studies conducted in Ethiopian case reviewed.

Research conducted by Eden (2017) evaluated Practices and Challenges of Kaizen Implementation at Tikur Abbay Shoe Share Company. In doing so, the researchers used a mixed method research design and gathered data using structured questionnaire and interview from respondents. Eden (2017) based on their finding claimed that in each organization very high levels of user satisfaction and spectacular improvements in kaizen implementation in Tikur Abbay Shoe Share Company

were brought some changes in minimizing work flows and in reducing time conception but there had been challenges which emanated from various sources, like gaps in knowledge of executives, trainers and employees; their negative attitude towards the kaizen implementation; their lack of knowledge and skills; gaps in available infrastructures and material resources; and gaps in the capacity and capabilities of the management body. The study disclosed that there were inadequate training on the concept and application of kaizen. As per the researchers" recommendation, thus, to reduce the knowledge and skill gap of the implementers on pillars of kaizen, training on kaizen is suggested as an important force of smooth kaizen implementation.

The study of Asayehgn Desta (2014) showed Analysis of Kaizen Implementation in Northern Ethiopia's Manufacturing Industries. Hence, the researcher Mapping out a survey questionnaire, interviews, direct observation of the personnel who were directly involved with the implementation process, the effects of the newly introduced kaizen techniques at three case factories from the Northern Ethiopia were assessed. Although the research tried to present kaizen theory and practice by organization, the finding report Based on key performance indicators that specifically relate to inputs, outputs and process factors of the kaizen management system the three pilot case companies were assessed to determine if 1) top managers and employees have a genuine concern for the short and long-term health of the company, 2) the companies' work teams have a mindset for action, 3) employees are committed to the companies' value systems, and 5) the employees' suggestions are used as leverage for improvement in the production process. The study found that the three pilot companies have reduced the costs of production, improved quality, reduced lead time, improved customers' satisfaction and have partially achieved three out of five (5S) kaizen steps: sorting, setting, and shining, but they have not yet achieved how to standardize and sustain self-discipline. The study also established that the executives of the three pilot cases don't seem to be committed to the kaizen teamwork. Though vital for continuous improvement, the front line workers are rarely asked to participate as a team.

Berhanu (2014) the study was to assess Practices and Challenges of Kaizen Implementation at Entoto Polytechnic Cluster College in the case of Woreda three enterprises Gulele Sub-City in Addis Ababa City Administration, and submitted. To address the objectives, case study research design was employed, and a mixed research methods (i. e. an approach of both quantitative and qualitative data collection methods) were used to collect data from 80 respondents through questionnaires and from 7 key informants using semi-structured interviews and cross-sectional data

(i.e. data collected at one point in time) collected from the primary sources, and secondary sources like review of assessment documents ranging from 2011 to 2014. The primary data was collected using semi-structured interviews, questionnaires, and observations. Secondary data were also obtained from available documents at six SMEs and one TVET College in the study areas, and books, web-based internet source, journals articles, pamphlets and other related materials. The quantitative data were analyzed through descriptive and inferential statistics with SPSS Version 20. The secondary data were analyzed using thematic and content analyses.

The authors claimed that the findings of the research showed that there was moderately implemented kaizen strategy. The kaizen implementation indicated that there were success stories, but there had been challenges which emanated from various sources, like gaps in knowledge of executives, trainers and employees; their negative attitude towards the kaizen implementation; their lack of knowledge and skills; gaps in available infrastructures and material resources; and gaps in the capacity and capabilities of the management body.

Finally, Berhanu (2014) recommended that the stakeholders should consider those stories as good lessons and to effectively address the challenges identified. Thus, it is recommended that in order to be successful government institutions and private enterprises should implement kaizen/TQM as a strategy.

However, due to its recent introduction in Ethiopia, limited number of study conducted the concept of Kaizen in manufacturing firms as evident in the foregoing review however some study has focused on the manufacturing firms especially in the Ethiopia context and in this era of globalization and technological advancements where quality improvement is key for operational performance. As per the researcher knowledge, there is no enough comprehensive study on assessment of effectiveness of kaizen implementation in Ethiopian context, specifically, manufacturing company" kaizen implementation stands. Thus, this gap leads to originate the following general research question and a need to study Assessment of effectiveness of kaizen practice in NA Metal Industry & Engineering.

2.7 Conceptual Framework

Figure 2. 1 Conceptual Frame work of the study

Independent Variables   **Dependent Variable**
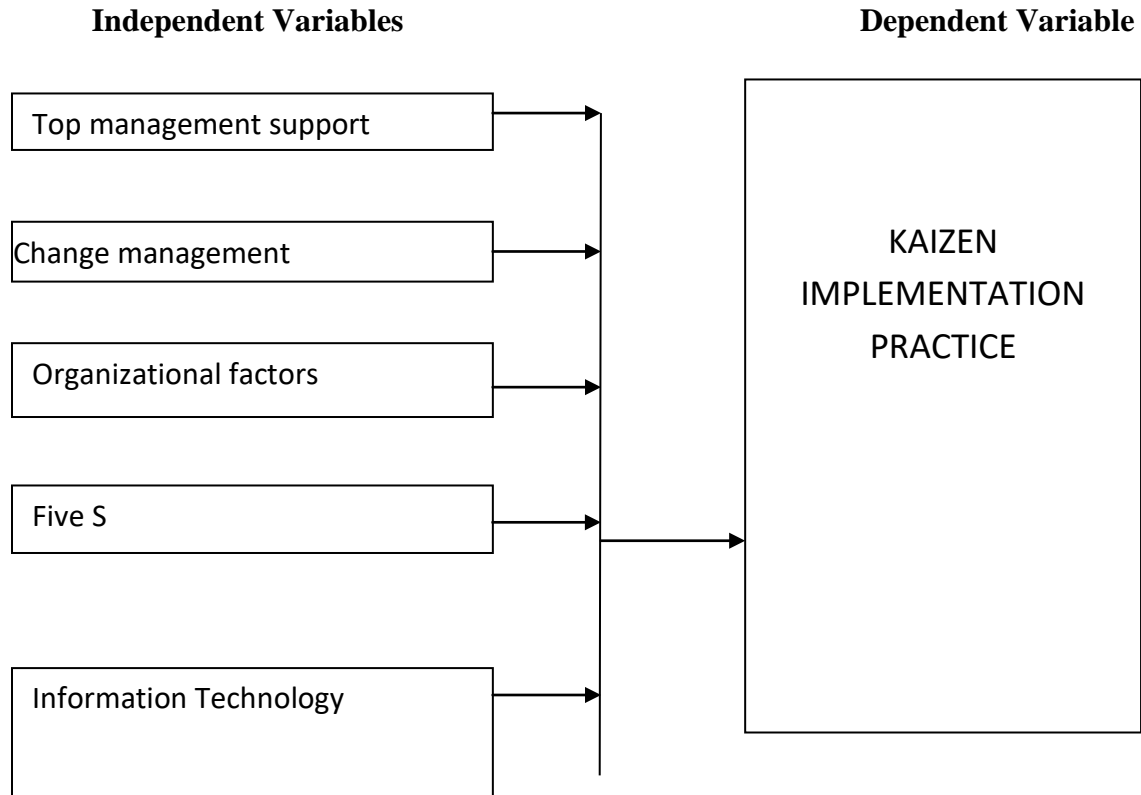
Source: Developed by the Researcher based on Literature

In this study, five indicators are extracted for measuring the independent variable being Top management support, Change management, Kaizen projects management, Information Technology, & organization factor. The dependent variable is Kaizen implementation practices of NA Metal Industry & Engineering.

Chapter Three
Research Methodology

This chapter outlines the methodology on how data and information relevant to the research were gathered and analyzed in order to achieve the objectives of the study. It discusses the description of study procedures and the methods employed in the study. Areas covered include the research design, sources of data, instruments of data collection, population and sampling procedures, methods of data analysis, and ethical consideration.

3.1 Research methods

There are many definitions of research design; one definition that Kelliher (2005) uses is that "research design is the blueprint for fulfilling research objectives and answering questions where it aids the researcher in the allocation of limited resources by posing crucial choices in the methodology". Other definitions are that research design is an activity- and time-based plan and a guide for selecting sources and types of information to obtain answers to research questions (Blumberg, el al. 2005).

Though it can be complicated in selecting an appropriate research design, Cooper and Schindler (2008) are of the view that, by creating a research design which uses a combination of methodologies, researchers can achieve greater insight than if they were to follow methods which used frequency or methods which have been mentioned the most in media.

This research has been conducted in a descriptive method of research called survey studies to assess clear understanding about existing trends of the kaizen implementation and its effectiveness in the factory under study. The descriptive research method helps to draw a valid general conclusion, and it is the most popular and widely used research method. This idea is strengthened by survey study is the most commonly used descriptive method in research.

3.2 Source of Data

The main sources of data for this research were both primary and secondary data.

Primary data:- In relation to this, Trochim (2003:179) argues that alternative forms are designed to be equivalent to the types of questions … that leads to the outcome .Likewise, Kothari (2006:266) describes that the collection of primary data is either through questionnaire or through interviews. Accordingly, for this study, the primary data have been collected directly from the sample respondents through the selected instruments discussed in the following sub-sections.

Secondary sources: - Besides primary data, secondary data were obtained from different books, newspapers, magazines, academic papers, reports, etc. In addition to these, authentic and reliable online scholarly written literatures were used to supplement the information. To assess the effectiveness of the factory's kaizen implementation, the researcher has referred to the annual reports and compared the factory's productivity, the major of the factory's strategic objective, before and after kaizen in order to examine the improvement.

3.3 Instruments of Data Collection

The researcher collected data by administering a questionnaire and un structured interview questions. The questionnaire used structured questions, developed based on the literature review, most of the items in the instrument adapted. All items in the instrument were close-ended questions. In addition, items in the questionnaire categorized in to four parts (see appendix)
Part 1 of the questionnaire sought to get respondent's profile. Part 2 dealt about kaizen implementation at the company, typical questions in this part sought to get the extent of kaizen implementation and the period required to implement. Part 3 try to get responses in the areas of kaizen cost and benefits. Thus, to get the perceived level of kaizen cost and benefits, all items in this part developed using five-point Likert-type scales („strongly agree" to „strongly disagree").

The last part sought to get responses in the areas of implementation. Like part 3, all items in part 4 developed using five-point Likert-type scales. The Likert-type questions helped to get respondents" perceived experiences about each factors. Besides, to make clear about the study, the cover page of the instrument indicated study's objectives, importance of their responses to the study along with confidentiality matter and procedures to mark their responses.

The structured interview questions were prepared for the researcher to collect the data through interview.

Interview: - it is verbal form of data gathering instrument. "Interview is a form of verbal questioning and it is a principal means of data gathering. It is one of the most popular techniques in survey research" Robson, A, (1993). The research has used unstructured interviews to collect more detail information about the topic with Management, Supervisors, & Officers respectively were interviewed to gather first-hand information regarding the effectiveness of kaizen implementation and its challenges in the factory.

Questionnaire: - is a written question in the form of text (Sarantakos, 1993; Robson, A., 1993) defining it as "questionnaires are written question, which can be self-administered by the researcher or could be sent by mails. Information is offered by the respondent" The researcher used closed - ended questions prepared and presented for Kaizen facilitators and Kaizen product team leaders, since they are able to read and understand the questions and reply in rating form. This is believed to produce quick and consistent result.

Observation:- the researcher conducted observation on factory production and production related departments' general environment, the factory production store organization, main production and machine outline of the factory, the factory production records before and after kaizen implementation and other related issues implementation of different kaizen tools activities.

Document analysis: - the factory's production and improvement related documents of different years and final annual reports were analyzed.

3.3.1 Research Population and Sampling Procedures

To study kaizen implementation at NA Metal Industry & Engineering, the study population units constitute service providers and users. However, defining the study population and study units depend on the research problem and study's objectives (Walonick, 2005). To help ensure validity, Huber and Power (1985, cited in Grover et al., 1995) also suggested to select informants who are most knowledgeable about the issue of interest research. Thus, to gather data on the perceived experiences of respondents, the study's population units comprised individuals who were directly involved on NA Metal Industry & Engineering as design or implementation team members.

Accordingly, to generate the sampling frame, lists of participants acquired from each departments of the company. The numbers of design and implementation team members of the company total population of the study determined. The organization has 8 teams members, out of these each team members have 5 participants members. These recognized teams were from different sections of the 3 separate factory units (unit I, II & III).

The research followed a sampling process to select participants of the survey so as to fairly generalize the study of sample characteristics to the population (Trochim, 2006).

Thus, census survey was used. Therefore, the population for this study was 8 team leaders and under each leader there are 4 group members, thus making the size of the total population 40 employees. Managers, kaizen officer and supervisors were also involved in the interview as a way of triangulating the data obtained from the employees. Totally, the study's population size comprised individuals from respective departments. As a result, the study comprised 40 respondents.

Furthermore, pertinent documents were included in this study to gather important and relevant information. Besides, to make clear about the study, the cover page of the instrument indicated study's objectives, importance of their responses to the study along with confidentiality matter and procedures to mark their responses.

3.4 Data Analysis

Data analysis in descriptive methods research relates to the type of research strategy chosen for the procedures. For the analysis process, version Excel 2013 was used to maintain the large database and is used for the descriptive data analysis. As indicated in the sampling strategy section, the data collected from different sources have been summarized, categorized and coded to suite for analysis. The qualitative or the open-ended questions have been summarized and presented as they are, while the closed-ended questions have been coded and analyzed using both Descriptive and inferential statistics by using ratio, percentages, frequencies. The outputs of the data were presented appropriately depending on the respondents' response.. The end result has been presented in a written form and in the form of table. Finally, presentation, analysis, and interpretation of data and conclusions and recommendations have been drawn using analysis and data outcomes into a text format.

Chapter Four
DATA PRESENTATION, ANALYSIS AND INTERPRETATION

The preceding chapter presented some principles of research methodology and the adopted research method for the study along with its rationale. This chapter presents the results and analysis of findings for the adopted sequential explanatory mixed method design in two sections. The first section presents the results and analysis of findings for the quantitative future of mixed method. Then, section two presents the results and analysis of findings for the qualitative future of mixed method.

4.1 Demographic Variables of the Respondents

The first phase (quantitative) of this study objective is to evaluate the effectiveness of current kaizen implementation practice of NA Metal Industries & Engineering.

Part one of the Questionnaire attempted to acquire respondents" profile with respect to their current educational level, their position at company, and their roles during kaizen implementation. Of the fourteen Respondents, about 83 percent were undergraduate and 15 percent were postgraduate (see Table 4.1). While only one respondent were diploma or certificate holder and no one accounted to the PhD educational level choice of item one in the survey instrument. In addition as the table shows, of the forty respondents, 70 percent were staff, 30 percent were Management. In terms of respondents" role in their company engaged with kaizen practice, of the forty respondents, 30 percent were design team members, Whereas70 percent of respondent accounted to implementation team member of kaizen practice

Table 4.1: Survey respondents by educational level

Educational level	Frequency	Percent
Undergraduate	33	83
Postgraduate	6	15
diploma or certificate	1	2

Total	40	100.0
Position		
Staff	28	70
Management	12	30
Position		
Role		
Design Team	13	32.5
Implementation	27	67.5

Generally, most of respondents for this study had Undergraduate, who is staffs of the company. In addition, most of them were implementation team members when their company engaged with kaizen implementation.

4.2 Kaizen implementation cost and benefits

To undertake kaizen, organizations incur financial and non-financial costs. In this regard, a thorough reform that requires a lot of money and time. Fees for consultants and incentive for design team members to cultivate their energy indicated as financial costs. Devoting time by senior managements to discuss issues on the implementation indicated as nonfinancial costs. However, these costs not incurred without benefit. The objective of kaizen is to enhance organization's performance in terms of reducing business cost and cycle time, and increasing service quality and customer satisfaction. Despite the fact that organization incurs costs related to the project, the benefits gained from implementing the designed & implementation kaizen outweigh.

Data obtained from part three of the Questionnaire helped to highlight company" kaizen implementation cost and benefits. To identify whether kaizen of company cost a lot or not, respondents were asked to rate a five-point scale („strongly agree" to „strongly disagree"). In addition, to identify the benefits of kaizen implementation, respondents were asked to rate the expected benefits (cost reduction, process cycle time reduction, increasing service quality, and increasing customers and employees satisfaction) of designed processes when implemented.

As shown in Table 4.2, of the forty respondents, 30 percent of respondents claimed the consensus with kaizen implementation *of* company cost a lot", while 17.5 percent of respondents were undecided about the consensus and 55 percent of respondents respond it cost a less. However, taking the frequency mean (i.e., 3.1), the responses inclined to the agreement scale (i.e., more than 3). In this case, company kaizen implementation had cost less. Since company engaged with kaizen implementation to improve their performance dramatically, the benefits gained when implemented

Designed processes improved.

Table 4.2: kaizen implementation cost

kaizen implementation cost		Frequency	Percent
Kaizen implementation cost a lot (n=40)	Strongly disagree	12	30.0
	Disagree	10	25.0
	Neutral	7	17.5
	Agree	5	12.5
	Strongly agree	6	15.0
Mean		3.1	
Standard Deviation		1.297	

4.3 Practice of kaizen program implementation

In Kaizen principles, designed processes piloted before full-scale implementation at the organization. The pilot tests help the organization to assess the performance of designed processes and to take revision and improvement actions for organization wide implementation. However, the implementation phase of Kaizen is not a straightforward activities, which involves a complex and intricate activities for its success.

In order to measure the progress of Kaizen implementation at NA Metal Industries, respondents were asked in the survey instrument to rate the perceived level of designed processes implemented in their respected company.

As Figure 4.1 shows, based on respondents" rated percentage of Kaizen implementation in their company, the extent of designed processes implemented varied among respondents. For the scale category of 11-20 percent of Kaizen implementation, 20 percent of respondents rated their

company in this category. For the scale category of 21-30 percent of Kaizen implementation, 30 percent of respondents rated their company in this category. For the scale category of 31-40 percent of Kaizen implementation, 40 percent of respondents rated their company in this category. 10 percent of respondent's respondent rated the scale category of 41-50 percent of Kaizen implementation for the company.

Figure4.1 designed processes implemented
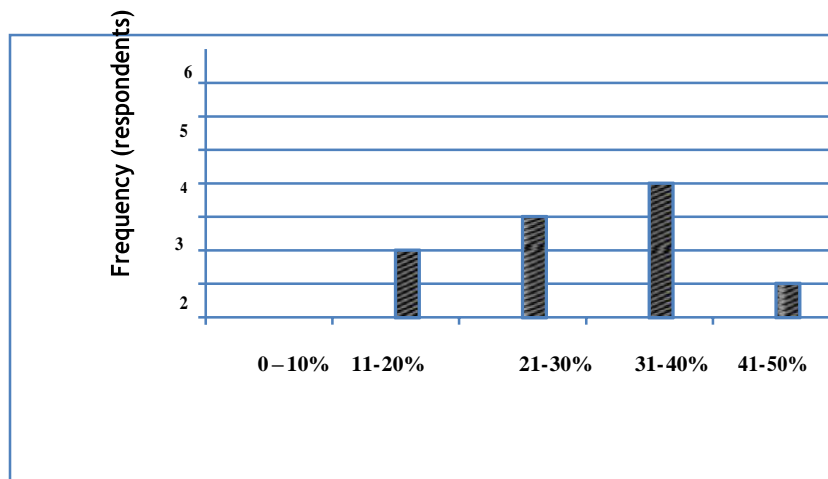
The above discussion evidenced that the designed processes of NA Metal Industries implementation. As such, company not achieved the intended objectives of Kaizen, unless the company radically and fundamentally changed their designed processes, they cannot achieve dramatic performance improvements using Kaizen.

In line with Kaizen implementation extent level at company, the survey instrument attempted to capture the periods required to implement the entire processes of company. As Table 4.3 presents, of the forty respondents, 35 percent and 30 percent of respondents believed company to implement the entire processes between three-to-four years and two-to-three years, respectively. For the periods that covers less than two years and more than four years, 15 percent and 20 percent respondents considered company to implement the entire processes in these periods, respectively. Generally, 45 percent of respondents believed that company to implement the designed processes

within one to three years, while 55 percent of respondents believed the implementation to take more than three year.

Table4.3: Kaizen implementation periods

Period	Frequency	Percent
Between 1 year to 2 years	6	15.0
Between 2 years to 3 years	12	30.0
Between 3 years to 4 years	14	35.0
More than 4 years	8	20.0
Total	**40**	**100.0**

Core processes are those processes that are the reason an organization exists (Linden, 1998, pp.9), in case of NA Metal Industries, production process as core processes. Support processes are those processes internally focused and they are necessary, but they are not the purpose of the organization created to serve (Linden, 1998, pp.9). Administrative processes such as human resource management, finance and budget, facility management and so on indicated as support processes of the company.

Due to these, the questionnaire attempted to identify the most difficult process to implement at company. As Table 4.4 shows, of the forty respondents, 95 percent of them claimed core processes as the most difficult to implement at company, while 5 percent of them claimed support processes of company as difficult to implement. Thus, it is evident that core processes of company difficult to implement compared to support processes.

Table4.4: Difficult process of to implement

Type of process	Frequency	Percent
Core processes	38	95
Support processes	2	5
Total	**40**	**100.0**

With respect to the responsibility to implement the designed processes of company, most of respondents (above 50 percent) consented implementation team members, top management and employees of company as responsible to implement the designed processes (see Table 4.5). However, none of respondents considered external consultants as a responsible to implement the designed processes.

Table4.5: Responsible to implement Kaizen

Responsible to implement (n=40)	Yes		No	
	Frequency	Percent	Frequency	Percent
design team members	20	50.0	20	50.0
Top managements of the company	31	77.5	9	22.5
employees	27	67.5	13	32.5
External consultants	0	0.0	40	100.0

The above discussions attempted to present Kaizen implementation in NA Metal Industries that

Related to the extent of the designed processes implemented, the period required for full-scale

Implementation Of processes, the difficult process to implement, and the responsible body to

 Implement the processes.

To add insight in to the profiles of implementation practice that impeded kaizen, this subsection attempted to refine various effectiveness factors. Thus, this subsection tried to answer the research question 1, i.e., „ How do those factors affect kaizen practice effectiveness of NA Metal Industries & Engineering

To compare and analyze the groups‟ responses for the items in part four of the survey instrument, mean values were calculated based on the scores on a five-point scale (Likert scale) & using Yes or no questions. Hereunder, results and analysis of findings presented

Five s

With respect to the responsibility to implement the designed processes of company, most of respondents (above 50 percent) consented implementation team members, top management and employees of company as responsible to implement the designed processes (see Table 4.9). However, none of respondents considered external consultants as a responsible to implement the designed processes.

Efficiency in the literature review was defined as equipment search time and work place to determine the impact of 5S on efficiency; test was performed to compare survey scores. 5S led to a perceived increase in efficiency as the majority of respondents responded yes to the question below in table 4.9 presented. With respect to the sort, most of respondents (above 50 percent) consented that There is no excess stocks, cabinets are free from items, store area are free from unwanted items., and passage way is free after implementing five s   Thus, Results suggested that respondents perceived there was an improvement in the time spent finding items during practicums and in workplace practices after 5S implementation.

After implementing 5S in relation to whether items were sets in order the respondents responded that 54%, 60% and 70% responded that items are labeled, Items are visible in their stored location

& Items are easily stored respectively. As a result they concluded that the workspace will increase. In addition, the workspace area 5S led to a perceived increase in workspace as the majority of respondents responded yes. The storage cabinets attached to the walls of the production area made it difficult to save workspace. However, after 5S, workspace was freed up.

In relation to shine as the responded in the table below shown After implementing 5S, working environment will improve5S led to a perceived positive increase in working environment as the majority of respondents responded yes in association about Shine. The respondents responded that Weekly cleaning exercise is conducted regularly for continuous periods of time, everyone is actively involved in cleaning & the store & production areas are free from gas & Oils. In general result showed after implementing kaizen Results from the test, observation, and feedback from participants showed that there was a perceived improvement in the working environment.

In relation to standardization the respondents were asked four question responded that after implementing 5S safety (standardize) will improve 5S led to an increase in perceived workspace safety. All the respondents i.e. 100 % were responded there is established production & store rules, 92.5 %(37 respondents) responded there is standard operating procedures, 100 %of the respondents responded there is no floor marking as well as color coding & with regards to safety manual they responded 50% 0f respondents responded there is safety manual whereas the remaining 50% responded there is no safety manuals. Generally majority of respondents responded that there is store rules, standard operating procedures, there is no floor marking

Table4.6: KAIZEN PRACTICES of Five S

Responsible to implement (n=40)	yes		No	
	Frequency	%	Frequency	%
There is no excess stocks	32	80	8	20
Some of the cabinets are free from items	31	77.5	9	22.5
The production & store area are free from unwanted items.	27	67.5	13	32.5
The passage way is free	40	100	0	100.0
Every items are labeled	22	54	18	46

Items are visible in their stored location	24	60	16	40
Items are easily retrieved and stored	28	70	12	30
Weekly cleaning exercise is conducted	40	100	0	100
Everyone is actively involved in cleaning	28	70	12	30
The store & production areas are free from gas & Oils	40	100	0	100
There is established production & store rules	40	100	0	100
There is standard operating procedures	37	92.5	3	7.5
There is floor marking and color coded cabinets	0	100	40	100
There is a safety manual	20	50	20	50

Total Quality maintenance

According to Mullins, 2010 Total Quality maintenance 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. The following section tried to analysis response obtained from respondents about total quality maintenance their response were presented as follows.

Table 4.7 Shows respondents view on which department was responsible for product quality in the organization. 5 (13%) were of the view that no one was responsible. 22 (55%) thought that quality control department was responsible. 10 (74.6%) were of the view that quality assurance was responsible.3 (7%) were of the view that TQM department was responsible. This table shows that majority (87%) of the respondents new which department was responsible for product quality.

Table4.7 department responsible for product quality

Responsible to implements	n=40	
	Frequency	**Percent**
No body	5	13
Quality Control	22	55

Department	10	25
Quality Assurance	3	7
TQM Department	40	100
Total		

Source: Field data 2019

Table 4.8 Shows the respondents view on training received on the job. 30 (76.1% of respondents) were of the view that they had received training on the job. 10 (24% of respondents) were of the view that they had received no training on the job. This indicates that the firm is doing well to train the valued staffs, which is a good practice of TQM

Table4.8 Response on training received on the job

	Frequency	Percent
Yes	30	76
No	10	24
Total	40	100

Table 4.9 Shows the respondents 'view on whether training received has impacted positively on the work.36 (90% of valid respondents) was of the view that the training has impacted positively on the work.4 (10% of valid respondents) were of the view that the training received had no impact on the work. The table

shows that the training received by the respondents had helped them to impact positively on the work. This suggests that the training given was helpful. This is a good practice of TQM.

Table 4.9 training received has impacted positively on the work.

	Frequency	Percent
Yes	36	90
No	4	10
Total	40	100

Source: Field data 2019

To add insight in to the profiles of challenging factors that impeded kaizen implementation in the company, this subsection attempted to refine various challenging factors. Thus, this subsection tried to answer the research question 1, i.e. what are the challenging factors that affect kaizen implementation NA metal industries.

To compare and analyze the groups" responses for the items in part 4 of the survey instrument, mean values were calculated based on the scores on a five-point scale (Likert scale). Hereunder, results and analysis of findings presented based on the five categories of kaizen implementation challenging factors heading.

a. Top management support factors

According to Attaran (2000), kaizen changes all aspects of a business, but more than changing jobs and skills, it forces changes in management style. As the author further noticed, it forces managers to reevaluate not only what they do, but also who they are because new system requires new management philosophy. Therefore, top management support is required for successful kaizen implementation; otherwise implementing the designed processes could be a challenging endeavor. In connection with this, Table 4.10 presents the rated responses for the items related to top management support factors. Taking the mean values of each challenging factor, most of

respondents showed a higher degree of agreement with the five challenging factors. In other words, all items" mean values are above three, this indicates that most of respondents either strongly agreed or agreed with the items.

This indicated that the five challenging factors related to top management support category contributed to delay the implementation of designed processes in the company. Generally, Table 4.10 evidenced that top management's total support and commitment, sufficient understanding of kaizen concepts, and changing the entrenched values can help to implement kaizen successfully. Otherwise, the existence of problems related to top management support could endanger the implementation phase

Table 4.10 To_P management support factor

Factors	Percent (n=40)					Mean
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Lack of leadership, commitment and support by senior management	0	20	25	45	10	3.45
Top management's insufficient understanding about kaizen	10	20	20	40	10	3.2
Top management fears to support the new values and beliefs required by the designed processes	15	15	20	40	10	3.15
Lack of total involvements of top management who have real power to Change	15	10	30	30	15	3.2
Top management does not change their value unlike the designed Processes	10	20	25	30	15	3.2

b. Change-management factors

As Debela and Hagos (2011) indicated, kaizen by itself is a change project that needs to be managed appropriately. Therefore, the change initiative of kaizen requires adequate risk management (for instance, economic, political, organization and employees" resistance risk management), creating a culture of change and new values, and developing policies and strategies for new processes. In connection with this, Table 4.11 shows the rated responses for the items related to change-management factors.

As the mean values column of Table 4.11 shows, except the factor of „*employees"* *resistance"*, most of respondents maintained a higher degree of agreement to all challenging factors of kaizen implementation. That is, four challenging factors on average rated above three, while „*employee's resistance to change"* on average rated at 2.55. These indicate that to implement the designed processes, problems related to change- management contributed to delay the implementation, while „*employee"* resistance" not contributed to delay the implementation.

Among the five challenging factors of change management, the pattern of responses for change factor is „absence of incentive, training and education to cultivate required values of designed processes" is surprisingly insignificant (see Table 4.15). In line with this finding, Mengesha and Common (2007) finding also claimed that nonexistence of appropriate rewards and motivational instruments in Ethiopian organizations caused to sluggish kaizen change initiatives. In addition, study finding indicated that employees" resistance was not strong during kaizen implementation at the case studies of NA Metal industries.

Table 4.11 Change-management factor

Factors	Percent (n=40)					Mean
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Fears about political, economic, and organizational risks due to change initiative of kaizen	10	15	25	50	0	3.15
Lack of creating organizational culture and values for change	0	15	10	60	15	3.75
Employees" resistance to change	20	40	15	15	10	2.55
Lack of necessary changes in human resource policies for kaizen Implementation	15	5	15	55	10	3.40
Absence of incentive, training and education to cultivate required values of designed processes	5	15	10	40	30	3.75

c. Organizational factors

As Wu and Du (2010) noted, prior to kaizen project undertaken, organizations must be carefully think the necessity of kaizen to determine their readiness to change. If kaizen project begin due to the felt needs of changing the old system for improved performance, organizations can quickly change the old processes with new ones. In addition, to implement new system successfully, new organizational structures, jobs definition and responsibility allocations, and infrastructures adjustments are required.

Table 4.12 presents the results for the five organizational factors and their statistical summaries. Considering the mean values for each item and the pattern of responses, With the factor, i.e., „*lack of organizational readiness to change*", all respondents' respondents rated on average above three. Organization's readiness to change helps in determining the capabilities that the organization possessed to implement kaizen initiatives, which requires change in a cultural, human resource, financial or technological standpoint (Ahmad et al., 1999). Thus, it is critical to assess organizational readiness prior to the project start.

However, this was not the case, because the mean value (above 3) for this factor indicates that most of respondents showed a higher degree of agreement that their company were not ready to change prior to the project started, which in turn resulted to impede designed processes from successful implementation. To implement new system, Wu and Du (2010) indicated to consider organizational size and historical factors. As the authors suggested for organizations those are larger or have more long time history, gradual method should be taken to implement new system, because they have more rigid and complex organizational structures and business processes, whereas smaller size organizations should take a revolutionary implementation method. In connection with this, respondents rated the factor, i.e., problems related to rigid hierarchical structures, jobs definition, and responsibility allocation" on average above three. The mean values rated by " respondents are 3.55 (see Table 4.12).

With respect to the factor of „large organizational size", respondents the company responded that they are either strongly disagreed or disagreed (below mean value of 3).

Even though Wu and DU (2010) indicated to consider organizational size during the implementation phase, the respondent claimed that, the difference between success and failure of kaizen not depend on organizational size or resources, but on appropriate planning and avoidance of pitfalls. Assertions, this study finding also evident that organizational size had no impact to implement the designed & implementation processes

The other organizational factor is „existing infrastructure". Most of respondents were either strongly disagreed or disagreed (a mean value of 2.95) with this challenging factor. Therefore, it is evident that company" infrastructures not impeded the implementation of designed processes. As indicated above, the other notable factor is needs for change. Most of respondents either strongly disagreed or disagreed (mean value of 2.65) with the factor i.e., kaizen project initiatives not caused by the felt needs of change",

Table 4.12 Organizational factors

Factors	Percent (n=40)					Mean
	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	
Lack of organizational readiness to change prior to kaizen start	0	35	10	45	10	3.30
kaizen initiatives not caused by the felt needs of change	30	20	15	25	10	2.65
Larger organizational size impede kaizen implementation	10	55	0	20	15	2.75
Existing infrastructures impede kaizen implementation	5	35	30	20	10	2.95
Problems related to rigid hierarchical structures, jobs definition, and responsibility allocation	5	10	25	45	15	3.55

d. IT factors

As O'Neill and Sohal (999) noted, the common theme running through kaizen or breakthrough improvements is technology, in particular IT. However, the authors noted that kaizen is not necessarily depends on IT solutions. IT considered as enabler of the designed processes, because instead of automating the processes by IT, kaizen principles require to design the processes in simplified ways. Having this, Table 4.18 shows the results related to IT factors.

As the table shows, most of the respondents manifested a higher degree of agreement with IT as enabler of the designed & implementation processes. In other word, with a mean value approximately 2, " respondents disagreed with the factor of IT role not considered as enabler of kaizen during design & implementation phase". This indicates that unless company had invested on IT infrastructures and provided trainings on IT use, change through kaizen could not occur. Mean value of 3.55 for company about significant role of IT in the processes also indicates their complex information requirements, because have numerous departments or units that require information sharing among them and information integration.

Although respondents considered the use of IT significantly in the designed processes, most of respondents from company demonstrated nonexistence of problems related to „IT infrastructures investment and sourcing" for the designed processes.

With respect to know-how deficiency about IT use", respondents manifested a higher degree of agreement. As Table 4.18 shows, the mean value of this factor is (i.e., 3.5). However, its severity weighted company, because company" designed processes significantly relied on IT (mean value of 3.55). On the other hand, problems related to training provision about IT use" were immaterial to company. This can be accounted to the fact that company accommodated experienced IT experts, as such training provision were not their problems.

Table4.13   IT factors

Factors	Percent (n=40)					Mean
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
IT role not considered as enabler of kaizen during design phase	30	40	20	10	0	2.10
IT has significant role for the designed processes	5	20	10	45	20	3.55
Problems related to IT infrastructures investment and sourcing decision	20	25	20	25	10	2.80
Employees" and customers" know- how deficiency about the use of IT in the designed processes	0	20	20	50	10	3.50
Problems related to training provision about IT use in the designed processes	5	30	30	35	0	2.95

To sum up, the above findings suggest that most of the challenging factors of kaizen implementation were common. Specifically, top management factors and change-management factors, except employees" resistance, were common challenging factors to kaizen implementation. In the organizational factors category, problems originated from lack of organizational readiness and organizational structures   were factors to kaizen implementation. On the other hand, problems originated from engaging with KAIZEN project without the felt needs of change and existing infrastructures they were not challenging factors to the company.

Among the five IT factors, employees" and customers" IT use know-how deficiency challenging factors. Although company was not challenged to provide IT related trainings, their designed processes were relied significantly on IT.

The preceding section has presented the results and analysis of findings for the first phase (quantitative) of the study. This section then used the Assessment of kaizen implementation practice. As it was indicated in chapter one the researcher further deployed qualitative analysis to address objective and to answer research question interviews were held with NA metal industries supervisors & managements. These respondents were selected purposefully, because it was believed that they have had better knowledge about kaizen. Thus, the researcher interviewed three interviewees on the issues related to factors affecting kaizen implementation in case of NA metal industries.

As it was noted in the first phase, in assessment of kaizen implementation have been grouped in to five categories of challenging factors , namely top management support factors, change- management factors, organizational factors, project management factors, IT factors, . Thus, the results and analysis of findings for the second phase of the study, thematically presented hereunder based on the four categories headings.

a. Top management support

As the interviewee noted, the management body of company" had exerted significant potential when their respective company conducted the designing phase of kaizen, however, after the processes being designed, the implementation phase totally lacked support and commitment from top management. „*Unless top management of company totally supported and committed by providing the necessary time, financial and other resources, implementing the kaizen could be unthinkable. Without top management willingness for the project, implementing could be unlikely.*"

On the other hand, kaizen require new values and beliefs for the designed processes. However, two interviewees claimed that top management's fears about new values and beliefs required by kaizen as the major cause to delay the implementation phase.

b. Change-management

Kaizen recognized as designing of processes and implementing them into the organization for dramatic performance improvement. As such, it needs adequate change-management actions to transform the organizations to a new one.

However, findings in the first phase of this study showed that designed processes of company lack implementation and for this problem, various factors of change-management contributed. As one interviewee considered, change-management are the most challenging compare to others and that inevitably exist. This indicates that unless various change-management factors appropriately handled, implementing disposed to failure.

On the other hand, to create a culture of change and to implement the designed processes, teamwork needed. However, teamwork could not be exercised in the absences of incentive, training and appropriate human resource policies. As the interviewee claimed, these problems also existed in NA Metal Industries and contributed to delay kaizen implementation effectively.

c. Organizational factors

. In line with this, interviewees also claimed that problems related to rigid organizational structures, jobs definition and responsibility allocation in company may cause to delay implementation, because the autonomous nature of various departments or units in company could not allow the dictation of actions from top management.

All interviewees also remarked the fact that lack of organizational readiness to change existed prior to start. This also indicates that companies were not ready to use kaizen as a performance enhancement tool prior to engage with the project. Thus, lack of organizational readiness considered as a challenging factor for successful kaizen implementation. Hence, all interviewees contend that none of all factors related to kaizen including insufficient trainings and absence of advice, were the problems of company to implement the designed processes. As one interviewee claimed: design team members were interdisciplinary, experienced and committed for the project. In addition, they had taken training on kaizen and they were enthusiastic about kaizen."

d. IT factors

As Corran and Bryan (2010) indicated, the more complex an organization, the more apparent is the need for a system to pull together overall operational processes. As a result, the system helps to integrate and disseminate information for various units of the organization. To achieve the intended objectives of kaizen, the integration of IT needed in

The designed processes. However, the integration of IT have to be considered as enabler, rather than automating the processes by using IT.

All interviewees believed that IT considered as enabler when company" processes designed, however, significantly incorporating IT in the system created problems to implement. Because IT needs huge investments starting from software and hardware acquisitions and installations to IT related trainings and maintenance provisions. However, one interviewee claimed that since company is huge, these problems could not be attributed to delay the implementation. Generally, interviewees stressed that IT related factors could not obstruct company to implement the designed processes, because IT helps to enable processes and to integrate various departments or units of company that in turn reduce processes" cost and cycle time.

Chapter Five
Conclusions

So far, results and analysis of findings presented for the first phase (i.e., quantitative) and second phase (qualitative) of this study. The purpose of this last chapter is to present summaries of major findings, concluding remarks, and to highlight future research directions on the topic. Thus, the first section presents the study's major findings summaries. The second section presents conclusions finally presents the study's Recommendation and future research directions.

5.1 Summary of Major Findings

A survey was conducted using a questionnaire with structured questions divided into two parts: respondents' demographic information and respondents' opinions regarding the effectiveness of implementation of kaizen cost & benefits in NA Metal Industries. A total number of forty (40)staff were selected to provide answers to the structured questions. In addition, data were collected through personal interviews with 5 staff members of the Factory.

According to the data collected, presented and analyzed in this research work, implementation of kaizen in NA Metal Industries has highly contributed to meeting its strategic objectives. Thus, implementation of Kaizen has increased the practice of improving most of the factory's systems from time to time and it contributed a lot to every department's improvement through reducing production cost, applying wise resource utilization and through avoiding non value adding production instead of net production. It also has played a great role in minimizing power distance and built trust between employees and managers through shared common values, believes and improved relationship between employees and management for the success of the factory' objectives.

5.2 Conclusions

Using a sequential explanatory mixed method design, this study attempted to achieve its objectives. The objective of the first phase of this study was to assess kaizen implementation practice in NA Metal Industries. Forty kaizen project design and implementation team members in the company were subjects of the study. On the other hand, the objective of the second phase was to better understand the magnitude of the Assessments factors in the first phase. To achieve this objective, interviews were held with three interviewees. Hereunder, both phases" summaries of major findings synchronously presented.

Findings in the first phase of the study showed that most of respondents perceived their company implemented the designed processes between 11 to 40 percent. This indicates that about 60 percent of the designed processes were not implemented at company. Hence, to implement the designed processes at company, most of respondents (55 percent) believed that the implementation phase to take more than three years. The study also found that core processes (i.e., production processes) of company as the most challenging process to implement compared to administrative. In this case, result obtained from the interviews in the second phase of the study showed that most support processes requires amendments of various rules and regulations of the country compared to core processes. Thus, implementing core processes could be difficult unless existing rules and regulations of the country amended in line with the designed processes requirements.

As the first phase findings showed, the benefits gained from the project outweigh the costs when company implemented their designed processes. However, were not realized the benefits of kaizen, because the implementation phase of kaizen has been confronted with various challenging factors. To identify the factors of kaizen implementation, factors were incorporated in part 4 of the survey instrument and respondents rated each item using five-point Likert scale („strongly agree" to „strongly disagree").

As it was presented more than 50 percent of respondents showed a higher degree of agreement with factors of kaizen implementation. These factors in descending order are: lack of creating

organizational culture and values; problems related to rigid hierarchical structures, jobs definition and responsibility allocation, absence of incentive, training and education, lack of necessary changes in human resource policies, lack of leadership, commitment and support by senior management, lack of organizational readiness to change, lack of financial resources, top management's insufficient understanding about kaizen, top management fears to support new values and beliefs, employees" and customers" IT use know-how deficiency, top management not change their value, fears about political, economic, and organizational risks, insufficient trainings on kaizen implementation and absence of consultants" advice; and significant role of IT.

Thus, in view of the survey respondents, the aforementioned factors limited the percentage of designed processes implemented at company between 11 to 40 percent. However, findings of the second phase showed that not all of the seventeen factors challenged company to implement the designed processes.

According to the mean values of the five top management support factors, most of respondents showed a higher degree of agreement with all factors as challenging to implement the designed processes. However, results from the second phase of the study emphasized that only the severities of two factors magnitude to challenge the implementation phase were decisive. The two factors are „lack of leadership, commitment and support by senior management" and top management fears about new values and beliefs required by the designed processes. For change-management factors, " respondents also rated   all factors similarly. Taking the mean values for the five change-management factors, all of them, except „employees" resistance", were agreed by the respondents. Results in the second phase also confirmed that, except employees" resistance" and „fears about political, economic, and organizational risks", all factors magnitude to obstruct the implementation phase were significant.

The severities of organizational factors by comparing the mean values and the pattern of responses for the factor of kaizen initiatives not caused by the felt needs of change", indicates

that it was less significant. Although respondents considered the factor, i.e., „problems related to rigid hierarchical structures, jobs Definition, and responsibility allocation" as challenging factor. On the other hand, „lack of organizational readiness" was considered as factor to implement the designed processes

For IT factors, problems related to „employees know-how deficiency about IT use" had impact to implement the designed processes. As the mean value of 2.1 for the factor, i.e., „IT role not considered as enabler" indicates that considered IT as enabler of kaizen, while „IT has significant role" for company kaizen implementation. Conversely, results in the second phase showed that none of all IT factors challenged company to implement.

5.3 Recommendation

This study could benefits different classes of groups, including NA Metal industries, because it can draw attention where corrective actions are necessary to implement kaizen. It also adds value to those who would like to pursue their research on kaizen, particularly KAIZEN implementation in context of Ethiopia, because the introduction of kaizen in Ethiopia is a recent phenomenon. Thus, this study attempted to contribute to the body of literature.

Based on the analysis of results in the preceding chapter, this study suggests that several factors of kaizen implementation to be settled. Thus, the following points suggested ensuring successful kaizen implementation in NA Metal industries:

➢ With respect to change-management, results of the analysis in the previous chapter indicated that change-management factors were the most challenging factor to implement kaizen at this company. To succeed in implementing kaizen, thus, it is critical to handle change-management factors appropriately. Existing company" culture has beliefs and values that have been created to fit the old processes. As a result, existing culture no longer appropriate for the designed processes. Therefore, shall create and appreciate new values and beliefs for the designed processes and this can help to create a culture of change to implement the kaizen at company.

➢ The results of the analysis in the previous chapter indicated that lack of top management support to kaizen delayed the implementation phase. Thus, company" top management shall demonstrate active interest on the project. This encompasses top management appropriate style of leadership, commitment and support, and accepting and supporting new values and beliefs that are required by the designed processes. The vision also needs clear communication to employees of the company; otherwise, they will lose their motivation. In addition, top management shall demonstrate commitment and support to implement kaizen. If not, employees could manifest resistance to change during implementation and they will be skeptic about the implementation.

➢ Organizational factors also contributed to delay the implementation phase, because the implementation processes need flattened organizational structure and readiness to accept new processes. Thus, to implement, it is suggested that company to flatten their organizational structure to tap responsibilities that were created when designed. Before this, company shall be ready to accept new processes for their businesses. Thus, preparing to accept kaizen related changes could ensure implementation successes, because the change could not be accidental. In addition, appropriate responsibility allocation for this necessary to succeed with kaizen.

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Appendix

Appendix I

St. Mary's University
School of Graduate Studies

To be filled by………………..
The study is entitled **"Assessment of effectiveness of kaizen implementation in case of NA metal Industry & Engineering"**. The researcher is Selamawit Shemelash, who is currently postgraduate student of ST. MARY'S UNIVERSITY, Addis Ababa, Ethiopia.

The objective of the study is to evaluate the effectiveness of kaizen implementation and to better examine the magnitude of the identified factors of kaizen implementation. To carry out this study, sample of kaizen design and implementation team members of company selected. Thus, the study needs your participation to respond for the questionnaire and the results obtain from the questionnaire will be further studied to better understand the effectiveness of kaizen implementation.

The questionnaire responses will be analyzed anonymously in order to preserve confidentiality. Thus, respondents" name will not be included in the study report. At the end of the study, the summery of findings will be forwarded if you deserve it through your e-mail address.

General information 1

Read each statement carefully and respond to each item by expressing your degree of agreement or disagreement by ticking (□) on one of the alternative for one question in the box and in the alternative given. Response options are provided under columns titled "**strongly disagree" (1), "disagree" (2), Neutral" (3) "agree" (4), or "strongly agree**" (5)**. Items under Part II of the questionnaire** are attitudinal questions meant

Thank you in advance Selamawit Shemelash Mobile:0913413024

E-mail: Selam.hisan@gmail
Part 1: Respondent's profile (please tick the box that best describes your response)

1. Which of the following best describes your current educational level?
   - ☐ Diploma or certificate
   - ☐ Undergraduate
   - ☐ Postgraduate
   - ☐ PhD or above

2. What is your position at your company:
   - ☐ management
   - ☐ Staff
   - ☐ Customers
   - ☐ other

3. What was/were your role during your company engaged with kaizen project?
   - ☐ design team member
   - ☐ Implementation team member
   - ☐ design and implementation team member

Part 2: kaizen implementation at the company (please tick the box that best describes your response)

4. To what extent the kaizen of the company implemented? (**Based on your perception**)

☐ 0 – 10%   ☐ 51- 60%

☐ 11- 20%   ☐ 61- 70%

☐ 21- 30%   ☐ 71- 80%

☐ 31- 40%   ☐ 81- 90%

☐ 41- 50%   ☐ 91-100

5. Which one best describe the time frame to implement kaizen fully at your company?

☐ Less than one year
☐ Between one year - to - two years
☐ Between two years – to – three years
☐ Between three years – to – four years
☐ More than four years

6. Which process of the company do you suppose as the most challenging to implement?
   a. Core processes
   b. Support processes

7. Who is responsible to implement kaizen (**you can choose more than one item**)?
   a. design team members selected as implementation team members
   b. Top managements of the company
   c. employees
   d. External consultants

Part 3: kaizen cost and benefits (please tick the box that best describes your response)

S.no		Availability				
		1	2	3	4	5
1	Kaizen project of the company too costly undertaken.					
2	Cost reduction of the processes expected as a result of implementing kaizen					
3.	Process cycle time reduction expected as a result of implementing the kaizen					
4.	Increased product quality expected as a result of implementing the kaizen					
5.	Increased customers" satisfaction expected as a result of implementing the kaizen					
6.	Increased employees" satisfaction expected as a result of implementing the kaizen					

PART 4: KAIZEN PRACTICES

I.   Five S

The following listed yes or no question tries to collected response on the five s please tick on the space by selecting yes or no

S/no	5 s Activities	Response		Comment
		Yes	No	
	Sort			
a.	There is no excess stocks			
b.	Some of the cabinets are free from items			
c.	The production & store area are free from unwanted items.			
d.	The passage way is free			
	Set – In – order			
a.	Every items are labeled			
b.	Items are visible in their stored location			
c.	Items are easily retrieved and stored			
	Shine			
a.	Weekly cleaning exercise is conducted			
b.	Everyone is actively involved in cleaning			
C.	The store & production areas are free from gas & Oils			
	Standardize			
a.	There is established production & store rules			

b.	There is standard operating procedures			
c.	There is floor marking and color coded cabinets			
d.	There is a safety manual			

II.　　　Total Quality maintenance

1. Which Dept. is responsible for product quality in the organization?

Nobody ☐　　　Quality Control Dept. ☐　　Quality Assurance ☐　　TQM ☐ Dept.

Other please specify it _____

2. Which of the following TQM practices are effectively being used in the organization?

Quality Circles ☐　　　Bench marking ☐　　Quality functional deployment ☐
Employee development process management ☐　　Self-assessment ☐

3. Has the organization subscribed to any quality award system?　Yes ☐　No ☐

If yes specify……………………………………………………………………

If no why?..

4. Have you had any training on the job you are doing?　Yes ☐　　　No ☐
5. Has the training impacted on the work positively?　Yes ☐　　　No ☐
6. If no why?,,,
7. All the resources you need to carry out any improvement on the job are readily available.

Yes ☐　　　　　　**No** ☐

Part 5: kaizen implementation practice success/failure factors (please tick the box that best describes your response)

Section A: Top management support factors

S.no	Top management support factors	Availability				
		1	2	3	4	5
1	Failure to implement **kaizen** caused by lack of leadership, commitment and support demonstrated by the company highest level management					
2	Top management's insufficient understanding about **kaizen**					
3	Top managers' fear to support the new values and beliefs required by the redesigned processes					
4	The fundamental source of difficulty for the company to implement kaizen is the fact that processes get change and management does not					
5	Lack of total involvements of top management who have real power to change					

Section B: Change-management factors

S.no	Change-management factors	Availability				
		1	2	3	4	5
1	Fears about political, economic, and organizational risks due to change initiative of kaizen					
2	Lack of creating organizational culture and values for change					
3	Lack of necessary changes in human resource policies of the company for kaizen implementation					
4	Absence of management systems (e.g., incentive, training and education) to cultivate the required values of kaizen					

Section C: Organizational factors

S.no	Organizational factors	Availability				
		1	2	3	4	5
1	Lack of organizational readiness to change prior to kaizen project start					
2	kaizen project initiatives of the company not caused by the felt needs of change the company					

3	Larger organizational size of the company impede kaizen implementation					
4	Existing infrastructures of the company impede kaizen implementation					
5	problems related to rigid hierarchical structures, jobs definition, and responsibility allocation					

Section D: kaizen project management factors

S.no	kaizen project management factors	Availability				
		1	2	3	4	5
1	company employees and customers not openly and actively involved and consulted at all stages of kaizen implementation					
2	various Department of the company extremely involve					
3	Ineffective kaizen teams members of the company					
4	Insufficient trainings on kaizen implementation and absence of consultants advice to implement kaizen					

Section E: Information technology (IT) factors

S.no	Information technology (IT) factors	Availability				
		1	2	3	4	5
1	IT role not considered as enabler of kaizen during implementation					

2	IT has significant role for the kaizen during implementation of the company					
3	Problems related to IT infrastructures investment and sourcing decision impede kaizen implementation					
4	Employees" and customers" know-how deficiency about the use of IT in the impede kaizen implementation					
5	Problems related to training provision about IT use in the kaizen implementation					