Identification of Key Success Factors and Kaizen Implementation for Sustainable Development

(Case in Selected Manufacturing Industry in Addis Ababa)

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I hereby declare that the work which is being presented in this thesis entitled **"Identification of Key Success Factors and Kaizen Implementation for Sustainable Development"** is original work of my own and has not been presented for a degree of any other university and all the resource of references used for this thesis have been duly acknowledged.

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

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Dr. Ephrem Gidey (Advisor) Date

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Abstract

Kaizen means continuous improvement involving everyone from top management to shop floor workers. Kaizen originated in Japan to be applied in the improvement of productivity, quality, efficiency, and it is also the overriding concepts behind good management and problem solving tool. The Government of Ethiopia introduced Kaizen as one of the change tools. The purpose of this thesis focused on identifying critical success factors for sustainable first phase Kaizen implementation in Addis Ababa manufacturing companies. The study design is descriptive research. Both qualitative and quantitative data were used on six sample factories. In order to achieve the objectives of the research, case study methodology were utilized. This thesis presents the results of a survey with final eight key success factors for kaizen implementation and four key success factors for kaizen sustainability. The questionnaire was applied to 128 employees in five sample factories and 40 formal and informal interviews for case factory. The data collected were analyzed using Microsoft office Excel and IBM SPSS Statistics version 23 software. Based on literature review and collected data's analyzed, this study proposed and developed a conceptual framework for improving kaizen implementation practice and enhancing sustainability of the implementation. It has expressed as representative evidence the existing key success factors of kaizen sustainability in Ethiopia companies.

Keywords: kaizen, sustainability, continuous improvement, challenge.

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List of abbreviations

3F…….Finfine Furniture Factory

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

EKI …… Ethiopia Kaizen Institute

JICA …….. Japanese International and Cooperation Agency

JIKA……... Japan International Kaizen Agency

JIT……...Just in Time

KPT…… Kaizen Promotion Team

MSEs…….. Micro and Small Enterprises

PDCA……. Plan-Do-Check-Act

QCC…… Quality Control Cycle

SPSS…… Statistical Package for the Social Sciences

TPM…… Total Productive Maintenance

TQC…… Total Quality Control

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1. Introduction

The government of Ethiopia has implemented different techniques, strategies, initiatives and packages for improvement of productivities to increase the competitiveness of the sector as national movement. The main objective of these movements is to improve productivity and quality as well as minimizing wastage and cost by adopting kaizen philosophy. Kaizen is originated from Japan two words 'Kai' and 'Zen' and has a meaning 'change' and 'better' respectively. There for kaizen directly translated to mean 'change for better' (Palmer, 2001)

Kaizen is introduced as one of the change tools and directed some 30 organizations to apply it at the beginning. Kaizen can be applied to any area in need of improvement. Kaizen by now is a widely discussed and applied manufacturing philosophy, in a variety of industries (EKI, 2014).

Different researchers are reported the benefit of kaizen implementation along both social and technical dimensions of organization and include cost reduction, productivity improvement, reduction in defects, and improvement in employee's morale and motivation (Bessant, 2003).

Manufacturing sectors are now engine of growth, since it raises productivities through increasing return and generating high levels of output. It also plays the role of aiding in technological innovations and diffusions to other sectors. Survival of any manufacturing company is strictly dependent on its competitiveness at market. Continuous improvement is the main competitive parameters of any company (EKI, 2017).

1.2. Background of the study

At present time, Ethiopia is one of the fastest growing countries in Africa and is also in a journey of building industry lead economic through industrialization. A number of industries zone (park) are now established in Ethiopia. Industrialization is one of the important tools to develop strong economy with manufacturing sector. According to previous studies in Ethiopia manufacturing companies the first phase kaizen implementation practice was based on housekeeping using 5S through kaizen promotion team (KPT) or kaizen development team (Kelbu) like Japanese quality circles approach.

Different researchers are reported the benefit of kaizen implementation along both social and technical dimensions of organization (Bessant, 2003).

Further, they described due to their origin in Japanese organizations, applicability of kaizen to other countries with different cultures and different management styles still remains as a failed (Recht, 1998).

The practical observation of some manufacturing companies in Ethiopia shows that they are characterized by low quality productivity, poor customer satisfaction, much wastage, high manufacturing cost, problem related to safety, work place organization and employees complaint.

Regarding to above further discussion, the researcher main objective in this study is to examine the kaizen implementation problems through manufacturing sectors. And also can develop main key factors for sustainability of kaizen.

1.3. Statement of the problem

As Admasu Abera (2015) viewed, different scholars in the area have been arguing that proper understanding of policy instruments, methods, culture, principles, and application techniques of the kaizen philosophy would be one essential step towards addressing and solving the currently existing problems and challenges (Murata, 2009).

Kaizen philosophy acquiesces in accordance with the legislative procedure, the necessary degree of the culture of the country need to carry out the career. The companies also need to understand and follow the methodology and tools of kaizen. This brings a significant result on performances and processes in the companies. According to different literatures perspective, the benefits of kaizen are described as eliminate waste, establish a strong corporate culture of continuous improvement in the companies, substantially improving competitive position of market, productivity due to improvement in work process, reduce operational cost and improve efficiency and levels of worker participation in decision making and worker contribution to improve the organizational system.

To some extant this holds true, but there is a gap in some manufacturing companies to examining the impact of kaizen implementation and sustainability with respect to specific kaizen tools and pillars. Past studies have signified that despite the benefits of kaizen, there were many companies failed to achieve the success of the activity in their organizations.

When factories implemented kaizen first, the management and employees are actively involved in significant change in the organization, but in a short period of time their moral is collapsed and

returns to the initial point and even a lower level, because of shrinkage of improved processes(Dale, 1997). To remove this instability of improvement activity, a certain studies are made on key success factors to stabilize the improved processes.

According to previous studies in Ethiopia manufacturing companies the first phase kaizen implementation practice was based on housekeeping using "5S" through kaizen promotion team (KPT) or kaizen development team (Kelbu) like Japanese quality circles approach. This team is organized below twelve members and having responsibility for actively participates on "5S" and "7muda" elimination techniques for continuous improvement. As the Kaizen system is new to Ethiopian manufacturing sector, its implementation using kaizen teams in manufacturing firms have been facing different problems and as previously discussed there are also big gaps and problems identified by different literatures are concerned on the implementation and sustainability of kaizen activities in countries outside Japan. If these problems and challenges are not solved, the implement Kaizen will remain futile. There for, the factors have been used to solve these problems are properly assessed and examined the facts on Ethiopian manufacturing firms.

In general overview, studies done on kaizen sustainability in Ethiopia manufacturing companies are still very few and have not been able to get enough information, but from other countries trend the researcher would investigated all these specific problems and found solution about the challenges that has encounter through the process and tries how the implementation is sustain. Finally the study find out key success factors have taking into consideration when kaizen is implemented in manufacturing companies and identified the lessons that can be drawn for other organizations to be learn.

1.4. Research questions

The research is proposed to seek answers for the following research questions:

A. What are the challenges, driving forces and key success factors for Kaizen implementation?
B. What are the measures taken to overcome the challenges faced in the kaizen implementation?
C. What are the parameters for performance measurement of the kaizen implementation process?
D. How to develop a model for the success?

1.5. Objective of the study

1.5.1. General Objective

The general objective of this thesis is to identify key success factors for sustainable kaizen implementation in Addis Ababa manufacturing companies. And to analyzed the key success factors for sustainability and develop a conceptual framework.

1.5.1. Specific objectives

The specific objectives of this study are:

I. To identifying the challenges and key success forces
II. To find out the measure taken for the challenges and parameters for performance measurement.
III. To develop a conceptual framework.

1.6. Scope of the research

The scope of the study is focused on the challenge of kaizen implementation and identified key success factors for sustainable development in manufacturing companies.

1.7. Organization of the thesis

This research is organized into six Chapters:

Chapter one - which is an introduction part to the study background, statement of the problem, includes rational of the study description and research questions, objectives of the study, scope and limitations of the study, significant of the study, and the organization of the thesis.

Chapter two - is covered the review of literature on the study of various aspects of kaizen implementation as a continuous improvement methodology related in manufacturing sectors. And also highlights the understandings of various authors on the concept of kaizen implementation as well as a description of the most common kaizen key success factors for sustainability practices is covered.

Chapter three - describes the research design and methodology, target population and sampling, data collection instruments, methods of data analysis an ethical concerns considered in the study.

Chapter four - described about kaizen implementation survey result in Addis Ababa manufacturing organization. Especially on this part one of case company that interrupted kaizen implementation is taken as case study assessment. And in this case factory the main cause and the gaps is identified.

Chapter five - present both quantitative and qualitative data, their analysis, findings and presented a summary of theoretical and empirical findings from authors and develop key success factors influences of various kaizen practices on kaizen sustainability interpretation.

Chapter six - puts together summary of major findings of the study, draws conclusions from those findings which are substantially supported by empirical evidence and then forwards plausible recommendations for concerned stakeholders at different levels, including suggestions for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1. Historical Overview and Definitions of Kaizen

Every researcher believes that kaizen was started in Japan during the country's recover after World War II for improvement of quality and production. The researcher found in all related literatures as kaizen is originated from Japan two words 'Kai' and 'Zen'. These means 'change' and 'better' respectively. There for, kaizen directly translated to 'change for better' (Palmer, 2001). It is internationally known recently as a continuous process of quality and productivity improvement in industrial development in particular. Kaizen by now is a widely discussed and applied manufacturing philosophy, in a variety of industries across the globe. Kaizen can be applied to any area in need of improvement.

Continuous Improvement is defined as making continuous incremental effective changes to the products or process organization so that it can meet the customer expectations through time. Manufacturing firms forced to implement continuous improvement to improving customer satisfaction by reducing cost, reducing delivery time and improving quality. Kaizen is continuous improvement in performance, cost and quality which strives to empower the workers, increase worker satisfaction, facilitates a sense of accomplishment, thereby creating a pride of work (M. Imai, 1986).

According to Imai the Kaizen philosophy is what distinguishes the Japanese management from the Western concepts and focuses on the process way of thinking as opposed to the western focus on innovation and result orientation. And extend among other Japanese manufacturers as they gained fame in the international market for high quality products in the 1980s.Kaizen activities have developed and spread among other Japanese manufacturers as they gained fame in the international market for high quality products and later to the rest of the world in four phases (Forum, 2009).

The first phase was the absorption of foreign technique by Japan in the early postwar period. In the 1950s, the world market perceived Made-in-Japan products to be as "low price, low quality". Driven

by a sense of urgency for industrial catch-up, Japan learned American style quality management from Deming and Juran (Forum, 2009) and adapted this to the Japanese context.

The second phase was diffusion throughout Japanese companies, including small and medium sized ones. This led to a rapid increase in the number of QCCs in the 1970s and 80s. The two oil crises in the 1970s drove Japanese companies to integrate energy saving into their quality and productivity improvement efforts.

The third phase was the regional spreading of kaizen beginning in the mid 1980s, which coincided with the globalization of Japanese business activities. The sharp appreciation of the Japanese yen after the Plaza Agreement in 1985 prompted Japanese manufacturing companies to shift their production bases to East Asia where production costs were lower. Japanese firms tried to duplicate the quality management system in their factories abroad.

The fourth phase, which is now beginning, has witnessed growing interest in East Asia's industrial experience in other developing regions (including Africa).

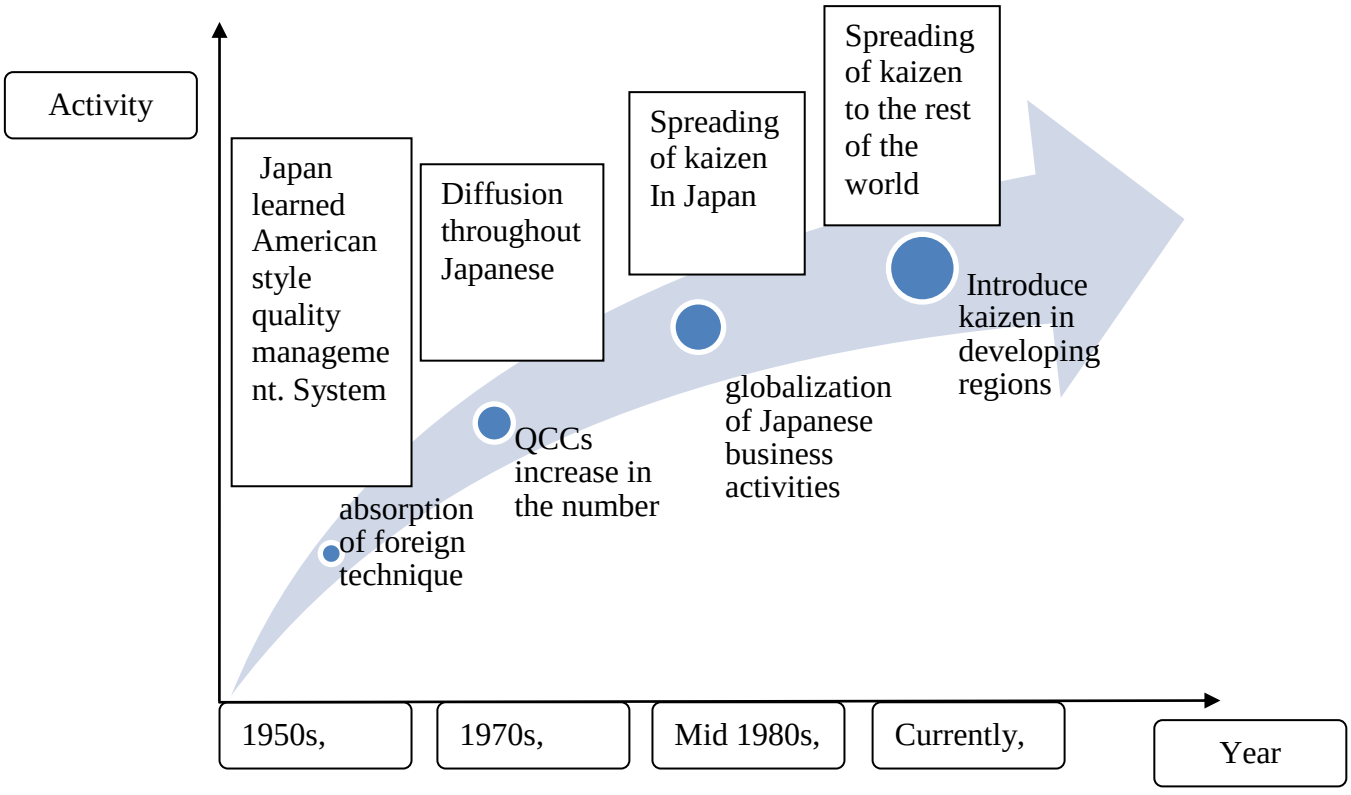


Figure 2.1: Kaizen activities development. Source: (Forum, 2009)

The report(JICA, 2012), Kaizen has spread among Japanese companies in Japan and abroad. JICA has also offered assistance for kaizen to many developing countries in Asia, Latin America and Eastern Europe and now in Africa. Kaizen is conducting in Africa through Japan international corporation agency and implemented for the first time in Singapore, from 1983 to 1990, for productivity management and it was very successful.

According to Admasu Abera (2015), Ethiopia is one of the seven African nations that started to implement kaizen philosophy. It becomes the leading nation in Africa through successful kaizen implementation, organizing an independent kaizen institute (EKI) under the Ministry of Industry. As the Ethiopia kaizen institute (EKI, 2014) report Ethiopian late Prime Minister Meles Zenawi who requested Japan to introduce kaizen to Ethiopia. He remarked, "I knew about kaizen but I did not know JICA was helping kaizen implementation in many developing countries. Will you please do in Ethiopia what you have done in Tunisia?" (GRIPS, 2015). Therefore this question brings support concerning the transferability of Kaizen to Ethiopia. JICA's kaizen project was started in the autumn of 2009with a pilot project in 30 companies out of which 28 have succeeded. Report on (JICA, 2013) have shown the implementation of kaizen in Ethiopia performance is good and effective in industries, service sectors, technical and vocational institutions, and housing construction development programs, by reducing the cost as well as encouraging enrollment, but in some sectors this activities not sustaining throughout.

Generally, Kaizen is a continuous improvement involving everyone in the organization from top management, to managers then to supervisors, and to workers concept that focuses on improving a work area or an organization in incremental steps by eliminating waste; it can be applied to any area in need of improvement. As Brunet (2003) reviewed that kaizen is continuous, incremental, and participative in nature. Boer et al. (2000), defined kaizen as "planned, organized, and systematic process of ongoing, incremental and company-wide change of existing work practices aimed at improving company performance".

2.2. Implementation of Kaizen in Manufacturing Industries

Nowadays the world economy is moving towards more global. Due to this many manufacturing sectors are a victim of the effect of globalization. As the world is becoming more connected to one another, especially with the advance in information technology, it has created a new level of competition among the industry players. Globalization has caused business decision or action at one

part of the world to have significant impacts in other parts of the world. In this case the global market place competition will rise. In order to stay in the market place a number of manufactures are forced to rethink their manufacturing and management approach to lower costs of production, minimize waste, improve productivity, boost quality, and achieve sustainability. Improving customer service, making operation faster, more operation and reduction in costs are challenges faced by manufacturers today.

As Mohd Ghazali Maarof (2016), review, some of the challenges in implementing Kaizen are resistance to change, failure to motivate employees, lack of understanding on companies' strategic path and difficulties in managing continuous improvement. And they also stated the introduction of ASEAN Economic Community (AEC) in 2015 poses another challenges to the Small and Medium Enterprises (SMEs) in Malaysia to remain competitive in a larger market of ASEAN, apart from the existing effect of globalization from low cost countries such as China and India. This shows, even if there is a globalization effects, kaizen cannot smoothly implemented unless giving enough Liker (2004) emphasized on individual skills development as an essential element of kaizen stating that kaizen is a process of enhancing the individual skills such as working effectively with teams, solving problems, documenting and improving processes, collecting and analyzing data, and self managing with in a peer group.

From the above review, resistance to change (culture), motivation, training, companies' strategies and globalization are the most important factors for continuous improvement. So the author's dose not considered the rest important factors in his study. But he shows the globalization effects in Malaysia. It is the same true in Ethiopian. Some past studies show that many Ethiopian (SMEs) have the globalization challenges. Especially this time some product imported to the above and other countries.

As Admasu Abera(2015) stated that, cross functional teamwork approach, tools and techniques, executive managers commitment are necessary for continuous improvement of productivity in the three pilot companies. On the other hand, the study found that Ethiopia does not have problems of leadership, since kaizen was driven by strong commitment of the top leader. And also stated in Ethiopia there is no conclusive empirical evidence which clearly show whether or not the kaizen implementations in different contexts (such as SMEs) have brought about positive outcomes (Taye., 2014). As he discussed kaizen practices could be implemented by the manufacturing companies of host countries provided that the host companies have a low level of centralization of authority, and

practice cross-functional team cooperation of 8 to 12 people with a skilled facilitator to identify, measure and correct the problem associated with the process.

As discussed by Imai (1997), a process kaizen utilizes various tools and methods to make the problem visible, and uses formal root tool cause analysis and other means to identify and correct the problem. In order to implement the kaizen, the company should follow the methodology and standards of kaizen. These standard and methodology of kaizen can be implemented in various fields. Today, Deming's cycle; Shewhart cycle or PDCA cycle (Watson.M., 1986)is used to improve various kinds of processes that are involved in manufacturing, management and other supporting processes in the business. Improvement of production quality can be performed on several ways and on any element of production like production processes, production equipment, management structure, employees and organizational culture.(Admasu Abera, 2015), also reviewed the critical success factors as; job satisfaction, company involvement and no finger pointing.

The researcher noticed that on (Admasu Abera, 2015) review the critical success factors are cross functional teamwork, manager's commitment, training, standards, methodology, production processes, production equipment, management structure, employees culture , organizational culture, job satisfaction, company involvement and no finger pointing.

Kaizen implemented by new principles include Kaizen, just-in-time, lean thinking, six sigma, total quality management, and process improvement (Erdogan, Sevtap, 2015). According to the literatures review the main target for using these new techniques is better meet customer needs by eliminating practices that do not add product value for reduce high production costs and to improve low levels of productivity, insufficient quality and poor safety.

On the other hand, manufacturing factories wastage during production process is rapidly growing day by day. This will lead to increase in production costs. Due to these challenge the global competition of the market is very high and stiff for manufacturing companies. Therefore a lot of studies suggest that manufacturers need to do something to ensure that they remain competitive in the market. Increasing competition in the industrial world requires the company to make continuous improvement about the quality of product and services offered (Winy Utari, 2011). If the companies want to improve their competitiveness they can apply the continuous improvement or Kaizen concept in their organization (Teece, 2007).

As previously discussed Kaizen is a system of continual improvement which is undertaking by an organization to improve its business activities and processes with the goal to always improve quality

of products and services resulting to meet customer satisfaction. Kaizen can be built in and run with an integrated and companywide approach through the collaboration of all the levels of the organization that are top management, middle managers and frontline employees.

As Jalu (2015) conclusion, kaizen has resulted for Finca'a sugar factory in reduction on: cost, dawn time, defects, searching for tools and improve lead time, working environments, employee motivation, health and occupational safety workers. In addition it gains more than 123 million birr within two year.

As discussed earlier, the philosophy of kaizen is one of the instruments to increases productivity of the company and helps to produce high quality products with minimum efforts. If the philosophy is implemented properly using effective tools, methods, culture, principles, and application techniques, the existing problems and challenges in manufacturing industries it can be solved. There is large evidence that kaizen implementation have positive impact on the performance of the industries William (2001), which results in better space utilization, improved productivity, quality, faster delivery time, better safety to the employees, Increased employees motivation and greater customer satisfaction.

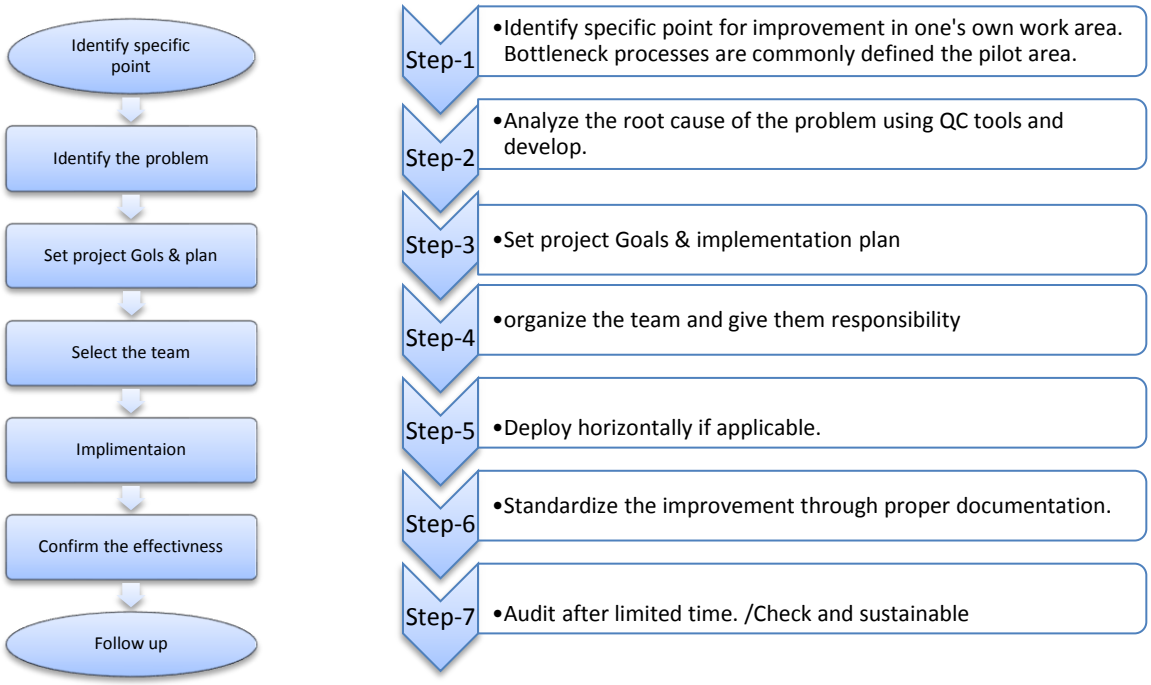


Figure 2.2: Kaizen implementation steps, Source: Admasu (2015)

As articulated by Anh, et al., (2011) though not a universal model for successful kaizen transferability to other countries; kaizen practices should be adapted to the local culture in order to have the highest probability of success (J. Michalska, D. Szewieczek,, 2007).

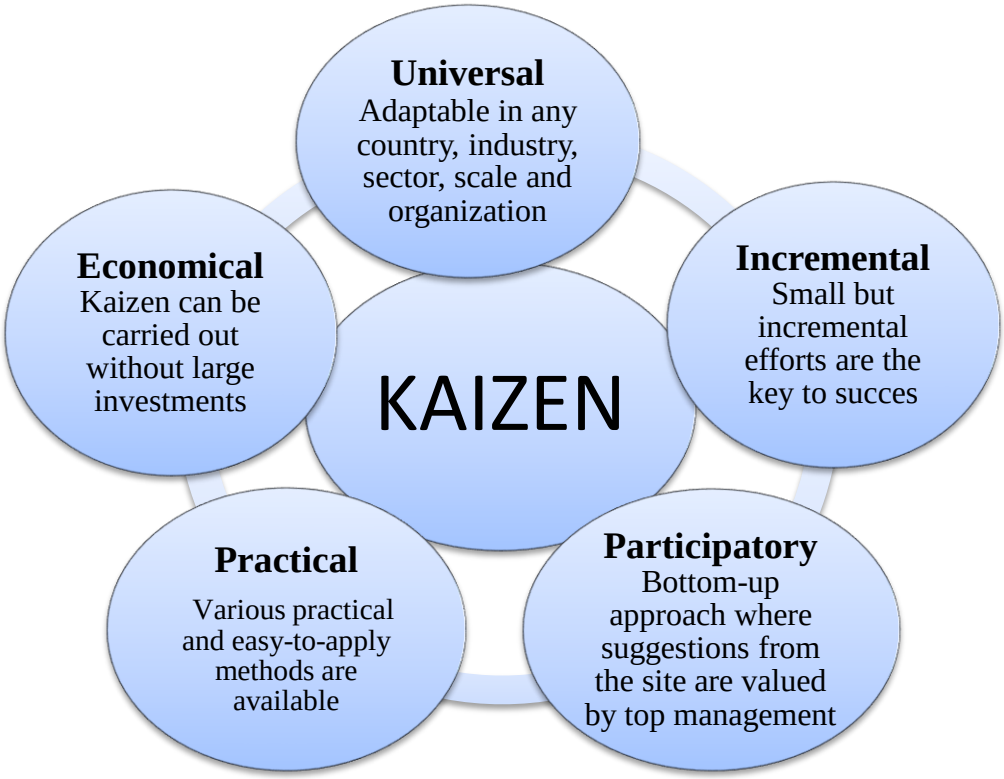


Figure 2.3: Characterizes of Kaizen: Source: (JICA, 2016)

The researchers observed that nowadays, more than six hundreds companies and service sectors implemented kaizen in Ethiopia, need arises for better understanding of kaizen process and the factors that are critical to kaizen implementation. Globalization has influenced manufacturing organization with market place competition. Manufacturing organization undertake quality product and services improvement to meet customer satisfaction.

A better understanding of kaizen implementation and the factors that influence its implementation could help to better manage the kaizen implementation and reduce the likelihood of kaizen implementation failures.

2.2.1. Principle and Tools (techniques) of kaizen implementation.

Kaizen Principle and Tools are a comprehensive way of approaching the continual improvement of manufacturing processes. The implementation of Kaizen principles has been viewed as one of the key factors to Japanese competitive success. Kaizen then has emerged in the U.S. as a methodology leading to dramatic increases in productivity by manufacturing companies. Kaizen covers many techniques which includes kanban, total productive maintenance, six-sigma, automation, just in time, suggestion system and productivity improvement (Imai M. , 1986). Here, Imai does not consider the rest of the techniques.

As (G, Jalu; , 2015) cited based on (Thessaloniki, 2006)Kaizen philosophy listed in kaizen definition are Leadership, Cross-functional Teams, 5S, Productivity improvement, Process focus, Discipline in the workplace, and Teams. All these are discussed by (Thessaloniki, 2006), but he lose Improvement as Kaizen philosophy.

Many studies have been done to identify Kaizen Principle and tools in their perspective for implementation of kaizen techniques in the manufacturing firms, which show within this concept there are a gap between them. There for the researcher is summarized the main Principle and Tools of kaizen from different literatures as follows.

2.2.1.1. Kaizen tools (techniques):

1. 5S.

The word "5S" was generalized in 1980's in manufacturing sector in Japan. It is derived from acronym of five Japanese words which stands for Seiri (Sort), Seiton (Straighten/set in order), Seiso (Shine), and Seiketsu (Systematize / Standardize), and Shitsuke (sustain /Self-Discipline) (Ho S. C., 1995) (Vasudevan, 1998).

1. Sorting (Seiri): Sort refers to the practice of going through all the tools, materials, etc., in the work area and keeping only essential items. Everything else is either stored offsite or discarded. This leads to fewer hazards and less clutter. The goal is to eliminate nonessential items from the workplace. Items are "red tagged" and stored in a local red tag area for a specific period of time, typically five days. If not reclaimed by the work group, items are then moved to one of the company's central red tag areas. Here everyone can sift through the items to see if there is anything they need. When items have been in the central area for a specific period of time, the company disposes of them through resale, donation, recycling, or trash.

2. Set in order (Seiton): In Set in Order, team members come together and share the insights they have gained during Sort and Shine. They analyze the work area for additional improvement opportunities and look for ways to reduce sources of waste and error as well as to make the workplace more visually instructive. The team brainstorms potential solutions, with special emphasis on using visual resources to achieve improvement.

3. Shine (Seiso): The Shine step includes three primary activities which include getting the workplace clean, maintaining its appearance, and using preventative measures to keep it clean. Shine the workplace by eliminating dirt, dust, fluids, and other debris. Each team member should be equipped with adequate cleaning supplies that have been tested to make sure the solution will not harm any equipment or work areas. Teams can clean things such as equipment, tools, work surfaces, desks, storage areas, floors, lighting, and anything else that affects overall cleanliness. A team may also paint or coat work surfaces, equipment, floors, and walls.

4. Standardize (Seiketsu): During Standardize phase of implementation, the team identifies ways to establish the improved workplace practices as a standard. The goal of standardization is to create best practices and to get each team member to use the established best practices the same way. As 5S standards are adopted into each individual work area, each locale will develop unique approaches and methods to accomplishing the specified tasks and goals. Any team member working in a specific area must receive training in that specified approach and method of work. Where possible, the tools used to standardize and sustain the 5S effort should be unified across all areas of the plant.

5. Sustain (Shitsuke): The purpose of Sustain is to maintain the momentum generated during the initial event or project. Sustain is considered to be the toughest to implement. Many firms do the 5S activities for months. But it becomes very difficult to sustain the activities performed for a longer period of time (Peterson, J. and Smith, R, 2001).Standards have to be maintained year after year in an effective manner(Harrington, 2000). A management auditing process should be put into practice to ensure that employees understand that maintaining the level of workplace organization is a top priority. Management audits should focus on ensuring that the routines and schedules specified in S4 Standardize are being properly maintained. The audit also provides an excellent opportunity for asking questions and providing suggestions that stimulate further improvements.

Sustain is one of the most widely adopted techniques. Along with Standard Work and Total Productive Maintenance, 5S is considered a “foundational” lean concept, as it establishes the operational stability required for making and sustaining continuous improvements.

Beyond this, many companies begin their lean transformation with 5S because it exposes some of the most visible examples of waste it also helps establish the framework and discipline required to successfully pursue other continuous improvement initiatives (Brady, 2011).

Once a stable operating base has been established, the next step is to implement a kaizen-style improvement program that continues to raise the bar in operational excellence. At this stage, creating a visual workplace becomes even more critical, since a continuously improving work environment is also a constantly changing one.

Hybrid 5S

The Hybrid 5S model is based upon the Deming's cycle (PDCA cycle) of Kaizen (Kanji, 1996), which integrates process improvement tools with inventory management techniques. The implementation of the Hybrid 5S model entails four phases: 1) Observation and preparation, 2) Planning Lean, 3) initiatives Implementation, and 4) Measurement of improved process.

2. Waste (Muda) Elimination

According to (Womack, 1990) , there are seven types of wastes that should be eliminated. The wastes are overproduction (Production more than production schedule), transportation (Long moves; re-stacking; pick up/put down), waiting (Poor balance of work; operator attention time), inventory (Too much material ahead of process hides problems), motion (Walking to get parts because of space taken by high work in process.), over processing (Protecting parts for transport to another process) and defects (Material and labor are wasted). From the Muda elimination point of view, every activity in the workplace is either value adding or non-value adding. Customers pay for value adding activities and do not pay for non-value adding activities. All non-value adding activities are Muda. Waste elimination can be the most cost effective way of improving productivity and reducing operating costs.

3. Suggestion System

A Suggestion System is the method by which the ideas and suggestions of employees are communicated upwards through the management hierarchy to achieve cost savings or improve product quality, workplace efficiency, customer service, or working conditions. During 70s many Western business persons visited Japan to see suggestion systems in progress as part of kaizen umbrella-concept and when returned home started efforts on their companies by initiating and establishing systems like that. But the process of obtaining ideas from employees is not a new one also in the West. In companies such as Toyota and Canon, a total of 60 to 70 suggestions per

employee per year are written down and implemented (Poornima, 2011). Kodak Company started such a program around the turn of the century in the United States. British Royal Navy had a suggestion scheme in 1772. Through suggestions, employee participate in continuous improvements activities in the workplace and play a vital role in upgrading standards (Imai M. , 1986).Suggestions or proposals start from a problem perception and recognizing the need to solve it.

Kaizen focuses on making improvements in any area where there is a scope for improvement. The management of the company encourages suggestion or Kaizen from employees regarding possible improvements in their respective work area.

4. Quality Control Circle (QCC)

QCC is a small group of workers who collectively find a problem, discuss alternative remedies, and propose a solution. QCCs voluntarily perform improvement activities within the workplace, with self disciplined and humanity focused approaches, utilizing scientific techniques. QCC need to be supported by the top management and the middle managers who treat QCC activities as an important part of employee development and workplace utilization, and provide guidance and support for genuine participation while respecting the humanity of all employees, (Kaizen manual, 2011). From the definition of Kaizen provided by (Imai M. , 1986),QCC is the vehicle, which could call intention and participation from all levels of employees from top managements, managers, supervisors, to shop floor workers. The Kaizen concept utilizes the cooperative features of the QCC to collect suggestions on the work process.

5. Total Quality control (TQC)

Total Quality control (TQC) means that the quality is determined at all stages of the whole product lifetime, and all the functions are included in the quality control. The quality activities start with the product design, incoming quality approval, and continue through production control, product reliability, inventory, delivery, and customer service (Feigenbaum, 1920).

6. Total Quality Management (TQM)

According to Kanji (1990) 'TQM is the way of life of an organization committed to customer satisfaction through continuous improvement. This way of life varies from organization to organization and from one country to another but has certain essential principles which can be implemented to secure greater market share, increase profits and reduce cost'.

Total Quality Management TQM represents a number of management practices, philosophies and methods to improve the way an organization does business, makes its products, and interacts with its

employees and customers. QCC activities function as an integral part of TQM. Historically, statistical quality control was born in the US, and Japan imported and developed that concept as Total Quality Control (TQC) in the 1960-70s, which evolved as TQM in the late 80s., is a method by which management and employees can become involved in the continuous improvement of the production of goods and services. It is a combination of quality and management tools aimed at increasing business and reducing losses due to wasteful practices.

7. Toyota Production System (TPS)

TPS is the philosophy which organizes manufacturing and logistics at Toyota, including interaction with suppliers and customers. It focuses on the elimination of waste and defects at all points of production including inputs, process and final output (delivery). The term "Lean Production System" can be used interchangeably. Lean manufacturing refers to a manufacturing improvement process based on the fundamental goal of Toyota Production System in order to minimize or eliminate waste while maximizing production flow

8. Just-In-Time (JIT) System

JIT, a part of TPS, is a production system aimed at eliminating non-value- adding activities of all kinds and achieving a lean production system flexible enough to accommodate fluctuations in customer orders.

9. Kamban System

Kamban refers to a communication tool in the JIT production and inventory control system, developed at Toyota. A kamban (signboard) is attached to a given number of parts and products in the production line, instructing the delivery of a given quantity. When the parts have all been used, the kamban is returned to its origin where it becomes an order to produce more.

10. Total Productive Maintenance (TPM)

TPM is a methodology that seeks for productive excellence. This methodology is used in companies with continuous production processes. In order to achieve the excellence it is necessary to implement Autonomous Maintenance and Planned Maintenance. Basing on the conceptual analysis of the both concepts of TPM and Kaizen, both concepts focus on the issue of improvement. However, TPM could be seen as a more specific version of Kaizen since it works specifically on the area of maintenance.

2.2.1.2. Kaizen principles

Kaizen principles and Kaizen implementation tools are a comprehensive way of approaching the continual improvement of manufacturing processes and have a significant impact upon improvement of quality and productivity.(Dipak P. Gauri et al., 2015), indicate that Japanese competitive success is based on kaizen principles. The researcher observed different kind of kaizen principles from a few literatures. For example 35 kaizen principles are found from five researchers as follows.

Table 2.1: Kaizen Principle

No	Kaizen Principles	Researcher (Source)
1	A major source of quality defects is problems in the process.	(Bagul Niraj Ravindra, 2016)
2	Address the work place with good housekeeping discipline	(Bagul Niraj Ravindra, 2016)
3	All ideas are addressed and responded to in some way	(Bagul Niraj Ravindra, 2016)
4	Ask "WHY?" five times and seek root causes	(G, Jalu; , 2015)
5	Collect, verify, and analyze data to enact change	(Bagul Niraj Ravindra, 2016)
6	Continually improve	(Bagul Niraj Ravindra, 2016)(Tadesse M. , 2014)
7	Decrease waste.	(Bagul Niraj Ravindra, 2016)
8	Decreasing variability in the process is vital to improving quality	(Bagul Niraj Ravindra, 2016)
9	Discard conventional fixed ideas	(G, Jalu; , 2015)
10	Discipline	(Tadesse M. , 2014)
11	Do not make excuses. Start by questioning current practices	(G, Jalu; , 2015)
12	Do not seek perfection. Do it right away even if it will only achieve 50% of target	(G, Jalu; , 2015)
13	Don't spend money for kaizen use your wisdom	(G, Jalu; , 2015)
14	Empower the worker to enact change.	(Bagul Niraj Ravindra, 2016)
15	Every interaction is between a customer and a supplier.	(Bagul Niraj Ravindra, 2016)
16	Focus change on common sense, low-cost, and low-risk improvements, not major innovations	(Bagul Niraj Ravindra, 2016)

17	Human resources are the most important company asset	(Tadesse M. , 2014)
18	Identify and decrease non value added steps.	(Bagul Niraj Ravindra, 2016)
19	Identify, report, and solve individual problems	(Bagul Niraj Ravindra, 2016)
20	If you make mistake, correct it right away	(G, Jalu; , 2015)
21	Improving and maintaining standards	(Hailu, 2015)
22	Kaizen focuses on small improvements of work standards coming from ongoing efforts	(Hailu, 2015)
23	Kaizen ideas are infinite due to continuous improvement	(G, Jalu; , 2015)
24	Kaizen is process oriented	(Hailu, 2015)
25	Kaizen is almost entirely action based	(Dipak P. Gauri et al., 2015)
26	Kaizen involves every employee in making change in most cases	(Dipak P. Gauri et al., 2015)
27	Kaizen rules may vary in detail from company to company	(Dipak P. Gauri et al., 2015)
28	No idea is too small	(Bagul Niraj Ravindra, 2016)
29	People Orientation	(Hailu, 2015)
30	Processes must evolve by gradual improvement rather than radical changes	(Tadesse M. , 2014)
31	Seek the wisdom of ten people rather than the knowledge of one	(G, Jalu; , 2015)
32	Think of how to do it, not why it cannot be done	(G, Jalu; , 2015)
33	Teamwork	(Tadesse M. , 2014)
34	Use all of the team’s knowledge.	(Dipak P. Gauri et al., 2015)
35	Wisdom is brought out when faced the hardship	(G, Jalu; , 2015)

Table 2.2: Kaizen implementation Tools

No	Tools	Researcher (Source)
1	Automation and robotics	(G, Jalu; , 2015)
2	Customer orientation	(G, Jalu; , 2015)
3	Just-In-Time (JIT) System	(G, Jalu; , 2015)
4	Kamban System	(G, Jalu; , 2015)
5	Quality Control Circles (QCC)	(G, Jalu; , 2015) (Bagul Niraj Ravindra, 2016)
6	Quality improvement	(G, Jalu; , 2015)
7	Small group activities	(G, Jalu; , 2015)
8	Suggestion System	(G, Jalu; , 2015) (Bagul Niraj Ravindra, 2016)
9	Total productive maintenance (TPM)	(G, Jalu; , 2015)
10	Total Quality Control (TQC)	(G, Jalu; , 2015) (Bagul Niraj Ravindra, 2016)
11	Total Quality Management (TQM)	(G, Jalu; , 2015) (Bagul Niraj Ravindra, 2016)
12	Toyota Production System (TPS)	(Bagul Niraj Ravindra, 2016)
13	Zero defect	(G, Jalu; , 2015)

2.2.1.3. Kaizen Drivers

Kaizen drivers should have an impact on productivity improvement. specific components of productivity improvement include cost savings, lead time, labor productivity, and on-time delivery as measures in the products industry (Gunasekaran, 2004) , (Liker J. K., 1997).

From deferent literature review the following kaizen drivers found;

Teamwork and cross-functional teams, quality planning and control, employee awareness and training- team autonomy, productivity improvement, management support, goal difficulty, work area routineness, goal clarity , affective commitment to change, internal processes, team kaizen experience, action orientation , functional heterogeneity and team leader experience.

2.3. Factors influencing kaizen implementation

According to the findings and discussions, there are some obstacles or problems that affect the use of kaizen in organizational efforts. The Japanese concept of kaizen, or continuous improvement, has been long lauded as a success. While many achievements obtained during kaizen execution, there are a number of problems and failures in kaizen growth in companies outside of Japan (Putti, J. and Chong, T., 1985).

As reviewed by Muhammad Asif (2011), and Oki (2012) reviewed, both are discussed the role of culture and organizational structures as the key factors in kaizen implementation. Many implementations failed because of these factors. Culture and organizational structures terms are discussed by a number of authors (Recht, 1998). The role of culture and found that successful transfer of kaizen oriented suggestion system is possible in non-Japanese companies through a number of changes that impact organizational culture (Flynn, 2006). And Power et al power (2010) mentioned of general cultural dimensions that may influence a process management program.

Kaizen approaches were not easily adopted in abroad due to environmental factors as the differences in national culture and working ethics. Along with national culture aspects, scholar argued that the adoption of kaizen highly depends on some specific organizational culture such as centralization of authority and cross functional cooperation (Recht, 1998). (Muhammad Asif, 2011), also share this concept and gave evidence like the Japanese companies in Singapore were least successful in the practices which are implemented in their mother companies in Japan.

Fukuda et al. (1989), also mentioned of failures in the implementation of Japanese management systems in non-Japanese companies. Some authors have attributed these difficulties to the context specificity of kaizen which means that due to its origin in Japanese organizations kaizen is difficult to replicate elsewhere (Recht, 1998). But Kono (1982) not accept this concept and conclude it is possible to transfer these practices to other countries.

Abera Admasu (2015), also discussed that, in Africa power is at the hand of top managements and top managers could not share or encourage the employees at work place. It may be a challenge for managers to change their attitude and trust the workers in workplace. As a result, workers' involvement in production is decreases and leads to delays in delivery.

Many writers highlighted the social factors that contributed to the success of kaizen. These factors include life time employment in Japanese organizations, teamwork, trust based business management,

strong networking, and supplier development, low labor turnover rate (Beechler, 1994)(Choy, C. L. and Jain, H. C, 1987);(Kenney, 1993).

On the other side the main factors that influencing kaizen implementation is managerial commitment. It is part of the key factors affecting effective kaizen implementation (Bessant et al., 1994)(Imai M. , 1986). Top management should establish clear targets to guide everyone and make certain to provide leadership for all kaizen activities directed toward achieving the targets and to develop kaizen culture (Bassant J, Caffyn S., 1994). Leadership is one of the key factors for kaizen. Kaizen is driven by strong commitment of the top leader. As a result, kaizen has come to be known among policy makers and business managers in Ethiopia (GRIPS., 2011). Puvanasvaran et al (2010) strength the above concept as the problems faced on the implementation are much of the responsibility lies with upper management (Chen et al, 2000). The study also reminds a lack of initial training in teamwork effectiveness is factors for influencing kaizen.

As Admasu Abera (2015) reviewed, when organization implemented kaizen management, they can face several obstacles in implementing period therefore, scheduled internal and external training is more important to understand the kaizen management philosophy and solve the obstacles.

Parry (1993) and Nonaka (1995) highlighted the Japanese organizations culture is unique because their sharing knowledge and communicate each other.

As noted in Asayehgn Desta at el.,(2014), based on the three pilot companies (Mesfin Industrial Engineering PLC, Almeda Textile Factory PLC., and Sheba Leather and Tanning Industry PLC), employees didn't have the full capacity to accept the kaizen management system, problem solving tools and techniques so they were one of the influenced factor for the implementation.

The kaizen method has been established as an outcome of various activities undertaken for improving the productivity and quality of Japanese products after mid 1940s, as Japanese manufactures were urgently trying to catch up with the standards of American and European manufacturers (Chen J C, 2000).

The review also found that resistance to change, failure to motivate employees, lack of understanding on companies' strategic path and difficulties in managing continuous improvement itself formed some of the challenges in implementing Kaizen. Beside these, lack of commitment is one of several common reasons why kaizen implementation fails. Executive managers were themselves not committed to the kaizen teamwork because they didn't usually participate nor did they allow the shop

floor workers. There is also huge gap between developed and developing countries in way of implementation kaizen due to their working culture.

Improvements are based on many, small changes rather than the radical changes that might arise from research and development (Imai M. , 1986). 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. Kaizen normally places the foremost importance in improvements at the frontline workplaces as the foundation of all the improvement efforts.

The researcher understand from a variety of studies that in many other countries, out of Japan kaizen is implemented successfully, Therefore, kaizen philosophy would be one essential step towards addressing and solving the currently existing problems and challenges in the organization. But the main findings of kaizen failures come from inefficient country's leadership involvement and underlying labor force, and full participation are facing during the implementation.

2.4. Key Success Factors for Kaizen Implementation

Kaizen can only succeed in places where there is a true desire to improve management involvement, employees involvement, sufficient time for change, motivation, Performance measurement and KPIs. The improvements gradually accumulate over time, as processes are perfected and methodologies tweaked. Success of kaizen activities performed highly depends upon the contribution of teamwork. Every member's role and responsibility has been described by taking an example of Nissan Motor Plant in UK. Direct contact and communication between the employee and boss is a key for successful implementation of kaizen activities in the organization (Wickens P.D., 1990).

Research has shown that companies that adopt sustainable practices are able to achieve increased product quality, increased market-share and increased profits. Toyota's sustained success is credited due to their persistent and pervasive application of the lean principles to their manufacturing and management systems (Hino, 2006), (Liker J. , 2004). Besides Toyota, many other instances of successful lean implementation studies can be found in the literature, some of these studies are empirically evaluated (Krafcik, 1988), (Womack, 1990) ,(Womack et al., 1990; Womack and Jones, 1994; Womack and Jones, 1996); (Spear, S., & Bowen, H. K., 1999) and others are anecdotal (Alavi, 2003).

As Admasu Abera (2015) identified key success factors, employees must be satisfied with their jobs and be interested in working to continuously improve their performance (Job satisfaction), The company must be dedicated to a kaizen strategy for it to work (Dedication), The organization must present a kaizen strategy to the managers and employees as a way to improve company productivity and add to the corporate bottom line (Company involvement), A kaizen philosophy requires a lot of questions about individual and group performance (Questioning), The employees need to have an open mind for a kaizen strategy to work (Open-Minded),When a person working within a kaizen philosophy has a question about a work process, the manager should encourage that person to ask several people for input (teamwork) (Wickens P.D., 1990).

Therefore, from the above review the important key factors are driven out and listed according to their level to determine the success of the implementation and avoid the risk of failure. If these critical success factors are not emphasized, not only there could be a significant difference in the success gained, but also losses in terms of effort, time and money (Coronado and Antony, 2002)

Table 2.3: Identified Kaizen Implementation factors

Kaizen Implementation Main Factor	Factor Level one	Factor Level Two	Factor Level Three	Source
Education and training	Initial training in teamwork effectiveness			(Ibrahim Alhuraish, 2014)(HAILU, 2015)(A.P. Puvanasvaran, Robert S.T. Kerk and A.R. Ismail, 2010)(Admasu Abera, 2015)(Mohd Ghazali Maarof, 2016)
	Skill and expertise	Benchmarking and knowledge transfer		(Farris, 2008)
			Using an appropriate methodology, techniques and tools	(HAILU, 2015)(Muhammad Asif & KodoYokozawa, 2011)(Ibrahim Alhuraish, 2014) Documentation
Commitment	Top Management commitment	Set the right mindset		(A.P. Puvanasvaran, Robert S.T. Kerk and A.R. Ismail, 2010)(Muhammad Asif & KodoYokozawa, 2011)(Ibrahim Alhuraish, 2014)(Admasu Abera, 2015)

	Employee commitment	Employee attitude		(HAILU, 2015)
Involvement	Top Management involvement			(A.P. Puvanasvaran, Robert S.T. Kerk and A.R. Ismail, 2010)(Admasu Abera, 2015)
	Employee involvement	Teamwork	Employee empowerment	(Netland, 2015)(Ibrahim Alhuraish, 2014)(Muhammad Asif & KodoYokozawa, 2011)(Admasu Abera, 2015)
	Consultant involvement	Customers involvement	Supplier involvement	(Ibrahim Alhuraish, 2014) ,(Netland, 2015)
Communication	Coordination between departments	Cross-functional integration		(A.P. Puvanasvaran, Robert S.T. Kerk and A.R. Ismail, 2010)(Netland, 2015)(Muhammad Asif & KodoYokozawa, 2011)(HAILU, 2015)
Resources	Allocated resources (time, economic, spaces),			(HAILU, 2015)
Organizational objectives	Culture (employee, organizational			(Muhammad Asif & KodoYokozawa, 2011)(Ibrahim Alhuraish, 2014)(Admasu Abera, 2015)(Mohd Ghazali Maarof, 2016)
	Management structures	Process management	Project prioritization and selection	(Muhammad Asif & KodoYokozawa, 2011)(Netland, 2015)(Ibrahim Alhuraish, 2014)(Admasu Abera, 2015)
	infrastructure	workplace safety		(Muhammad Asif & KodoYokozawa, 2011)(HAILU, 2015)
	Top management responsibility	Job security and social responsibility		(A.P. Puvanasvaran, Robert S.T. Kerk and A.R. Ismail, 2010)(Netland, 2015)
	Formalization			(Hector Ricardo Formento, 2013)
Leadership	Program Coordination			(Ibrahim et al, 2014)(Hailu, 2015)(Hector Ricardo Formento, 2013)
	Manager's approach	Strong team leaders		(Hailu, 2015)
Globalization	External factors			(Mohd Ghazali Maarof, 2016)

Source: researcher own construction, 2018

2.5. Sustainability

The word sustainability originated from the verb sustains which the Oxford Dictionary defines as 'to maintain or keep in existing' (Oxford Dictionaries, 2011). According to many researchers the word sustainability has no single definition. It has several definitions of sustainable development given in the literature (Glavic, P. and Lukman, R., 2007).At time, sustainability is perceived as an activity that has managed to maintain kaizen implementation at some degree of improvement after a process improvement activity while in other contexts or maintaining well being over a long, perhaps even an in limited period (Kuhlman & Farrington, 2010).

Kaizen initial success is not guarantee for sustainability, because it can be interrupt after a time. Therefore the questions on sustainability are unanswered (Bateman N & David A, 2002). That is why many researchers come with an idea that kaizen events should not be done unless they can done with right intent and activities necessary to sustain results (Friedli, 1999).

Table 2.4: Identified Kaizen Sustainability factors

Kaizen Sustainability Main Factor	Factor Level one	Factor Level Two	Factor Level Three	Source
Standardization	Standards	Documentation		(HAILU, 2015)(Admasu Abera, 2015)
Performance Measurement and evaluation	Continuity / Duration			(Hector Ricardo Formento, 2013)(Ibrahim et al, 2014)
Strategies planning	Clear corporate company strategy	Establishment of long-term plan		(Muhammad Asif, 2011)(Hailu, 2015)(Mohd Ghazali Maarof, 2016)
		Clarify goals and common ideas		(Hailu, 2015)
	Developing a culture of continuous improvement	Establish policies		(Hailu, 2015)
Motivation	Rewards and recognition	Job satisfaction		(Ibrahim et al, 2014)(Admasu Abera, 2015)

Source: researcher own construction, 2018

2.6. Factors influencing sustainability

Many studies note that, in both Japan and abroad, especially in the cases of American and European companies, leadership is the single most important factor for success implementation and sustainability of kaizen Imai M. (1986). This affirms the view that successful implementation and sustainability of kaizen is largely influenced by an organization's ability to develop these capabilities (Aoki, 2008).

The factors motivating companies to get on upon sustainable development include social responsibility and investor demands, government regulations and international standards, and increased customer consciousness (Nambiar, 2010). Sustainable manufacturing is connected with the effectiveness of production processes. There are several solutions to improve manufacturing sustainability. According to (Leong et al., 1990), there are five key dimensions of the effectiveness of a production process including costs, delivery efficiency, quality, flexibility, and innovation. (Vickery et al., 1997), synthesized the knowledge on priorities within the enterprise competitiveness raise. An improvement of business processes is necessary in order to maintain the competitiveness of the business and increase the financial performance. The enterprises have to carry out various innovative activities, not only for the outputs, but also for the processes. 5S System is one of the tools that can help to improve competitiveness in business industry (Rahayu, 2009). Besides that, (Ho S. , 2008) mentioned that Lean and 5S Business model play a vital role for the global sustainability and economic development.

2.7. Continuous improvement

As Bhuiyan and Baghel (2005) reviewed, the origin of continuous improvement goes back to the 1800s. After the Second World War, the Japanese developed Continuous improvement ideas into a management tool for better improvement of process and quality in the organization. Continuous improvement has become a popular study topic in last decade, and the kaizen approach, outside the original manufacturing area, has received a great deal of attention. Continuous improvement is becoming increasingly important, partly because driving efficiencies is critical in today's flat market, but mainly because of a dramatic shift in business strategy. A continuous improvement process as the name implies has no end to it. There is several definition of continuous improvement described by researchers. As (Anand et al., 2009) definition, continuous improvement is a systematic effort to seek out and apply new ways of doing work, another definition of continuous improvement is getting the

right things, to the right place, at the right time, in the right quantity while minimizing waste and being flexible and open to change (Womack., 2003).

2.8. Summary of literature Review

Literature reviews are an essential tool for helping understand the depth and variety of information that has already been gathered about a topic and aid in providing a strong foundation to build a study from (Levy, 2006). The review of literature shows that the implementation and sustainability of kaizen practices have influenced by the above identified factors. These factors pose challenges to successful sustainability of kaizen practices in manufacturing firms and consequently the influence on operational performance. In this perspective, this research paper attempts to answer the research question, "what are the key factors that kaizen implementation to be sustainable in Ethiopian manufacturing firms".

From these papers the researcher has been observed that research up to day has studied kaizen can be implemented in every country and in every manufacturing and service sector. A very important thing when implemented 5S kaizen to follow the above job aid table.

From the above literature review the researcher investigated forty key factors and categorized in to eight main key success factors for kaizen implementation and four main key success factors for sustainability as shown below.

Implementation Factors

Education and training, Commitment, Involvement, Communication, Resources, Organizational objectives, Leadership and Globalization are implementation factors.

Sustainability Factors

Standardization, Performance Measurement and evaluation, Strategies planning and Motivation are sustainability factors.

2.9. Conceptual frame work

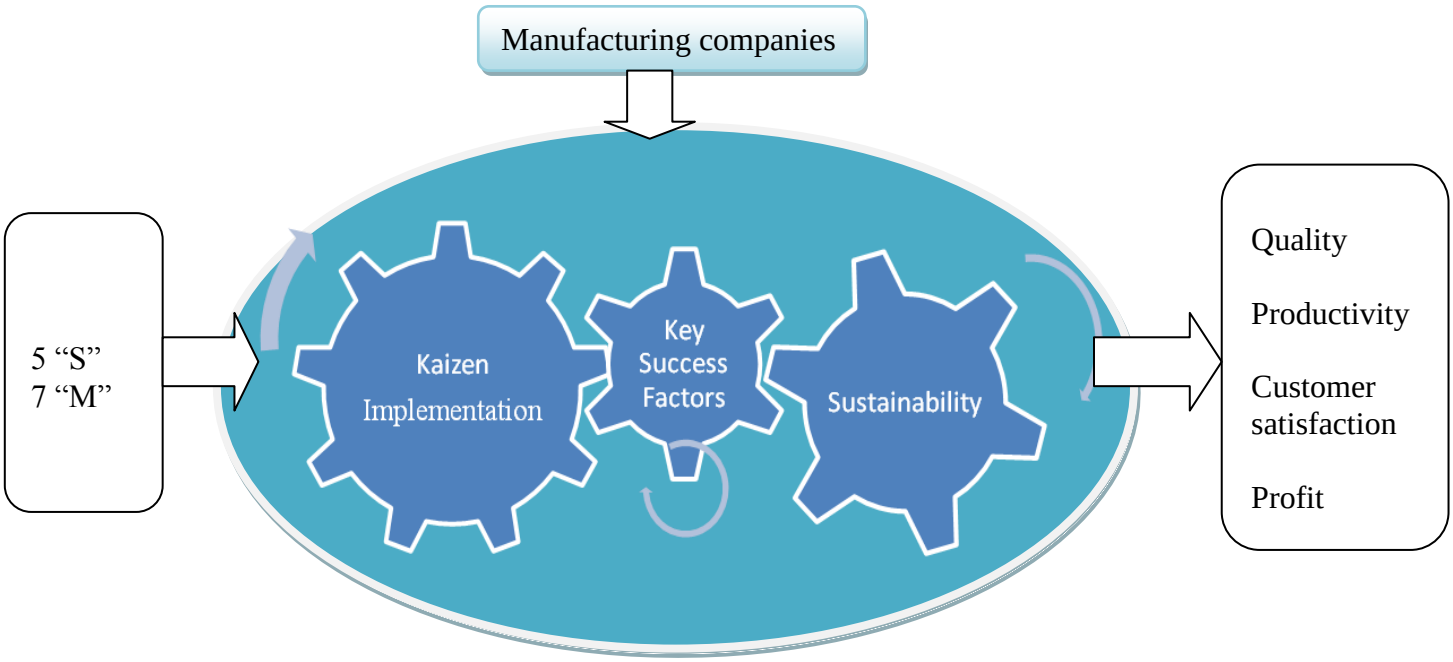


Figure 2.4: Conceptual frame work, Source: researcher own construction, 2018

2.10. Research Gap

There are only few studies on key success factors development for kaizen sustainability in Ethiopian manufacturing firms.

One of the related title "Critical success factors for sustainable kaizen implementation" studies is done by Haftu Hailu (2015), studied on the case of Peacock shoes manufacturing industry. He identified eight Critical success factors for sustainability. They are: Factor 1: Preparation (Ownership; Training and education) Factor 2: Process control Factor 3: Planning (Effective communication)

Factor 4: Implementation (Employee participation) Factor 5: Effective leadership Factor 6: Continually Evaluation Factor 7: Recognition and reward Factor 8: Employee's Attitude.

Generally, his finding has a gap of four factors. The second identical study was done by Gelila Getachew. She also studied on title "Assessment of kaizen and challenge toward sustainability" in case of Hibret manufacturing and machine building industry. On her research paper, she finds kaizen influencing factors.

The third related research is done by Michael Tadesse on title "Assessment of kaizen implementation process, success stories, challenges and employees' work attitude", Studied on the case of wonji/shoa sugar manufacturing factory. The research objective is intended to assess Kaizen program implementation, major achievements, challenges and employee work attitude. He discussed on team work, training, involvement, kaizen tools, continues improvement, motivation, Kaizen implementation, strategy, communication of plan, goals and values, challenges, organizational structure and human resource. He raised five similar factors, but the other are focused on challenge and opinion of managers on different issues.

In general, most of the researches are done based on one case company, but this study gives answer to all organization that have the same type problems.

2.11. Literature papers selection approach.

The researcher systematically collects from web site several literatures, research papers and international journals that be used to study the research title (Identification of Key Success Factors and Kaizen Implementation for Sustainable Development) and then select 31 references papers compatible with the topic (See Appendix I).As a result the selection were made only in a table below and then divided in to four categories and were used by the study. According to the categories the four topics in which division are kaizen implementation (13pcs), key success factors (8pcs), challenge of kaizen (4pcs), and improvement (6pcs).

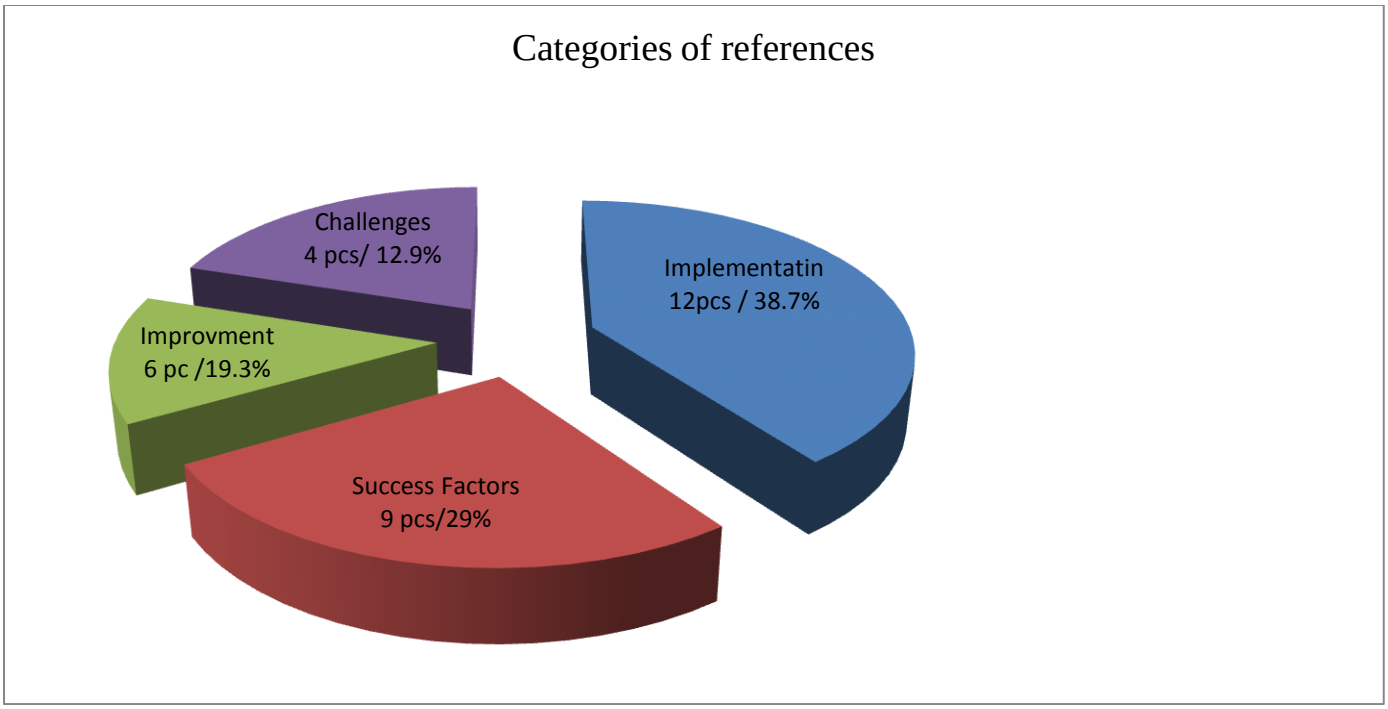


Figure 2.5: Reference distribution Source: researcher own construction, 2018

CHAPTER THREE

RESEARCH METHODOLOGY

This research is using tangible triangulation quantitative and qualitative data methodology to prove the existing real facts and follows the descriptive survey method. Qualitative approach is collecting, analyzing and interpreting data by observing what people do and say whereas quantitative approach refers to counts and measures of things.

3.1. Research Design

The research design utilized in this study is the descriptive survey method and follows from the questions and fit them with data. According to (Punch, 2000), the design used basic ideas and tools for collecting and analyzing empirical data.

This study is a cross sectional survey and conducted among six selected manufacturing factories in Addis Ababa.The reason for selecting of these factories is, As Ethiopian kaizen institute recommendation they have better experience on implemented and adopted the kaizen methodology in their factory to evaluate the kaizen sustainability. They are also found hear in Addis Ababa. The researcher also took one case factory which interrupted of the kaizen implementation.

The research process used in this study can be depicted using a research framework consisting of the following main stages as shown in Figure 3.1.

The first stage is literature review: This stage is a systematic method for identification, evaluation and interpretation of the existing research problem and gaps of knowledge

The second stage is case company investigation. On this stage the kaizen implementation activities of the case company is studied. The sustainability barriers are identified.

The third stage is study of key successes factors survey. On this stage the questionnaire is developed and data is collected from the sample case factories.

The fourth stage is data evaluation. The collected data are evaluated accordingly.

The last stage is development of conceptual framework. By tested the validity of the framework conclusion is drawn.

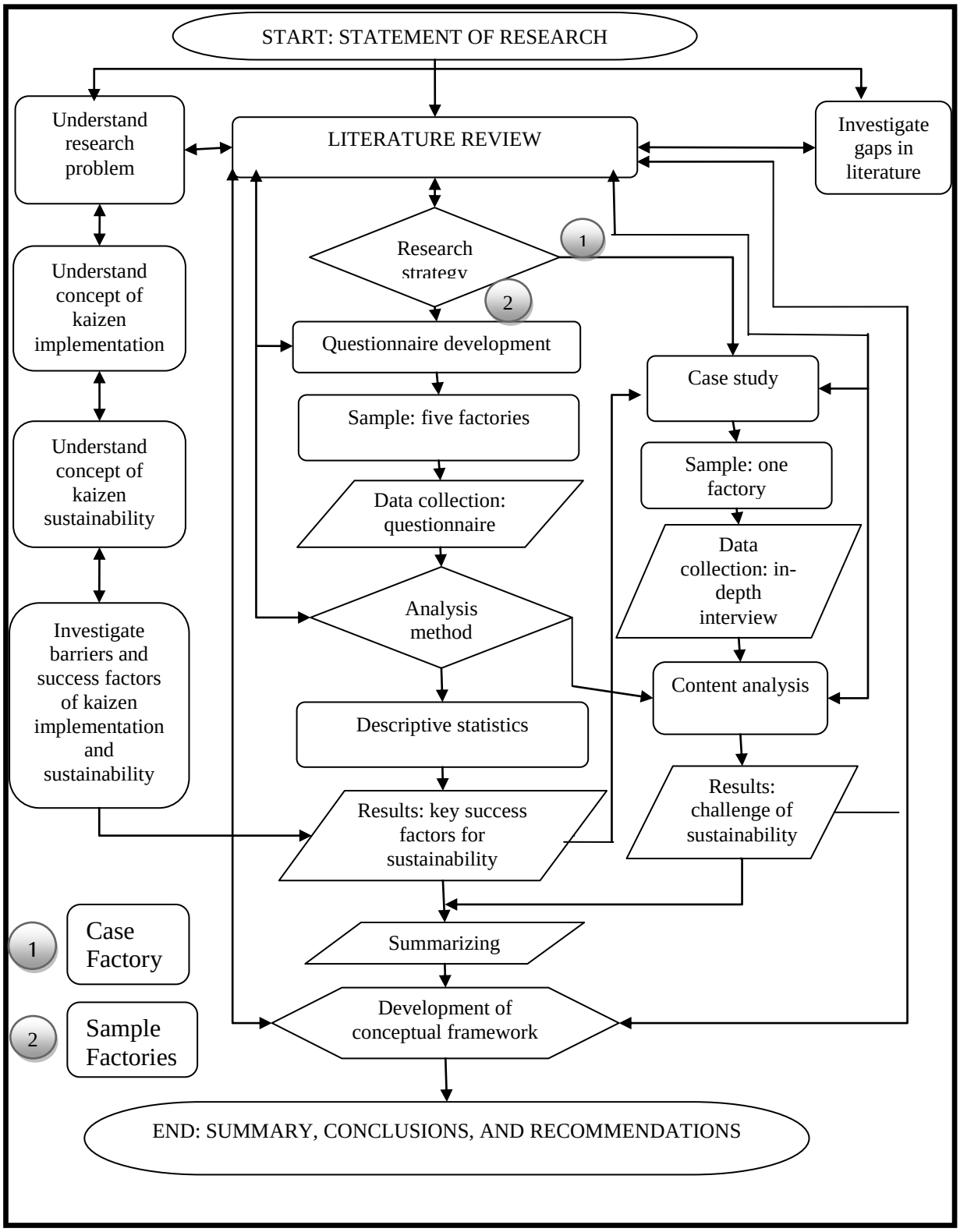


Figure 3.1: Research Framework Source: researcher own construction, 2018

3.2. Source of Data

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

Primary data: - the primary data was questionnaires both open and close-ended questionnaires interview and focus group discussion with the selected companies. The questionnaires were developed aiming for respondents to be sample frontline workers, Kelbu (KPTs) leaders, kaizen facilitators and managements (top, middle& lower).

Secondary sources: - Secondary data was collected from the company's documentation, kaizen office report, research papers based on a systematic literature review. The literature sources were accessed through web of knowledge which provides access to leading citation databases covering numerous journals and conference proceedings. Also, some textbooks were found useful in the research process related with kaizen implementation and sustainability.

3.3. Data collection methods and instruments.

The data gathering procedure followed based on research methodology expression, measures, analysis and evaluation for both primary and secondary data. The data was collecting using purposive sampling from the selected companies. For scale types of questionnaire, descriptive statics in the form of mean and frequency percentage was presented to illustrate the level of agreement of the respondent.

Most of the structured questions were the close-ended type and respondents were asked to mark the appropriate box matching the correct answer.

Questionnaire: - Robinson (1991), 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 open and closed - ended questions. The questions were comprised of the statement followed by five Likert scale ranging 1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree.

Level of agreement: [1.00-1.49] Strongly disagree; [1.50-2.49] Disagree; [2.50-3.49] Neutral, [3.50 - 4.49] Agree and [4.50-5.00] Strongly agree

There are three sections in the questionnaire which include;

Section A - Respondent Profile, Section B - Technical questions,and Section C-Kaizen Implementation and sustainability Survey

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" (Robinson, 1991). The research is used structured interviews to collect more detail information about the topic.

Observation: - the researcher conduct observation on selected factories 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.

Case study: - In order to understand how to use this developed model in practice, a case study would be conducted in one of kaizen interrupted factory in Addis Ababa. According to (Yin, 1989), case studies are the preferred strategy "when" "how" or "why" questions are being posed. Therefore, it was suitable to conduct a case study to answer the research question analyzed using document and reports.

3.4. Target population.

In this study, the unit of analysis will be the manufacturing industries which are found in Addis Ababa and the target populations are the manufacturing companies that have implemented kaizen methodology in their operations with better sustainability. The companies' size will be determined according to Ethiopian Kaizen Institute recommendation. In order to determine the factories that are included in this study, it is necessary to know the implementation and sustainability level of Kaizen philosophy in their organization been successful. So the case factories that have been selected in Addis Ababa is for many reasons,

a) Ethiopian Kaizen Institute approved that these factories have better practice and awarded by their strength.

a) Currently, some of the Addis Ababa manufacturing factories are interrupted the implementation.

c) They selected case factories had better practice before interrupted the kaizen implementation.

There for Ethiopian Kaizen Institute information directorate office recommend to study on six of the best-known factories, and one factory was not willing to cooperate with the study, there for five factories were used as evidence for the study and the researcher nominated additional one factory as a case factory to compare its weakens;

3.5. Description and background of the Sample factories

1. Sino-Ethiopia association (Africa) PLC

Sino-Ethiopia association (Africa) PLC (SEAA) was established in March 2001 with a partnership of two Chinese Companies (China associate Group & Dandong JINWAN Group) and an Ethiopian company, ZAF Pharmaceuticals PLC to manufacturing empty hard gelatin capsules (EHGCs) in various sizes and colors and supply to Pharmaceutical factories in Africa and the middle East countries.

Driven by its customers' distinct experience and focus on market success, Sino-Ethiopia association (Africa) plc delivers high quality two piece empty hard gelatin capsules for both the Pharmaceutical and health & nutrition markets.

A Pharmaceutical grade Gelatin with high bloom strength of bovine gelatin is used for manufacturing capsules. The gelatin and other additives fulfill all applicable current regulatory requirements. The gelatin used in formulation is free from BSE/TSE risk and also complies with customer's religious requirements.

SEAA's capsules are manufactured with moisture content between 13-16% and should be maintained at this level for optimum filing performance.

Sino-Ethiopia association (Africa) PLC (SEAA) is expanding its production capacity in order to fully satisfy the local demand to increase its share in the global market. The expansion project has been already completed & started production of empty hard gelatin capsules. This has increased the company's current production capacity by two fold (i.e. 2.4 billion capsules per annum empty hard gelatin capsules).

2. A.A. Mugher cement factory

Mugher Cement Factory is a leading public enterprise in the industry playing a significant role in national development by producing and supplying to the market mainly two types of cement products which are needed for construction industry in the country.

Main factory of Mugher Cement Factory is located in Oromia National Regional State, North Shoa Zone Administration, 90 kilometer away from Addis Ababa Ada BergaWoreda, at particular location called Mekoda.

The factory, which used to be previously known as Mugher Cement Factory, was integrated with Addis Ababa Cement Factory since June 1999, and became known as Mugher Cement Enterprise under Council of Ministers' Regulation No 53/91; and later incorporated under Chemical Industry Corporation under Council of Ministers' Regulation No 280/2012 since 8th of January 2013.

Addis Ababa Mugher Cement Factory was established in 1965 to produce with the capacity of 70000 ton cement per year.

3. Kaliti Metal Products Factory (KMPF)

Kaliti Metal Products Factory (KMPF) was established in 1968 with the objective of producing structural and furniture hollow sections, door and window frame profiles, EGA and ribbed sheets for roofing & wall cladding, galvanized corrugated iron sheet, pressed and plain sheet metal products trailer & Cargo truck bodies and other job order products.

The factory is located on the main road to Debrezeit, 20 Km away from the center of Addis Ababa (capital). Now it occupies a total land area of 99,400 square meters.

KMPF is one of the metal industries in the country that manufactures range of products. The factory was acquired by Tsehay Industry Share Company from Privatization and Public Enterprises Supervising Agency (PPESA) since July 12, 2012. It is now working with a total capital of more than Birr 700 million and with a work force of 408 workers which is comprised of 348 male and 60 female.

The fact that the factory have been in the business for more than 47 years, it has contributed significantly to the emerging industries and construction sectors through the supply of metal products. Moreover the factory has made efforts to improve itself and its out reach by carrying out various system improvement works such as:-

- Quality Management System (ISO 9001:2008)

- Integrated performance Management System
- Business Process Re-engineering and also expansion works on the manufacturing units especially on tube making lines.
- Management Information System.
- Implementation of KIZEN Philosophies.

4. Peacock shoe products factory

Peacock shoe factory is one of the leather products manufacturing located in Addis Ababa, Ethiopia; the company is working in clothing and accessories, shoes business activities. A Peacock shoe factory is one of implementing Kaizen. The company attains greater end result by strong activities of kaizen implementation for the past five years. This achievement enables the company to be role model.

5. Universal leather product factory

Universal leather product factory is the garment goods manufacturing factory and found in Akaki Kality sub city. This factory is one of the sisters companies of ELICO. ELICO was established in august 1997 as the leather wing of MIDROK Ethiopia to manage and operate two tanneries and leather garment and leather goods manufacturing factory that were acquired from the Ethiopian privatization agency. Universal leather product factory produce high class leather goods and garments for export market. Domestic and export production of finished goods produced from, cowhide, goat and sheepskin. Any type of leather (cow, goat and sheep) can be produced and supplied by tanneries under ELICO. The techno-commercial partner should be reputed company with a good and reliable track recorded in the leather goods/garments manufacture.

3.6. Sampling

The purpose of this research is to understand the main key success factors for implementation and sustainability of kaizen. Since kaizen is improvement technique in manufacturing companies, it is well understood haw is implemented on a high priority basis. The researcher was selected manufacturing companies operating in the Addis Ababa. The latter was the biggest recipient of companies which are worked with kaizen implementation. Then this research was developed key success factors for kaizen sustainability. Data regarding manufacturing companies

was obtained from the selected companies who agreed to participate in research. The numbers of factories list obtained from Ethiopian kaizen institute and later by proper sampling techniques. The sampling techniques used for this study is Stratified Sampling. The total population of the study was large and heterogeneous in type stratified sampling techniques is preferred. In stratified sampling, the size of the sample drawn from each stratum is proportionate to the relative size of that stratum in the total population of the study. These stratify data were arranged per sub manufacturing firms (strata) and then after from each manufacturing firms (strata) equal number of samples were selected randomly based on simple random sampling techniques. Gebreyesus (2016) stated that, to be more accurate the data generating mechanisms of large population which determines a sample sizes. There are no general rules to take sample size; the sample size usually depends on the population to be sampled. In this study to select sample size, lists of the population are registered in the case manufacturing factories.

According to Gay (2008) who suggests that “10%” of large populations and “20%” of small populations as minimums can be taken as sample size". However, the researcher had considered from Gebreyesus (2016) and Carvalho (1984) table as “medium” for population size of the target population 1201-3200 which is 125 sample size and from Gay (2008) 10% which is 137sample size and comparing with the case companies kaizen promotion teams (KPTs) number in each factory which is 145 sample size. There for, the researcher has taken the sample size of total KPTs 145 number (10.84% of the population) to get more reliable data from each case company respondents. The details of the sample taking activities are described in the table below:

Table 3.1: Sample size determination

Population size	Small	medium	Large
51-90	5	13	20
91-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1200	32	80	125
1201-3200	50	125	200
3201-10,000	80	200	315
10,001-35,000	125	315	500
35,000-150,000	200	500	800

Source (Gebreyesus, 2016) and (Carvalho, 1984)

Table 3.2: Survey Sample Size

Factory Code	Case Company Name	Population Size	KPTs Number	Percentage (%)
Factory 1	Universal leather product factory	211	30	14.2
Factory 2	Sino-Ethiopia association PLC	180	23	12.8
Factory 3	A.A. Mugher cement factory	236	32	13.6
Factory 4	Kaliti metal products factory	450	30	6.7
Factory 5	Peacock shoe products factory	260	30	11.5
Cumulative total		1337	145	10.84

Source: researcher own construction, 2018

As indicated in Table3.2, the target population for this study was 145.Through these companies Kaizen team members, Leaders, Kaizen Facilitator & middle and top management were the sample groups.

3.7. Data Analysis

The collected primary, secondary, qualitative and quantitative data was analyzed in order to identify and examine the existing practice of the key success factors. Quantitative data was analyzed using Statistical Practices and Social Services (SPSS version 23). The use of descriptive statistics in data analysis is due to its appropriateness in finding out the basic features of the study data and hence aid in realization of the research objectives. To analyzed the collected data Microsoft Excel used.

CHAPTER FOUR

CASE STUDY

4.1. Kaizen in Ethiopia

According to Admasu Abera (2015) review, Ethiopia is one of the seven African nations that started to implement kaizen philosophy. As the Ethiopia kaizen institute(EKI, 2014) report Ethiopian late Prime Minister Meles Zenawi asked support concerning the transferability of Kaizen to Ethiopia. According to (GRIPS., 2011) report, the first phase Kaizen was started in 2009 through the initiation of a bilateral policy dialogue between the Japan government and Ethiopian government in collaboration with Japan international corporation agency (JICA) with pilot project in 30 companies based on 5S and QC Circles. The second phase (2011-14) strengthened the institution and human resource to sustain kaizen. In this time EKI more upgrade his human resource and take acquired basic kaizen skills such as 5S, waste (muda) elimination and equipment layout. In Phase 3 (2015-19), EKI will aim to be producing high-level kaizen leaders for making kaizen as a key tool for improving productivity.

After the establishment of Ethiopian kaizen institute in 2011, most of the initiatives taken for quality and productivity improvement implementation of kaizen management techniques through the country by identifying and solving their current manufacturing problems without high-tech approaches, only involving people on the shop floor in kaizen activities.

Even if this institute tries to implemented kaizen management throughout Ethiopia, some factories are interrupted their implementation after certain period. This is investigated by Ethiopian kaizen institute in January 2018 unpublished report. In this report briefly described the activities of the Certification and Quality Directorate in Ethiopian kaizen institute. According to this report one of the directorate duties is to ensure the level of the first step of kaizen training and implementation has now comes change on service delivery, productivity, and profitability in the organization. There for this sector visited 25 samples- based organization in Addis Ababa and its environs and checked with appropriate inspection, assessment lists and necessary queries that implemented the first phase kaizen implemented since 2005. According to the screened and collected result, out of 25 organizations, fifteen organizations have terminated the implementation and nine of them were willing to resume the implementation.

Based on the above result the researcher is studies the cause of interrupted of kaizen implementation in one of the resume factory named (3F) Finfine Furniture Factory Company as a sample. To determine the continuing problem of kaizen implementation in this factory, the researcher asked that, what the overall kaizen implementation would look like and what the process was and how it was impacted on the implementation.

4.2. Ethiopian kaizen institute survey

In Ethiopian kaizen institute, one of the activities of the Certification and Quality Directorate is to ensure the level of the first step of kaizen training and implementation in the kaizen implemented organization. And that has now comes change in service delivery, productivity, productivity, savings and profitability has now come to an end. As a result of this, the enterprise has a core position in Addis Ababa and its environs since 2005. The selection process for the 25 sample-based organizations, the appropriate inspection and assessment lists and necessary queries, the creation of links with the institutions (EKI, 2018),

15 kaizen implemented organizations have terminated the implementation;

9 kaizen implemented organizations were willing to resume the implementation.(Case company is taken from this group)

Survey result by EKI

During their review, some of kaizen application has been discontinued for reasons stated below: When a kaizen officer left the organization, Non-compliance with the rewards and accrue rules described in the controlled guidelines, Inadequate understanding of kaizen philosophy, Inadequate follow up, support and supervisions, Absence of ownership, The existence of training gaps, the creation of a fatal workload, Imagine that the application is useless for our part thinking Required forms for holding an application file, which should be based on the checklists that to be registered needs more time (paper work load),The consultants stated that they did not want to go to the plan with and without planning, The presence of facilitators who are dissolved and the opportunity for new work running, Terminated of workers, Lack of treatment for rehabilitation and new staffs, As a result of government tax increase, all employees are resting, As the company uses input, and foreign currency inflows increased.

4.3. Kaizen implementation in (3F) Furniture factory (Case Company)

(3F) Finfine Furniture Factory Company is established in 1959 E.C. found in Nefas Silk Lafto and Alemgena sub city. It is playing critical role of in the development of furniture industry by inventing new designing furniture and applying modest technologies. The company is fully owned by an Ethiopian investor and creates job opportunity for 558 permanent workers.

(3F) Finfine Furniture Factory and Ethiopian Kaizen Institute (EKI) made an agreement dated on 10/03/2014 to implement Kaizen management in this factory as a project. According to the agreement, the EKI experts gave training for kaizen facilitator members for five days and two days for top managements on title basic kaizen philosophy, waste (Muda) elimination, work place standardization (5S) and problem solving.

The implementation was done jointly with Company and EKI members by taken Photos and video to evaluating all departments. These were presented by EKI experts then the core team discussed and identified the company basic problems on working place and utilizing resource and set priority for the selected problems. After prioritization the EKI consultants together with kaizen core team had visited and observe the company to understand the process and examined the condition of workplace according to Housekeeping “5S” and Waste (Muda) elimination and Problem solving aspect then selected the model place. Finally they organized 5S Basic kaizen and Problem solving themes.

The following were done by 5S Basic kaizen theme:

Established company’s 5S promotion teams (KPT), Decided KPT meeting day, Gave training for model work place workers, Hold kick-off ceremony and conducted big cleaning day, Evaluated the problems proposed by workers using YK proposal sheet (Y= Yarinikul- Japan word / hard to do the work/, K= Kizukai- Japan word /attention is very necessary for the work/), Analyzed the current information and data obtained from picture, video & YK proposal, Prepared the implementation action plan of the registered problem, Performed sort, set in order and shine actively per given schedule, Follow up of implementation items and evaluated the results.

The following were done by Problem solving team:

Conform the production gap (standard and actual) and company improvement expectation, discussion on factory lay out considering circulation time, critical element on work process. On this time they discussed and observed company concerns on disorganized work place, weak

inventory management, weak space utilization, muda of waiting, muda of defect (finished product), lay out problem, delivery problem, low labor efficiency, poor equipment and machine utilization, skill and poor motivation and poor awareness of safety equipment.

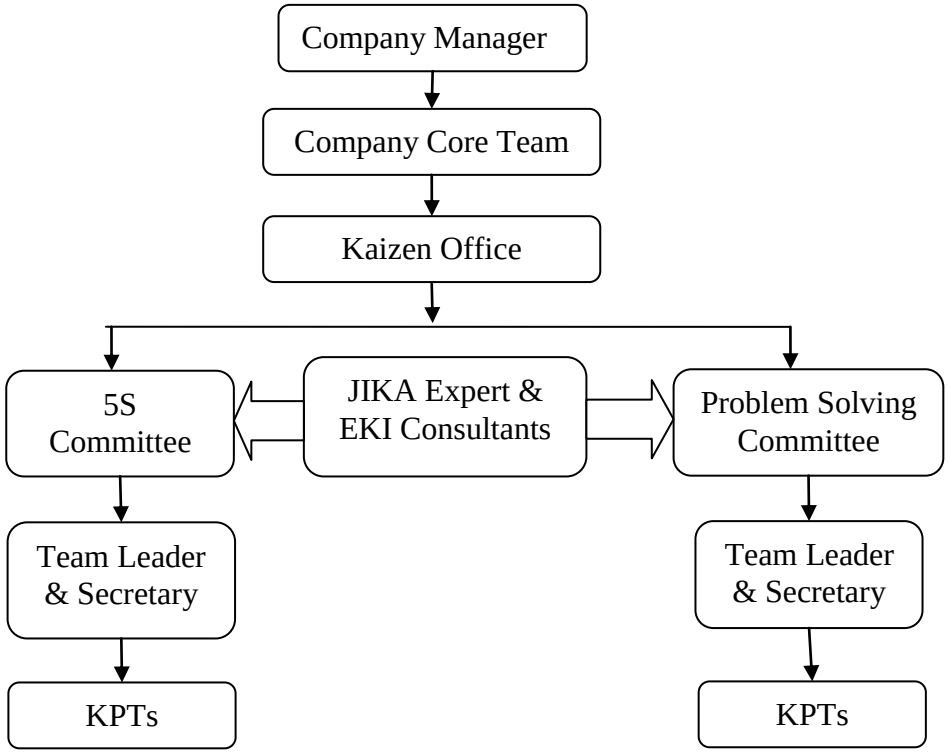


Figure 4.1: Kaizen structure on project phase (by the researcher)

4.4. Survey Result on Kaizen implementation in case study factory

As the core purpose of this study was to identify the most achievable result of kaizen implementation in such factories and how them interacted to sustain the implementation.

a) Housekeeping "5S"

This first phase kaizen management was started by housekeeping journey of the work area using "5S" techniques. As stated by Imai (1997), "5S" is fundamental techniques that provide a standard approach to good housekeeping and fosters an increase in quality and productivity.

5S and kaizen is a powerful tool and it is the most widely adopted techniques in Ethiopian manufacturing firms. On the basis of different case studies in Ethiopia, 5S and kaizen tools

produces measurable outcomes and benefits for improving their productivity by reducing non-value adding activity.

In this factory, Company and EKI together evaluated all departments which had more problems on working place arrangement and resource utilization and finally they selected the construction material production department as a model of work place.

In this department the main problem was accumulation of materials. These commodities have been stored for many years, with holding capital and working spaces. Kaizen can put them into production process during the period of 5S stage.

During the sorting period in selected construction material production department,25 types of materials which were not give value heavily stored and they did not need them at their work and also15 machines were not functioning due to spare part problems. Therefore the KPTs had them red tagged and asked the management to give a decision.

After the decision, 8 of the machines have been ordered to purchase a spare part from the suppliers, 2 machines after repaired were moved to another work area for work and 5 machines sit down in the garbage store. The implementation of kaizen strategy resulted in positive outcomes in sorted materials the factory has got 30.1 M^2 free extra spaces and from 44.8 M^2 collected materials around 91,818.00 Eth birr converted in to work process. It is also possible to convert 13,772.70 birr to capital income from 15% of waste material sale. Therefore, from this department a total of 105,590.70 birr and 30.1 M^2free spaces can be obtained.

During set in order, the materials used for production are arranged in proper way to be found easily by every employee. By putting out individuals' cupboard, a modern dressing room is established. By doing this and new machines arrangement, it is possible to create 200.1 M^2 free working space and good working environment in the factory.

In shining stage, by using appropriate colors the walk way lines (Transport routes), pallet area, and hydraulic trolley stations were plotted. It was also possible to clean and paint production machines with a better view.

All the above positive outcomes on the part of the construction material product department are examples of success stories about the implementation of kaizen strategy. There for 3F was benefited from the proper implementation of kaizen strategy in terms of the above-stated dimensions.

The researcher is observed from this factory and different literatures, the first three "S"s are (Sorting, Set-in-order and Shine) implemented by kaizen team without any problem. On the contrary the rest two "S"s (Standard & Sustain) have need management's follow up. Especially Sustain is considered to be the toughest to implement. This is shown when the factory was implemented kaizen in the rest departments as factory level.

b) Waste (MUDA) elimination (7M)

As previously discussed one objectives of kaizen as seen in the literature review are to reduce waste or muda based on non-value adding activities includes removing unnecessary wastes caused by people and machine on inventories, lead time, defects, set-up time, handling, and a lot size of in the process, This could be happened by company may have more than necessary equipment, materials or people for quantity production. Muda or west elimination can be the most cost effective way of improving productivity and reducing operating costs.

At this point it is seen that the 3F had an over and outdated products, long periods of inactivity for people that waiting of product and machines, inappropriate processing, product quality defect, unnecessary inventory, excessive transportation, and unnecessary motion.

The researcher understands that all these activities were a responsibility of kaizen promotion team (KPT) or in Amharic Kelbu like Japanese quality circles approach. These teams were actively participated through open discussion, mutual understanding as a team work on 5S and &muda (7M) elimination process on their working area to build a sustainable environment. The company that implemented kaizen through KPT activities more successfully followed roadmap in installing the house keeping.

In general the following results are achieved as the result of kaizen implementation through KPT in this case company: Work place organization and space utilization improved, Wastages are decreased, Quality of product is improved, and Cost is saved in every aspect.

The studies briefly defined the benefit of kaizen management in the selected department by brought change on increasing of effectiveness and efficiency in the processes, improved visibility of the process, improved morale and safety of the employees, reduced mistakes from employees and suppliers, reduced delays, searching time in navigating the facility and locating tools, parts stored in inventory, unnecessary human motion and transportation of goods, improve

floor space utilization, improve product quality and extend equipment life through more frequent cleaning and inspection.

4.5. Before and after kaizen implementation in 3F.

After the project phase was completed, the company implemented kaizen in the rest of departments as a whole factory level with 54 KPTs, 12 Kaizen facilitators and a kaizen officer. Before started the implementation they investigated the current states of the 5S. Therefore the finding shows before kaizen was 34.84 % and need improvement to 84.96 %.

Table 4.1: 5S study in 3F before implementation

	Sort	Set in order	Shine	Standard	Sustain	Average
Finding	40.90 %	44.29 %	42.71 %	27.58 %	18.72 %	34.84 %
Plan	85.56 %	86.37 %	86.14 %	82.07 %	84.68 %	84.96 %

(Source factory data)

After the implementation all departments were actively involved in housekeeping and waste elimination and the factory achieved a result of 85.9%. This result shows that the implementation of kaizen in this factory was above satisfactory.

Table 4.2: Factory's situation before and after kaizen implementation

No	Description	Unit	Before Kaizen	After Kaizen	Result in Birr
I. "5S" indicators					
I.1	Average 5S performance evaluation point	%	34.84	85.9	59,393.00
I.2	Material used for reproduction	Pc	36	117	38,150.00
I.3	Repaired defected machines	Pc	2	5	10,000.00
I.4	Free space for production	M^2		390.1 m^2	3,901,000.00
I.5	Accident in production per month	Pc	6	1	1,400.00
II. "7M" Muda elimination indicators					
II.1	Finding information, tools & equipment	Sec	148.33	8.5	3,250.00
II.2	Raw material consumption	%	65	85	60,000.00
II.3	Other input consumption	%	45	80	30,000.00
II.4	Excessive transportation	Mt	2306	218.7	50,000.00

II.5	Unnecessary motion	Mt	935	358	70,000.00
II.6	Information interchanging time	Hr	181.33	50	22,750.00
II.7	Unnecessary inventory stock	M^2	105	16.5	62,500.00
II.8	Damaged product stock	M^2	35	7.5	77,000.00
III. Productivity indicators					
III.1	Machine breakdown repetition in month	Pc	126	10	38,000.00
III.2	Manpower productivity	%	57.5	87.5	50,000.00
III.3	Machine Productivity	%	62.8	78	26,500.00
III.4	Raw material Productivity	%	63.3	90	60,000.00
IV. Quality indicators					
IV.1	Defect of production	%	22.58	1.53	10,000.00
IV.2	Wastage of raw material	%	12.63	2.53	50,000.00
IV.3	Customer complain	pc	45	10	17,000.00
V. Other indicators					
V.1	Innovation	pc		22	27,491.00
V.2	Cost reduction	%	15.25	5.43	40,000.00
V.3	Process improvement	%	0.6	0.9	35,000.00
V.4	Reused materials	Birr		38,150.00	38,150.00
V.5	Employee creation sale	Birr		27,491.00	27,491.00
V.6	Unnecessary material sale	Birr		22,520.00	22,520.00
Total					4,827,595.00

Source (EKI, 2017)

Registered cost: Budget allocated = 23,125.00 Birr + Employees Motivation = 14,995.00 Birr

Total cost = 38,120.00 Birr

Net saved almost 4,789,475.00 Birr

According to the data collected and analyzed in this research work, implementation of kaizen in 3F Finfine Furniture Factory had highly contributed to meeting its strategic objectives on housekeeping, boosted team spirit culture and has saved almost five million Ethiopian birr. Thus, implementation of Kaizen in all departments has increased the practice of improving most of the factory's production systems and it contributed a lot to every department's improvement through reducing production cost, resource utilization and avoiding non value adding activities.

3F Finifine furniture factory was one of the competent in national kaizen implemented competition. The factory is awarded 4^{th} place out of 17 manufacturing sector competent. Beside this it was 2^{nd} place in KPTs and awarded cup and certificate.

4.6. Gap analyze in case factory

It has been a very successful activity in the past few years to improve productivity, quality, competitiveness and profitability by formulating a broad, grassroots movement of ideas through implementing, and adopting kaizen management philosophy. Results have been archived. To keep up all the above achievement and to ensure the sustainability of the results the company management has a responsible to overcome the incoming challenges. The researcher was able to find the following gap and termination of kaizen implementation in this factory through deep interview and looking different source of information.

When implementing the Kaizen approach, much of the responsibility lies with upper management. Top management acts as a driver of kaizen implementation, creating values, goals and systems to develop kaizen culture. Therefore they must be having enough knowledge of kaizen management. But the factory management was only taken the basic kaizen philosophy training at the initial stage. This knowledge was not enough to precede kaizen throughout the time.

The company's kaizen report also shows that almost all of their employees were given kaizen training on kaizen overview, 5S, problem solving and Muda identification and elimination concept for ones in the beginning of the implementation stage. This training was not given for new coming employees. In this case knowledge gap is created between the workers. Due to this their attitude and trust is changed in workplace.

The second key factor that can influence the successful kaizen implementation was managerial commitment (Bessant et al., 1994)(Imai M. , 1986). In 3F the top management commitment in having a clear corporate strategy, policies and goals that can stimulate Kaizen culture in the organization was poor.

A strong management involvement and active workers involvement are significant in ensuring successful Kaizen implementation. In this factory when the program were initially launched there was a good involvement in both sides, but after receiving the awarded of encouragement, as time went on, all managers come back to involve.

The company management did not aware employees complain regarding to his earned salary. Most of the workers had economical problem due to high cost living. Therefore they don't accept additional kaizen activities instead of the regular work.

The study was also assessed the implementation of kaizen strategies for continuous improvement in 3F Fifine Furniture Factory. The findings indicate that, company did not properly use the required regulation and problem solving mechanisms. The researcher believes that the company was not strictly follows each procedure and contents of the implementation by introducing effective standards to KPTs. One of the standards and able to cope with changing environments through implementing the Plan-Do-Check-Act (PDCA) cycle (Watson.M., 1986).The PDCA cycle ensures sustainability of improved actions. Organizations review their standards periodically by analyzing collected data and through encouraging teams to conduct problem solving activities.

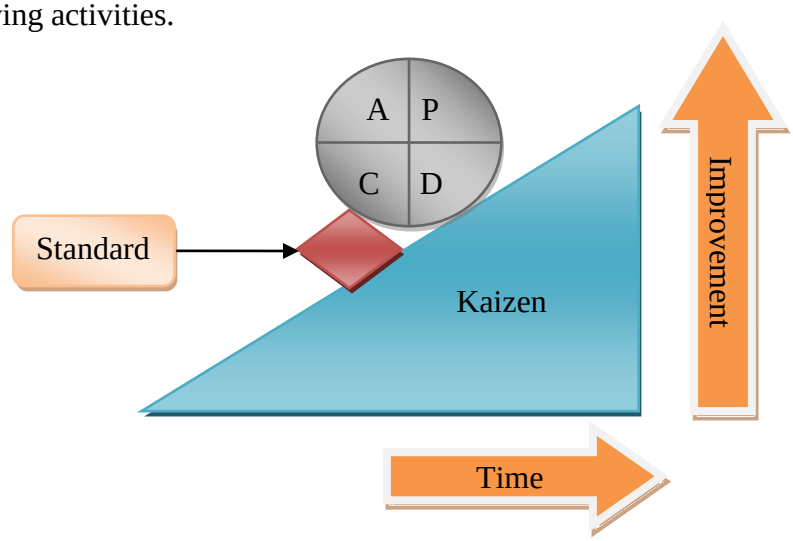


Figure 4.2: Deming Cycle for continuous improvement

- Plan - developing a hypothesis / Establishing a target and a strategy for improvement/.
- Do - run experiment / Implementation of the plan. Making or working on the product/.
- Check - evaluate results /Confirms weather the system is work or not/.
- Act - refine the experiment; then start a new cycle /standardizing the improved procedure so that it can be continued and the compliant will not return/.

CHAPTER FIVE

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

This chapter deals with the presentation, analysis and interpretation of the data collected through questionnaire, interview and document analysis from manufacturing companies operating in the Addis Ababa who agreed to participate in the research. On this research factories kaizen team leaders, kaizen facilitators and department heads are involved in order to get the relevant information about the kaizen implementation practice and successes of the implementation.

Finally, the researcher distributed 132 questionnaires in five factories and managed to collected data from 132 sample respondents. However, Out of the total questionnaire distributed, only 128 respondents were fully completed and returned the questionnaires. Likewise, five team leaders, five kaizen facilitators and ten middle and top managers were interviewed using semi-structured interviews in order to capture their views on the sustainability of the implementation. Generally, the response rate of the questionnaire was calculated as Table 5.1.is88.3%which allowed further data analysis.

Table 5.1: Returned Questionnaires from five sample factories

Factory Code	Case Company Name	Total Distributed	Total Respond	Percentage (%)
Factory 1	Universal leather product factory	30	24	80
Factory 2	Sino-Ethiopia association	23	22	95.6
Factory 3	A.A. Mugger cement factory	32	26	81.2
Factory 4	Kaliti metal products factory	30	27	90
Factory 5	Peacock shoe products factory	30	29	96.6
Cumulative total		145	128	88.3

Source: field survey output (2018)

5.1. Data presentation

In Chapter Two, the literature review conducted and discussed in detail within the concept of this study and identified several important factors for implementation and sustainability of Kaizen. These factors are arranged according to the following categories; Housekeeping (5S), waste elimination (7Muda) and kaizen implementation and sustainability survey.

The literature review conducted also identified many barriers that limit Kaizen events and other continuous improvement efforts. The most common barriers cited in the reviewed literature include:

Survey Questions

The questionnaire included categorical and open-ended background questions, as well as Likert-scale questions asking respondents to agree or disagree with statements related to Kaizen implementation and other continuous improvement practices. These questions were grouped according to the discussed objectives for this research**.** The questionnaire was created for respondents who may find it more convenient to complete with a paper form. A sample of the questionnaire with all survey questions administered is included as Appendix I - Section A to C. This questionnaire is divided in to four main groups. The first group is surveyed about the implementation of Housekeeping (5S), and the second one is surveyed about waste elimination (7Muda), the third is about kaizen implementation and the fourth is about continuous improvement (sustainability) of kaizen.

The survey questionnaires were designed based on educational levels and arranged in Amharic for kaizen team members (Kelbu) to feel and express their opinion. The remaining questionnaires are designed in English for kaizen facilitator, line leaders and department heads.

Housekeeping (5S) survey

As (Dulhai, 2008) suggested that 5S rules have immediate and significant effects on the sequence of activities, thus influencing the performance of processes in the company. It is a philosophy and checklist for good housekeeping to achieve greater order, efficiency and discipline in the workplace. In the Housekeeping (5S) survey, each S holds three questions and totally 15 questions are discussed;

Waste elimination (7Muda) survey

According to (Womack, 1990) , the seven types of waste elimination are discussed. Each type of waste has one question that the respondents are answered. There for there are seven questions.

Kaizen implementation survey

In this first part there are eight main key success factors are created from literature review on chapter two. Based on eight major criteria identified by the consultant, he developed a series of queries and analyzed the accuracy of the philosophy in the study areas. These main factors are holding 29 sub factor level questions and discussed by the respondents.

Kaizen sustainability survey

The second survey part also contain four main key success factors and have 11 subs key success factors level questions in the same manner.

Interview Questions

These interview questions reflect and build upon the findings of the literature review conducted as part of gain a deeper understanding on how continuous improvement is applied at on the case companies. Appendix 1, section D includes an expanded list of interview questions used to ask the middle and top managements as part of this case study research.

5.2. General information of the respondents.

According to the responses obtained from respondents, the characteristics of the study group were examined using IBM SPSS Version 23 and micro soft office Excel 2007.The way that use for the study is, identify the gender differences, the age difference, qualification difference, and service year's difference where they are working in current factory of the respondents which can be used as testing resource.

5.2.1. Distribution of the Respondents

Table 5.2: Distributions of the Respondents by Sex

Item		Respondents (N=128)										Total	
		Factory 1 (N=24)		Factory 2 (N=22)		Factory 3 (N=26)		Factory 4 (N=27)		Factory 5 (N=29)			
		F	%	f	%	f	%	f	%	f	%	f	%
Sex	Male	23	95.8	11	50	20	76.9	26	96.3	15	51.72	95	74.2
	Female	1	4.2	11	50	6	23.1	1	3.7	14	48.28	33	25.8
	Sub Total	24	100	22	100	26	100	27	100	29	100	128	100

Source: field survey output (2018)

As can be seen in the above tables, out of the128 (100%) respondents, 95(74.2%) were male and 33 (25.8%) were female. There for, the largest numbers of respondents were men, and there is two times less women's participation in the case factories.

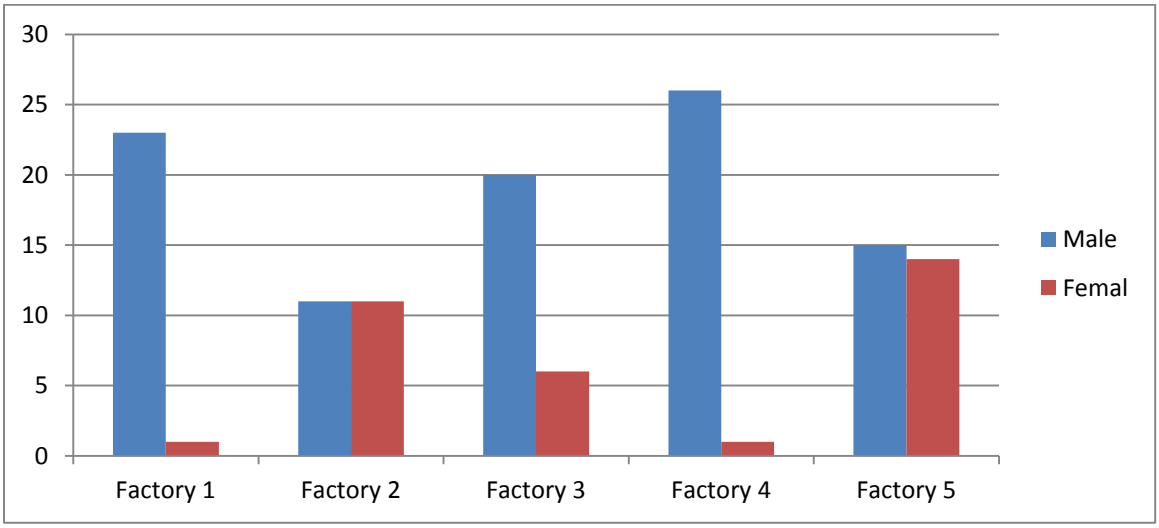


Figure 5.1: Distribution of the Respondents by gender Source: field survey output (2018)

Table 5.3: Distributions of the Respondents by Age

Item		Respondents (N=128)										Total (N=128)	
		Factory 1 (N=24)		Factory 2 (N=22)		Factory 3 (N=26)		Factory 4 (N=27)		Factory 5 (N=29)			
Age	Years	f	%	f	%	f	%	f	%	f	%	F	%
	26–35	8	33.3	7	31.8	5	19.2	8	29.7	15	51.7	43	33.6
	36–45	7	29.2	12	54.6	13	50	7	25.9	11	37.9	50	39
	46–55	6	25	3	13.6	8	30.8	9	33.3	2	6.9	28	21.9
	Above 55	3	12.5	0	0	0	0	3	11.1	1	3.5	7	5.5

Source: field survey output (2018)

With regard to age of the respondents, 39 % of the respondents were aged from 36-45 years. These show that more than one third of the employees were in the mature age category. Besides, this 33.6 % of the employees were 26-35 years in young age category. Therefore, this show mostly in the sample factories work is done by young and adults respectively.

When the samples of factories are being tested individually, indicating that Peacock shoe products factory (factories 5) use half of the sample size is youth, and Sino-Ethiopia association (factory 2) is using adult man power for production work;

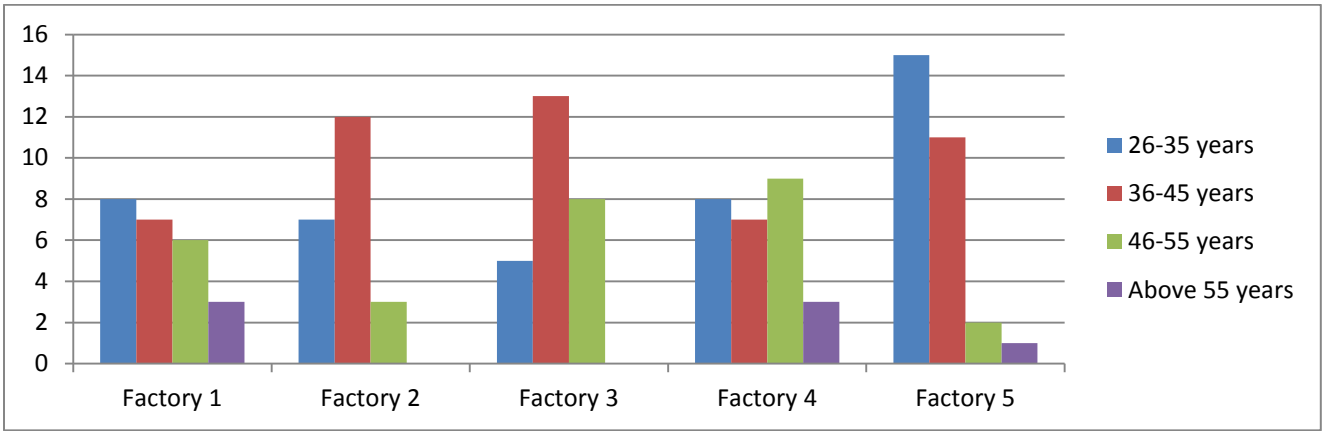


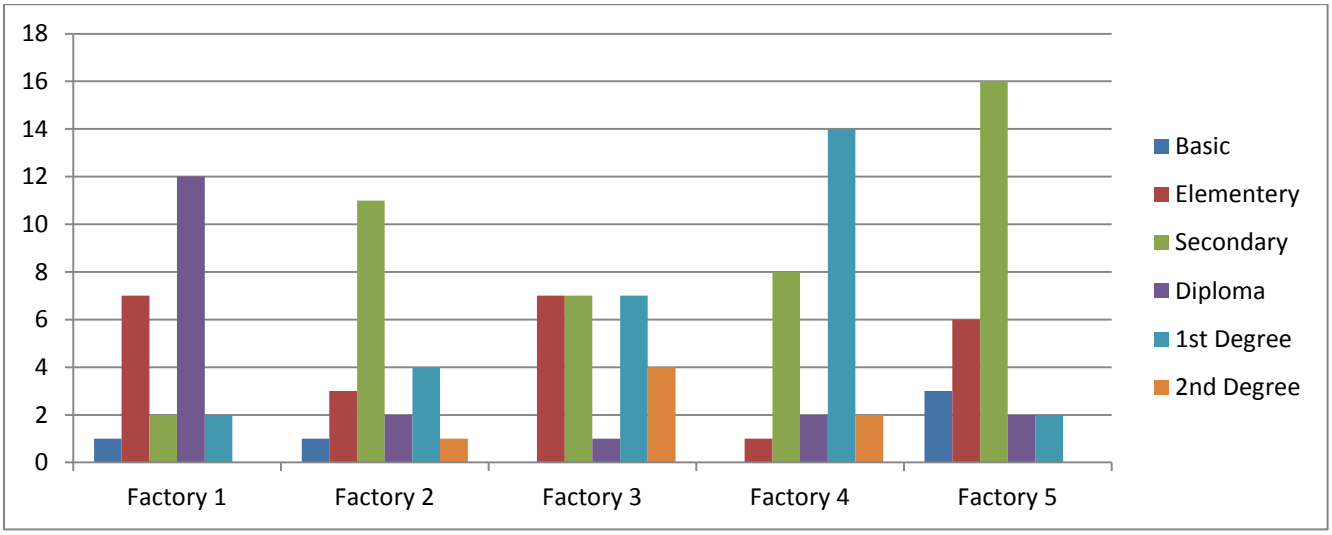
Figure 5.2: Respondents by Age

Table 5.4: Distributions of the Respondents by Qualification

Item		Respondents										Total	
		Factory 1		Factory 2		Factory 3		Factory 4		Factory 5			
		F	%	f	%	f	%	f	%	f	%	f	%
Qualification	Basic	1	4.2	1	4.6	0	0	0	0	3	10.3	5	3.9
	Elementary	7	29.2	3	13.6	7	26.9	1	3.7	6	20.7	24	18.8
	Secondary	2	8.3	11	50	7	26.9	8	29.6	16	55.2	44	34.3
	Diploma	12	50	2	9	1	3.9	2	7.4	2	6.9	19	14.8
	1st Degree	2	8.3	4	18.2	7	26.9	14	51.9	2	6.9	29	22.7
	2nd Degree	0	0	1	4.6	4	15.4	2	7.4	0	0	7	5.5
	Total	24	100	22	100	26	100	27	100	29	100	128	100

Source: field survey output (2018)

With the total respondent, 34.3 % of them completed secondary school and 22.7 % of them completed Bachelor's degree. This result shows, education is significant for sustainability of kaizen.



Source: field survey output (2018)

Figure 5.3: Respondents by Qualification

5.2.2. Technical information of the respondents

In this topic eight questions were presented (QB1-QB8) to know the general knowledge of the respondent. Based on this query stated on Appendix I, respondents were asked that, have they enough knowledge about Kaizen? How often they were given training for continuous improvement activities? Dose kaizen brought radical change in their company and what was the result of change? Does the management support kaizen initiatives? How often they were meeting and implement kaizen group activities? According to table 5:5, the response out of the total respondents 59% of the respondents are answered "yes I have good knowledge" and 40% of the respondents are answered "I have a little knowledge" for the first question. This result shows almost half of the total respondents have better kaizen knowledge, but they need further training.

For question number two out of the total respondents, 47% of the respondents are answered the training is given for them "yearly" and 28% "quarterly". 25% of the respondents said that they would receive no training, and this results show it need further training for sustainable kaizen.

For question number three, 88 % of the total respondents agree that kaizen is brought radical change in working area, in quality of production and in west reduction.

For question number six, 85% of the total respondents agree that there is management support for implementing kaizen activities.

Finally for question number seven and eight, 100% of the respondents stated that, they have a time table to meet their goal and the meeting day is stated. 52% of the total respondent "weekly" and 34% is "within two weeks" respectively. There for regular meeting day is very important for sustainability of kaizen.

Table 5.5: Distributions of Technical information

Factory	Section B-Q1				Section B -Q2				Section B-Q3			Section B- Q6				Section B-7			Section B -Q8				
	f			N	f			N	f		N	f			N	f		N	f				N
	a	b	c		a	b	c		a	b		a	b	c		a	b		a	b	c	d	
1	11	12	1	24	4	4	16	24	20	4	24	18	4	2	24	24	0	24	1	5	17	1	24
2	16	6	0	22	16	2	4	22	22	0	22	21	1	0	22	22	0	22	0	5	17	0	22
3	14	12	0	26	0	21	5	26	23	3	26	21	2	3	26	26	0	26	1	22	0	3	26
4	22	5	0	27	3	23	1	27	24	3	27	25	0	2	27	27	0	27	0	18	5	4	27
5	12	16	1	29	13	10	6	29	24	5	29	24	3	2	29	29	0	29	1	16	5	7	29
N	75	51	2	128	36	60	32	128	113	15	128	109	10	9	128	128	0	128	3	66	44	15	128
%	59	40	1	100	28	47	25	100	88	12	100	85	8	7	100	100	0	100	2	52	34	12	100

Source: field survey output (2018)

5.3. Kaizen implementation and sustainability survey result

The selected key success factors are grouped in to two main divisions. The first group is the implementation part and the second group is the sustainability part.

In implementation part the researcher first surveyed how the Housekeeping "5S" application works and how to reduce the amount of west"7M" in the sample case factories. And finally the researcher analyzed the key success factors which are driven from the literature.

5.3.1. Five "S" activities responses for kaizen pillars factor

As (Dulhai, 2008) suggested that "5S" rules have immediate and significant effects on the sequence of activities, thus influencing the performance of processes in the company. It is a philosophy and checklist for good housekeeping to achieve greater order, efficiency and discipline in the workplace. In the Housekeeping "5S" survey, each "S" holds three questions as shown in Appendix I.

Table 5.6: Five "S" activities responses

Question	Factory 1		Factory 2		Factory 3		Factory 4		Factory 5		Average	
	μ	S.D	μ	S.D	μ	S.D	μ	S.D	μ	S.D	μ	S.D
1"S" Sorting Activities responses												
1	4.25	0.442	4.45	0.912	4.5	0.51	4.22	1.251	3.14	1.684	4.11	0.960
2	3.88	0.947	4.45	0.739	3.5	0.906	4.22	1.251	3.38	1.237	3.89	1.016
3	3.71	1.488	4.23	1.02	3.27	1.511	4.33	1.271	2.38	1.699	3.58	1.398
Avg.	3.95	0.959	4.38	0.89	3.767	0.976	4.26	1.258	2.97	1.54	3.87	1.125
2"S" Setting in order Activities responses												
4	3.88	1.569	4.77	0.528	4.19	1.059	4.11	1.476	3.38	1.613	4.07	1.249
5	3.88	1.296	4.32	0.945	4	0.98	4.11	1.476	3.21	1.473	3.90	1.234
6	3.96	0.69	4.45	0.912	3.81	0.801	4	1.271	3.17	1.627	3.88	1.060
Avg.	3.91	1.185	4.513	0.795	4	0.947	4.073	1.407	3.253	1.571	3.95	1.181
3"S" Shining Activities responses												
7	3.88	1.465	4.64	0.79	4.08	1.23	4.22	1.251	3.28	1.601	4.02	1.267
8	4.33	1.523	4.05	1.327	2.46	1.555	4.22	1.251	2.66	1.778	3.54	1.487
9	3.46	1.318	4.27	1.162	3.92	0.845	3.7	1.05	2.86	1.597	3.64	1.194
Avg.	3.89	1.435	4.32	1.093	3.487	1.21	4.05	1.184	2.933	1.659	3.74	1.316
4"S" Standardizing Activities responses												
10	4	0.978	4.5	0.74	3.54	1.303	4.11	1.219	3.21	1.612	3.87	1.170
11	4.38	1.013	4.64	0.492	4.04	0.999	4	1.441	3.45	1.617	4.10	1.112
12	3.71	1.197	4.55	0.912	3.15	1.223	3.44	1.368	2.66	1.675	3.50	1.275
Avg.	4.03	1.063	4.563	0.715	3.58	1.175	3.85	1.343	3.11	1.635	3.83	1.186
5"S" Sustaining Activities responses												
13	4	1.445	4.18	1.14	2.65	1.468	3.89	1.396	3.28	1.36	3.60	1.362
14	3.88	1.262	4.32	1.041	3.54	1.104	4	0.832	3.28	1.601	3.80	1.168
15	4.13	1.076	4.41	1.054	2.85	1.255	3.33	1.271	3.14	1.457	3.57	1.223
Avg.	4	1.261	4.3	1.078	3.01	1.276	3.74	1.166	3.23	1.473	3.66	1.251

Source: field survey output (2018)

As it is indicated in the Table 5.6, the summarized mean and standard deviation for 5 "S" factors of kaizen implemented were calculated. This has mainly been prepared to check the outcomes regarding 5 "S" activities results in terms of meeting the first phase kaizen implementation objectives and improving the factory's working areas and resource utilization in each factory.

Sorting Activities responses -1st "S"

On the basis of appendix I. section C. regarding to the first "S" sorting, the following three questions were examined. Did team clear all items not needed on workplace boundaries? Did

Sorting criteria established? And did local red tag area designated with red floor marking tape or comparable boundary?

The above Table 5.6 answered that, sorting in "Factory 2" has the highest mean 4.38 and a standard deviation of 0.89. Sorting in this company has highest mean value when compared other case factories. And it indicates sorting activity is fully operational in the company when compared with other case companies. "Factory 4" is the second place to score highest mean value of 4.26 and a standard deviation of 1.258 performed sorting in the working area. "Factory 1" is the third place where implemented sorting activities with mean value of 3.95 and a standard deviation of 0.959. "Factory 3" scored a mean value of 3.767and a standard deviation of 0.976. According to these results the above four factories that have a responses lies on the range of "agree" by the respondents'. This shows sorting is well performed in these factories.

"Factory 5" scored "neutral" by the respondents' with a minimum mean value of 2.97and a standard deviation of 1.54. In "Factory 5" sorting is not performed properly when compared to other companies.

Setting in order Activities responses - 2nd "S"

The second "S" setting in order also discussed about the Kelbu (kaizen team) arranges and label needed items so that they are easy to use, improvement opportunities listed, discussed, and prioritized and ideas for making the workplace more visually instructive.There for, "Factory 2" has a highest mean value is 4.51 and standard deviation of 0.0.795.A response "strongly agree" by the respondents'. "Factory 4" is the second place to score highest mean value of 4.073and standard deviation of 1.407,"Factory 3" also scored a mean value of 4.0 and standard deviation of 0.947. "Factory 1" and "Factory 5" scored a mean value of 3.91, 3.253 and standard deviation of 1.185, 1.571in descending orders respectively. From the registered result, setting in order ranked on the range of "agree" by the respondents'. This highest mean value shows that setting in order activities is well done in all sample companies.

Shining Activities responses – 3rd "S"

Regarding this activities, the main tasks were, does the kaizen team keep things in a good condition to be used when needed? Is there proper distribution of personal protective equipment? And is there observation sharing among kaizen team members about inspection activities?

According to Table 5.6 the response indicate two factories "Factory 2" and "Factory 4" have registered "Agree" by the respondent with a mean value of 4.32,4.05 and standard deviation of

1.093, 1.184 respectively. "Factory 1" and "Factory 3" have registered third and fourth with a mean value of 3.89, 3.49 and standard deviation of 1.435, 1.21. These result shows the respondents lies on the range of agree in shining activities is done in their work stations. But "Factory 5" has registered lies on the range of neutral with a mean value of 2.933 and standard deviation of 1.659.

Standardizing Activities responses – 4th "S"

This activity include the companies standardize to integrate the above three activities (sorting, setting in order and shining) into a unified whole, ideas generated for establishing standard operating procedures and documentation created and updated. According to Table 5.6 the following results were registered.

"Factory 2","Factory 3","Factory 2","Factory 2" and "Factory 2" scored a mean value 4.563, 4.03, 3.85, 3.58 and 3.11 and standard deviation 0.715, 1.063, 1.343, 1.175 and 1.635 as descending order respectively. These results indicate for the first company has a response lies on the range of "strongly agree" and for others companies' responses lies on the range of "agree" by the respondents'. There for it indicates, all factories are performed standardization in a better way than other "S".

Sustaining Activities responses - 5th "S"

Regarding to this requirement the following main issue were discussed. Dose the company making a habit of maintaining procedures and discipline to avoid backsliding? Dose ideas generated for continuously improving? Doses sustain methods clearly defined?

The result on sustaining shows that "Factory 2", has registered a mean value of 4.3 and a standard deviation of 1.078. "Factory 1", has registered with a mean value 4.0 and standard deviation 1.261. "Factories 4", "Factory 5" and "Factory 3" have a mean value of 3.71, 3.23 and 3.01and standard deviation of 1.166, 1.473 and 1.276 respectively. These results show all companies have a response lies on the range of "agree".

As in the literature discussed, the sustain part is more difficult to implement in deferent sector. Even though, the above analysis indicates that sustaining activities are successfully implemented on the case companies.

Based on the result, it can be deduced that kaizen implementation using 5"S" has helped the factories to achieve improvements in light of such parameters as organization of work place, cost reduction and wise utilization of time and other resources.

5.3.2. "7M" waste elimination activities responses

As (Womack., 2003) Kaizen focused on eliminating waste (Muda) and losses from the processes. According to his discussion waste as any activity that creates or adds no value to the process defined by ultimate customer. The seven types of waste (Muda) caused by: overproduction, unnecessary inventory, inappropriate processing, unnecessary motion, excessive transportation, defects and waiting.

Table 5.7: Summarized Seven "M" MUDA elimination activities output

Factory	Muda1		Muda2		Muda3		Muda4		Muda5		Muda6		Muda7	
	μ	S.D	μ	S.D	μ	S.D	μ	S.D	μ	S.D	μ	S.D	μ	S.D
1	3.88	1.3	3.21	1.56	3.83	1.17	2.75	1.42	2.71	1.55	3.29	1.46	2.96	1.81
2	4.41	0.91	4.59	0.73	4	1.35	3.95	1.13	4.18	1.18	3.59	1.5	4.14	1.13
3	3.85	1.32	3.69	1.41	3.38	1.36	2.27	1.25	2.42	1.33	2.81	1.27	2.73	1.15
4	3.44	1.81	3.78	1.34	3.33	1.27	3.22	1.65	3.22	1.16	3.22	1.42	3.44	1.37
5	2.83	1.77	2.9	1.9	2.72	1.56	2.45	1.62	3.31	1.51	2.24	1.43	3.24	1.57
Avg.	3.68	1.42	3.63	1.39	3.45	1.34	2.93	1.41	3.17	1.35	3.03	1.42	3.3	1.4

Source: field survey output (2018)

On table 5.7, the summarized mean and standard deviation score for waste reduction activity of kaizen implemented factors were calculated. The highest level of muda was reported for muda of overproduction and unnecessary inventory with a mean value 3.68 and 3.63 which lies on the range of "agree". On the other the rest of muda were rated lies on the range of "Neutral". As regarded the sample factories, the level of all the seven types of waste in the company's production process needs an improvement.

5.3.3. Questionnaire Survey Findings

Respondents were asked different questions regarding the key success factors (see appendix II, 1-40) affecting for kaizen implementation and kaizen sustainability activity. Based on the responses on the survey their responses are organized and the key success factors of the Kaizen Implementation evaluated according to "Table 5.9" survey result in the following manner.

Table 5.8: Summarized Key success Factor result

Key Factor	Factory 1		Factory 2		Factory 3		Factory 4		Factory 5		Average	
	(μ)	S.D	(μ)	S.D	(μ)	S.D	(μ)	S.D	(μ)	S.D	(μ)	S.D
KSF.1	3.68	0.361	3.80	1.234	3.48	0.778	3.32	0.333	3.79	1.207	3.61	0.782
KSF.2	3.73	0.462	4.18	0.129	3.69	0.351	3.92	0.133	3.79	0.414	3.86	0.298
KSF.3	3.41	0.217	3.93	0.217	3.65	0.284	3.67	0.475	3.45	0.892	3.62	0.417
KSF.4	3.75	0.295	4.27	0.129	3.23	0.435	3.56	0.471	3.69	0.439	3.70	0.354
KSF.5	2.75	0.273	2.94	0.501	2.86	0.357	2.35	0.278	1.68	0.000	2.52	0.282
KSF.6	3.51	0.399	3.59	0.841	3.80	0.707	3.72	0.758	2.35	0.939	3.39	0.729
KSF.7	3.79	0.057	4.09	0.127	3.89	0.375	4.19	0.163	3.09	0.658	3.81	0.276
KSF.8	2.75	0.000	2.91	0.000	2.96	0.000	3.78	0.000	2.62	0.000	3.00	0.000
KSF.9	3.88	0.233	4.28	0.516	3.5	0.212	4.17	0.028	3.85	0.658	3.93	0.330
KSF.10	3.28	0.559	3.96	0.191	3.56	0.41	3.56	0.410	3.85	0.658	3.64	0.446
KSF.11	2.46	0.274	4.00	0.127	3.77	0.269	4.15	0.182	3.69	0.358	3.61	0.242
KSF.12	2.65	0.186	3.88	0.208	2.63	0.183	3.31	0.330	2.52	0.764	3.00	0.334

Source: field survey output (2018)

Part I. Factors for kaizen implementation activity

KSF.I. Survey result of Key success Factor of Education and training

In education and training evaluation, four key success factor questions are prepared. They are "Regular training", "skill manpower", "knowledge transfer" and "appropriate methodology". From these success factors (shown in Appendix III) "Regular training" ranked the first place with score an average mean 4.1328. The second and third ranked are "skill manpower" and "knowledge transfer" with an average mean value 4.0469 and 3.75 respectively. These are the most significant success factor to implementing kaizen and sustainability. The fourth factor "appropriate methodology" is scored a mean value 2.51. Which means the question was need negative response, because they are experienced using appropriate methodology for problem solving in all sample factories (refer to Appendix III).

Concerning the response to the first criterion "education and training" is provided by each factory result presented in Table 5.8,"Factory 2" and "Factory 5"have scored the highest value of a mean value 3.8 and 3.79 and standard deviation of 1.234 and 1.207 respectively. , "Factory 1", "Factory 3", and "Factory 4"scored from third to fourth place with mean value3.68, 3.48 and 3.32 and standard deviation of 0.361, 0.778 and 0.333 respectively. In all factories the response of the respondents' lies on "Agree" level.

Generally, the first main key success factor (KSF.I) is ranked fifth place with average 3.61 mean values and applied in all factories and they are significant success factor to implementing kaizen and sustainability. It appears that all the identified success factors extracted from literature are seen to be important in the implementation process. Therefore the response from all factories confirms that education and training is very important not only kaizen implementation but also for kaizen sustainability.

KSF.II. Survey result of Key success Factor of Commitment

Regarding to the second main key success factor of commitment, four key success factors are included. These are "management commitment", "employee commitment", "set the right mindset" and "Employee attitude". From Appendix III, the most significant ranked key success factor is "set the right mindset". This factor is scored an average mean value of 4.0234. The rest "management commitment" with mean value 3.9688, "Employee attitude" with average means value of 3.8594 and "employee commitment" with mean value of 3.5625 ranked in ascending order.

According to table 5.8, this factor is ranked the first place with 3.86 average mean values. Commitment is very essential in all factories. The management and employee are committed during the implementation and kaizen continuity period. All companies reply "Agree" that, commitment is essential factor for kaizen implementation. It is one of the key factors that influence the successful kaizen implementation (Bessant et al., 1994).

KSF.III. Survey result of Key success Factor of Involvement

To evaluate this topic, five key success factors are included. Top Management involvement, Employee involvement, Teamwork, Customers involvement and expert involvement are the key

success factors. According to the respondent presented in Appendix III, "Employee involvement" is ranked the first place with a mean value of 4.0625. Without employee involvement kaizen implementation is not achieved the required results.

The role of all the above involvement in kaizen implementation has shown in average yield shown in Table 5.8. The best involvement is shown in "Factory 2" with a mean value of 3.93 and standard deviation of 0.217. The rest factories registered mean and standard deviation value according to their descending order is "Factory 4", "factory 3", "Factory 5" and "Factory 1"with a mean value 3.67, 3.65, 3.45 and 3.41 and standard deviation of 0.475, 0.284, 0.892 and 0.217 respectively. Involvement has ranked fourth place with responses average mean value of 3.62. As the survey response all sample factories agreed by, management commitment is the fourth most essential prerequisites in aiding any of the desired productivity improvement initiatives in kaizen management.

KSF.IV. Survey result of Key success Factor of Communication

Regarding to communication, two key success factors are included. These are Coordination between departments and Cross-functional integration. All factories are responded more than just average. Therefore communication is critical to the work processes. According to the result on the Table 5.8, factory 2 has best mean value that is 4.2727and standard deviation 0.12855. The rest factories have a mean value in their order are, factory 1, factory 5,factory 4 and factory 3 with mean value 3.75, 3.689, 3.555 and 3.23 and standard deviation of 0.2945,0.438, 0.4714 and 0.435 respectively.

The survey result shows, communication scored an average mean value 3.7 and standard deviation 0.354. Communication is ranked third place and it is an important factor in successful kaizen implementation (Kumar et al, 2009).

KSF.V. Survey result of Key success Factor of Resources

In this factor, three key success factors are included. These are time, finance and spaces constraint. This factor is ranked the last eighth place with average mean values of 2.52. According to the response result the factor is not more important for kaizen implementation.

KSF.VI. Survey result of Key success Factor of Organizational objectives

Under this main factor, six small key factors are included. These are culture, organization structure, management structures, infrastructure, work process, safety and project prioritization.

As illustrated in Table 5.8, except "factory 5" the others sample respondent factory's response scale of all item lie on the range of "agree". In "factory 5" the above key successes factors lie on "disagree" with mean value 2.35 and standard deviation of 0.939. This result indicates that, kaizen implementation in this factory not insure the improvement as they expected.

The rest are arranged in their order of degree like, factory3, factory 4, factory 2, factory 1 and factory 5 have the highest to lowest mean. That is mean 3.7985, 3.7175, 3.5852, 3.505 and 2.3535 and standard deviation of 0.7.662, 0.758, 0.8414, 0.3985 and 0.9386 respectively.

According to the response result, this factor ranked sixth place with average responses mean value of 3.39 and standard deviation of 0.729. This means kaizen implementation in these sample factories contributed working culture, work process, and job security improvement.

KSF.VII. Survey result of Key success Factor of Leadership

The leadership included manager's approach and team leaders as shown in the Appendix II. All respondents' response lies on "Agree" level. "Factory 4" has the highest 4.19 mean value and 0.163 standard deviation result. "Factory 2" has the next with mean value of 4.09 and standard deviation of 0.127. The other factories "Factory 3", "Factory 1" and. "Factory 5" has a mean value 3.89, 3.79, and 3.09 and standard deviation of 0.375, 0.057, and 0.658 respectively with their descending order.

According to the response, leadership ranked the second most significant factor for kaizen implementation. This factor recorded an average mean value 3.81and standard deviation of 0.276.This factors contributing to the success of kaizen sustainability in all sample factories and plays a critical role in bringing about any change in the existing organizational systems and culture.

KSF.VIII. Survey result of Key success Factor of Globalization

As shown in the Table 5.8, globalization scored an average mean value of 3.00 and ranked seventh place. Globalization had no impact in all factories for influence the implementation of kaizen outcome. That is why the response indicates "Neutral" level. But only "factory 4" has influenced by globalization. This factor is not fully represents all manufacturing factories.

Part II. Factors for kaizen sustainability activity

KSF.IX. Survey result of Key success Factor of Standardization

Under this main factor, documentation and clear standards are considered. From the Table 5.8, the respond are above 3.5 mean value, specially two factories have scored high 4.28 and 4.17 mean value. Therefore, according to their decreasing order "Factory 2", "Factory 4", "Factory 1", "Factory 5" and "Factory 3" have mean value 4.275, 4.17, 3.875, 3.845 and 3.5 and standard deviation of 0.5162, 0.02828, 0.2333, 0.6576 and 0.2121 respectively.

The average means value in all sample factories lies on "Agree" with mean value of 3.93 and ranked the first place for kaizen sustainability.

As stated Asayehgn Desta (2014), benefits of standardization could a) help the company optimizes operations, save cost and improves profits, b) enhance customer satisfaction and increase sales, c) increase market share, and d) reduce negative impacts on the environment. Therefore this factor is very essential part for continuous improvement.

KSF.X. Survey result of Key success Factor of Performance Measurement and evaluation

According to Table 5.8, the registered survey result fails on "Agree" level with mean value 3.64 and standard deviation of 0.446 and ranked in second place for kaizen sustainability. In this evaluation part ineffective performance and periodical evaluation using PDCA and other tools are examined. Based on the survey result all sample factories are used periodical evaluation of kaizen activities with PDCA cycle approach extensively for process control and continuous improvement. Therefore all factories confirmed that, the factor is very essential for kaizen sustainability.

KSF.XI. Survey result of Key success Factor of Strategy planning

Strategy planning is one of the sustainability factors. In this survey clear corporate company strategies, developing a culture of continuous improvement, Establishment of long-term plan and established policies factors are included (refer to Appendix III). The obtained response is in level of "agree" with an average mean value of 3.61. "Factory4" and "Factory2" have better strategy plan than other sample factories. They have a mean value of 4.15 and 4.00 respectively. The

other factories have the mean value between 2.46and3.69. This key success factor is ranked third place and it is very important to outline where an organization wants to go. Strategic plans outline an organization's intended approach for achieving its mission.

KSF.XII. Survey result of Key success Factor of Motivation

This factor is associated with people and all employees' encouragement. In this main factor rewards and recognition, freedom and job satisfaction are included. The average mean value given by respondents' is 3.00 this result ranked the fourth place for sustainability and lies on the range of "Neutral". Since the case companies have already established evaluation system, but, it needs further effort for kaizen sustained journey.

Generally, all the above mentioned key success factors are significant for kaizen implementation and sustainability and confirmed by all sample factories. Globalization is one of the factors that influence kaizen implementation and sustainability, but in this study, this factor is not common for all factories. Some factories have no direct relation with globalization.

5.4. Conceptual frame work

According to respondents' survey, all factors are ranked in descending order in their categories as follow in the frame work.

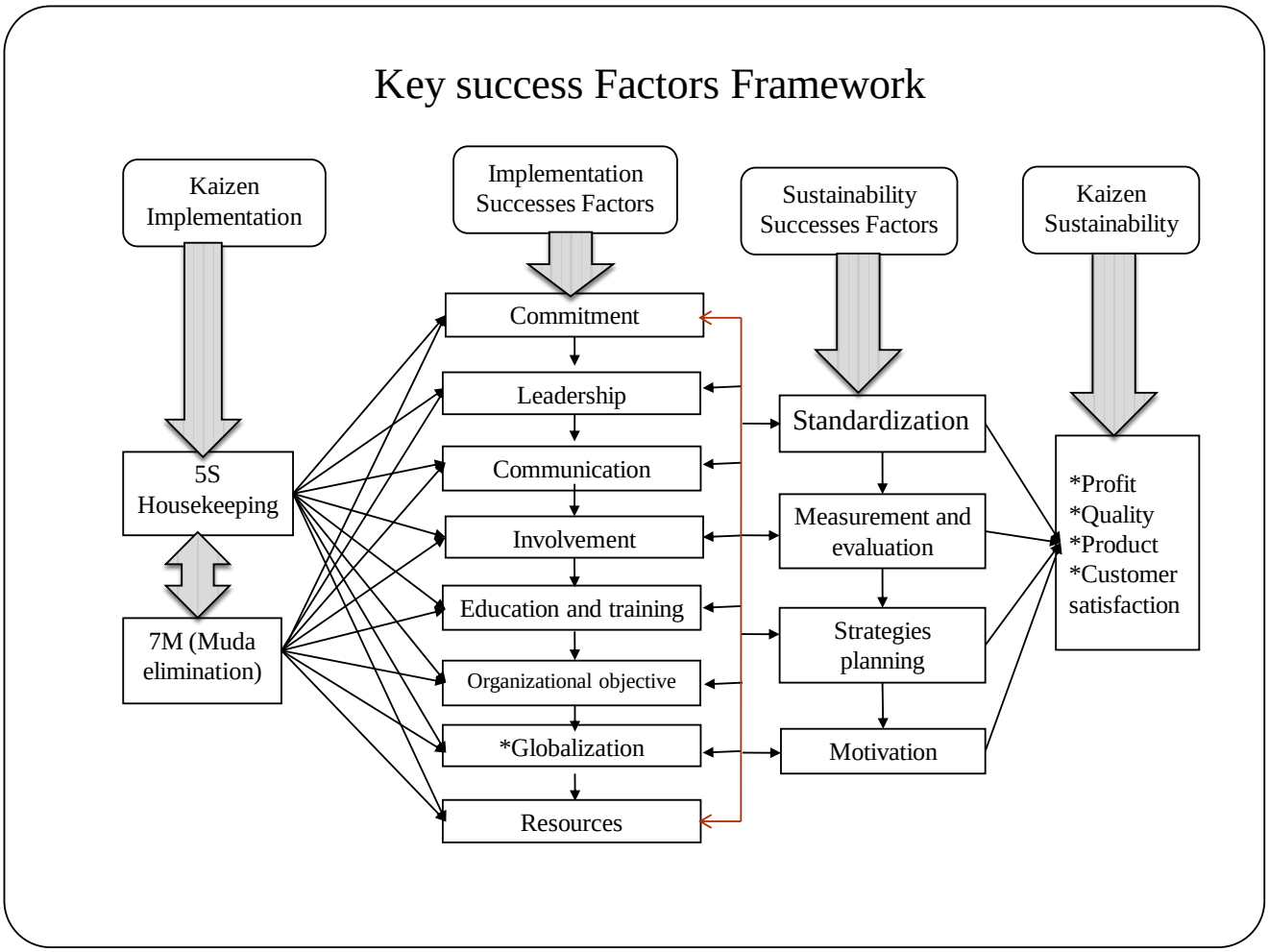


Figure 5.4: Conceptual frame work

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

This chapter deals with summary, conclusions and recommendation of the research. The summary part gives brief discussions of the study. The second conclusions section it presents the major findings. The last part presents potential recommendations that the researcher believes could be good for the Factory and any other beneficiaries.

6.1. CONCLUSIONS

This study provides an insight into some selected factors in ensuring a successful Kaizen implementation and its sustainability in Addis Ababa manufacturing companies. This study deals an appropriate analysis and evaluation of the current kaizen implementation and challenge toward sustainability in six sample factories based on the identified key success factors.

The study took two basic ideas. The first study was done on a case company, which was interrupted kaizen implementation and the second was five sample factories those have a good experience on sustaining of kaizen implementation.

According to the data collected and analyzed in this research work, implementation of kaizen in 3F Finfine Furniture Factory has highly contributed to meeting its strategic objectives on housekeeping, boosted team spirit culture and has saved almost five million Ethiopian birr. Thus, implementation of Kaizen in all departments has increased the practice of improving most of the factory's production systems and it contributed a lot to every department's improvement through reducing production cost, resource utilization and avoiding non value adding activities.

Even if all the benefits of the above are found in the factory, the kaizen implementation program has been terminated for a number of reasons after two years. The reasons for interrupted kaizen management are, lack of problem solving culture in the factory, lack of follow up and support by top managements, failure to provide good mobility to the well-being of others, lack of training

for rehabilitation and new staff, the existence of key success factors that are considered as essential for the successful adaptation did not meet the requirement.

According to Ethiopian kaizen institute evaluation report, an evaluation was undertaken with 25 companies in and Addis Ababa and its environs that Kaizen implemented from 2005 up to 2009.In this survey, 15 out of 25 evaluated companies was discontinued the implementation.

Overall, the review shows that the trend in Addis Ababa and around industries have been discontinued and reversed, this is because lack of the management support towards the sustainability of kaizen, absence of ownership, lack of follow-up and shortage of monitoring and supervision by kaizen facilitators.

According to the data collected and analyzed in sample factories which have more experience and strength to sustainability research work, the developed key success factors are highly contributed to meeting implementation and sustainability of kaizen in all factories.

On the basis of the findings, the first phase housekeeping activities using these identified key success factors has been successfully implemented in all sample factories. Therefore, Kaizen has paved the way for the factories' bright future through mobilizing resources, enhancing management members work commitment, facilitating team building. Much more, the employees' attitude towards teamwork has been improved; that is, it has been possible to create effective team and work accomplishment. Furthermore, as has been discussed in the data analysis, Kaizen implementation in sample factories has brought significant achievements on workers attitude and working environments.

The personal interviews and questioners response shows implementation of Kaizen has increased the practice of improving the sample factories' systems contributed a lot to every department's improvement through reducing production cost, applying wise resource utilization,

minimizing waste that non value added activities 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.

In general, kaizen is an endless journey; all manufacturing factories that have interrupted the implementation must work hard and return to this philosophy. Because, kaizen has helped the factories to improve their working environment; productivity as well as production cost.

6.2. RECOMMENDATION

Based on the findings and conclusions of the study, the researcher would like to forward the following recommendations in the hope that it may help to ensure successful Kaizen implementation and kaizen sustainability.

- The factories give special attention to understand these basic key success factors and providing effective training within a specified time frame when implements kaizen management.
- The factories must be devoted to change existing working culture by breaking down the barrier between the management and shop-floor workers in order to engage the organization's employees towards common strategies that will alleviate the current productivity measurement and improvement practices.
- Facilitators and leaders of the company should establish evaluation systems to measure the performance of the employees.
- The company should follow the problem solving 5W1H analysis and PDCA cycle approach extensively for process control and improvement.
- Ethiopian Kaizen Institute must have scheduled visiting program in all kaizen implemented origination to give his assistance when it needed.

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Appendix I: Questionnaire

Section A. General Information

Instructions: Please answer by making a tick **(√)**

1. Kindly indicate your gender.
   a) Male ( ) b) Female ( )
2. Which one best describes your age?
   a) 18-25 years ( ) b) 26-35 years ( ) c) 36-45 years ( ) d) 46-55 years ( )
   e) above 56 years ( )
3. Kindly indicate the highest level of your education.
   a) Basic Education ( ) b) Completed Elementary School ( ) c) Completed High school ( ) d) Diploma ( ) e) Undergraduate ( ) f) Masters ( ) g) Doctor ( )
4. For how long have you worked for your current Company?
   a) 0 – 5 years ( ) b) 6 – 10 years ( ) c) 11 – 15 years ( ) d) 15 – 20 years ( )
   e) above 20 years ( )
5. How long has your company been using Kaizen management
   a)1 year ( ) b) 2 years ( ) c) 3 years ( ) d) 4 years ( )
   e) 5 years ( ) f) above 6 years ( )

Section B. Technical questions

1. Do you think you have enough knowledge about Kaizen?
   a) Yes I have good knowledge ( ) b) I have a little knowledge ( )
   c) I don‘t have any knowledge ( )
2. How often the employees have training for continuous improvement activities?
   a) quarterly b)yearly c) never
3. Do you think Kaizen has brought radical change in your company?
   a) Yes it can bring ( ) b) No I don‘t think so ( )
4. If your answer is ‟ yes” for question number 3, what are the radical changes?
   Explain…….…….

……

……

5. If your answer is " no" for question number 3, Why?

   Explain……...

   ……

   ……

6. Does the management support 5S kaizen initiatives?

   a) Yes ( ) b) No ( ) c) Don't know ( )

7. Is there a typical timeline for teams to meet their work goals?

   a) Yes ( ) b) No ( )

8. If your answer for 7 is yes, How often Kaizen group activities?

   a) Daily ( ) b) weekly ( ) c) two weeks ( ) d) monthly ( )

Section C. Kaizen Implementation and sustainability Key success factors evaluation

Use the scale given below to appropriately answer the questions that follow by ticking **(√)** accordingly.

1= Strongly Disagree, 2= Disagree, 3= Neutral 4= Agree, 5= Strongly Agree

A. 5 "S" and "Muda" /waste/ elimination activities

Pillars	5"S" and 7 "Muda" /waste/ elimination activities	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
		1	2	3	4	5
Sorting	Team clear all items not needed on workplace boundaries					
	Sorting criteria established (e.g., frequency of use; actual quantity needed-no buffer)					
	Local red tag area designated with red floor marking tape or comparable boundary					
Setting in	The Kelbu arranges and label needed items so that they are					

order	easy to use.					
	Improvement opportunities listed, discussed, and prioritized					
	Ideas for making the workplace more visually instructive					
Shining	The Kelbu keep thing shine in a condition so it is ready to be used when needed					
	Personal Protective Equipment (e.g., gloves, safety glasses) distributed					
	Observations shared among team members about inspection activity					
Standardizing	The company standardize to integrates Sort, Set in Order, and Shine into a unified whole.					
	Ideas generated for establishing changes as standard operating procedure					
	Documentation created and updated					
Sustaining	The company making a habit of properly maintaining procedures and discipline to avoid backsliding.					
	Ideas generated for continuously improving the company's 5S approach					
	Sustain methods clearly defined, with responsibilities and target dates identified					
Overproductio n	The company does not Produced more than immediate use.					
Unnecessary inventory	Any raw material or work in process that not exceed what customer needs.					
Inappropriate processing	Adding more value than the agreed standard work process procedures or systems					
Unnecessary motion	There is no poor workplace organization, resulting in poor ergonomics for example excessive bending or stretching					
Excessive transportation	There is no unnecessary movement of products, materials or information resulting in wasted time, effort and cost.					
Defects	There is no defect production that results in rework.					
Waiting	Non activity period for operator or machine is reduced.					

B.Key success factors evaluation

Use the scale given below to appropriately answer the questions that follow by ticking **(√)** accordingly.

1= Strongly Disagree, 2= Disagree, 3= Neutral 4=Agree, 5= Strongly Agree

No	Factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
	I. Education and training					
1	Luck of regular training of workforce has influenced the sustainability of Kaizen improvement outcome in our organization.					
2	Skilled manpower is one of the capacity constraint to sustain Kaizen					
3	Employees demonstrate, by words and actions, that they understand the mission, vision and values of their organization.					
4	There is no experience using an appropriate methodology, techniques and tools for problem solving.					
	II. Commitment					
5	Management's work commitment has been improved as a result of implementation of kaizen					
6	Employees' commitment and innovativeness is one of the challenges facing Kaizen sustainability					
7	Employees' attitude towards teamwork has been improved.					
8	There is an interest in changing or adopting Kaizen activities					
	III. **Involvement**					
9	There is a top management's involvement and support towards the sustainability of kaizen					
10	Having positive attitude to actively involved employees in problem solving, quality & productivity improvement					
11	There is no enough expertise involvement on how to implement Kaizen activities.					
12	Team problem solving culture has been established					
13	Customer feedback enhancing our company's kaizen implementation. Analyze customer complaint information to formulate further improvement actions.					
	IV. **Communication**					
14	There is a good communication and coordination between departments.					
15	There is regular feedback and communication system between the skilled supervisors and kaizen implementers.					

V. **Resources**						
16	There is no enough time for the company to currently implement Kaizen activities.					
17	Financial constraint is a challenge facing in our company for Kaizen sustainability					
18	There is no enough spaces to implement kaizen activities in our work unit					
VI. **Organizational objectives**						
19	Employee work Culture has been improved as a result of implementation of kaizen					
20	The organization structure affects sustainability of Kaizen					
21	There is good management responsibility to encourage and facilitate positive change.					
22	Luck of Infrastructure can affects sustainability of Kaizen					
23	Kaizen improve working process.					
24	Sustaining kaizen event results ensuring job security					
25	Kaizen implementation improves safety and environmental issues					
26	There is project prioritization and selection for implement kaizen in work place					
VII. **Leadership**						
27	Our top management is in support of the organization's kaizen activities.					
28	Strong team leaders can play on program coordination for kaizen sustainability					
VIII. **Globalization**						
29	The globalization impact has influenced the sustainability of Kaizen outcome in our organization.					
IX. **Standardization**						
30	There are clear standards for considered acceptable work					
31	Processes have been documented with measures to understand performance of kaizen output.					
X**. Performance Measurement and evaluation**						
32	Ineffective performance measures of Kaizen is affecting Kaizen success					
33	There is Periodical evaluation of 5S activities with PDCA and other tools for further improvements					
XI. **Strategy planning**						
34	Our company has clear corporate strategies for continuous improvement.					
35	The organization demonstrates, by words and actions, that continuous improvement is part of the organization's culture					
36	The company has a long-term plan and follows it up on a day-to-day basis.					
37	Organizational structure and Establish policies has enabled our organization sustain Kaizen improvement outcome.					

XII. **Motivation**						
38	There is a rewards and recognition system to motivate employees to increase performance					
39	The kaizen teams had the freedom of changing the work environment when needed.					
40	Employees are satisfied with their jobs and be interested in working to continuously improve their performance					

Thank you for your participation!

You have been very helpful!!

Section D. In-Depth Interview Questions

Thank you for making the time for this interview. The purpose of this interview is to gain a deeper understanding on your company and get your opinion on how continuous improvement is applied at your location.

Date…….

Company Name……

Position …….....

Job Title……

1. What made the company decide to implement kaizen?
2. What were the challenges encountered during Kaizen implementation?
3. How did you solve the problems that occurred?
4. Which of these challenges are your companies still facing?
5. What are the best practices from your company in applying Kaizen?
6. Are there strong commitment on 5S and waste elimination practice?
7. Do you think Kaizen implementation improve the performance of the company in terms of quality, lead time, space, work flow process and revenue?
8. Do you believe that Kaizen brought cultural changes in terms of production?
9. What are significant positive outcomes for the company?
10. How do you communicate goals and strategies with your employees?
11. How do you reward workers for their performance?
12. Any other comments on sustainability of kaizen?

Thank you again for your time.

ቀን……

ለ……..
አዲስ አበባ

ውድ ምላሽ ሰጪዎች፤

የዚህ መጠይቅ ዋና ዓላማ ለሁለተኛ ድግሪ ማማያ ይረዳ ዘንድ በካይዘን አፈፃፀም እና ዋናዋና ቁልፍ የስኬት ማረጋገጫዎች ዙሪያ ጥናታዊ ፅሁፍ ለማዘጋጀት ነው፡፡

በመሆኑም መላሾች ይህ መጠይቅ ለምርምር እና ጥናታዊ ዓላማ ብቻ የሚውል መሆኑን አውቃችሁ ማንነታችሁን ሳትገልጹ በነፃነት እና በታማኝነት የምታውቁትን እንድትመልሱ እየጠየኩ ሚስጢራዊነቱ የተጠበቀ እንደሆነ እገልፃለሁ፡፡

በመጨረሻም በመጠይቁ ላይ ማንኛውንም አይነት ጥያቄ ቢኖራችሁ አዲስአበባ ዩኒቨርስቲ እንስቲትዩት ቴክኖሎጂ የትምህርት ክፍል ማነጋገር የምትችሉ መሆኑን በአክብሮት አሳውቃለሁ፡፡ ግዜችሁን ሰውታችሁ መጠይቁን ለመሙላት ላደረጋችሁት ከፍተኛ ተሳትፎ ከልብ አመሰግናለሁ፡፡

ከታላቅ አክብሮት ጋር!

ውብሸት ሙላቱ

ክፍል "ሀ". አጠቃላይ መረጃ

መመሪያ፡ እባክዎን ይህን ምልክት (√) በመጠቀም የሚስማማዎት ላይ ምልክት ያድርጉ፡

1. *ፆታዎ*

   ሀ) ወንድ ( ) ለ) ሴት ( )

2. የትኛው እድሜ ክልል ውስጥ ይገኛሉ?

   ሀ) 18-25 ዓመት ( ) ለ) 26-35 ዓመት ( ) ሐ) 36-45 ዓመት ( )

   መ) 46-55 ዓመት ( ) *ሠ*) ከ 56 ዓመት በላይ ( )

3. አሁን የደረሱበት ከፍተኛው የትምህርት ደረጃ

   ሀ) ማንበብና መጻፍ ( ) ለ) የመጀመሪያ ደረጃ ማጠናቀቅ ( ) ሐ) ሁለተኛ ደረጃ ማጠናቀቅ ( )

4. በእዚህ ድርጅት ውስጥ ለምንያህልዓመትአገልግለዋል?

   ሀ) 0– 5 ዓመት ( ) ለ) 6 – 10 ዓመት ( ) ሐ) 11 – 15 ዓመት ( )

   መ)15 – 20ዓመት ( ) *ሠ*) ከ 20 ዓመት በላይ ( )

5. ድርጅትዎ የካይዘንን ፍልስፍና ተገበራዊ ካደረገ ምን ያህል ግዜ ይሆነዋል? * (ተጨማሪ ጥያቄ)

ሀ) 1 ዓመት ( ) ለ) 2 ዓመት ( ) ሐ) 3 ዓመት ( ) መ) 4 ዓመት ( ) ሠ)5ዓመት ( ) ረ) ከ 6 ዓመት በላይ ( )

ክፍል "ለ" መሰረታዊ ጥያቄ

1. በካይዘን ላይ በቂ እውቀት አለኝ ብለው ያምናሉ?

ሀ)አዎ በቂ እውቀት አለኝ ( ) ለ) በመጠኑ አውቃለሁ ( ) ሐ) ምንም ያህል እውቀት የለኝም ( )

2. ድርጅትዎ በምን ያህል ጊዜ ውስጥ ለሰራተኛው ስልጠና እና ትምህርት የሚሰጠው?

ሀ) በየሩብ ዓመት ( ) ለ) በየዓመቱ ( ) ሐ) ምንም የለም ( )

3. በድርጅትዎ ውስጥ ካይዘን ለውጥ አምጥቷል ብለው ያስባሉ ?

ሀ) አዎ ( ) ለ) ምንም ያመጣ አይመስለኝም ( )

4. በሶስተኛው ጥያቄ መልስዎ አዎ ከሆነ የተገኘው ለውጥ ምንድነው?

ያብራሩት……

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በሶስተኛው ጥያቄ መልስዎ አላመጣም ከሆነ ለምን ይመስልዎታል?

ያብራሩት……

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5. ከፍተኛ አመራሩ አምስቱን "ማ" የካይዘን እንቅስቃሴን ይደግፋል ብለው ያምናሉ?

ሀ) አዎ ( ) ለ) ምንም አይደግፍም ( ) ሐ) ያወቅኩት የለም ( )

6. የካይዘን ልማት ቡድን ሰለስራው የሚወያይበት የተፈቀደ ቀን አለወይ?

ሀ) አዎ አለ ( ) ለ) ምንም የለም ( )

7. ለዘጠነኛው ጥያቄ መልስዎ አዎ ከሆነ የልማት ቡድኑ በየስንት ጊዜ ይገናኛል?

ሀ) በየቀኑ ( ) ለ) በየሣምንቱ ( ) ሐ) በየአስራምስት ቀን ( ) መ) በየወሩ ( )

ክፍል "ሐ" የካይዘን ትግበራ እና የማስቀጠል አሰሳ

ከዚህ በታች የተሰጡቱን መስፈርቶች በመጠቀም(√) ይህንን ምልክት ለጥያቄው ይመጥናል ብለው በሚያስቡት ቦታ ውስጥ ያስቀምጡ

1= በጭራሽ አልስማማም 2= በተወሰነ መልኩ አልስማማም 3=መካከለኛ 4= በተወሰነ መልኩ እስማማለሁ 5=በጣም እስማማለሁ

<u>የአምስቱ ‘‘ማ’’ እና የብክነት ማስወገድ እንቅስቃሴ መለኪያ</u>

ምሰሶዎች	<u>የአምስቱ‘‘ማ’’ እና የሰባቱ ብክነት ማስወገድ እንቅስቃሴ</u>	በጭራሽ አልስማማም	በተወሰነ መልኩ አልስማማም	መካከለኛ	በተወሰነ መልኩ እስማማለሁ	በጣም እስማማለሁ
		1	2	3	4	5
ማጣራት	የካይዘን ልማት ቡድን በስራ አካባቢ የማይፈለጉትን ቁሳቁሶች አጥርተል					
	የማጥራት እንቅስቃሴውን ለማስቀጠል መስፈርት ተዘጋጅቶለታል					
	የሚወገዱ ቁሳቁሶች በቀይ ቀለም የተከለለ ቦታ ወይም የተለየ ቦታ ተዘጋጅቶላቸዋል					
ማስቀመጥ	የካይዘን ልማት ቡድኑ የሚፈለጉ ቁሳቁሶችን መለያ በመለጠፉ በቀላሉ አንስቶ ለሥራ መጠቀም ይቻላል					
	የማስቀመጡ ስራ ማሻሻያ እቅዶች በውይይት ተለይተው ቅደም ተከተል ተዘጋጅቶላቸዋል					
	የማስቀመጡ ስራን የበለጠ እንዲታዩ ጠቃሚ ሀሳቦች ይቀረባሉ					
ማንጻት	የካይዘን ልማት ቡድን ቁሳቁሶችን በማንጻት ለስራ ዝግጁ አድርጓል					
	የማንጻት ስራን ለማከናወን የሚያስችሉ የአደጋ መከላከያዎች ተከፋፍለዋል					
	የካይዘን ልማት ቡድኑ በፍተሻ ወቅት የታዘበውን ይወያይበታል					
ማላመድ	ድርጅቱ የማጥራት የማስቀመጥ እና የማንጻት ስራን ለማቀናጅት መስፈርት ህግ አብጅቶላቸዋል					
	ለውጦችን እንደመደበኛ አሰራር ሂደት ለማዘጋጀት የሚያስችሉ ሀሳቦች ይፈልቃሉ					
	መስፈርቱ በሰነድ ላይ ሰፍሮ በየጊዜው ይታደሳል					
ማዝለቅ	ድርጅቱ ወደነበረበት እንዳይመለስ በተገቢው መንገድ የመንከባከቢያ ሰነሰርዓት እና የዲሲፕሊን እርምጃ የመውሰድ ልምድ አለው					
	አምስቱን ‘‘ማ’’ በድርጅትዎ በዘላቂነት ለማስቀጠል የሚያስችሉ ማሻሻያ ሀሳቦች አሉ ወይ?					
	ሐላፊነቶችን እና ቀናቶችን ለይቶ በመግለጽ የማዝለቅ ሂደቱን ግልጽ በሆኑ መርሆዎች ማስቀጠል					
ከሚገባው በላይ የማምረት ብክነት	ድርጅቱ ወዲያውኑ ከሚያስፈልገው ምርት መጠን በላይ አያመርትም					
የክምችት ብክነት	ማንኛውም ጥሬ እቃ ወይም በስራ ሂደት ላይ ያሉ ምርቶች ደንበኛው ከሚፈልገው መጠን አይበልጡም					

የአሰራር ሂደት ብክነት	ከተስማሙት መደበኛ የስራ ሂደቶች ወይም ስርዓቶች የበለጠ እሴት በመጨመር መስራት					
የእንቅስቃሴ ብክነት	ምንም ዓይነት ደካማ የስራ ቦታ አደረጃጀት ባለመኖሩ በሰራተኛው ላይ የማያስፈልግ የአካል እንቅስቃሴ የለም					
የማጓጓዝ ብክነት	የማያስፈልግ የምርት የቁሳቁስ ወይም የመረጃ እንቅስቃሴ ባለመኖሩ የሚባክን ጊዜ ጉልበት እና ወጪ የለም					
እንከን ያለው ምርት ብክነት	የምርት ግድፈት ባለመኖሩ ድጋሚ ስራ የለም					
ጊዜ የመጠበቅ ብክነት	በሠራተኛው በማሽንና ሌሎች ተመሳሳይ ጉዳዮች ላይ የማያስፈልግ ጊዜ መጠበቅ ቀንሰል					

ለትብብርዎ ከልብ በጣም አመሠግናለሁ፡፡

Appendix II: Literature papers selection

No.	Title	Author	Research Approach	Industry	Summary of objective	General focus Area
1	A Case Study of Kaizen Implementation in SMI	(Puvanasvaran et al., 2010)	Case study	Small Medium Industries (SMI) Company that is ABC Company,	Kaizen generates breakthrough improvements quickly, without huge capital investments and or extensive commitments of employ time. Company using kaizen find that they not only reduce waste and see immediate results; they also increase productivity, lower costs, and energize employees. Overall, Kaizen project conducted on sales order processing processes at ABC Company have been a success and it contributes for the reduced lead time.	This case study is focused on reducing lead time of sales order processing and follows PDCA approach.
2	A Review of Contributing Factors and Challenges in Implementing Kaizen in Small and Medium	(Mohd Ghazali Maarof, 2016)	Research paper	Small and Medium Enterprises Malaysia	The summery indicates that factors such as communication between the top management and its employees, clear strategy, the need of personnel who can champion the implementation of Kaizen in a company, having good knowledge and provide employees with certain level	This paper focused on some selected factors contributing to the successful implementation of Kaizen and its challenges among small and medium enterprises.

	Enterprises				of empowerment are important to ensure a successful Kaizen implementation.	
3	Achievement of Quality, Productivity for Market through Kaizen Implementation in Ethiopia Park our	(G, Jalu; , 2015)	Research paper	Finca'a sugar factory, Ethiopia	Kaizen contribute the following results for Finca'a sugar factory such as financial, cost reduction, obtaining additional income, decrease down time, defects reduction, re usage of machines and equipments by repairing, increasing labor productivity by reducing time loss for searching for tools, additional space obtained, defect improvement, lead time improvement, clean working environments creation, team work and motivation of workers development, health and occupational safety workers improvement, increasing labor employee participation, knowledge obtained on how to meet quick delivery to reduce costs.	Focus on kaizen implementation within the factory in accordance with its Principles, philosophy, tools and three pillars in order to achieve profitability, productivity and quality.
4	Advanced Manufacturing Technology Implementation Process in SME:	(Jani Rahardjo, Salleh bin Yahya, 2010)	Research paper	Small Medium Enterprise (SME).	Soft technology such as expert knowledge and skills in the AMT area is an important element to optimize the use of the hard technologies. To seek for the quality of production improves at a	Focus on critical factors that constitute a successful implementation of the Advanced Manufacturing Technologies (AMT) in Small

	Critical Success Factors				greater degree, soft technologies must be included.	Medium Enterprise (SME).
5	Analysis of Kaizen Implementation in Northern Ethiopia's Manufacturing Industries	(Desta Asayehgn, 2014)	Research paper	Methara Sugar Factory, Ethiopia	The sustainability of the company should not be seen only in the production of highly productive cane sugar (sucrose). But, it should extend to the production and processing of other products that include, molasses, bagasse (the residual dry fiber of the cane after cane juice has been extracted, that can be used as a fuel source for the boilers, production of paper, cardboard and panel boards.	Focus on Business Process Re-engineering (BPR) and Kaizen strategic management initiatives, tools, and methods.
6	Article Sustainable Optimization of Manufacturing Process Effectiveness in Furniture Production	(Andrea Sujova, Katarina Marcinekova , and Stefan Hittmar,, 2017)	Research paper	In the production process of furniture.	The objective of this paper to create a mathematical model of the key processes in order to maximize productivity and cost reduction by identifying key processes and parameters influencing manufacturing effectiveness.	This paper deals with the possibilities of the utilization of mathematical methods to solve optimization problems in the production process of furniture.
7	Assessment of Kaizen Implementation Process, Success	(Tadesse M. , 2014)	MA degree research thesis Case study	Wonji /Shoa Sugar Manufactur	The purpose of this research is to study and assess Kaizen program implementation, major achievements, challenges and employee work attitude.	The paper focus on the basic kaizen and management.

	Stories, Challenges and Employees' work attitude			ing Factory, Ethiopia		
8	Assessment on the Implementation of Kaizen and its Challenges: The Case of African Union Commission	(Getu Assefa, 2016)	Case study for MA degree research thesis	The Case of African Union Commissio n	This study is examined current status, effectiveness and challenges of kaizen in African Union Commission.	Focus on the customer satisfaction and current status, effectiveness and challenges of kaizen
9	Challenges in Sustainable Manufacturing	(Nambiar, 2010)	Literature review	Company	Sustainable development seeks to optimize efficiency while minimizing environmental impact and maintaining social equity.	Focus on factor affecting product design, product life cycle, products utilizing, Technology Systems and supply chain network
10	Critical Success Factors for Implementing Lean Production: The Effect of Contingencies	(Netland, 2015)	Literature review	Company	It summarizes a collective list of CSFs across 14 existing literature reviews, and then introduces contingency theory to question the rationality of such universal lists.	Focus on the impact of contingencies on the CFSs for lean implementation.
11	Critical success factors for Kaizen	(Jorge L et al., 2013)	Literature review	Manufactur ing	The paper presents the results of a survey with 37 main tasks associated	Focus on Critical success factors for Kaizen

	implementation in manufacturing industries in Mexico			industries in Mexico	with Kaizen implementation and it was applied to personnel with responsibilities in continuous improvement programs in companies located in Ciudad Juarez, Mexico	implementation
12	Critical Success Factors for Soft TQM and Lean Manufacturing Linkage	(Amjad Khalili, Md Yusof Ismail , A.N.M.Karim & Mohd Radzi Che Daud,, 2017)	Research paper	Manufacturing industries in Malaysia	The paper proposes that both Total Quality Management (TQM) and Lean Manufacturing (LM) are not in conflict inside Malaysian manufacturing industries as TQM is a driver for LM tools and techniques. The similarities aspects between both employ that these have to be integrated together inside enterprises.	Focus on Total Quality Management (TQM) and Lean Manufacturing (LM)
13	Critical Success Factors for Sustainable Kaizen Implementation in Manufacturing Industry: the Case of Peacock Shoes Manufacturing Industry	(Hailu, 2015)	Case study for MA degree research thesis	Peacock Shoes Manufacturing Industry, Ethiopia	In a literature review of 20 authors, it was found that there are 41 key success factors that have been cited. This variety of factors reported in different companies and countries led to the need to seek and identify specific factors that have to use Ethiopian companies, with their own culture. The result shows Peacock shoes manufacturing industry should always practice the identified	Focuses on identifying critical success factors for sustainable Kaizen implementation.

					critical success factors for sustaining Kaizen implementation in order to achieve sustainable improvements	
14	Development of a Tool to Measure the Effectiveness of Kaizen Events within the Wood Products Industry	(Erdogan, Sevtap, 2015)	Case study for MA degree research thesis	Wood Products Industry	This research identify the significant link between how employees view Productivity improvement and the effectiveness of Kaizen, through these three principles 1) productivity improvement should lead to increased long-term employment and hiring; 2) in order to increase productivity, production and management employees must coordinate and cooperate so that there are good labor-management relations; and 3) gains from improved productivity should be fairly distributed between production employees, management employees, and consumers.	focused on the implementation of Kaizen and other continuous improvement methods within the wood products industry or on the perceptions of employees within this industry regarding either the motivators for, barriers to, and effectiveness of perceptions of Kaizen, or the drivers affecting Kaizen implementation
15	Effective Factors on Sustainability of Manufacturing Processes, Overcoming Shrinkage in	(Abbas Toloei Eshlaghy, Hydeh Mottaghi and Rasool	Research paper	some major Iranian companies	With respect to importance of determining a sustainability model for improved processes and necessity of analyzing the relationship among the aforementioned factors and sustainability, an audit analysis via	Focus on some factors such as a list of daily problems of processes, clear perception of the necessity of improvement, process monitoring and standardization which is

	Improved Processes	Shafieyoun, 2011)			discriminate regression (by dividing processes into stable and unstable ones), determines effect of each factor on sustainability and achieves the study's goal to provide a stable improvement model.	selected as independent or predictive variables with a significant effect on discrimination of two sustainability groups (as dependent variables).
16	Factors Influencing Employees' Motivation in Implementing 5s system	(Noni Hartika Binti Juhari et al, 2011)	Research paper	Nibong Table Paper Mill Sdn. Bhd (NTPM), Malaysia.	The present study concludes that there are significant and positive relationships between communications and training with employees' motivation in implementing 5S System while negative relationship for the top management support. Besides that, based on the findings, reward and recognition have no significant relationship with the employee's motivation in implementing 5S System.	Focus on examine relationship between the variables: communication, System, training, reward and recognition and top management role with the employees' motivation in implementing 5S System.
17	Implementation of Kaizen as a Productivity Improvement tool in Small Manufacturing Company	(Gurway, .Shubhangi . P., 2016)	Research paper	Manufacturing of PVC &HDPE pipes. India.	The company is currently facing with the problem of increased lead time and stock out situation. In order to solve the faced problem the researcher emphasize on two major alternatives & select Kaizen as a main productivity improvement tool.	This paper illustrates about kaizen implementation in small manufacturing industry & also focuses on the scenario of Indian manufacturing company while implementing Kaizen.

18	Implementation of Lean Strategies in a Furniture Manufacturing Factory	(Sudipta Chowdhury, Kazi Aminul Haque, Musabbirhasan Sumon, 2015)	Research paper	Furniture manufacturing company. Bangladesh	The objective of the study is to improve the productivity of the factory floor. This study clearly shows that lean strategies such as SMED, Gemba and short interval control can be effectively applied to improve the condition of a furniture manufacturing company.	This paper experiments application of different lean strategies to a real production problem at a furniture manufacturing company.
19	Improvement of Quality in production Process by applying Kaikaku Method	(Milan Radenkovic, 2013)	Research paper	furniture industry	Kaikaku is radical improvement where fundamental changes occur in the production system. Benefits of implemented kaikaku were inventory savings, reduction of floor space and last but not least higher quality.	Focus on how to implement Kaikaku method and how influence on quality improvement of production process.
20	Kaizen as a Strategy for Improving SSMEs' Performance: Assessing its Acceptability and Feasibility in Tanzania	(Bwemelo, 2014)	Research paper	Small Scale Manufacturing Enterprises (SSMEs) Tanzania	The findings of the study revealed that KAIZEN was perceived to be an effective strategy for improving SSMEs' performance and participants expressed desire to benefit from it. However, the study concludes that Kaizen as a strategy for improving SSMEs' performance is acceptable in Tanzania though its feasibility is very challenging.	This paper examines the acceptability and feasibility of Kaizen among SSMEs mainly focused on 5S-Kaizen in Tanzania.
21	Kaizen concept	(Bagul et al, 2016)	Research paper	Samsung Electronics	Kaizen continuous improvement by the small steps should be realized due to	Focus on kaizen concept, principles, management and

					each employee's involvement. Kaizen improvements should proceed without any additional investment or through small investments.	supporting tools
22	Kaizen Implementation – Stages and Determinants	(Muhammad Asif, 2011)	Research paper	Japanese manufacturers operating in the Netherlands.	Kaizen implementation requires organizational resources and manager's time. Depending on particular contextual factors, organizations may have their kaizen implementation at any one of the aforementioned stages. The understanding of kaizen process is likely to enable effective management of kaizen.	focus on investigation on the factors that are critical to kaizen success and how they influence kaizen implementation
23	Kaizen Implementation in Ethiopia:	(Abera Admasu, 2015)	Research paper	Manufacturing Industries	From the literature, it can be concluded that there is a reasonably vast literature available on kaizen philosophy, which gives a broad view of past practices and researches carried across the globe. However, there has been limited empirical research in implementation of kaizen in Ethiopia to verify the degree of outcomes achieved through kaizen.	This paper is focus on different literatures that has been published before on the effective implementation of kaizen methodology.
24	key factors for a continuous	(Hector Ricardo	Research paper	large companies	Each organization must develop its own continuous improvement strategy; a	The focus of this work is to examine the content of

	improvement process	Formento, 2013)			working plan oriented to these findings may increase the success possibilities. To summarize, the researcher recommend establishing lines of work which take into account the nine key factors and, specially, the seventeen prominent components.	continuous improvement processes, taking into account its inclusion in modern organizations´ strategies.
25	Process Flow Improvement through 5S, Kaizen and Visualization	(Mayank Dev Singh Swati Singhl. & at.el, 2015)	Research paper	Sandvik Asia Pvt. Ltd ,pipe manufacturing industry in Gujarat, India.	This project is based on lean manufacturing tools like 5S, Kaizen and Visualization. 5S is tool to ensuring systematic organizational environment, Kaizen is continuous improvement through small steps to obtain economical result of the organization and Visualization is technique of creating images, diagrams or animations of firm's activity which are helpful and effective way of communication for all people connected with firm	Focus on to reduce abnormality in organization by applying ergonomics for various working positions of employees. As an industrial perspective, this project intimates practical implementation of lean concepts.
26	Productivity Improvement in Furniture Manufacturing Industry by Using	(Kishore B. Lad, 2016)	Research paper	Space wood Furniture Pvt. Ltd	The objective of this study is to understand and improve the productivity by applying kaizen methodology in the industry. The study initiated by evaluating and identifying the problems	Focus on Kaizen facility layout system to reduce Total Distance Travel In Process that affect production time

	Kaizen				occurred in the industry, continued by data collection. The plant layout is modified by using kaizen methodology	
27	The 5S and kaizen concept for overall improvement of the organization: a case study	(Gupta & Jain, 2014)	a case study	small scale manufacturing organizations	The purpose of this study is to implement some of the 5S and kaizen principles to assist small scale manufacturing organizations to become more efficient and more productive	Focus on Kaizen 5S and kaizen concept for overall improvement of the organization
28	The Art of the Kaizen Approach for Sugar Production in Ethiopia: Lessons from the Methara Sugar Factory	(Desta A. , 2014)	Research paper	Methara Sugar Factory, Ethiopia.	The company would be able to achieve sustainable productivity if it further addresses the impacts of environmental and social concerns such as soil degradation, biodiversity, the overuse of water, air and soil pollution and the processing effects of cane and beets.	At the binging it focuses on Business Process Re-engineering (BPR) after it challenged looking for kaizen.
29	The Concept & Methodology of Kaizen A Review Paper	(Jignesh A. Bhoi, Darshak A. Desai, Rohit M. Patel, 2014)	Research paper	Manufacturing industries across the world.	This paper discusses various literatures and presents a Concept & Methodology of Kaizen which will helpful to new research in different fields. Besides this, one representative “Kaizen Idea Sheet Format” is presented	Focus on concept of Kaizen written by different authors
30	The Study of the Relationship between Kaizen	(Chanda, 2017)	Research paper	Zambian Manufacturing	The main purpose of this study is to investigate the relationship between Kaizen practices and improvement in	Focus on kaizen Operations Performance

	Practices and Operations' Performance Improvement in Zambian Manufacturing Companies			Companies	operations performance in Zambian Manufacturing companies. The study also sought to find out the extent of Kaizen practices implementation in these companies, determine the influence of Kaizen practices on human resources outcomes and the challenges faced by these companies in implementing Kaizen	
31	Wood Furniture Components: Implementation of Flow-line Technology based on Lean Manufacturing Concepts	(Schule et al., 2005)	Case study	Furniture and wood component supplying industries.	This case study provides information about lean manufacturing and how a lean manufacturing system can be implemented, followed by a detailed case study of a wood component manufacturing company's adoption of a new flow-line technology based on lean manufacturing concepts.	Focus on increase the productivity of furniture manufacturing organization by using flow line technology.

Appendix III: Sample factories Respondents' Responses for each success factor evaluation

Question No	Factory 1		Factory 2		Factory 3		Factory 4		Factory 5		Average	
	(μ)	S.D	(μ)	S.D	(μ)	S.D	(μ)	S.D	(μ)	S.D	(μ)	S.D
KSF.I. Education and training												
Q-1	4.0830	0.97431	4.1818	0.8528	4.1538	0.7845	3.5926	1.3661	4.6207	0.4938	4.1328	0.98309
Q-2	3.8750	1.07592	4.8182	0.3948	3.8846	1.2434	3.5185	1.4243	4.2414	0.9876	4.0469	1.16281
Q-3	3.4167	1.28255	4.1818	0.9579	3.5000	1.0677	3.3333	1.0742	4.3103	0.4708	3.7500	1.06483
Q-4	3.3333	1.43456	2.0000	1.0690	2.3846	0.8038	2.8519	1.0640	2.0000	0.0000	2.5078	1.08676
KSF. II. Commitment												
Q-5	3.7083	0.9079	4.1818	0.8528	3.8462	1.1204	4.1111	0.5774	4.0000	0.0000	3.9688	0.78306
Q-6	3.0833	1.44212	4.0000	1.3093	3.7308	1.0415	3.8889	1.1209	3.1724	1.7742	3.5625	1.40163
Q-7	4.0833	0.92861	4.2727	0.8827	4.0000	1.0955	3.8148	0.8338	4.0000	0.0000	4.0234	0.82734
Q-8	4.0417	0.7506	4.2727	0.8827	3.1923	1.1669	3.8519	0.7181	4.0000	0.0000	3.8594	0.85789
KSF.III. Involvement												
Q-9	3.1250	1.2959	4.0909	1.1080	3.7690	1.1767	3.9630	0.8077	3.5517	1.2979	3.6953	1.18094
Q-10	3.6250	1.0135	4.1818	0.8528	4.0380	0.7200	4.1111	0.5774	4.3103	0.4708	4.0625	0.76075
Q-11	3.3750	1.0135	3.6364	1.5280	3.2690	1.0414	2.9259	1.4392	2.6207	0.9417	3.1328	1.23831
Q-12	3.6250	0.8754	3.9091	0.9211	3.6154	1.2673	3.4815	0.8490	4.3103	0.4708	3.7969	0.94210
Q-13	3.2917	0.8065	3.8182	1.4355	3.5385	0.9892	3.8519	0.8640	2.4483	1.2980	3.3594	1.20846
KSF. IV. Communication												
Q-14	3.9583	0.4643	4.3636	0.9021	3.5380	0.9891	3.8889	0.8916	3.3793	0.9417	3.7969	0.91668
Q-15	3.5417	1.0624	4.1818	1.3675	2.9230	1.1280	3.2222	1.1547	4.0000	0.0000	3.5625	1.12067
KSF.V. Resources												
Q-16	3.0417	1.0417	3.2727	1.2414	2.9610	1.3700	2.1852	1.0755	1.6786	0.4756	2.5781	1.21415
Q-17	2.7083	0.9546	3.1818	1.3675	3.1530	1.5660	2.1852	1.0755	1.6786	0.4756	2.5625	1.27822
Q-18	2.5000	0.8847	2.3636	1.3290	2.4610	1.1038	2.6667	1.2710	1.6786	0.4756	2.3203	1.08630
KSF. VI. Organizational objectives												
Q-19	3.7500	0.7940	4.0000	1.0690	3.8460	1.0070	3.8519	0.8639	1.6897	0.4708	3.8906	0.81554

Q-20	3.3750	1.1726	2.3630	1.5289	2.7690	1.3050	2.2963	0.9929	1.7931	0.7736	2.8906	1.34711
Q-21	3.7917	0.7211	3.9091	1.4771	3.1154	1.1774	4.1111	0.5774	1.6897	0.4708	3.4766	1.14990
Q-22	2.7083	1.2329	3.2273	1.3778	3.2308	1.2102	2.8519	1.2619	4.0000	0.0000	3.1250	1.29201
Q-23	4.0417	0.8065	4.5455	0.6710	4.6538	0.4852	4.4444	0.6980	3.5517	1.2980	4.4688	0.66330
Q-24	3.3750	1.3772	4.2727	0.8827	4.3462	0.6895	4.0741	0.7299	2.6207	0.9417	3.9844	1.12931
Q-25	3.5800	1.2830	4.0000	1.0690	4.5800	0.7030	4.3700	0.6880	1.6897	1.2979	4.40	0.863
Q-26	3.4200	0.9740	2.3636	1.5289	3.8462	1.2720	3.7400	1.0230	1.7931	0.4708	3.66	1.006
KSF.VII. Leadership												
Q-27	3.8300	0.8160	4.0000	1.3090	3.6200	1.2670	4.3000	0.6690	3.5500	1.2980	3.85	1.123
Q-28	3.7500	0.8970	4.1800	1.1400	4.1500	0.7840	4.0700	0.9970	2.6200	0.9420	3.72	1.122
KSF. VIII. Globalization												
Q-29	2.7500	1.3590	2.9100	1.4770	2.9600	1.1830	3.7800	1.1550	2.6200	0.9420	3.01	1.270
KSF.IX. Standardization												
Q-30	3.7100	0.8590	3.9100	1.4770	3.6500	0.9770	4.1900	0.6220	3.3800	0.9420	3.76	1.018
Q-31	4.0400	0.7510	4.6400	0.4920	3.3500	1.0180	4.1500	0.6020	4.3100	0.4710	4.09	0.804
KSF. X. Performance Measurement and evaluation												
Q-32	2.8800	1.0350	4.0900	0.8110	3.8500	0.8810	3.8500	0.9340	4.3100	0.4710	3.80	0.959
Q-33	3.6700	0.7610	3.8200	1.0530	3.2700	1.3430	3.2700	1.0310	3.3800	0.9420	3.47	1.049
KSF.XI. Strategy planning												
Q-34	2.2900	1.3980	3.8200	0.9580	4.0000	0.6930	4.3300	0.4800	3.3800	0.9420	3.58	1.154
Q-35	2.7500	1.4220	4.0900	0.8110	3.9600	0.6620	4.2600	0.5940	4.0000	0.0000	3.83	0.957
Q-36	2.1700	1.2740	4.0000	1.3090	3.6900	0.8840	4.0700	0.7300	3.3800	0.9420	3.47	1.223
Q-37	2.6300	1.1730	4.0900	0.9210	3.4200	1.1020	3.9300	0.9170	4.0000	0.0000	3.63	1.042
KSF.XII. Motivation												
Q-38	2.4600	1.3820	3.6400	1.5290	2.7700	1.6320	2.9300	1.3570	1.9300	1.4120	2.70	1.544
Q-39	2.8300	1.4350	4.0000	1.0690	2.4200	1.3010	3.5200	0.9350	3.3800	0.9420	3.22	1.248
Q-40	2.6700	1.3080	4.0000	1.0690	2.6900	1.1920	3.4800	1.0140	2.2400	1.2720	2.98	1.319

Appendix IV: Frequency Distributions of Respondents' Responses to Key success factors

Key Success Factors	Sub Factors	Frequency / Percent	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N / 100%
KSF.I. Education and training	Q - 1	Frequency	5	7	3	64	49	128
		Percent	3.9	5.5	2.3	50	38.3	100
	Q - 2	Frequency	3	18	11	34	62	128
		Percent	2.3	14.1	8.6	26.6	48.4	100
	Q - 3	Frequency	4	22	2	74	26	128
		Percent	3.1	17.2	1.6	57.8	20.3	100
	Q - 4	Frequency	9	86	1	23	9	128
		Percent	7	67.2	0.8	18	7	100
KSF. II. Commitment	Q - 5	Frequency	1	11	2	91	23	128
		Percent	0.8	8.6	1.6	71.1	18	100
	Q - 6	Frequency	17	21	0	53	37	128
		Percent	13.3	16.4	0	41.4	28.9	100
	Q - 7	Frequency	1	12	0	85	30	128
		Percent	0.8	9.4	0	66.4	23.4	100
	Q - 8	Frequency	0	17	6	83	22	128
		Percent	0	13.3	4.7	64.8	17.2	100
KSF.III. Involvement	Q - 9	Frequency	6	26	0	65	31	128
		Percent	4.7	20.3	0	50.8	24.2	100
	Q - 10	Frequency	1	9	0	89	29	128
		Percent	0.8	7	0	69.5	22.7	100
	Q - 11	Frequency	5	57	0	48	18	128

		Percent	3.9	44.5	0	37.5	14.1	100
	Q - 12	Frequency	0	22	6	76	24	128
		Percent	0	17.2	4.7	59.4	18.8	100
	Q - 13	Frequency	11	29	7	65	16	128
		Percent	8.6	22.7	5.5	50.8	12.5	100
KSF. IV. Communication	Q - 14	Frequency	1	21	0	87	19	128
		Percent	0.8	16.4	0	68	14.8	100
	Q - 15	Frequency	3	34	0	70	21	128
		Percent	2.3	26.6	0	54.7	16.4	100
KSF.V. Resources	Q - 16	Frequency	22	60	2	38	6	128
		Percent	17.2	46.9	1.6	29.7	4.7	100
	Q - 17	Frequency	22	63	7	21	15	128
		Percent	17.2	49.2	5.5	16.4	11.7	100
	Q - 18	Frequency	20	81	0	20	7	128
		Percent	15.6	63.3	0	15.6	5.5	100
KSF. VI. Organizational objectives	Q - 19	Frequency	3	10	2	96	17	128
		Percent	2.3	7.8	1.6	75	13.3	100
	Q - 20	Frequency	15	58	1	34	20	128
		Percent	11.7	45.3	0.8	26.6	15.6	100
	Q - 21	Frequency	3	38	3	63	21	128
		Percent	2.3	29.7	2.3	49.2	16	100
	Q - 22	Frequency	12	43	10	43	20	128
		Percent	9.4	33.6	7.8	33.6	15.6	100
	Q - 23	Frequency	1	1	3	55	68	128
		Percent	0.8	0.8	2.3	43	53.1	100
	Q - 24	Frequency	5	17	1	57	48	128
		Percent	3.9	13.3	0.8	44.5	37.5	100
	Q - 25	Frequency	3	4	2	49	70	128
		Percent	2.3	3.1	1.6	38.3	54.7	100
	Q - 26	Frequency	1	27	6	74	20	128

		Percent	8	21.1	4.7	57.8	15.6	100
KSF.VII. Leadership	Q - 27	Frequency	4	22	1	63	38	128
		Percent	3.1	17.2	0.8	49.2	29.7	100
	Q - 28	Frequency	0	34	1	60	33	128
		Percent	0	26.6	0.8	46.9	25.8	100
KSF. VIII. Globalization	Q - 29	Frequency	9	58	1	43	17	128
		Percent	7	45.3	0.8	33.6	13.3	100
KSF.IX. Standardization	Q - 30	Frequency	2	24	1	77	24	128
		Percent	1.6	18.8	0.8	60.2	18.8	100
	Q - 31	Frequency	0	11	3	78	36	128
		Percent	0	8.6	2.3	60.9	28.1	100
KSF. X. Performance Measurement and evaluation	Q - 32	Frequency	0	23	5	75	25	128
		Percent	0	18	3.9	58.6	19.5	100
	Q - 33	Frequency	4	30	8	74	12	128
		Percent	3.1	23.4	6.3	57.8	9.4	100
KSF.XI. Strategy planning	Q - 34	Frequency	10	20	3	76	19	128
		Percent	7.8	15.6	2.3	59.4	14.8	100
	Q - 35	Frequency	7	8	5	88	20	128
		Percent	5.5	6.3	3.9	68.8	15.6	100
	Q - 36	Frequency	11	26	3	68	20	128
		Percent	8.6	20.3	2.3	53.1	15.6	100
	Q - 37	Frequency	8	16	6	84	14	128
		Percent	6.3	12.5	4.7	65.6	10.9	100
KSF.XII. Motivation	Q - 38	Frequency	47	19	3	43	16	128
		Percent	36.7	14.8	2.3	33.6	12.5	100
	Q - 39	Frequency	14	33	5	63	13	128
		Percent	10.9	25.8	3.9	49.2	10.2	100
	Q - 40	Frequency	22	36	3	57	10	128
		Percent	17.2	28.1	2.3	44.5	7.8	100