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The Concept and Implementation of Kaizen in an Organization

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Abstract

For continuous improvement in an organization, Japanese philosophy Kaizen is very popular. Flawless concepts of kaizen methodology and proper implementation of tools can lead to a successful kaizen program in a company. From the reviews of various case studies, it has revealed that most of the companies have implemented kaizen efficiently and observe better performance. Besides, some companies also failed to implement kaizen due to the lacking of proper knowledge about the concepts of kaizen.

Index terms— kaizen, 5 why technique, 5s, 7 QC tools, 7 wastes, jidoka, PDCA cycle, poka-yoke.

1 Introduction

ome types of change inevitably need a key project; meaning months of hard work, big budgets and upheaval. But, often undervalued, an alternative or complementary approach to improving systems, processes and so on, is through more subtle, ongoing changes and continuous improvements. Once a new foremost change has happened, perhaps a new system or structure put in place, is everything perfect? Will the new processes stay set in stone until the next major change in a few years? Almost certainly not. With the continuation of such attitude, gradual decline in benefits has occurred after the initial step improvement, as inefficiencies and bad practice crept in. There is always room to make small improvements, challenge the status quo, and tune processes and practice on an everyday basis. Any employee with his/her colleagues probably does this week in, week out without calling it ”change” or even ”continuous improvement”. They’re already getting real benefits from the intuitive approach to continuous improvement. And over time, all of these incremental changes add up and make a significant positive impact on the team as well as the organization. One approach to continuous improvement is called kaizen. It originated in Japan, and the word translates to mean change (kai) for good **??**zen).

The philosophical belief that potential improvement of everything is the foundation of kaizen: Some organizations look at a process and see that it’s running fine; Organizations that follow the principle of Kaizen perceive a process that can be improved. This means that nothing ever comprehend as a status quothere are continuous efforts to recover which result in small, often unnoticeable, changes over time. These incremental changes add up to substantial changes over the longer term, without having to go through any radical innovation. It can be a much gentler and employee-friendly way to institute the changes that must occur as a business grows and adapts to its changing environment [1].

Its history begins after World War II when Toyota first implemented in a group of workers performing the same or similar work, who meet regularly to identify, analyze and solve work-related problems in its production process. This revolutionary concept became very popular in Japan in the 1950s and the term kaizen became famous around the world through the works of Masaaki Imai.

When Kaizen is applied as an action plan through a consistent and sustained program of successful Kaizen events, it teaches employees to think differently about their work. In other words, consistent application of Kaizen as an action plan creates tremendous long-term value by developing the culture that is necessary for truly beneficial continuous improvement [2].

Kaizen is a system that involves everyoneupper management to the cleaning team. Everyone is encouraged to come up with small improvement suggestions on a regular basis [3]. The concept of Kaizen focuses on improving the work environment of an organization in step by step upgrading the process and eliminating wastes. The review indicates that the application of Kaizen promises to reduction/elimination of wastes and improves process efficiency.

Usually, a consumer will want a product or service which is the best quality with the lowest price and available when they want it. Failure of the market leader in meeting this demand will pave the way for the competitors. This is why a business must continually improve to maintain their market share, not wait until they lose their position and then make panic reactions to gain back what they have lost.

The focus here is to show how can incorporate kaizen event into company kaizen program -the companies that undertake a Kaizen philosophy place an emphasis on the processes -on the 'how' of achieving the required results. A process emphasis goes beyond designing effective processes; it requires the teams to understand why a process works, whether it can be modified or replicated somewhere else in the company and how it can be improved.

The philosophy, concept, and tools of kaizen have been adopted not only in Japanese firms but also in many multinational corporations in the US and Europe. 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 successful implementation of kaizen **??**4] [5]. This implies that it is possible to apply kaizen in countries with different socio-cultural contexts, but that application must be conducted under proper leadership and with adjustments that reflect the uniqueness of the targeted society.

2 II.

3 Literature Review a) Review of Literature Related to Kaizen Concept

According to Imai (1986), Kaizen is a continuous improvement (CI) process involving everyone, managers and workers alike. Broadly defined, Kaizen is a strategy to include concepts, systems, and tools within the bigger picture of leadership involving and people culture, all driven by the customer [4]. Suzaki (1987) explains that CI is a philosophy widely practiced in manufacturing and quality circles. As the name implies, it relies on the idea that there is no end to make a process better [6]. Wickens (1990) describes the contribution of teamwork to make the concept of Kaizen [7]. Teian (1992) describes that Kaizen is more than just a means of improvement because it represent the daily struggles occurring in the workplace and the manner in which these struggles are overcome [8]. Hammer et al. (1993) explain that Kaizen generates process-oriented thinking since processes must be improved before better results are obtained [9]. Womack and Jones (1996) refer to Kaizen as a lean thinking and lay out a systematic approach to help organizations systematically to reduce waste [10]. Imai (1997) describes that the improvement can be divided into Kaizen and innovation [11].

Kaizen signifies small improvements as a result of ongoing efforts. Innovation involves a drastic improvement as a result of large investment of resources in new technology or equipment.

4 b) Review of Literature Related to Case Studies

The case studies are the essential means to check the effectiveness of Kaizen philosophy in different fields of applications, especially in manufacturing industries. Many researchers have performed case studies to cover a wide range of benefits like increased productivity, improved quality, reduced cost, improved safety, and faster deliveries, etc. [12]. Jayaraman et al. (1995) demonstrate the application of the CI in simulation model development which presents several techniques that can be used to build the accurate and efficient model of systems that include one or more transfer machines and long conveyors. The simulation analysis helps to predict optimal combinations of operation times, material handling speeds, buffer sizes, preventive maintenance, breakdown schedules; and a considerable cost saving has been obtained [13]. Radharamanan et al. (1996) apply Kaizen technique to a small-sized custom-made furniture industry. The main purpose is to progress the product with higher quality, lower cost and higher productivity to meet customer requirements. The main aim is to develop the product with higher quality, lower price, and higher productivity to meet customer requirements [14]. Sheridan (1997) has applied Kaizen events to Allied Signal Inc., jet engine manufacturing industry to overcome the difficulties like low production rates and great floor space requirements [15]. Erlandson et al. (1998) apply Kaizen tool, i.e., poka-yoke on fuel-fitter assembly. The fixture shows considerable variation in the assembly process [16]. Savolainen (1999) has conducted two case studies including a medium sized metal industry and other larger group in the construction and concrete industry. The main aim of the studies is to increase the understanding of the processes and dynamics of CI implementation. The focus is placed on how these companies are renewed through the embedding of quality related management ideology [17]. Lee (2000) has conducted a case study at Nichols Foods manufacturing food products. The study describes how the company values have improved the work environment for the employees and motivated them to achieve excellence and how the Kaizen program has implemented in this company using 5S technique and team training [18].

5 c) Review of Literature Related to Surveys

Surveys are the actual means to check the performance of different Kaizen practices, determining the extent of use of these practices and to check how the industries are deploying various Kaizen practices to achieve their goals. Gibb and Davies (1990) have identified and highlighted the success factor for CI and innovative strategy in Australian Small to Medium Enterprises (SMEs), the importance of market orientation and effective strategic formulation in successful SMEs [19]. Soderquist (1996) investigate CI and innovation practices in French SMEs.

They examine the drivers for change and the short-and long-term goals, the sources of innovation and the nature of innovative management in French SMEs [20].

Based on the survey in a small-scale manufacturing company, Irane and Sharp (1997) suggest that in the employees' heart, the CI strategy should ingrain as a belief. The ideal situation of CI strategy is its integration with the corporate culture [21]. Hongming et al. (2000) survey Chinese companies and find that not all companies that have carried out CI activities achieve desired results. It has a significant impact on companies, where CI implementation requires adequate input on company capital human resource and organizational activities. In the organizational structure, it is a challenge for companies' business principles and operations methods [22]. Gonsalves (2002) performs a survey on the effect of ERP and CI on the performance in 500 manufacturing companies. He concludes that CI implementation has a positive influence on BPR execution. Integrated CI and BPR have positive effects on the company's performance [23].

6 III. The Methodology of Kaizen

Different fields like engineering, manufacturing, management and other supporting processes in the organization can use standard methodology of Kaizen. The practice of Kaizen is illustrated in following Fig. 1.

7 Fig. 1: Methodology of Kaizen

Kaizen will help in teaching people how they can perform tasks in a rapid way through experiments, and this will lead to identify & reduce/eliminate wastes in the process, and the selected practice can be improved.

8 a) Kaizen Toolbox

The two significant features of kaizen are incremental and continuous improvement and involvement of the entire workforce in that process. The workforce, even workers, need to participate in producing small but frequent changes by making suggestions for improvement in both manner and product. Beyond that, the logical structure of the concept of kaizen, the precise relationship among its tools, and concrete measures and sequences adopted on the factory floor are difficult to pin down since there are many different schools of teaching that emphasize diverse aspects and tools of kaizen relative to others. Even among excellent companies, Toyota's way is different from Honda's way, and the Panasonic philosophy is quite distinct from Canon's. According to Masaaki Imai, who introduced kaizen to the international audience with his seminal book, Kaizen: The Key to Japan's Competitive Success, kaizen is an umbrella concept for a large number of Japanese business practices [4] [11]. It could even a matter of argument that, like Zen Buddhism, it is not just a management technique but a philosophy which instructs how a human should conduct his or her life. Kaizen focuses on the way people approach work. It shows how management and workers can change their mindset together to improve their productivity. As Edwards C. Johnson III, CEO of Fidelity Investments, puts it, while there are many strategies for management success, kaizen is different since it helps to focus in a very straightforward way on how people conduct their work [11].

Research defines that for implementation of Kaizen no standard technique/instruments are necessary. There are a large number of related and often overlapping components that belong to the kaizen toolkit. The Kaizen Toolbox contains various tools related to Kaizen are as following:

5 Why Technique: This technique enables a profound discussion about the causes of a problem, which is a very crucial step towards identifying solutions, based on what diverse persons bring forward. This technique is invented in the 1930"s by Toyota Founder Kiichiro Toyoda's father Sakichi and made popular in the 1970s by the Toyota Production System; the 5 Whys strategy involves looking at any problem and asking: "Why?" and "What caused this problem?" By asking the question "Why" you can separate the symptoms from the causes of a problem. This is critical as symptoms often mask the causes of problems. Fig. **??** expresses an example of finding root cause by 5 Why Technique [24]. or "automation with a human touch" [27].

PDCA Cycle: The PDCA Cycle is a checklist of the four stages which one must go through to get from 'problemfaced' to 'problem-solved.' The four phases are Plan-Do-Check-Act, and they are carried out in the cycle illustrated below (Fig. **??**) [28].

Fig. **??**: The PDCA Cycle Poka-Yoke: Poka Yoke or Mistake proofing is a simple technique that developed out of the Toyota Production system through Jidoka and Autonomation. It is a simple and often inexpensive device that prevents defects from being made or highlights a fault so that it is not passed to the next operation [29].

IV.

9 The Company Kaizen Program

Increasing competition in the global market, the rapid development of technology and growing customer orientation are just a few examples of the challenges a company has to deal with nowadays to survive. During the last decade, there has been a growing interest in the concept of continuous improvement (CI) as a means of coping with this upheaval and as a way towards improving business performance. Deming (1986) adopted the concept of CI as his first quality principle through plan-do-check-act (PDCA) cycles. Imai (1986) even argues that CI is part of Japanese culture, where it is known as kaizen -meaning improvement and defined as a "company-wide process of focused and sustained incremental improvement" [30].

This philosophy of continual improvement emphasizes the importance of involving employees at every level of the organization. This philosophy assumes that our everyday life should focus on constant improvement efforts. This is so natural and obvious to many world-class organizations that they sometimes forget that they already possess it. Integration of kaizen into normal day-to-day activities with the focus on eliminating wastes, creating standards, and having a clean, organized workplace. Improvements made through kaizen are generally small and subtle; however, their results over time can be huge and long-lasting. Manufacturers should constantly think about the possible places of improvements. The success of kaizen comes from its people and their actions, not from new pieces of equipment and machinery. American management almost worships this idea of buying innovation and using the latest and greatest in management techniques. This type of mentality will not promote a sense of continuous improvement like kaizen can [31].

Kaizen is neither a "flavor of the month" nor a "fly by night" idea, and will not disappear simply because management or engineers are not comfortable with change. Change is displayed by actions, not by words. A company's kaizen program can deliver change to the production floor and become the policy for sustaining effective change as well as continuing future improvements. To stay competitive in today's global economy, manufacturers must operate by necessary policies that encourage and embrace change and promote commitment to continuous improvement. Companies that choose not to do this will fall behind those that follow enhancement and excellence.

Operators and production supervisors will initially resist the concept of kaizen and kaizen events. Management should expect this reaction and prepare them by demonstrating their commitment, dedication, and enthusiasm to its philosophies and the positive results that it will generate. They must remember that for constant change strong will, commitment, and persistence is compulsory. Top management must be firmly committed to the kaizen philosophy to train and convince employees of its benefits. Humans naturally fear change, especially after becoming comfortable in established routines, and breaking old practices and their attachments to them is a challenge that is necessary before and after implementation of process.

In short, if a company wants to drive towards success and profitability, becoming a world-class organization, set the vision, commits, and dedicates the company to develop a long-term, comprehensive kaizen program. Following are the processes through which kaizen can be implemented into an organization [31].

10 a) Kaizen Events

A kaizen event is different from kaizen as a philosophy. Kaizen events are sometimes referred to as rapid improvement events. Kaizen events involve small groups of individuals on the company that are brought together to address a particular area of the company. Unlike the usual day-to-day kaizen activities, a well thought out kaizen program encompassing monthly kaizen events can reap widespread rewards for the organization.

Many organizations utilize kaizen events but still cannot create a culture that embraces change, and many improvement efforts fall short of their cultural and financial goals. The reason behind this is that the company did not have a program or policy in place to keep the employees involved, accountable, and more importantly, wanting more. Kaizen events can become a nuisance to employees if the proceedings are unorganized and under management that does not believe in their cause. Organization must set clear targets to guide everyone and make sure to provide leadership for all kaizen activities directed towards achieving those targets. Real kaizen strategy at work requires closely supervised implementation.

For conducting kaizen events, top management must devise a long-term strategy and provide the tools necessary for the kaizen teams to be having a final destination. Kaizen events are most effective when everybody works to achieve that vision.

11 b) Kaizen Program

Here are the key ingredients in establishing the company kaizen program.

? Create and Communicate the Vision.

? Establish the Kaizen Champion.

? Communication Boards and Newsletters.

12 c) Kaizen Governing Committee

Another vital element of the kaizen program is establishing a committee of employees to help schedule and watch over the monthly kaizen events that will take place. This kaizen governing committee is responsible for ensuring the success of the kaizen teams and helping to clear any obstacles or constraints that would impede the improvement efforts. It is the responsibility of the kaizen champion to ensure that the hands-on work during kaizen events is getting done. If there is any issue that needs management resolution, then the kaizen governing committee must resolve them. Kaizen governing committee members should include:

? The kaizen champion ? The plant manager ? The production manager ? The engineering manager ? The materials manager ? The quality manager ? The facilities/ safety manager ? The human resources manager Due to varying staff, a company may not have people in all of these positions. This is an ideal situation; one has to adjust accordingly.

13 d) Kaizen Team Selection

One of the fundamental aspects of kaizen is the participation of employees from all levels of the organization. Many companies fail to recognize the importance of utilizing production operators in making decisions. The kaizen program should be an ongoing corporate practice so that at some point every employee in the company has been on a kaizen event, including Year 2019 ( ) A Dedication and commitment to change is essential and should be addressed on the production floor first. A company with well defines support departments but poorly run, and inefficient assembly lines or other manufacturing processes cannot hope to be competitive in today's market. plant managers and presidents. However, one should create a kaizen team selection criterion that identifies the significant job titles to ensure a successful kaizen event. As mentioned before, when establishing the kaizen governing committee, the company size may not allow having the ideal team. The goal of the group is to implement 5S, standard work, reduce waste, and create visual management. Based on these key kaizen philosophies, the team should involve the following members:? Team Leader ? Team Members ? Process Engineer ? Quality Engineer ? Facilities/ Maintenance Personnel ? Materials Handler ? Line Operators ? Management

14 e) Kaizen Monthly Meeting

A company that runs a well thought out, structured meeting will find that more work gets done on time. Never let meeting take up too much time, and always stay focused on the subject at hand. The kaizen monthly meeting should take place once a month on a recurring basis. For instance, schedule kaizen meetings every second Tuesday of the month. This allows the committee members to schedule their other responsibilities so they do not forget a meeting. It is a good rule of thumb to advertise the meeting in the company newsletter, acting as a friendly reminder for everyone in the plant. The kaizen monthly meeting should be broken into following agendas:

15 f) Training and Accountability

Before conducting kaizen events, all employees in the company will need some knowledge and understanding of basic lean philosophies and terminology. As kaizen events are scheduled and teams are selected, training should occur. Kaizen governing committee should be trained first and then the team of employees selected for the first arranged kaizen event. Lean management begins kaizen with the assembly line and the line operators. But, at some point, the company will require all employees to participate in a kaizen event, and they all will need this training.

16 g) Moving Forward

First successful kaizen event will feel great. This sense of accomplishment should be a great catalyst for future improvement efforts. Now is the time to get refocused and begin the next phase of improving the operations of the company. Kaizen should become a way of working, and continually improving upon what the kaizen team has done is the next step. It helps create a foundation for other improvement efforts that should be ongoing in the facility [31].

V.

17 Results Achieved Through Implementation of Kaizen a) How Companies Used Kaizen Successfully

Kaizen is a concept that many people and companies know to be successful. However, those new to this idea may be curious about how exactly it has worked in the past. There are a few specific companies that are well-known for using Kaizen to achieve much better production results as follows:

Toyota is renowned as one of the leaders in using Kaizen. In 1999 at one U.S. plant, 7,000 Toyota employees submitted over 75,000 suggestions, of which they had implemented 99%. These continual small improvements add up to foremost benefits. With every employee looking for ways to make improvements, you can expect results such as [3]:

? Kaizen reduces waste in areas such as inventory, waiting times, transportation, worker motion, employee skills, over-production, excess quality and in processes. ? Kaizen improves space utilization, product quality, use of capital, communications, and production capacity and employee retention. ? Kaizen provides immediate results. Instead of focusing on large capital intensive improvements.

Great Western Bank is a U.S. bank that has been around for decades. According to ArgusLeader.com, opening a checking account at Great Western used to take 34 steps. Thanks to Kaizen, this has been reduced to 24. Great Western Bank uses Kaizen to analyze its processes and provide a better service for their customers. They have also been able to work on internal processes, reducing the amount of money they spend on ordering office supplies. Great Western Bank shows how Kaizen can be used to improve internal as well as external processes.

The Ford Motor Company focused on efficient processes and was able to recover from rough times during the Great Recession of the late 2000s to lead the company back to success; in 2014, Ford announced that they would be creating over 5,000 jobs in the United States.

Herman Miller is an American office furniture company that is best known for producing the Aeron chair. Business magazine Fast Company reported back in 2012 that Herman Miller had adopted Kaizen and enjoyed a resulting 500% increase in productivity and 1,000% increase in quality since 1998. Their Aeron chairs, which used to take 82 seconds to come off the line, can now be produced in just 17 seconds.

Lockheed Martin is a well-known aerospace technology company that does a tremendous amount of business with the United States government. Lockheed Martin's use of Kaizen shows how the concept can help industries launch a new product or service.

Gujarat is one of the most significant states in the country of India, the world's largest democracy. In late 2012, the Kaizen Institute of India reported that the Education Department of the Gujarat government commissioned two weeks of Kaizen training for more than 80 employees, as an attempt to improve the functionality of its public sector. This is a great example of how Kaizen can help government and municipal organizations, not just private companies.

Coin Dispenser Manufacturer Company had a variety of production problems, all resulting from the poor assembly line and workstation design. After implementing kaizen, Floor space, Travel distance, Throughput time and Scrap/month decreased by 32%, 28%, 43%, and 68% respectively. Above all, productivity increased by 19%. Their hard work and their investment of only US dollars 10,000 to implement the kaizen program and hold kaizen events resulted in a cost savings of nearly US dollars 1.8 million at the end of the year. [32].

Copeland Corporation, manufacturer of air conditioning and refrigeration reciprocating compressors began adopting an adaption of Kaizen and lean manufacturing the early 1990s. Since then productivity has doubled, and there has been a 33% reduction in manufacturing floor space. Also, time per unit is 35% less than before [33]. Haque et al. (2014) implements different S of the 5S system on different occasions on the RMG industry in Bangladesh and results 54.67m2 saving space. This saving space resulted in an additional cost savings of 4,735.95 US dollars or 37,887.6 Taka [34].

Mr. Meles Zenawi Asres, the Honorable Prime Minister of Ethiopia, requested Japan International Cooperation Agency (JICA) to continuously assist the dissemination of Kaizen to private enterprises including both large and medium enterprises (LMEs) and micro and small enterprises (MSEs) in Ethiopia. The Kaizen Project duration was from October 2009 to May 2011. The pilot project brought various positive results to pilot companies qualitatively and quantitatively. The progress and achievements of the Project were:

18 Qualitative results

? Clean working environment created; Quantitative results comprise of monetary impact and non-monetary impact. The monetary impact is ETB 500,000 per company on average, although it ranges from ETB 10,000 to ETB 3,259,000, depending on the size of the company and its sector characteristics. The average of ETB 500,000 is a large amount of money for an Ethiopian company, which has 10 to 50 employees.

The crucial success factors identified concerning some companies are:

? Management's positive attitude towards KAIZEN including management's strong commitment; and ? Good management-employee relationship where trust and empowerment is ingrained in the management practice, including management's willingness to communicate with employees and train them. By contrast, in some cases expected results not achieved. The factors behind them are:

? lack of management commitment to KAIZEN as revealed by personnel changes that neglect the KAIZEN efforts or by management priority on production volume and inattention to quality; and ? Management problems that jeopardize the company's operation as a viable going concern [35].

19 b) Reasons behind Failure of Kaizen

Chris A. Ortiz provides a great example of an organization that struggled to implement lean manufacturing but did not experience the desired success.

One of the reasons for kaizen failure is that a company is not fully committed to making kaizen the cornerstone of their strategy. Kaizen isn't just a set of tools for implementation: it is a long-term mind-set in

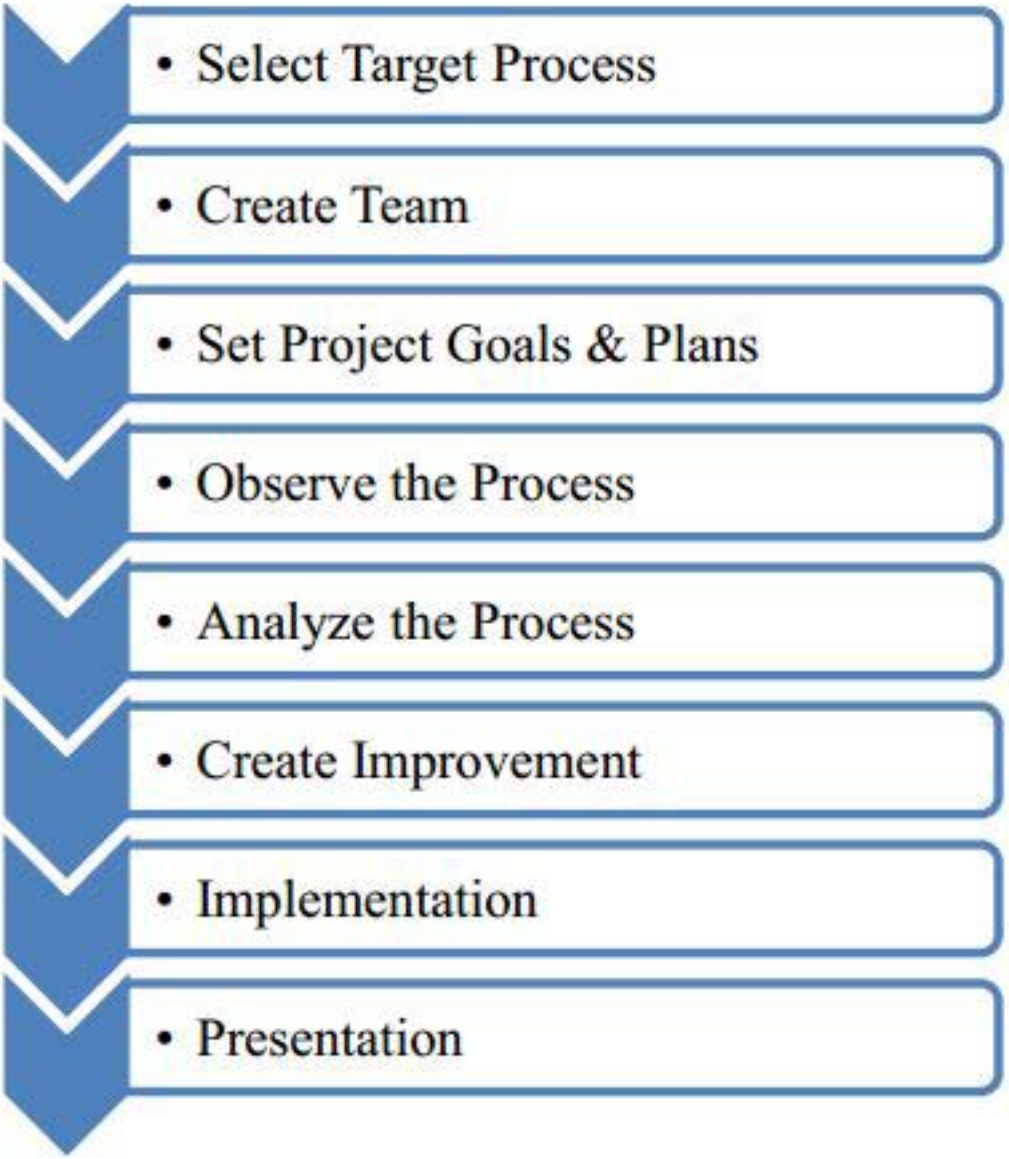

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Figure 1: Fig. 2 :Fig. 3 :

4

Figure 2: Fig. 4 :

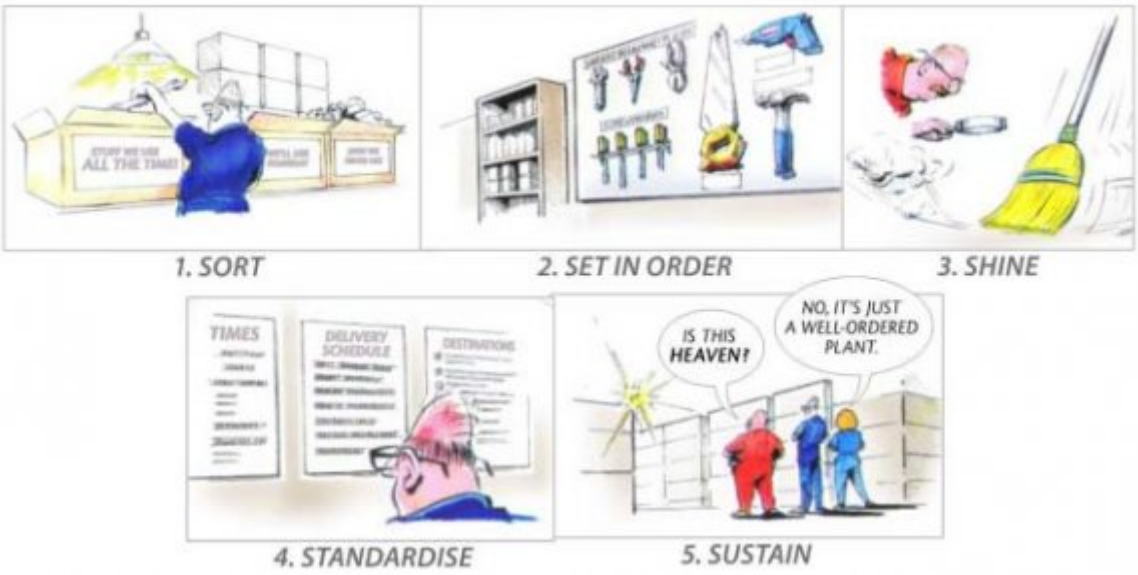

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Figure 3: Fig. 5 :

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Figure 4: Part 1 :

Quantitative results
? Monetary impact
o

Figure 5:

which every single employee is committed to making things better. If in an organization with one or more of the following features attempting to implement kaizen without changing, then there is a high possibility of kaizen implementation failure.

? Kaizen as a short-term project ? Overemphasis on tying kaizen to KPIs ? Implemented in a heavily bureaucratic organization ? Management pays lip service to kaizen ? Where training on kaizen is inadequate ? Where management does not support kaizen initiatives.

Kaizen is about everyone improving everything, not just a group doing all the work. Kaizen is all about making things better in the long run and improving your profits and processes. It is a strategy that needs to be implemented now, for the future [36].

.1 VI. Conclusion and Future Research a) Conclusion

Here both the success stories and failures of kaizen program in organizations are discussed. For an organization to realize the exact benefits of Kaizen, it should form a long-term strategy, which admits that by involving employees in making their processes better and implementing kaizen tools appropriately.

Finally, Kaizen is not a new word in this competitive marketplace. It is very popular term for improvement in a company, or a tool or methodology for problem solving. The basis of the Japanese Kaizen is the never-ending quest for continuously pinpointing problems and providing solutions. Implementing Kaizen may become easier with a continuous effort of the employees, besides identification of critical factors which may cause the failure of a kaizen program is essential to thrive.

The Kaizen principles presume a practical approach and low costs of improvement. The base of Kaizen management system is on the continuous loss reduction by means of methods that do not rely on investments, but on the improvement of the processes and the employees' performance. According to the Kaizen principles, we must be sure that, when we take action, our action will go on in the best possible way and is not merely an intermediate action to generate a temporary result.

.2 b) Future Research

From the literature, one can conclude that there is a great literature available on Kaizen philosophy, which gives a broad view of past practices and researches carried out across the globe. Kaizen is widely accepted philosophy in manufacturing industries and also more research work is required in this field, but the authors feel that Kaizen philosophy can also applicable to different areas like business, service, commerce, etc. Thus a great scope of research is available for new researchers in this field. So more research is necessary which could improve the awareness aspects, as these factors are highly imperative for the success of the Kaizen philosophy in most of the manufacturing industries across the world.

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