

CHAPTER – I

INTRODUCTION

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The objective of this chapter is to provide basic knowledge on Kaizen Philosophy. This chapter will focus on fundamental concepts used in Kaizen. It also reflects importance of Kaizen techniques and its procedure for implementation. The contents of this chapter are arranged in the following manner.

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1.1 Introduction to Kaizen Concept

Change is constant and everyone needs to embrace change as we progress in life. However, organizations are no exception to this rule because in the current competitive market scenario, it is very difficult to survive and sustain without adapting to change. Faster and timely adaptation to changes—has become a key to success. Change could be divided in two categories: change for solving problems and change for better. Kaizen is later i.e. “change for better”.

KAI = Change ZEN = Good (for the better)

KAIZEN = Continual Improvement

This requires a lot of commitment & self-discipline by all. So Continual Improvement is not a good enough word so, presently it has a new interpretation as – Everyday Improvement, Everybody Improvement & Everywhere Improvement

Kaizen is Japanese word formed by combining two words Kai and Zen. Kai means “change” and Zen means “good”. Therefore, the overall meaning is “change for good”. However, the English translation of word Kaizen is “continuous improvement”.

Again, there can be two different approaches for executing change for better:-

- Change for better by using innovative ideas with drastic, sudden, and wider changes in the current status quo.
- Change for better by using Kaizen Techniques, which involves taking small steps for making incremental and continual improvements in order to improve current status quo.

Kaizen is small improvements on day-to-day basis accumulated to give big results. It is low cost approach for continuous improvements because it totally replaces the need of large-scale pre-planning and extensive project scheduling with small experiments which are easy to implement and measurable. Kaizen saves time, money, resources, space, and efforts required for planning and scheduling.

In other words Kaizen seeks to achieve improvements by taking small steps instead of drastic, rigorous steps. The idea behind Kaizen is to take care of employee’s point of view as much as possible by encouraging them to participate in the management processes. Successful implementation of Kaizen requires involvement of everyone right from chairman to doorman who is a part of the organization.

Kaizen means improvement, continuous improvement involving everyone in the organization from top management, to managers then to supervisors, and to workers. The concept of Kaizen must be so deeply engrained in the minds of both managers and workers that they often do not even realize they are thinking Kaizen. Of course, strong willpower of top management is required to change the practices at work place constitute major input for Kaizen activities such willpower should be supported by active involvement of supervisors and workers. Kaizen could be implemented in four forms;

1. it can be in the form of individual Kaizen,
2. suggestion system,
3. Kaizen events or
4. CFT –Cross Functional Team

Kaizen is continuous, never ending process and hence everyday it encourages every employee to be more quality conscious and improvement oriented. One more advantage of Kaizen can be seen as it facilitates employee growth. Nowadays technologies are getting updated at rapid speed. In manufacturing industries it is very difficult to adapt such changed technologies due to the mind set of the employees. Employees at manufacturing industries have a tendency to perform in a conventional way and are reluctant to change. In such situation Kaizen helps to obtain positive support from employees when they are involved in the process right from the beginning and the overall logic behind change is explained to the worker with additional suggestions invited from them about how to execute this change. Indirectly whole process teaches employees about how to accept changes and by working on the changes they automatically learn new techniques of performing and hence organisation does not require spending additional money on training and development. Kaizen promotes “learning by doing” and that is why it is considered as a good platform for employee self training and development.

Earlier it was really difficult to convince CEO’s for promoting improvement oriented culture in the organisation but today it is the time to learn to change a strategy. Kaizen has been proved as a good business strategy in Japan. The Kaizen management system helps in dealing with all aspects that contribute in organisational success including quality, cost, logistics, staff, motivation, safety, technology, and environment. Cost reduction is one of the significant challenge, needs to manage for survival in the global market. One technique for cost reduction is application of

control mechanism for saving material, energy, and purchase by using effective technology. Simultaneously another way is adoption of Kaizen which results in proper management of labour, systematic and continuous improvement of processes, elimination of waste or non value adding activities, standardization, and lean thinking. To be more specific, Kaizen is a philosophy of change for better, which involves taking gradual, small and continues steps for making improvements. It is employee oriented, easy to implement but at the same time requires long-term discipline & top management commitment.

1.2 History of Kaizen

Kaizen is one of the popular Japanese concepts. Which come in to existence after World War II, When Japanese industries were struggling for maintaining their position in the international market. War effects completely destroy the industrial life of Japan and they suffered from various major problems such as lack of capital, dropdown of quality, lower production rates, and lack of skilled employees. To tackle with these problems they were trying to develop such techniques which can help them to improve their performance without huge investment of capital and manpower. During this journey they discovered Kaizen concept.

The thought of Kaizen first time discovered by Dr. Deming in 1950 in the form of Plan-Do-Check-Act cycle. PDCA cycle represents four steps for solving the problem systematically. Many of the organisations used PDCA cycle for problem solving and standardization and they get positive result from it.

After observing benefits of PDCA cycle, the Emperor of Japan gave Second Order Medal of the Sacred Treasure to Dr. Deming in 1960. In the subsequent years, Union of Japanese Science and Engineering (JUSE) declared Deming prizes for quality of products to Japanese industries.

But the whole credit of making Kaizen concept so popular goes to Masaaki Imai San who wrote the famous book named Kaizen- The key to Japan's competitive success in (1986) and thereafter he is considered as father of Kaizen concept. Masaaki Imai said "Kaizen strategy is the single most important concept in Japanese management- the key to Japanese competitive success and Kaizen means ongoing improvement involving everyone – top management, middle management, and workers". Masaki imai reformed PDCA cycle (Plan-Do-Check-Act) also known as Deming Cycle in to Kaizen concept by adding some more workplace elements to it. This four-step

management method is used in business for the control and continual improvement of processes and products

After applying Kaizen concept to the work place Japanese industries experienced high growth in their productivity without spending much of money on technology or on people. From this period Kaizen became one of the most important techniques of Japanese industrial culture. Kaizen concept was born and developed in manufacturing industries of Japan especially in automobile industries of Japan after World War II. The base of Kaizen was laid in Japan in 1950, when Japan was trying to rebuild factories and was rethinking on various systems. During this period Kaizen is proved as an important weapon in the hands of Japanese management style which offered competitive advantage to them in the world market. Kaizen emerged as a key to success for Japanese industries. In automobile industries Kaizen is particularly used for improving the manufacturing process by making continuous improvements in the processes involved in production activity. It was first time used in Toyota by Taichi Ohno in the form of local improvement within workstation through small groups; such small groups were encouraged to improve their own work places and productivity. Line supervisors were expected to provide guidance to them. This form of Kaizen implemented at Toyota brought small improvements in the processes, created process improvements, oriented work culture and assisted Toyota in maintaining standards which results in to significant improvements in productivity and quality of product plus reduction in production cost. With the help of Kaizen Toyota become successful to create quality culture at workplace and gained fame in the international market for providing higher quality products. Hence many of the Japanese firm and other firms in international market have started copying Toyota's Kaizen philosophy and that's how the Kaizen concept is spread all over the world. The application of Kaizen in manufacturing industries is proved as beneficial and hence Kaizen become so popular in manufacturing industries. After 1970s Japanese corporate expansion activities have been started and with this expansion Kaizen was spread throughout the world. In the 1980's with globalisation of Japanese firm Kaizen becomes globally known. In the beginning Kaizen was applied for improving manufacturing process only but as the time changes and as the importance of Kaizen is recognised by everyone now Kaizen is used in all organisational operations. Along with manufacturing industries Kaizen is applicable for many other industries also for e.g. healthcare industry, banking, and service sector. During last decade there has

been a growing interest in the concept of continuous improvement as it is treated as a means of coping with challenges constituted by global competition and as a way towards improving organisational performance. Now it has been approved by everyone that, Kaizen method helped Japanese companies to develop their industrial competitiveness by lowering the production cost and by increasing the production output.

Kaizen is partly action plan and partly philosophy.

- As a philosophy, Kaizen is about building a culture where all employees are actively engaged in suggesting and implementing improvements in the organization.
- As an action plan, Kaizen is about introducing and implementing Kaizen techniques at the work place, organizing events focused on improving specific areas within the organization. These events involve teams of employees at all levels.

Now let's discuss both the aspects of Kaizen in detail:-

1.3 Introduction to Kaizen Philosophy

Kaizen philosophy can be applied everywhere, by everybody. We can use Kaizen philosophy to improve our personal, social & work life. In personal life, Kaizen can be used to improve our daily schedule of working to save money, efforts, and time. In the context of this study, researcher focuses on implementing Kaizen philosophy at workplace and willing to study its implications on overall performance of organization. In organizational context, Kaizen philosophy is used for improving operational performance by improving quality of process, product, and mindset of employees.

When Kaizen philosophy is applied at the workplace, it means performing activities for making continuous improvements in all areas of the organization with the involvement of everyone right from top management to down the line workers.

Kaizen is not a one-time process; in fact, Kaizen is daily process. For successful implementation of Kaizen processes, everyone is encouraged to give suggestions regularly for the betterment of the organization and to enhance productivity.

Kaizen philosophy believes in making continuous improvements in the existing process, system and employees with an aim to improve productivity and quality.

Kaizen philosophy insists that creating and implementing continuous improvements is the only way to progress. Kaizen philosophy assists several firms all around the world to get superior operational excellence. Such superior operational excellence enhances their productivity and gives a competitive advantage. Such Process oriented approach makes Kaizen more effective as it facilitates implementation of suggestions gradually which brings about a long-term result.

Kaizen Philosophy helps in Productivity improvement through following ways:-

- Identifying problems and solving them at their source.
- Making Continuous efforts to identify and eliminate waste from the processes
- Kaizen approach motivates everyone to find solution to the problem by using resources available in hand so that there is a full utilization of resources and capital.
- While performing Kaizen activities employees are encouraged to come up with innovative ideas, which bring in small improvements to get long term results.

Kaizen philosophy believes that workers who are actually engaged in execution of processes are most knowledgeable individuals to share information about work processes and only they will be in a position to share true information about the inefficiency of the processes. They are completely aware about the areas where difficulties exist and hence it is good practice to involve down the line workman in Kaizen right from the start for know-how knowledge on processes. However, it shows that management has trust on their employee's capabilities.

Here is the brief introduction of Toyota way of practicing Kaizen philosophy.

"The basic idea of practicing Kaizen is that each and every employee in an organization is encouraged to identify either grey areas at their work place or scope for improvements which will simplify the processes. Be it however small, but it should have an impact to improve his/her particular job activity, job environment or any company process for that matter. The employees are not only encouraged to implement their ideas but also document them for review and consideration for incorporation wherever the idea might be applicable within the company.

What sets Toyota apart? Its production system & its people are the heart & soul of the Toyota way of work culture. Based on the concept of continuous improvement, or Kaizen, every Toyota team member is empowered with the ability to improve their

work environment. This includes everything right from quality and safety to the environment and productivity. Problem solving, Improvements, and suggestions by the team members are the cornerstone of Toyota's triumph.

As per Toyota way, its key success aspect is the people and everyone's participation in suggestion programs is always encouraged, and supervisors take the lead and responsibility to help those workers who have difficulty participating. The supervisor encourages, challenges, suggests, and teaches the employee how to implement their ideas.

The Toyota Way of thinking emphasizes on 'Continuous Improvement and Respect for People. Working towards continuous improvement with all the new ideas come up from its employees and their abilities what makes this system strong and makes it stand apart. The individual efforts of employees their abilities and a good team spirit is what make the success of any organization.

1.4 Basic Principles of Kaizen Philosophy

Most of the Kaizen philosophy is based on team work with positive approach towards change by continuously and experimentally working on the processes, identifies areas of improvement, to enhance quality. All these principles do not involve complicated mathematical or scientific calculations. In fact all these principles explain dedication, team work and the positive approach for the successful implementation. Following are few basic principles of Kaizen Philosophy:-

- Break away from the conventional setup and identify opportunities for innovations.
- Solve the problem by visiting Gemba (the real place of work)
- No room for criticism in case of failure or suggestions.
- Positive approach towards change.
- Involvement of all related individuals like - workers, management, suppliers, and customers whose suggestions could lead to fresh, improved, and easier ways of doing things.
- Don't wait for perfection:- do not expect 100% improvement at a go
- Improve ways of performing activities gradually because gradual changes are easier to understand and implement.
- Rectify errors promptly. To prevents breakdowns and failures and to avoid Production stoppages.

- Keep asking why until you get to the root cause of the problem. Don't be satisfied with temporary solutions. Always try to eliminate the root cause of the problem.
- Use team approach:- creativity of a team is always greater than creativity of an individual. Problems must be brainstormed collectively with a cross functional team at the Gemba to come up with creative solutions to the problem.

The above principles of Kaizen Philosophy acts as fundamental guidelines that every organization needs to follow while performing Kaizen activities to ensure excellent results.

1.5 Main Elements for Successful Kaizen Implementation

- **Teamwork:-** In organisational set up, there is a necessity that all employees should work as a team towards the common objective for accomplishing the desired improvement in production. All participants must put in their best as a team in the interest of the organization. Teamwork involves sharing responsibilities, knowledge, and brainstorming problems with each other.
- **Personal discipline:-** discipline is vital to all types of success. The employee should have self-discipline with respect to time management, quality assurance, material management, finance, and loyalty towards their organization. Any back fall in personal discipline will definitely affect the productivity of the employee as well as effecting the organisations growth.
- **Keep morale up :-** No matter how tough the circumstances may be during a particular time, the employer and employees must put in their best efforts to keep up the morale.. The employer, or the senior management, should put in place, motivational strategies in their Kaizen concept such as high-quality work conditions, worth promotions, good remuneration. All these encourages employees, provide the security as well as a sense of belonging towards the organization.

- **Effective communication:-** There should be transparency in communication system to discuss the problems at all hierarchy level at any time. Employees be given an opportunity to interact with other quality circles. Employees should have opportunities to share their views, ideas, skills, innovative techniques, and other relevant resources with the team and management at any point of time. This is vital for the success of Kaizen system
- **Suggestion system:-** another important element of the Kaizen system is the provision for the opportunity to give suggestions freely irrespective of the worker's position. No matter how illogical the suggestions may be, they should be welcomed, appreciated at all times.
- **Job Satisfaction:-** For a Kaizen strategy to work, employees must be satisfied with their jobs and be interested in working to continuously improve their performance. Human resource department authorities should survey employees to determine the staff attitudes toward job satisfaction.
- **Organization Involvement:-**The Organization must be dedicated to a Kaizen strategy for it to work. Managers need to be encourage employee involvement, and employees need to be allowed time to monitor work environment. A Kaizen needs to be a priority in business planning for it to be successful.
- **Dedication:** Kaizen strategy need to present to managers and employees as a way to improve organization productivity. A Kaizen strategy can look like a common-sense approach to job development, but its effectiveness is in the ability of employees and managers to stay dedicated to it. Developing the proper attitude toward a Kaizen strategy and getting organization to understand its benefits will make it easier to implement.

1.6 Features of Kaizen Techniques

- Kaizen techniques focuses on Process-oriented thinking: so, while using Kaizen techniques everyone is encouraged to follow process-oriented way of thinking for performing their activities. In Kaizen philosophy it is believed that processes are never perfect and there is always room for improvements in them. Productivity is greatly affected by quality of processes in turn affecting the quality of final product.
- Kaizen techniques promote employee-oriented culture and employees are treated as main drivers for suggesting and implementing continuous improvements. Hence Kaizen emphasises on the opinions of employees rather than technology. Kaizen approach assumes that employees are the best to identify improvements. Since they are observing the processes closely and performing it on the actual production line and hence they are the most reliable and original source to get the information about the inefficiencies on the production line. To obtain such co-operation from people it is necessary to have a culture that encourages and rewards employees for their contribution in improvements.
- Kaizen techniques promote continuous improvement: - Kaizen is not a one day activity or fixed duration program. In fact it is continuous journey towards improving quality, productivity, and efficiency considering every production factors by using related techniques.
- Kaizen techniques focus on incremental improvements: - Kaizen philosophy aims at making continuous improvements in people, processes, and in product by introducing small incremental changes in them on a regular basis. And hence all techniques comes under Kaizen also promote the same
- Kaizen techniques are participative: - Kaizen is participative activity. Successful Kaizen implementation requires whole hearted participation from the employees at all levels. Such participation is not restricted to any authority level or designation of person. All employees from all levels of management and non- managerial levels also need to come together, sit together, and work as a team to solve the problems. Such team is known as Cross Functional Team (CFT)

- Kaizen technique does not require huge investment in employees and technology:- Kaizen activities are performed by employees with their knowledge and skills about their own work area within existing production facilities and hence it does not require any additional investment in employees or in technology of production.
- One more notable feature of Kaizen techniques are used as a strategy of total quality control because Kaizen philosophy emphasizes on fulfilling customer needs. Therefore, Kaizen plays a crucial role in customer satisfaction. This feature of Kaizen is considered to be a secret to success of Japanese companies & its products worldwide.

1.7 Benefits of implementation of Kaizen Techniques

Benefits of Kaizen have been realized by every organisation who applies it for improved productivity, improved quality, better safety, faster delivery, lower costs, and greater customer satisfaction. On top of these benefits to the organization, employees working in Kaizen-based organizations generally find work to be easier and more enjoyable - resulting in higher employee moral and job satisfaction, and lower turn-over.

Following are some benefits from implementation of Kaizen techniques:-

- **Improved Safety:-** Kaizen techniques help in improving safety at the work place. These days trade union government and other social agencies has become sensitive towards employee safety and this issue has becomes a big challenge for organizations to manage and deal with safety issues. In Kaizen 5S technique is considered as one of the important and primary technique for maintaining a safe & pleasant work environment. Implementation of 5S needs to be adapted as a part of Kaizen activity for an organized way of working. This helps to cut down accident-related cost and injuries. The overall results of this are reduction in production stoppage, and medical expenses.
- **Better Quality:-** Continuous improvement of processes at the initial stage will definitely ensures continuous improvements in quality. Employees perform key role in process execution and process performs a key role in ensuring quality. When we succeed to improve the mind set of employees,

automatically the results are reflected in the work quality. Almost all Kaizen techniques emphasize on employee involvement & to improve processes. The overall impact of this will improve quality of final product. When Kaizen techniques are applied in all process areas of an organization, it creates quality culture. Such quality culture focuses on improving quality of man, machine, material, and methods to deliver quality products that meets customer requirement and result in customer satisfaction.

- **Employee Development** :- Kaizen techniques are based on process oriented thinking that requires teams to understand how process works, whether it can be improved, modified or replicated somewhere else in the organisation and how it can be improved hence it is believed that process oriented thinking promotes human quality by focusing on training & development of employees.
- **Facilitates Employee Involvement** :- As stated earlier Kaizen emphasises on involvement of workers in improvement processes by installing suggestion boxes at various locations in the organization and suggestions are invited from all levels in the organization and specifically for those who are physically perform on the machines and equipment and are facing problems in day to day activities while at work. This motivates the workers to perform not just with their hands but with their heart. It boosts their morale towards organisation. The overall effect gets reflected in employee's continuous involvement in production activity and in attaining production targets as well, which contributes in managing timely delivery of products to customer. Employee participation in Kaizen helps in getting better co-operation from them for effective management of internal processes.
- **Waste Elimination (Muda)** :- The key benefit arises from implementation of Kaizen techniques. It can be seen in the form of waste reduction. Kaizen techniques continuously motivate employees to identify waste at their work place. The main motto of Kaizen techniques is waste identification, waste prevention, and waste elimination. Kaizen techniques reduces waste in areas processes such as waiting times, transportation, man movement, over

production, excess inventory and quality. This results in better quality products, funds allocation capital, production capacity, space utilization, time saving and traceability.

- **Problem Solving** :- As per Kaizen philosophy problem solving is taken up right at the Gemba where actual production processes are carried out. In case a problem occurs on production line, it is curbed then and there itself with the help of CFT who interact with the process owner at the production line. During the whole process of problem solving, suggestions are collected from those who actually work at the problematic processes and brainstormed and hence it becomes easy to find more realistic and valid solutions to the problems.
- **Maximum Utilization of Resources** :- An important benefit of Kaizen techniques is improved efficiency of every production factor. This technique focuses on maximum utilisation of resources such as men, machine, method, and space. Everyone is encouraged to give maximum output by using minimum input. Hence resources are used efficiently.
- **Improved Teamwork** :- In Kaizen “We feel ” is more important than “I feel”. It means in Kaizen teamwork is expected rather than individual work. Whenever some problems arise at the workplace it is discussed collectively with CFT members (Cross Functional Team) who are part of that particular area where the problem occurred. This is done with a view to come up with better and creative solution to resolve the problem. And this discussion is done at the actual place of work (Gemba), where the problem has occurred and not in the conference rooms. Finally when problem gets solved by this way it increases understanding of member towards each other. Their confidence and communication level is also increases and most important everyone gets sense of participation. All of this concludes into improved teamwork, bringing about a smooth flow of work.

- **Employee Satisfaction**

Kaizen helps to improve employee satisfaction by offering them opportunity to participate in management of improvement process. A suggestion system or using team meetings to find ways to improve quality, productivity, and effectiveness provides a platform for the employees to express their point of views and ideas and afterwards such ideas are refined by team members by analysing feasibility of the idea. Another benefit of this system is increased productivity, because workers become more involved with the decision-making process and want to see their suggestions work.

- **Standardization:** - Before understanding the meaning of standardization let's discuss why standardization is necessary?

Answer is simple standardization helps in getting consist results. When process is performed by more than an operator, there is possibility that each operator may use different method for accomplishing the given task. Due to such practices there is of consistency and uniformity, hence the way to overcome these issues. With the help of process owners work processes are finalized and the process chart is displayed at the operating locations, so that it is uniformly followed by the operators.

Work Standards provide baseline for Kaizen. Main objective of standardisation is to capitalize on efficiency by eliminating waste. Work Standard can be defined as a set of predetermined procedure or routine to get something done in particular manner with proper explanation about required cost and quality level. Work Standard represents finest, secure, and straightforward way to achieve and maintain a defined quality level. Once standards are established efforts are put in by Kaizen teams to lift those standards to the next higher level. Such continuous improvement in standards makes them more acceptable and achievable. Some benefits of standardization:-

- a. Consistent results are achieved through Standardization. A dedicated approach with the predefined specifications mention by the increases to achieve consistent results.

- b. Standardisation reduces accident at work place. When standards are drafted utmost care is taken by management to ensure that processes defined under standards should not cause any trouble to the workers while performing their task and hence accidents and injuries to the worker are getting decreased. In other word we can say that standards add discipline to the work environment.
- c. Standards provide guidelines to the workers on how to perform activities and expect results from those activities. Hence employee themselves could analyze their performance and if required improve on it. This encourages how they learn from their own mistakes.

The objective of Kaizen is not only to increase productivity of man, machine, method and money, but it also aims at harmonizing the workplace, elimination of waste, promoting learning opportunities for the workers by allowing them experimental learning with work processes in their own work area. In addition to this Kaizen gives more realistic and valid training and development opportunities. Kaizen encourages continuous learning process in which employees learn by their real life experiences, by their mistakes and by observing others.

By adopting Kaizen, any manufacturing industry can get the benefit of economic wealth and performance improvement that ensures competitive advantage and economic stability of the industry. In Kaizen more importance is given to processes. Everyone is encouraged to give their suggestions for process improvement. After that valuable suggestions are choose by management and are implemented and tested to see their impact on processes efficiency. Such experimentation with processes makes processes better and efficient and explores new ways of resource utilisation. While giving suggestions employees are motivated to find out non-value adding activities. Once they identify such activities management simply eliminate them from production processes that results in saving of direct labour, direct material, and direct utility cost. It is advisable to call such suggestions at the product design stage because at this stage it provides important hints to management for selecting appropriate product design which uses less material, meets customer's requirement with less cost.

1.8 Introduction to Kaizen Techniques & it's Benefits

Kaizen forms an umbrella which covers many techniques that focuses on waste elimination, standardization, and improving efficiency at the workplace. This

includes 5S, waste elimination techniques, just-in-time, suggestion system, Total Preventive Maintenance, Kaizen event and 5Why Analysis All these techniques are used at different stages of production process. For e.g. 5S technique are generally applied prior to starting of core production activities. Waste elimination techniques of Kaizen are applied when production is in process. 5Why are used at the stage of problem identification. Standardization techniques are used for continuous revision of existing standard to make them more specific, clear, and simple.

For successful implementation of Kaizen philosophy following Kaizen techniques are need to be present in the organisation. Following techniques are treated as fundamental pillars of Kaizen philosophy.

1) 5S:- 5S is housekeeping technique for organizing workplace systematically. 5S is one of the Kaizen techniques and is expressed as a set of standards, regular audits using checklist to achieve better results. 5s is a technique, that's intend to decrease waste and optimizing productivity and quality through maintaining an orderly workplace and using visual cues to achieve more reliable operational results. It further aims at inserting the values of organizational tidiness, cleaning, standardization, and self discipline in at the workplace. 5S proves as an effective tool for ensuring good housekeeping. 5S term indicates five good practices for housekeeping. Implementation of 5S methodology also improves ergonomics at the work place. In the following paragraph 5S has been discussed in detail:-

- **Seiri:** - Seiri stands for sorting. This is the first step of 5S which focuses on removal of all unwanted items from the work place. The process of sorting is done by segregating the necessary from unnecessary, area wise and all unwanted items are collected at a specified location called Red Tagged area. The red tagged item of one location could be useful for other location so such process is also carrier out of exchanging items at the red tag location. Finally the items are tagged with a red printed card with details such as - Name of the item, frequency of usage, whether required/ not required, disposal time. Once the unnecessary items are removed & red tagged, the traceability in the work area increases, saves & recovers space, time, provides a pleasant work environment and ensures safety at workplace.
- **Seiton:** - Seiton stands set in order. After identifying and removing all

unwanted items it is arranged in proper order in appropriate place. In short PEEP is applied “*Place for Everything & Everything in its Place*”. Seiton helps in removing unnecessary movement, searching time, Excess Inventory, defective products, unsafe condition.

- **Seiso:** - Seiso stands for shine. The workplaces have to be kept clean. With clear gangways to avoid slip trip fall hazards, these practices results in neatness, sanitation, and safety at the work place
- **Seiketsu:** - The forth and most important step is Standardization, wherein it is ensured that consistency is maintained at workplace. This helps in achieving higher productivity with better quality.
- **Shitsuke:** - Shitsuke stands for Self- Discipline and doing it right the first time and every time.

Appropriate implementation of 5S principles ensures a positive result provided it is followed dedicatedly and sustained. Wholehearted employee & top management involvement in a focused way is the core to sustain this system.

2) Waste Elimination Techniques: - second most important technique of Kaizen is waste elimination which requires implementation of Kaizen Techniques like 5S, JIT, TPM, 5 Why's. Japanese Kaizen philosophy focuses on waste elimination & Non Value Adding (NVA) activities. Resources such as man, machine, land, capital, and raw material are scarce and hence effective utilisation of it is necessary to ensure long term growth of the organisation. Kaizen philosophy states that every process involved in manufacturing cycle either adds value (VA) or do not add any value (NVA). Such NVA activities are called muda in Japanese language. The resources and areas of NVA needs higher possibilities for improvements. Elimination of such processes makes the production process lean. Hence it becomes possible to deliver products and services at less cost without compromising with quality. When customer get quality product in less cost, definitely their satisfaction level increases. Kaizen techniques aims at eliminating the seven types of waste caused due to transportation, waiting, motion, processing, defects & repairs, inventory and overproduction. Let's discuss these areas in detail:-

- **Over-production Waste** - Put simply, making or doing things that are not required now. Building inventories of anything unnecessarily is anathema in

Kaizen and Lean. Producing more than needed, faster than needed or before it is needed. This occurs, when products are produced at a faster rate than is required. Causes may be a lack of communication, anticipating demand, poor scheduling, and production management.

- **Excessive Inventory Waste** – Having too many of the wrong thing in stock and not enough of the right things. Having too much work in progress or unfinished goods. For services this could be too many open or partially completed cases. Excessive inventory produced against the actual order. Inventory that stacked in storage areas waiting for delivery is a waste of material, blocked capital, unnecessary space utilization. Causes are due to poor sales forecast, poor inventory planning and poor tracking,
- **Unnecessary Time Waste** – People or things waiting around for the next action. It could be the delay in getting approval for that key item of safety equipment, a car off the road waiting for a spare part, or even the time spent waiting for your computer to come on line every morning. Idle machine, human, inventory contributes to waste within an Organization. Inconsistent Work Methods, Long Machine Change Over Time, Low Man/Machine Effectiveness, and Lack of Proper Equipment/Materials.
- **Transportation Wastes** – such as unnecessary handling or movement of materials, numerous storage areas, and excessive moving equipment, lack of 5S, lack of visuals. This refers to physical items and data rather than the movement of people. For example sending forms that arrive in HR department to Production Department for processing only and to be sent back again to HR department before they can be fully approved.
- **Processing Waste** - Over-engineering a product, including features or doing extra tasks that the customer has no requirement for. Filling more fields on a form more than needed and then again enter the same data in computer system. It is a waste that occur during any stage of production, planning. They can be human error, machine-caused defects, or quality problems, shortage of material due to improper planning, lack of understanding the process.
- **Corrections /Rework Waste** - Just the time and effort wasted when the things that you make are wrong or faulty. The Kaizen focus is to be always “right first time”. It is the time it takes to correct, inspect, scrap, or rework on

mistakes and hence it is a major waste. This is due to ignorant towards systemized practices.

- **Excess Motion Waste** - This refers to the physical movement of people. For example because of poor office design always having to go upstairs to visit important co-workers or walking halfway across the building to the nearest printer. It is any unnecessary human bending, reaching, and man movements during processes, looking for tools and material. This is due to improper work layout, lack of 5S, instructions, and visual control of processes.

3) JIT (Just In Time): - JIT is a production system aimed at giving faster response to customer demands without delays. JIT 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. It is a balanced, synchronized, simplified, & waste free way of working. System is designed to produce in volume with minimum inventories.

4) '5-Why':- The 5-why's technique is a structured and fact-based systematic approach for identifying the root cause of the problem. In case of any problems/ defects, a meeting is called with the affected team member and it starts by identifying the problem, its cause by asking 5 times 'why' it happened, the causes are noted to reach to logical root cause of the problem and find a solution to the root cause identified.

5) Kaizen event:- In this Kaizen technique small CFT's are formed and improvements projects are taken up for the betterment of the organizations and its processes in a stipulated time frame. It is usually a weekly event wherein it is focussed on a low-cost problem solving approach and is often implemented at a targeted work area. This is followed by improvement in the current standards of work processes as per the observations made during Kaizen event.

Here are seven important tips for making Kaizen event most efficient. Improving efficiency with a Kaizen event requires specific planning, a cross-functional team, operator involvement, and four other important attributes:-

- Pre-plan an event:- For most of them, this step would seem obvious, however many of them may fail to understand that the basic things can throw your event into a tailspin. To ensure that, this does not happen, develop the scope of the event with objectives, deliverables, and metrics; these are the right parameters to help determine the success of the event. It has to be made sure to select a team and book space for the event is going to take place. Prepare a checklist, jotting down each and everything, right from the scratch that is required for the event, such as flip charts, Post-it notes, tape, and paint. Pre-planning the event is very important so that nothing is left out. Having all the supplies pre-planned for the event will ensure that the most basic frustrations are eliminated.
- Form a Cross-Functional Team- A Cross-Functional Team should consist of employees from the processes/work areas, where the event will be held. This includes employees from office areas as well. When the CFT with different capabilities and abilities brainstorm, it always comes up with new perspective since they have a diverse views leading towards the same goal. And they think out of the box. By having a cross-functional team, people who have never been in a Kaizen event can familiarize themselves with the concept.
- Involve people in the area :- Involve operators and employees in the area by notifying them that there will be an event in their designated area. The most basic communication can help prevent confusion. Also, display flip chart in the area for employees to post ideas before an event takes place. Keep employees informed during events and follow up with operators for evaluation.
- The 80/20 rule :- During an event, identify the 20% of your time that is spent in the classroom with the 80% that should be spent at the shop floor, planning, designing, and doing—unless you are in a vision event, which could require maximum time to be spent in the classroom.

- Avoid scope creep:-Stay focused on the event. Do not let bigger issues curtail you. Remember the task at hand. Homework from the event should be minimal.
- Use PDCA (Plan, Do, Check, Act/Adjust) :- Do this every day for an event.

P = PLAN what you are going to do today.

D = What did we DO today?

C = What are the results on CHECK?

A = What are we going to do tomorrow? ACT/ ADJUST accordingly.

Follow up:- Follow up for 30 days after the event. Did everyone follow through? Is everyone satisfied with the results? Is all of the homework completed?

6) Total Preventive Maintenance (TPM) :- TPM is a maintenance technique that is focused on prevention of machine breakdowns. And it helps in preventing the issues before they stop the operations. It is normally implemented through practices such as “Autonomous Maintenance”. “Autonomous maintenance” refers to activities designed to involve operators in maintaining their own equipment independently. This is carried out at operator level. A TPM schedule is displayed on each machine and as per the schedule the TPM is carried out by operators. It consolidates the preventive and predictive maintenance approaches with an emphasis on employee participation.

7) Poka-yoke:- Poka-yoke technique focuses on mistake-proofing. It is any mechanism that helps an equipment operator to avoid mistakes. Its purpose is to eliminate product defect by preventing, correcting, or drawing attention to human errors as they occurs. Poka-yoke keeps processes free from errors. Preventing errors obviously improves quality, productivity without rework. It makes production process faster and easier with less lead time and cycle time. Faster production with fewer defects results in to lower cost of production.

8) Suggestion system: - a suggestion system is a technique in which the ideas and suggestions of employees are communicated to the Top Management and with a planned approach it is implemented phase-wise to achieve results with cost savings, improve product quality, workplace efficiency, customer service, working conditions etc.

1.9 Kaizen Implementation Procedure

There are no fixed guidelines or methodologies for implementation of Kaizen. In fact the implementation procedure of Kaizen differs from organisation to organisation. But in general following sequence is considered as ideal sequence for implementation of Kaizen. The sequence is as follows:-

1) Planning and preparation: - planning and preparation is first step to Kaizen implementation. In this step all grey area in the organization is identified like inventory and areas where significant delays occur, cluttered work place, quality issues in which performance of product does not match with customer expectation. Once the problematical or less efficient area is identified next challenge is to do more point to point detail analysis in order to identify the processes or activities in this area which requires application of waste elimination techniques. Such processes are termed as targeted processes. The outcome of this analysis further constitute objective for Kaizen activities. Once objectives are defined, managers brainstorm the processes with cross-functional teams. CFT members are those who are actually involved in the operations in problematic area. Such team member inputs are valuable in chalking out the further move to implement Kaizen techniques. The duration of Kaizen event is totally depends on degree of significance of issues. Managers should release team member's (process owners) from their regular activities to participate in the Kaizen events.

2) Implementation: - Implementation is next step in which the team should first develop clear understanding about the current state of problematic processes so that all team members can have same understanding of the problem which they intend to solve. In order to analyse current state of problematic area and for identifying manufacturing waste following two techniques are commonly used.

- **Five Why's:-** The 5-why's technique is a planned and fact-based logical approach for detection of problem and improvement, that focuses on reduction of defects and eliminating them. It is passionate in the motto "when you find a problem ask why five times", so as to discover the deepest root cause of the problem. The 5-why's analysis is usually used in lean manufacturing which is an addition of the ideas of JIT.

- **Value stream mapping:** - This method includes flowcharting the steps, operations, material flows, interactions, and other process components that are included in the process or conversion for e.g., conversion of raw materials into a finished product. Value stream mapping assists organisation in order to find out the non-value-adding components from the targeted process. This method is same as process mapping, which is commonly, apply to support pollution prevention planning in organizations. In some situations, value stream mapping can be used in step one to identify areas that needs Kaizen events. During the Kaizen event, it is required to collect information on the targeted process, such as measurements of overall product quality; scrap rate and source of scrap; a routing of products; total product distance traveled; total square feet occupied by necessary equipment; number and frequency of changeovers; source of bottlenecks; amount of work-in-progress; and amount of staffing for specific tasks. For this purpose, team members should be assigned with exact roles for research and analysis. As more information is collected, team members add detail to value stream maps of the process and conduct time studies of relevant operations. Once data is collected, it is analyzed and assessed to find areas for improvement. Team members find out and record all observed waste, by asking what the objective of the process is and whether each step or element adds value towards meeting this objective. Once waste or non-value added activity, is find out, and measured, team members then brainstorm improvement suggestions. Ideas are often tested on the shop floor or in process "mock-ups". Ideas regard most capable are elected and implemented. To completely understand the advantages of the Kaizen event, team members should examine and record new cycle times, and calculate overall savings from eliminated waste, operator motion, part conveyance, square footage utilized, and throughput time.

3) **Follow-up:-** An important step of a Kaizen event is the follow-up action. This is necessary to make sure that improvements are constant, and not just temporary. Further to the Kaizen event, team members regularly observe and record key performance measures and document the improvement gains. The CFT team presents their observations regularly to the management for further planning. Follow up gives an opportunity to examine the changes accomplishment and propose further

improvement to employees while doing this there should be proper mentoring and coaching. Follow up provides an occasion to communicate frequently with the value-adding operators and ask for additional process improvement ideas from them for tapping into your wealth of human talent.

1.10 Comparison of Kaizen and Innovation

KAIZEN:

Kaizen Effects	:	Kaizen effects are long term and for business Improvement purpose.
Scope	:	Kaizen involves small Improvement steps.
Time Frame	:	Continuous incremental & sustained process.
Change	:	Gradual and constant.
Involvement	:	All - right from Top to Bottom line employees
Approach	:	collective group efforts, systemized approach
Mode	:	Periodic Maintenance and improvement
Effort Orientation	:	Workman
Practical Requirement	:	Low Cost but sustained efforts for long term results
Advantage	:	Works well in slow growth economy

INNOVATION:

Innovation Effects	:	Innovation Effects Are Dramatic & Short Termed
Scope	:	Direct Approach Towards Improvement
Time Frame	:	Is Intermittent And Non-Incremental
Change	:	Abrupt And Volatile
Involvement	:	Selected Champions
Approach	:	Individual Ideas And Efforts
Mode	:	Scrap And Rebuild
Effort Orientation	:	Technology
Practical Requirement	:	Huge Investments, Not Much Efforts To Sustain The Same
Advantage	:	Better Suited For Fast Growth Economy.

Considering the above comparative we can conclude that Kaizen is a long termed strategy whereas Innovation is a short termed result.

Comparison of Kaizen with TQM

There are some misconceptions about the similarities in Kaizen and other quality improvement concepts such as Total Quality Maintenance (TQM), Six Sigma & Lean. However there are some major differences among these concepts.

Above mentioned improvement techniques focuses on customer satisfaction with quality improvement in final product.

TQM features mainly focuses on customer satisfaction through improvement in quality of final product. It uses top down and bottom up approach for implementation. Implementation of TQM is a costly approach. Moreover, TQM journey deals with management concerns such as organizational development, cross-functional Team management, and quality deployment. In other words, management has been using TQM as a concept and a tool for improving overall Quality performance. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous process improvement. The activities are ultimately focused on increased customer-user satisfaction. TQM is generally applied at the philosophical and organizational culture level.

Whereas, Kaizen concept focuses on improving quality of processes, mind sets of workers and their behavioural aspects. More specifically we can say that, Kaizen concept is related with quality assurance philosophy which emphasises towards process & people oriented thinking. Whereas Kaizen processes are focused on a bottom up approach of small incremental changes. Implementation of Kaizen is a cost effective approach . Kaizen improvements are made by using available resources in hand. Kaizen principles are more frequently cited at the "ground floor" level.

Comparison of Kaizen techniques with Lean and Six sigma

Kaizen technique is applied to eliminate all types of wastes in the organization, defined in Japanese as Muda, Mura, Muri, and Improving Employee mind sets with Teamwork approach.

Kaizen is more of an overreaching kind of process improvement that aspires to improve all aspects of a business through standardization, waste eliminating (defined in many ways depending on the type of business), and increasing man, machine & process efficiency.

When Kaizen is incorporated into business processes, the focus on improvement has a large scope. The function of each employee is monitored, regardless of their level.

As per Kaizen philosophy there is always scope for improvement, and better performance, greater efficiency. It helps to identify 3 MU's – Muda (wastes), Mura (variation / inconsistency), and Muri (strain/ burden on man & machine).

Lean is only for identifying and removing muda (waste) from processes and products

Lean is opposite to fat. Operations that fail to create value for the end customer are deemed “wasteful”.

Six sigma identifies and eliminates Mura (variation or inconsistency). Six sigma is a better statistical exercise to identify and eliminate defects from processes and products. Specific Six Sigma Trained Team is involved in the process of correction. Six Sigma focuses on process improvement that narrows its focus on improving the quality of the final product. This is done by examining the potential causes for failure in quality and eliminating the reasons for these defects. Instead of examining ALL the processes of a particular business, only those related to a specific final product are considered in a particular project. The aim is to reach zero defects on project completion.

1.11 Statement of the Problem

The chosen research context: “A study of Kaizen techniques in selected manufacturing industries in Pune” basically focuses on studying various Kaizen techniques used in Automobile and Auto ancillary manufacturing organizations in Pune region.

In the present cut throat competitive scenario, manufacturing industries are facing some major challenges that hinder their performances. These challenges are cost cutting, relationship management (with employee and customer), high quality product delivery, customer satisfaction, effective utilisation of resources, developing & learning organizational culture, etc. The survival of manufacturing industries solely depends on their capacity to serve customer requirement on priority at the right time with high quality and in low cost. In order to maintain balance between right time,

high quality, and low cost manufacturing, industries can adapt the cost effective solution i.e. “Kaizen”. Kaizen is not about making quantitative changes but it is all about making qualitative changes in processes by taking small steps in systematic manner, which later result in long term qualitative improvements of processes.

While discussing these problems, researcher points out that Kaizen techniques, can be applied to solve these problems systematically.

Hence in the context of present research the researcher studies the following area, related to Kaizen techniques.

Statement of the problem

In the context of present study the researcher will focus on examining following aspects related to Kaizen and its related techniques.

- Extent of Kaizen techniques implementation in automobile and auto ancillary manufacturing organizations in targeted area.
- Identifying primarily used Kaizen techniques.
- Awareness on Kaizen and its related techniques among employees of automobile and auto ancillary manufacturing organizations in targeted area.
- Modes used for implementing Kaizen and its related techniques in automobile and auto ancillary manufacturing organizations in targeted area.
- Impact of Kaizen techniques on productivity, quality of product and on employee involvement.
- Identifying possible benefits associated with each of the Kaizen techniques.
- Hierarchy based analysis of results.

Initially the researcher studies the level & awareness of Kaizen and its related techniques in selected automobile and auto ancillary manufacturing organizations. The purpose of this is to analyse the gravity in which the organizations have taken up this techniques.

Secondly the researcher studies the extent of implementation and mode of implementation of these techniques in automobile and auto ancillary manufacturing organizations, in order to evaluate the responsiveness of these organizations towards Kaizen techniques.

Thirdly the researcher analyses the Kaizen techniques that is being primarily followed in automobile and auto ancillary manufacturing organizations.

Fourthly the researcher examines the impact of Kaizen techniques on productivity, Quality of product and on employee involvement. In addition to this the researcher also analyses possible benefits that any organization can achieved using each of the Kaizen technique.

Finally the researcher will concludes the relevance of Kaizen techniques based on organizational structural hierarchy. The purpose of this is to analyse the hierarchy wise opinions on Kaizen techniques by managers, supervisors, and workers.

Definitions and Explanation of Key Terms:-

Kaizen

Kaizen is a Japanese term for “improvement”, or “change for the better” refers to philosophy or practices that focus upon continuous improvement of processes in manufacturing, engineering, and business management. By improving standardized activities and processes, Kaizen aims to eliminate waste.

Kaizen is a process of continuous improvement which creates a sustained focus on eliminating all forms of waste from a targeted process.

Kaizen is a system that involves every employee from upper management to the cleaning crew. Everyone is encouraged to come up with small improvement suggestions on a regular basis.

Kaizen is the philosophy of incremental continuous improvement with involvement of everyone.

Productivity

The ratio between output and input is known as productivity. It may also be defined as the arithmetic ratio of amount produced to the amount of resource used in any production. The resource may be land, plant, labour, material, machines, tools or it could be a combination of all.

Muda:- It is a Japanese term which means anything that increases the cost but creates no added value.

Mura : - It is a Japanese term which means Inconsistent or Irregular or uneven use of person or manufacturing capacity.

Muri :- It is a Japanese term which means overburden on equipment, facilities & people caused by Mura and Muda.

Quality Product:- A product that meets customer requirements on right time at right place at minimum cost.

Employee:- includes all individuals works at different level of hierarchy as per organizational structure.