

KAIZEN
DEFINITION & PRINCIPLES
IN BRIEF

A CONCEPT & TOOL FOR EMPLOYEES INVOLVEMENT



THESSALONIKI 2006

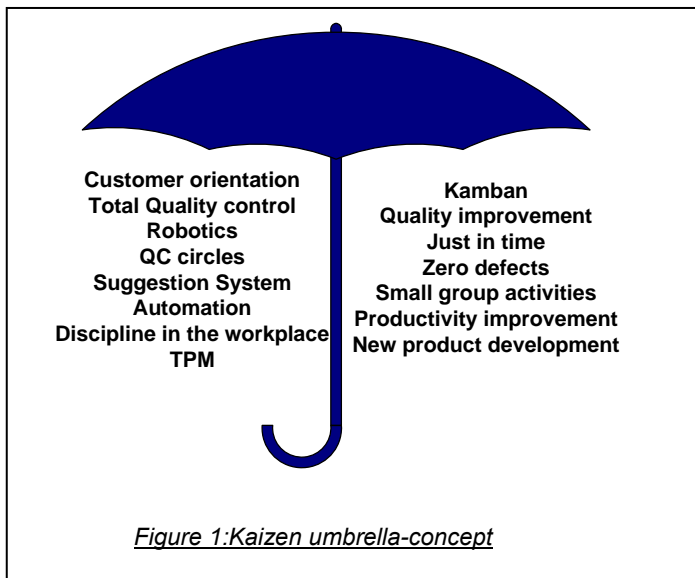
1. Definition and principles of Kaizen

In the decade of 1980, management techniques focusing on employee involvement, and empowerment through teamwork approach and interactive communications and on improving job design were not new, but Japanese companies seemed to implement such techniques much more effectively than others. The business lesson of the 1980's was that Japanese firms, in their quest for global competitiveness, demonstrated a greater commitment to the philosophy of continuous improvement than Western companies did (1). For such a philosophy the Japanese used the term Kaizen.

Kaizen means improvement, continuous improvement involving everyone in the organization from top management, to managers then to supervisors, and to workers. In Japan, the concept of Kaizen is so deeply engrained in the minds of both managers and workers that they often do not even realize they are thinking Kaizen as a customer-driven strategy for improvement (2). This philosophy assumes according Imai that "our way of life – be it our working life, our social life or our home life – deserves to be constantly improved" (3).

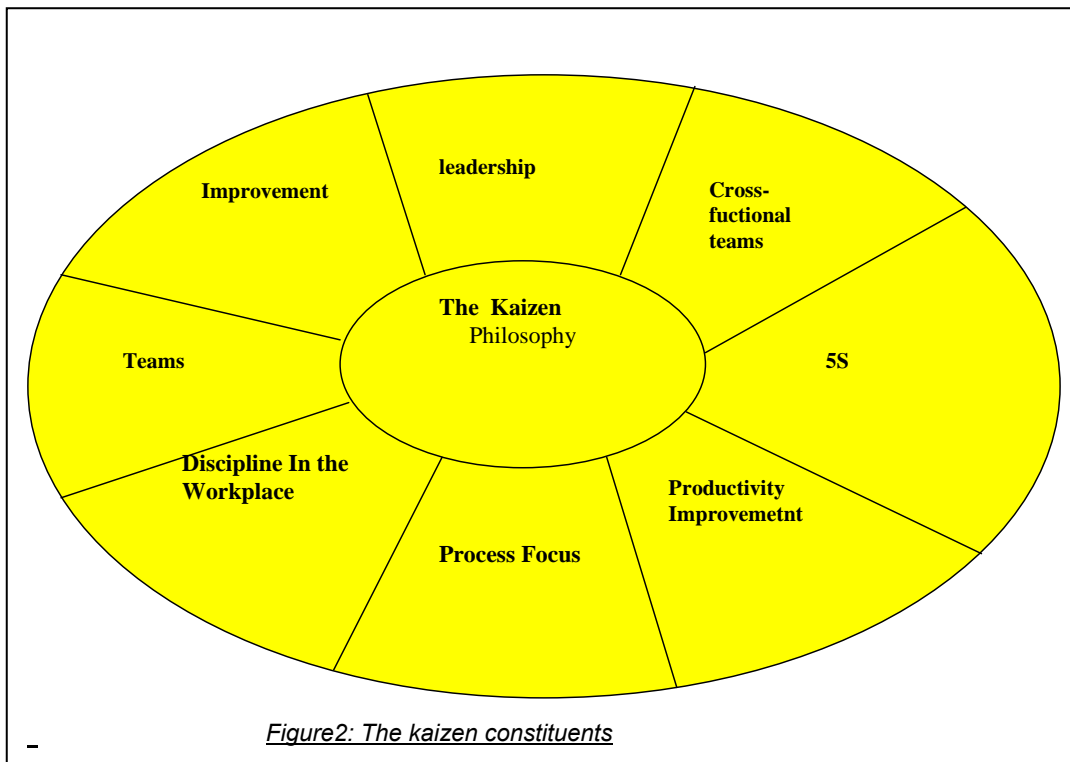
There is a lot of controversy in the literature as well as the industry as to what Kaizen signifies. Kaizen is a Japanese philosophy for process improvement that can be traced to the meaning of the Japanese words 'Kai' and 'Zen', which translate roughly into 'to break apart and investigate' and 'to improve upon the existing situation'(4). The Kaizen Institute defines Kaizen as the Japanese term for continuous improvement. It is using common sense and is both a rigorous, scientific method using statistical quality control and an adaptive framework of organizational values and beliefs that keeps workers and management focused on zero defects. It is a philosophy of never being satisfied with what was accomplished last week or last year (5),(6).

Improvement begins with the admission that every organization has problems, which provide opportunities for change. It evolves around continuous improvement involving everyone in the organization and largely depends on cross-functional teams that can be empowered to challenge the status quo.



The essence of Kaizen is that the people that perform a certain task are the most knowledgeable about that task; consequently, by involving them and showing confidence in their capabilities, ownership of the process is raised to its highest level (7). In addition, the team effort encourages innovation and change and, by involving all layers of employees, the imaginary organizational walls disappear to make room for productive

improvements. From such a perspective, Kaizen is not only an approach to manufacturing competitiveness but also everybody's business, because its premise is based on the concept that every person has an interest in improvement. The premise of a Kaizen workshop is to make people's jobs easier by taking them apart, studying them, and making improvements. The message is extended to everyone in the organization, and thus everyone is a contributor (8). So, when Kaizen for every individual could be an attitude for continuous improvement, for



the company also be a corporate attitude for continuous improvement .

As presented by Imai ,Kaizen is an umbrella concept that embraces different continuous improvement

activities on an organization as shown in Figure 1 (9) . Also Kaizen constituents are presented on Figure 2

According to James Womack in his book “ The Machine That Changed the World ” (1991), (10) with Kaizen, the job of improvement is never finished and the status quo is always challenged. Kaizen techniques became famous when Toyota used them to rise to world automotive leadership. Rather than undertake large projects, Toyota's staff was encouraged to identify problems, no matter how small, trace their root causes, and implement all necessary solutions.

Improvements through Kaizen have a process focus. Kaizen generates process-oriented thinking, is people-oriented, and is directed at people's efforts. Rather than identifying employees as the problem, Kaizen emphasizes that the process is the target and employees can provide improvements by understanding how their jobs fit into the process and changing it.

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. Table 1 ,illustrates some of the major differences between a conventional and a process-emphasis approach.

Conventional approach	Process-emphasis approach
Employees are the problem	The process is the problem
Doing my job	Helping to get things done
Understanding my job	Knowing how my job fits in the process
Measuring individuals	Measuring performance
Change the person	Change the process
Correct errors	Reduce variation
Who made the error?	What allowed tile error to occur?

Table 2. 1: improvements through kaizen: a process focus

The starting point of a process-emphasis approach is to map the process in order to understand the flow of the product or service. To give more pictorial the difference between process and targets concepts lets have a look on two ancient man-activities in real life. Farming and hunting activities :

On process approach (farming)the characteristics are :

Land preparation including levels
 Removal of obstacles, stones and rocks
 Soil enrichment
 Water management
 Planting
 Weed control
 Pest and disease control
 Comparisons and benchmarking with neighboring farms
 Monitoring progress relative to each step
 Harvesting

On a target approach (hunting) the characteristics are:

Hear or see possible prey
 Isolate a specific target
 Prepare personal tools
 Approach target with known skills
 Aim at first realizable opportunity
 Make second attempt if first fails
 Relax once successful until hungry.

The effect on thinking of these two activities then is presented on the following table:

Effects on Thinking	
Farming	Hunting
-Long term -The process is king -So enhance participation in the process -Weather affects output so poor years understood -Market share (amount of land that can be developed) is paramount -Growth comes from extra market share (more land) and improving the process	-Short term -The Individual is king -So enhance the empowerment of the individual -Weather should not affect output so a bad year not accepted -Hunting skill (return on outings) paramount -Acquisitions are another form of hunting -Growth from faster hunting

Table 2 : effects on thinking: target vs process approach

The Japanese have been farmers for 50 years , so easily one can understand their devotion and discipline on continuous improvement way of thinking and living (11) .The implementation

of Kaizen principles has been viewed as one of the key factors to Japanese competitive success. Kaizen then has emerged in the U.S. as a methodology leading to dramatic increases in productivity by manufacturing companies

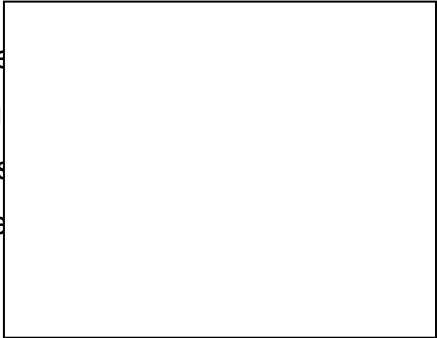
Process quality improvement needs the use of specific tools and techniques to be introduced and supervisors and operators to be trained on. Appendix 2.1 contains examples of continuous improvement tools, the ,so known as '9 Tools', such as : process flow charts, Pareto analysis , run charts, data collection, histograms, scatter analysis, checklist ,a cause and effect diagram, control charts, that used by the teams to detect problems , facilitate processes and implement proposals (12).

The role of visual management as a concept, practice or tool is promoted in Kaizen through individuals or teams to help people identify problems or promote empowerment. The practice of visual management involves the clear display of tangible objects (gembutsu), charts, lists, records of performance, so that both management and workers are continuously reminded of all the elements that make the Visual controls make it easy for everyone to identify the state of a normal or abnormal condition, thus providing operators and management visibility into performance (see Appendix2.2) Visual controls tracking performance should capture the team effort rather than the individual. Visual controls usually lead to visual management, which can be particularly efficient if it is used adequately to replace the bureaucratic monitoring systems that many companies employ in order to maintain control and attempt to prevent anything from going wrong. Visual controls must be relevant, easy to understand by the people performing the task being measured, and must emphasize proactive actions, rather than blaming ,so the visual workplace will: (13).

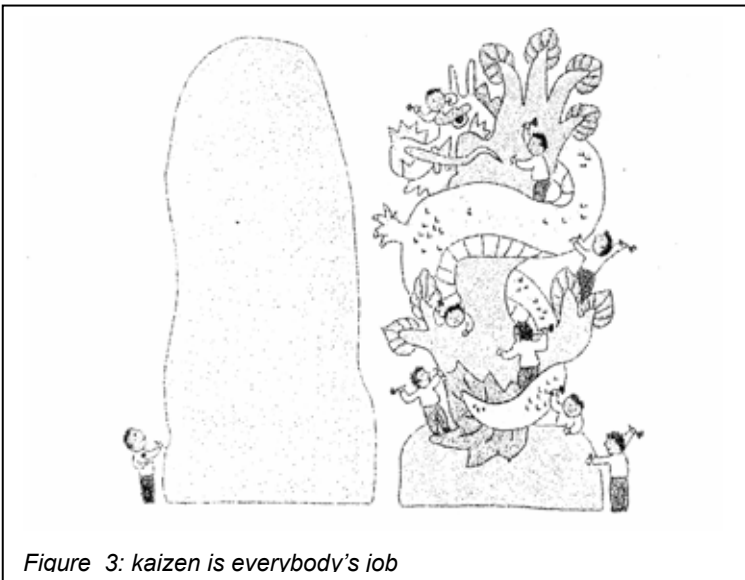
- improve safety
- make critical information available at a glance
- gain immediate measurable results including: reduced floor space, decreased process time and machine down time
- keep everyone informed of production schedules, daily attendance, inventory levels, etc.
- reduce search time by as much as 50%
- reduce inventory as much as 10% to 30%
- raise morale and on-time delivery

- introduce techniques that will allow significant reductions in lead time (10-25%)
- build communication between shifts, work areas, and organization levels
- improve quality 10-20% .

There are two elements that construct kaizen, improvement and continuity. Lacking one of those elements would be like a tree without roots. For instance, the expression of “business as usual” contains no element of improvement. On the other hand, the expression of “breakthrough” contains an element of change or improvement without continuity. Kaizen contains both.



Another key aspect of kaizen is that it is an on-going, never-ending improvement process. As the reader may already know, it is not too difficult to introduce something new into an organization.



The difficult part is, how to keep it going and maintain the momentum once it has been introduced. Many companies have tried to introduce such projects as quality circles, reengineering, and lean production. While some of them have been successful, most have failed to make such a project a going concern. For instance, many Western companies introduced quality circles by involving employees but most companies have

simply given up the idea of quality circle activities by now as a way to improve quality, cut cost and speed products to market.

The message of the Kaizen philosophy is that not one single day should go by in the firm without some type of improvement being made in some process in the company. Kaizen is everyone's job; it requires sophisticated problem-solving expertise as well as professional and engineering knowledge and involves people from different departments working together in teams to solve problems, as shown in Figure 3

Kaizen deals with the management of change and is a methodology in the right direction to improve manufacturing operations, on a continual and incremental basis following the right steps (14):

- Establish a plan to change whatever needs to be improved,
- Carry out changes on a small scale,
- Observe the results, and
- Evaluate the results and the process and determine what has been learned .

The starting point for improvement is to recognize the need. So Kaizen principles emphasize problem-awareness and provide clues to identifying problems. When identified, problems must be solved, so Kaizen is also a problem-solving process. But, most of all, Kaizen is a management philosophy that forces higher standards at all levels of the organization by encouraging continuous improvement in all processes. Professor Hitochi Kume of Tokyo University compared quality control in the West and Japan:” I think that while control in the West aims at ‘controlling’ the quality and conformance to standards and specifications, the feature of the Japanese approach centers around improving (Kaizen) quality. In other words, the Japanese approach is to do such Kaizen systematically and continually “(15). Kaizen approach is based on the premise that there is no perfection in a process, because no structure, product, or system ever achieves the ideal stage and where it can be improved by further reducing waste .

2. Kaizen -The three pillars

2.1The three pillars

According to M. Imai, a guru in these management philosophies and practices , the three pillars of kaizen are summarized as follows:

1. housekeeping
2. waste elimination
3. standardization

and as he states , the management and employees must work together to fulfill the requirements for each category. To be ensured success on activities on those three pillars three factors have also to be taken account .

1. visual management,
2. the role of the supervisor,
3. the importance of training and creating a learning organization.

More analytically on each one pillar of Kaizen:

2.1.1 Housekeeping

This is a process of managing the work place ,known as “Gemba” (workplace) in Japanese, for improvement purposes .Imai introduced the word ”Gemba “, which means “real place”, where value is added to the products or services before passing them to next process where they are formed (16).

For proper housekeeping a valuable tool or methodology is used , the 5S methodology. The term “Five S” is derived from the first letters of Japanese words referred to five practices leading to a clean and manageable work area: seiri (organization), seiton (tidiness), seiso (purity), seiketsu (cleanliness), and shitsuke (discipline). The English words equivalent of the 5S's are sort, straighten, sweep, sanitize, and sustain. 5S evaluations provide measurable insight into the orderliness of a work area and there are checklists for manufacturing and non-manufacturing areas that cover an array of criteria as i.e. cleanliness, safety, and ergonomics. Five S evaluation contributes to how employees feel about product, company, and their selves and today it has become essential for any company, engaged in manufacturing, to practice the 5S's in order to be recognized as a manufacturer of world-class status.

On the following table the 5S approach is presented briefly for each one from the five activities (17):

Seiri	SORT what is not needed. Use the red tag system of tagging items considered not needed, then give everyone a chance to indicate if the items really are needed. Any red tagged item for which no one identifies a need is eliminated (sell to employee, sell to scrap dealer, give away, put into trash.
Seiton	STRAIGHTEN what must be kept. Make things visible. Put tools on peg board and outline the tool so its location can be readily identified. Apply the saying "a place for everything, and everything a place".

Seiso	SCRUB everything that remains. Clean and paint to provide a pleasing appearance.
Seiketsu	SPREAD the clean/check routine. When others see the improvements in the Kaizen area, give them the training and the time to improve their work area.
Shitsuke	STANDARDIZATION and self-discipline. Established a cleaning schedule. Use downtime to clean and straighten area.

Table 3: 5S Activities

As some of the benefits of employees of practicing the five S could be referred to as follows: Creates cleanliness, sanitary, pleasant, and safe working environments; it revitalizes Gemba and greatly improves employee morale and motivation; it eliminates various kinds of waste by minimizing the need to search for tools, making the operators' jobs easier, reducing physically strenuous work, and freeing up space; it creates a sense of belonging and love for the place of work for the employees (18) .

2.1.2 Waste (Muda) elimination.

Muda in Japanese means waste. The resources at each process — people and machines — either add value or do not add value and therefore ,any non-value adding activity is classified as muda in Japan. Work is a series of value-adding activities, from raw materials ,ending to a final product. Muda is any non-value-added task. To give some examples ,there are presented here Muda in both manufacturing and office settings described below on Table 2.4:

Muda in Manufacturing	Muda inOffice
Shipping defective parts	Passing on work that contains errors
Waiting for inspection	Signature approvals, bureaucracy
Walking and transporting parts	Walking or routing documents
Overproduction	Copies, files, a lot of papers
Excess inventory which hides	Excess documentation

Table 2.4: examples of Muda

In Kaizen philosophy, the aim is to eliminate the seven types of waste (7 deadly wastes) caused by overproduction, waiting, transportation, unnecessary stock, over processing ,motion, and a defective part, and presented on the following table ,in summary (19):

- | |
|---|
| <ol style="list-style-type: none"> 1. Overproduction – Production more than production schedule 2. Inventory – Too much material ahead of process hides problems 3. Defects – Material and labor are wasted; capacity is lost at bottleneck 4. Motion – Walking to get parts because of space taken by high WIP 5. Processing – Protecting parts for transport to another process 6. Waiting – Poor balance of work; operator attention time 7. Transportation – Long moves; re-stacking; pick up/put down |
|---|

Table 5 : 7 deadly wastes

so muda (waste) elimination will cover the categories described as follows:

Muda of overproduction. Overproduction may arise from fear of a machine's failure, rejects, and employee absenteeism. Unfortunately, trying to get ahead of production can result in : tremendous waste, consumption of raw materials before they are needed, wasteful input of manpower and utilities, additions of machinery, increased burdens in interest, additional space to store excess inventory, and added transportation and administrative costs.

Muda of inventory. Final products, semi finished products, or part supplies kept in inventory do not add any value. Rather, they add cost of operations by occupying space, requiring additional equipment and facilities such as warehouses, forklifts, and computerized conveyer systems .Also the products deteriorate in quality and may even become obsolete overnight when market changes or competitors introduce a new product or customers change their taste and needs. Warehouses further require additional manpower for operation and administration. Excess items stay in inventory and gather dust (no value added), and their quality deteriorates over time. They are even at risk of damage through fire or disaster. Just-in-time (JIT) production system helps to solve this problem .

Muda of defects (repair or rejects). Rejects, interrupt production and require rework and a great waste of resources and effort .Rejects will increase inspection work, require additional time to repair, require workers to always stand by to stop the machines, and increase of course paperwork.

Muda of motion. Any motion of a persons not directly related to adding value is unproductive. Workers should avoid walking, lifting or carrying heavy objects that require great physical

exertion because it is difficult, risky, and represents non-value added activities. Rearranging the workplace would eliminate unnecessary human movement and eliminate the requirement of another operator to lift the heavy objects. Analysis of operators' or workers leg and hand motions in performing their work will help companies to understand what needs to be done.

Muda of processing. There are many ways that muda can happen in processing. For example, failure to synchronize processes and bottlenecks create muda and can be eliminated by redesigning the assembly lines so, utilizing less input to produce the same output. Input here refers to resources, utilities, and materials.

Output means items such as products, services, yield, and added value. Reduce the number of people on the line; the fewer line employees the better. Fewer employees will reduce potential mistakes, and thus create fewer quality problems. This does not mean that we need to dismiss our employees. There are many ways to use former line employees on Kaizen activities, i.e., on value-adding activities. When productivity goes up, costs will go down. In manufacturing, a longer production line requires more workers, more work-in-process and a longer lead-time. More workers also means a higher possibility of making mistakes, which leads to quality problems. More workers and a longer lead-time will also increase cost of operations.

Machines that go down interrupts production. Unreliable machinery necessitates batch production, extra work-in-process, extra inventory, and extra repair efforts. A newly hired employee without proper training to handle the equipment can consequently delay operation, which may be just as costly as if the equipment were down. Eventually, quality will suffer and all these factors can increase operation costs.

Muda of waiting. Muda of waiting occurs when the hands of the operator are idle; when an operator's work is put on hold because of line imbalances, a lack of parts, or machine downtime; or when the operator is simply monitoring a machine as the machine performs a value-adding job. Watching the machine, and waiting for parts to arrive, are both muda and waste seconds and minutes. Lead time begins when the company pays for its raw materials and supplies, and ends when the company receives payment from customers for products sold. Thus, lead time represents the turnover of money. A shorter lead time means better use of resources, more flexibility in meeting customer needs, and a lower cost of operations. Muda elimination in this area presents a golden opportunity for Kaizen. There are many ways to cut

lead time. This can be done through improving and speeding up feedback from customer orders, having closer communications with suppliers, and by streamlining and increasing the flexibility of Gemba operations .

Another common type of muda in this category is time. Materials, products, information, and documentation sit in one place without adding value. On the production floor, temporary muda takes the form of inventory. In office work, it happens when documents or pieces of information sit on a desk or in trays or inside computer disks waiting to be analysed, or for a decision or a signature.

Muda of transportation In workplace ,gemba, one notices all sorts of transport by such means as trucks, forklifts, and conveyors. Transportation is an essential part of operations, but moving materials or products adds no value. Even worse, damage often occurs during transport. To avoid muda, any process that is physically distant from the main line should be incorporated into the line as much as possible,

Because eliminating muda costs nothing, muda elimination is one of the easiest ways for a company to improve its Gemba's operations (20) .

2.1.3 Standardization

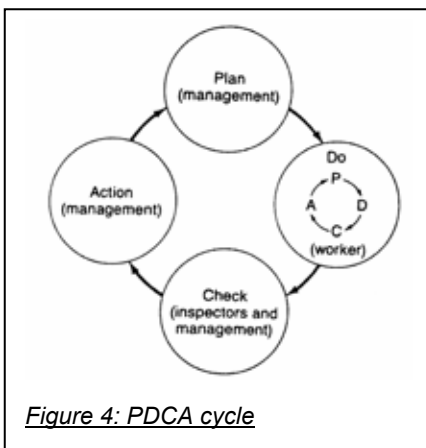
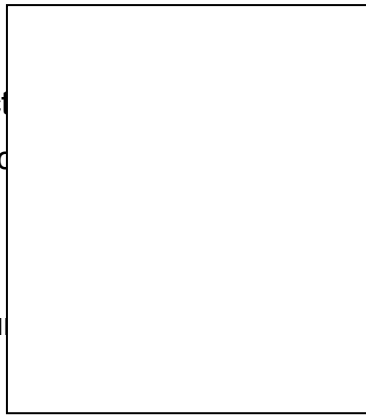


Figure 4: PDCA cycle

Standards are set by management, but they must be able to change when the environment changes. Companies can achieve dramatic improvement as reviewing the standards periodically, collecting and analysing data on defects, and encouraging teams to conduct problem-solving activities. Once the standards are in place and are being followed then if there are deviations, the workers know that there is a problem. Then employees will review the standards and either correct the deviation or advise management on changing and improving the standard. It is a never-ending process and is better explained and presented by the PDCA cycle(plan-do-check-act), known as Demming cycle , shown on figure 4 (21):

The management plans, each employee follow the plan act
the management correct or secure every step , systematic
each one employee follows his own PDCA cycle.



check , and
seen that
objectives,

An example of Kaizen PDCA cycle could be:

- PLAN refers to selecting the theme, understanding the current situation, and analysing the data in order to identify root causes;
- DO is the process of establishing countermeasures based on the data analysis;
- CHECK is confirming the effects of the countermeasures; and
- ACT is to establish or revise the standards to prevent recurrences, and reviewing the above processes and working on the next steps (22).

Then on each one stage of the cycle the appropriate practices and tools that used for ,are presented :

P – Plan

Pick a project (Pareto Principle)

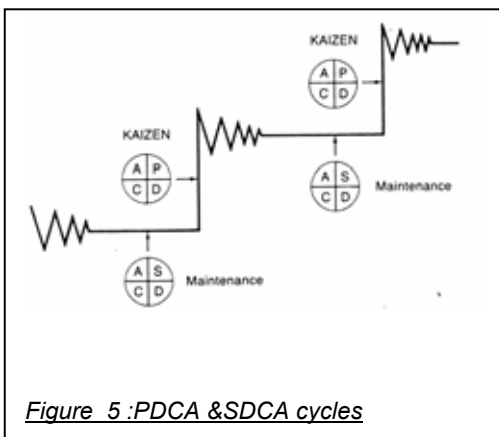


Figure 5 :PDCA &SDCA cycles

Gather data (Histogram and Control Charts)

Find cause (Process Flow Diagram and Cause/Effect Diagram)

Pick likely causes (Pareto Principle and Scatter Diagrams)

Try Solution (Cause/Effect , “5W AND 1H ” methodology : who, what, why, when, where, how)

D – Do

Implement solution

C – Check

Monitor results (Pareto, Histograms, and Control Charts)

A – Act

Standardize on new process (Write standards, Train, Foolproof, Quality-At-The-Source [QUATS])

A successful PDCA cycle then is followed by the SDCA cycle where ‘S’ stands for standardization and maintenance of the new situation. So, PDCA stands for improvement and SDCA stands for maintenance .The two cycles are combined and presented on the following figure 5 (22) : .

Standardization process is a very important one that has few key features, presented below:

- Represent the best, easiest, and safest way to do the job,

- Offer the best way to preserve know-how and expertise,
- Provide a way to measure performance,
- Show the relationship between cause and effect,
- Provide a basis for both maintenance and improvement,
- Provide objectives and indicate training goals,
- Provide a basis for training,
- Create a basis for auditing or diagnosis, and
- Provide a means for preventing recurrence of errors and minimizing variability.

2.2 Kaizen and innovation

Kaizen practices improves the status quo by bringing added value to it. Kaizen does not replace or preclude innovation. Rather, the two are complementary. After Kaizen has been exhausted, ideally, innovation should take off, and Kaizen should follow as soon as innovation is initiated. Kaizen will support the improvement of existing activities, but it will not provide the giant step forward. It is important for the firm to maintain a balance between innovation and a Kaizen strategy that focuses on improvement (23). It is top management's job to maintain this balance between Kaizen and innovation, and it should never forget to look for innovative opportunities (24) .

If efforts are continued toward a clearly defined goal , it is bound for Kaizen to yield positive results. However, Kaizen is limited in that it does not replace or fundamentally change the status quo. As soon as Kaizen's marginal value starts declining, one should turn to the challenge of innovation. Kaizen signifies small improvements made in the status quo as a result of ongoing efforts .Innovation involves a drastic improvement in the status quo as a result of a large investment in new technology and/or equipment or a totally re-engineered product/process (25) . On the following table are classified according to some important factors the differences between kaizen and innovation (26).

<u>FACTOR</u>	<u>KAIZEN</u>	<u>INNOVATION</u>
Improvement Size	Small improvements	Major improvements
Improvement Basis	Conventional knowledge	Technology of equipment
Main resource	Personal involvement	Money investment

People involved	Many people	A few champions
Orientation	Improve the process	Improve results
Economy	Even in slow economy	Mainly in good economy

Table 6 :Kaizen and innovation.

According Imai are shown on Figure 6 also reflects how conventional western management perceives job functions (28) :

Top Management	Innovation
Middle Management	
Supervisors	Maintenance
Workers	

Figure 6 : Job functions as perceived by western management

From that figure is apparent that there is little room in the Western managers' perception for a Kaizen approach because they depend largely on maintenance of the standards and operating procedures at the working level. Also, they depend on upper management to provide innovation at a very high level, where change is forced on management by market conditions and competition. As shown in Figure 7, divides improvement into Kaizen and Innovation on following sectors (27) .

Top Management	Innovation
Middle Management	Kaizen
Supervisors	Maintenance
Workers	

Figure 7: Kaizen and the role of management

In this model top management introduces Kaizen as a corporate strategy, middle management uses Kaizen practices in improving functional capabilities and helps employees develop proper skills for problem solving. Supervisors improve communication with the workers, formulate plans for Kaizen and provide guidance to workers. Workers engage in Kaizen through small group and team activities and practice the tools for continuous improvement.

Breakthroughs are essential for improvement, but continuous incremental improvement is the key to quality leadership. True breakthroughs are hard to predict. The Japanese place a high priority on continuous incremental improvements (Kaizen) that, over time, leave behind the

competitors who are depending on the 'magic idea' for success. Workers, supported by managers, are a major source of these improvements. Taken together, infrequent innovations and continuous improvement result superior productivity gains .

Applying Kaizen to routine work is the key to success. Working on special projects is important, but in the long run, it is the day-to-day application of Kaizen practices to routine work that gets results. Figure 8 , shows the relationship between Kaizen and innovation while pursuing a continuous improvement philosophy.

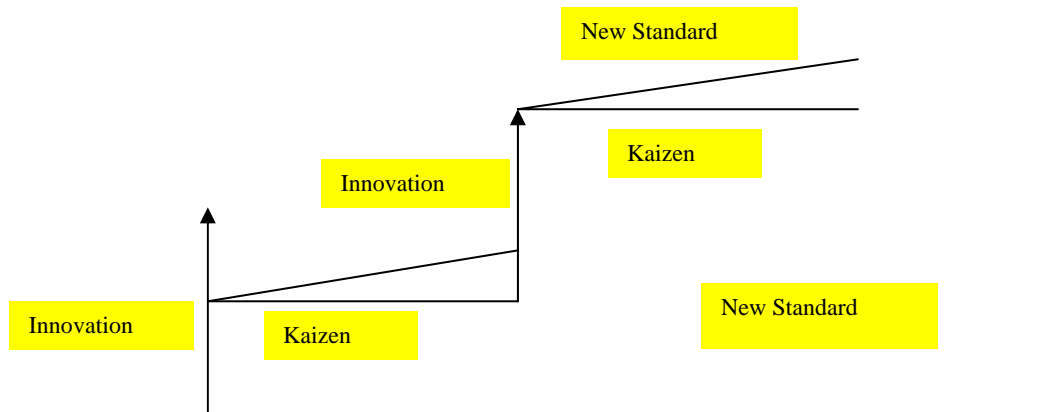


Figure 8 : The relationship between kaizen and innovation

It is true that Kaizen practices alone cannot "reinvent a better way of doing business." But a better way of doing business can be improved through Kaizen principles, as shown earlier. Another benefit of utilizing Kaizen practices to supplement innovation is that the Kaizen mindset of teamwork and a "can do attitude" will eventually absorb easily a radical change introduced by innovation.

2.3 Kaizen and "Humanware" parameters:

Teamwork approach ,Upper Management Commitment, Rewards.

2.3.1 Teamwork approach

Kaizen concept and strategy and its embraced tools emphasizes and revolves around teamwork activities. So it is worthwhile to present from bibliography types of teamwork with their characteristics that used in specific circumstances and can be adjusted or modified to any company to promote kaizen activities.

Teamworks principles

One of the most compelling reasons for the movement toward implementing empowered work teams is the fact that teams work . The basic rationale is that the use of teams allows an organization to take advantage of the diverse, backgrounds, and interests of team members. The team effort and cooperation often result in a motivated and entrepreneurial workforce .

Motivated employees take their team tasks very seriously, plan how they can complete them in their jobs, take pride and have satisfaction in their achievements. They put effort to accomplish objectives and reach company goals. Strong personal commitments to one another's growth and success are the key that distinguishes these high-performance work teams. The opposite holds true for many non-team employees. These tend to be unmotivated employees who try to do as little as possible (29).

An idea program can work well with teams, since everyone can participate on a team. The idea program allows those individuals to still have a voice in the organization. Additionally, a team member may have an idea that doesn't fit the current team's mission. This idea could get lost without a process to track team ideas. Team efforts normally have management input into their activities or focus whereas a suggestion system process taps any creative idea.

According to Laureau and Orsburn et al (30), a work team is a group of employees that is responsible for activities on a "whole" work process that delivers a product or service to internal or external customers. The product could be a chair or a service, such as a fully analysis on a company's health and safety claims. Work team members are people who have the power to manage the work they do on daily basis . A work team typically consists of two to ten highly trained workers

The philosophy underlying the creation of teams calls for a well-defined, planned process for giving responsibility to a group of people who know how to do their job well at their level and when to get other people involved.

Work teams consist of people who perform different and/or specific jobs that relate to the daily work of the company. Sometimes is confusing to find a specific reason why a team forms and the task it performs. The most common trouble with teams, in any form, is that many companies rush out and form the wrong kind of team for the job. For example, in the early

1980s ,Quality Circles were formed. Members of these teams took a few hours each week to discuss very specific problems. These teams were cross-functional (a representative from of various departments in a company who had a stake in the outcome) in nature and were primarily responsible for solving problems. While these teams provided gains in productivity, as evidenced by many studies, companies were looking for did not happen (31).

Team structures and characteristics

There are many different types of teams that can be found in organizations: however, the most common that will be presented here are:

- 1.intact work groups,
- 2.problem-solving,
- 3.cross-functional, and
- 4.proactive or implementation teams.
- 5 small group as used in Japanese companies.

Any of these five teams types can contribute on continuous improvement (Kaizen) activities and are presented in Table 7 through Table 11. On small group activities will be mentioned especially the cross-functional teams and the quality circles as developed with their different types shapes .Each team type has a definition, a purpose/function, member characteristics, process/tools used and reward environment .

Intact Work Groups/Teams			
Purpose/activities	Member Characteristics	Process/Tools Used	Reward System
Completes Day-To-Day Work	Employees hired to fill specific job positions (e.g. fork lift operator, merge operator) Consists of any members; depended on job requirements	Company Procedures Policies. Guidelines <u>Tools:</u> Performance Appraisal System	Paycheck. Benefits Package, Vacation Sick Time.

Table 7:: The Purpose,Characteristics,Process, and Reward System Defined for Intact Work Groups/Teams

Problem-Solving Teams			
Purpose/activities	Member Characteristics	Process/Tools Used	Reward System
Formed To Solve Specific Problem (S); Implement Solutions: Measure/Evaluate; Redefine Solutions Disband	Selected Employees From Various Intact Work Group; Have Content Knowledge Have Vision and Temperament To Complete Process Consists Of Six To Eight Members	Problem-Solving Step Process Methodology <u>Tools:</u> Flowcharts, Cause &Effect Charts, SPC Charts. Summary Report Forms	Company Sponsored

Table 8 : The Purpose. Characteristics. Process, and Reward System Defined for Problem-Solving Teams.

Problem-Functional Teams			
Purpose/Function	Member Characteristics	Process Tools Used	Reward System
Formed To Evaluate Intra-/Inter-Department/Company Processes; Implement Solutions; Evaluate; Disband	Selected Employees and Management From Department Specific; Have Content Knowledge; Have Vision and Department To Complete Process	Problem-Solving Step Process Methodology <u>Tools:</u> Flowcharts, Cause &Effect Charts, SPC Charts. Summary Report Forms	Company Sponsored

Table 9. : The Purpose. Characteristics. Process, and Reward System Defined for Cross-Functional Teams

Proactive/Implementation Teams			
Purpose/activities	Member Characteristics	Process/Tools Used	Reward System
Formed To Implement Specific Process/System: Measure/Evaluate; Continuous Problem(s) Solving Measures	Selected Employees and Management From The Intact Work Groups And Problem Solving Teams (Must Be Linked); Have Content Knowledge; Have Vision/Temperament	Implementation Process Methodology <u>Tools:</u> Charts Flowcharts, Cause &Effect Charts, SPC Charts. Summary Report Forms	Company Sponsored

	To Implement And Solve Problems For Entire Process Consists Of Six To Eight Members; Cross-Teamed With Problem Solving Teams		
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Table10 : The Purpose. Characteristics. Process, and Reward System Defined for Proactive/Implementation Teams.

Small group activities			
Purpose/activities	Member Characteristics	Process/Tools Used	Reward System
Formed To Implement Specific Process/System: Measure/Evaluate; Continuous Problem(s) Solving Measures	Selected Employees and Management From The Intact Work Groups And Problem Solving Teams (Must Be Linked); Have Content Knowledge; Have Vision/Temperament To Implement And Solve Problems For Entire Process Consists Of Six To Eight Members; Cross-Teamed With Problem Solving Teams	Implementation Process Methodology Tools:Charts Flowcharts, Cause &Effect Charts, SPC Charts. Summary Report Forms	Company Sponsored

Table 11: The Purpose,Characteristics,Process,and Reward System Defined for Small Group Activities.

Small group activities

Small group activities are activities developed on Japanese companies and could be any kind of team activities in order to improve business process , give solutions on problems , or do

proactively. The most known small groups are the cross-functional teams or quality circles with characteristics as developed in Japan and then transferred elsewhere.

Cross functional teams

Cross-functional teams are formed to conduct Kaizen events. A Kaizen event is a project in which a specific area or manufacturing process has been identified as the target for improvement, and a team has been assembled to undertake the project. A team leader is more concerned with "how" his or her team works rather than "what" the team produces. Solutions are sought as a team, even if a problem has to do with only one member, which reflects the Kaizen process-oriented approach.

In such an organizational culture, the role of the manager is to improve the processes and to facilitate people's roles in achieving such improvements. A Kaizen team leader will be primarily a coach. A process-oriented manager who has genuine concern for process-oriented criteria will be interested in:

- Discipline,
- Time management,
- Skill development,
- Participation and involvement,
- Morale, and Communication.

A cross-functional team assembled for a Kaizen (continuous improvement) event is responsible for attaining the results targeted by the team itself. Initially, the most difficult part of the Kaizen exercise is what problem to tackle first and how to measure the outcome desired. This is a typical situation experienced by functional teams in trying to focus on a specific task that has to be visibly measured. Once the team achieves some synergy the tasks of advising and innovating take place. Advising consists of gathering source data and information so that the team can use it as the foundation from which subsequent actions can be planned. Innovating consists of creating new ideas and thinking of new ways of improving existing processes and products .

Kaizen approach means that rules on the team has to be established:

- Goals shared by all team members,

- Participation and contribution by all team members,
- Conflicts should be negotiated to resolution, not suppressed, and
- Criticism directed at processes, not individuals.

Researchers like Robinson ⁽³²⁾ and Liker ⁽³³⁾ assert that the concept of establishing cross-functional teams to examine the processes and improve them depends on several factors that "empower" the teams to seek change.

There are many ways to achieve the same level of performance:

- Jobs are broadly defined and skill sets diverse to assure quick adaptation to change and effective resource utilization,
- Work teams control work design and functional responsibilities,
- The human/machine interface is designed to be optimal,
- Rewards are based on contributions made to the effectiveness of the team, and
- Training and development are considered life-long endeavors.

Because of these attitudes, the cross-functional teams are motivated to assure that the organization is continuously improving its performance through the redesign of work, experimentation, and risk-taking. This research deals with the role of training in Kaizen practices

Quality Circles

Quality circle are typically said to have originated in Japan in the 1960s but others argue that the practice started with the United States Army soon after 1945 with the Japanese then adopted and adapting the concept and its application. Quality circles are not a panacea for quality improvement but given the right top management commitment, organisation and resources they can support continuous quality improvement at shop-floor level.

What is a quality circle? a group of staff who meet regularly to discuss quality related work problems so that they may examine and generate solutions to these. The circle is empowered to promote and bring the quality improvements through to fruition. Thus the adoption of quality circles (quality improvement team) has a social focus. There must be commitment from senior management, unit management and supervision, other staff and of course the circle members.

A team of 3-9 people need to participate freely together, to challenge assumptions and existing methods, examine data and explore possibilities. They need to be able to call in expertise and ask for training. The quality circle needs a budget so that members can be responsible for tests and possible pilots. They need a skilled team leader who works as a facilitator of team efforts not a dominator.

The circle needs to have a very good approach to analyzing the context of the problem and its situation defining just exactly what the problem is and the relationship between its component parts. how it identifies and verifies that the causes are indeed the causes. These must be understood otherwise solutions as developed may fail to address the real problem.

Problem definition requires quantitative measurement and often a consensus of qualitative judgment. The impact of the "problem" - if it continues - must be comprehended. Where is it affecting other parts of the "problem system"? we need to understand the quality objectives to be achieved and evaluate the resources that can be brought to bear on the problem and possible solutions. Objectives relate to both what must be done and what we would like to do - if only everything else will fit into place. in the classical "functional, problem analysis" cycle, solution generation involves conceiving what might be done.

We must recognise also that there are tensions between resource constraints and solutions and the imagining processes of solution development. These must then be elaborated and grounded in detailed planning and operational implementation. such implementation planning and management of the change/operational programme involves scheduling, work allocation, capacity management, communicating, development of information monitoring systems and overall coordination and control of the solution programme.

Quality Circles, in the 1970's, was the first big push to mimic Japan's success with a team based work culture. Although there were success stories, and some organizations still use them, most saw them as a failure. Some of the reasons for failure included:

- Inadequate measurements of results.
- Management understanding of process.
- Team members not right for the problem.
- Management dominated the process.

- Lack of training with problem solving tools.

Teams, often called Quality Improvement Teams (QIT), Process Improvement Teams or a wide array of other names, are now in-place in many private and public sector organizations. They may be management or self directed. A well managed team process, tied with other quality programs can make an organization more viable while empowering employees to find solutions and opportunities. Management has to believe in the quality team process, listen to proposals and enable feasible solutions to be progressed through pilot stages and into full operation. Open-mindedness and a desire to avoid blocking is essential. It is a useful philosophy to realize that experimentation enables learning.

More modern team processes did learn from many of the mistakes of Quality Circles. Still there is much improvement that can be made.. Measurement of the overall team process is weak, if nonexistent, in many organizations. This can lead management to be misinformed about the effectiveness of "teams" and since a large amount of company time is spent by teams, it is a significant. Most organizations have limited resources to insure teams are operating effectively. Not everyone can be involved on a team. Those people often feel "left out". The ability of everyone to be able to participate on a team or in another quality process is important.

If the most skilled team of individuals is established, but the culture remains conventional and the structure of the systems in place remains rigid, the team is set up for failure and defeat. The consequence of such a failure could be catastrophic for the survival of innovation and change, because the results would condemn the process, without taking into consideration that the process was faulty because of the constraints imposed on the team. In a Kaizen approach, there is no gray line. Teams must be effectively empowered and management must be willing and able to cope with change, as well as some loss of control for the bigger benefit of the organization.

2.3.2 Kaizen and Upper Management Commitment

Since the benefits of Kaizen principles come gradually and its effects are felt usually on a long-term basis, it is obvious that Kaizen can thrive only under top management that has a genuine concern for the long-term health of the company. It has often been pointed out that one of the

major differences between Japanese and Western management styles is their timeframes. In general, Japanese managers have a long-term perspective, while Western managers tend to look more for short-term results. This difference is also reflected in the way each management style approaches improvement. Western management is usually reluctant to introduce improvement gradually and tends to favour innovation, which is more visible and provides an immediate return. If management makes positive use of the process-oriented way of thinking to support innovation and further reinforces it with a Kaizen approach, it will find that the company's overall competitiveness will be improved in the long run.

2.3.3 Kaizen and rewards and recognitions

Corporate culture has several essential components — corporate values, leadership, and the reward and recognition structure of the organization (34). The reward system reflects the corporate philosophy, democratic and innovative or autocratic and bureaucratic. Promotion and rewards reinforces employee commitment to corporate values and to the corporate culture.

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

- 1.They improve the reinforcement of quality-related behavior and achievements.
- 2.They show organizational values, and they show how the organization appreciates efforts.
3. They indicate achievement, and R&R activities provide feedback which is an element of continuous improvement (Kaizen). Recognition is also a form of feedback about the result of individual or team efforts. It shows the individuals or the teams that they are on the right track toward continuous improvement. Recognition as feedback can come from supervisors, other teams, internal customers in the organization, or external customers in the marketplace.
- 4.Kaizen philosophy and TQM processes demand empowered employees, team players and cross-functional activities. R&R can motivate these individuals and groups to continue their active participation in the organization. It will also create a positive environment for various teams to compete against each other and these give a 'win-win' situation between the organization and employees. Employees can also be motivated to utilize various TQM tools, solve problems, and to interact with internal and external customers.
- 5.The R&R system will increase the awareness among 'workers that management is prepared to reward them if they are serious in applying critical TQM values, such as quality, customer

satisfaction, and continuous improvement. Employees will have higher motivation if they work in organizations that are consistent in their R&R process and the workers will perceive management initiative as a fair effort by management. This will extend the feeling of trust, and create a strong sense of belonging in the organization. According to Deming's views, R&R can help transform the organization toward a philosophy of quality.

6. Some forms of recognition, such as awards and plaques, show publicly that the individual or team has achieved some degree of success within TQM frame. They are a visible indicator, both to the team and to outsiders, of a job well done. So recognition highlights employees and teams who make a definite contribution to the continuous improvement or TQM effort. Such recognition stimulates additional effort in employees.

The researcher believes that recognition should not be of high monetary value. There are some variations between the Japanese and Western methods of rewarding the worker. Imai on his influential book "Gemba kaizen a common sense, low cost approach to management", mentioned that the Japanese method does not encourage large monetary rewards. To them, monetary gain demeans the process. They do recognize the workers' efforts. Rewards for suggestion ideas from the workers are given on the basis of the number of ideas they contribute, and it does not really matter if it saves the company \$ 1 or \$100,000. Each suggestion will receive a point that later can be converted into products or services, such as a holiday trip, or \$5 worth of merchandise (depending on the accumulated points).

Oliver, cited on book on Imai "Gemba kaizen a common sense, low cost approach to management", has given some examples of rewards. There it is stated that rewards as much as possible, it should be given to team members rather than being based on individual participation. Recognition, ceremonies, and symbols are important underpinnings to the successful functioning of system or the TQM process. An expression of appreciation for a job well done can be as formal as a written "thank you." or a plaque, or a certificate. An informal verbal "thank you" can also encourage morale., such as a holiday trip, or \$5 worth of merchandise (depending on the accumulated points). For example, managers are encouraged to know their workers by name, only effective in big corporations. This process not only increases the manager's awareness of the worker's name, but it also increases the motivation of the worker to be recognized by performing well and by receiving the token. To make this plan workable, the company gives 25 tokens to hand out during the coming year for every 100 workers in the department. The manager will give a token to the worker who did an exceptional

job, whether the work was consistent or incidental. A bag may be given for the second year, and a company T-shirt may be the reward for the third year. A manager for exceptional performance must single out workers who receive this token.

2.4 Kaizen and Total Quality Management (TQM)

Kaizen as explained earlier is a kind of umbrella concept that includes initiatives and activities like TQM, suggestion systems , to mention those we think are the most important ones (and are the most interest issues faced by organization A, that we focus later on).

TQM is a journey, a movement centred on the improvement of managerial performance at all levels. It deals with:

- Quality Assurance,
- Employee Involvement,
- Cost reduction,
- Safety,
- Continuous Improvement, and
- Productivity improvement.

Moreover, TQM journey deals with management concerns such as organizational development, cross-functional management, and quality deployment. In other words, management has been using TQM as a concept and a tool for improving overall performance. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continuous process improvement (35).The activities are ultimately focused on increased customer-user satisfaction.

The importance of people in the total process is emphasized on TQM journey. Considerations such as culture, incentives, teamwork, training, and work involvement are typical. The optimum effectiveness of TQM results from an appropriate mix of the social and technical systems. It is common practice to emphasize the technical aspects of improvements, such as machine or computer-related, with less emphasis on people and their roles in the process. Improving quality and productivity to achieve competitiveness emphasizes the need for an enterprise to capture the potential inherent in the workforce by enabling each employee to do his or her job

right the first time. This requires that top management to demonstrate to all employees that it is personally committed and continuously pursuing efforts to improve quality .

The organization must provide an environment in which all employees will voluntarily cooperate to achieve the organizational objectives. This requires that management accept the idea that employees can and want to contribute. Management thus flows down ideas and goals and encourages the flow of ideas upward. The TQM philosophy provides a comprehensive way to improve quality by examining the way work gets done from a systematic, integrated, consistent, organization-wide perspective .

On TQM journey the focus is to:

- Emphasize continuous improvement of processes (kaizen), not compliance to standards,
- Involve all functional units, not just the Quality Control/Assurance function,
- Motivate and involve employees to become the driving force behind improvement,
- Satisfy the internal and external customers,
- Understand the effects of variation on processes and their implications for process improvement.

So it is self-evident that employee involvement and a process-oriented approach to manufacturing are cornerstones on journey to TQM. The team-based structures and activities fulfil both requirements by fostering greater individual participation and enhancing the organization's ability to pursue processes across functional boundaries.

The TQM journey needs patience otherwise there will be frustration and disappointment. A study conducted by Pfau and Gross for Conference Board Inc., (36) found that those looking to TQM for a quick fix were likely to be disappointed. "Patience, leadership, and the ability to nurture a long – term commitment to TQM is crucial to promoting and the buy – in process" .It was further reported on journey to TQM of 20 companies that their approach to quality divided into two categories: Little Q and Big Q. The Little Q approach emphasizes training and other tools, but lacks an overall strategy and top management support. The Big Q approach, led by management, has a well – articulated strategy, and is fully integrated in the companies. The Big Q strategy requires fundamental changes in a company's culture, structures, and processes.

TQM as a system that drives improvement is very analogous to a Kaizen approach. The elements and characteristics are considerably supportive of each other, and the two philosophies mandate a similar organizational mindset. Consequently on the road of a company to TQM, a Kaizen approach and any of its tools under its umbrella in practice, is a compatible valuable tool to TQM.

Companies that implement TQM as a comprehensive integrated initiative, report results in the areas of operational efficiency (such as cycle-time reduction, unproved productivity, and fewer defects), in customer satisfaction, and in organizational values such as lower turn over and higher morale (37).

2.5 Kaizen and suggestion systems

One of the most frequently discussed aspects of Kaizen as it is practiced in Japan, is suggestions and proposals system, as a part of the Kaizen constituents as described in the beginning.

During 70s many Western business persons visited Japan to see suggestion systems in progress as part of kaizen umbrella-concept and when returned home started efforts on their companies by initiating and establishing systems like that . But the process of obtaining ideas from employees is not a new one also in the West. Kodak company started such a program around the turn of the century in the United States. British Royal Navy had a suggestion scheme in 1772. Since their inception, suggestion systems have gone through significant evolution and new forms include: continuous improvement and employee driven idea systems (EDIS). Although some quality experts agree that idea processes (or suggestion programs) are dead, a well designed idea program will significantly add to an organization's quality arsenal while helping it cut costs and improve its performance (38).

Through suggestions, employee participate in continuous improvements activities in the workplace and play a vital role in upgrading standards(39). So they doing kaizen. Employee suggestions or ideas management systems serve a duality of purpose . At one and the same time serving as a productivity enabler as well as a culture change enabler. This duality is being served quite different in Japan than in Western countries .

Suggestions or proposals start from a problem perception and recognizing the need to solve it .The problems inside an organization are the sources of any kind of proposal systems. But employees inside the organization do not perceive problems on the same way . There are considered 5 levels of problems perceiving from employees in an organization, and are presented :

Level 1: People deny that are problems or don't want to see them

Level 2: People admit that there are problems but find excuses not being able to solve them

Level 3: People accept the fact that there are problems but unable to solve them because they don't know how attack them

Level 4: People want to see potential problems for this try to visualize them. They will attack them by learning proper methods

Level 5: People know their problems, methods to solve them and how to involve all the people to attack them. They are ready to attack any problem and to change their organization if needed after solving the problem.

It is management's main target to move organization's status on level 4 and level 5 , so a kind of suggestion or proposal system should help on this direction.

The effectiveness of the suggestions management system can be evaluated by a combination of results-oriented criteria (i.e. suggestions submitted per employee , benefits per suggestion etc.) and by process-oriented criteria during idea processing. (i.e. employee morale) . The proposals system as devised, improved and developed in Japan is known as Teian-system (40).Teian systems work on Kaizen environment where the process counts significantly as well , so have to be evaluated by process oriented criteria and below are presented some as taken from bibliography :

- Number of meetings
- Participate rate
- Number of intermediate reports
- Use of 7 tools
- The extent that company policy was used in selecting projects
- Originality of approach
- Standardization and prevention of a problem's recurrence

On each on element could be assigned a certain number of points and then the system evaluation can easily be accomplished.

2.5.1 Proposal (Teian) system versus traditional suggestion systems

There are two quite different directions in idea submitting and management systems ,the proposal systems that developed in Japan and the Western-style suggestion systems. The concept of proposals system differs from the concept of suggestions system as Kaizen differs from that of improvement. On Teian-system the financial aspect is not be highlighted instead of a suggestion system where there is a reward per suggestion, a business like transaction between the company and whoever comes up with a suggestion.

The Teian-system is created to promote participation in proposals activity from as many employees as possible . Kaizen driven proposal systems have much higher participation than classic suggestion systems .They require from employees to have the resources to solve their own problems and the support from management to tackle them. To give an understanding there are compared data from organizations in Japan and in U.S.A. where a participation rate of 75% in 1989 was a typical of a Japanese proposal system, where a participation rate of only 9% was typical of a suggestion system in the United States⁽⁴¹⁾. On Teian-system most proposals will be used, will receive some kind of evaluation and will be rewarded with some kind of bonus. Even small proposal and ideas are welcomed and carefully collected, because even small proposal are considered to have educational values. From the other side Western suggestions systems are designed to promote excellent, big result ideas, which are rewarded accordingly. These being stricter resulted in rejecting proposal as unsuitable after evaluation and employees often feel frustrated by the system and often do not bother to come up with suggestions at all. On following Table.12 , are presented the differences between Kaizen-Teian systems and Western type suggestions systems⁽⁴²⁾ .

Characteristics	Teian systems	Western suggestions system
Purpose	-employee involvement and development -communication -economic benefits	-economic benefits
Focus	-many very small changes	-few very large changes

		- "breakthroughs"
Awards	-few dollars -merchandise	-usually thousands of dollars -cash
Participation	-50% and higher -many ideas accepted	-5% and lower -many ideas not accepted
Implementation	-employees implement most of own ideas -quick -suggestion = implemented improvement idea	-management, -engineering driven -slow, drawn-out -employees less accountable -suggestion = improvement idea
Adoption rate	-near 100%	-near 25%
Administrator	-majority of time spent processing implemented ideas and issuing awards -specialist	-majority of time spent investigating unimplemented ideas and explaining "rejected" ones -manager
Suggestions received/year	-thousands	-hundreds
Highest award	-\$2.00-\$10,000(or merchandise valued at) relative data	\$200,000
Motivators	-intrinsic satisfaction ,personal development and recognition -frequent feedback and awards	-extrinsic rewards -money-infrequent

Table 12: Teian- Systems differ from Western type suggestions system

A proposal proceed through an appropriate system must be checked on issues of acceptability, legibility and quantifiability. Also concerning its content a proposal from employee could forward towards his (her) own department or towards other departments, and as expected could be a simple improvement (kaizen) or innovation . So if a proposal is a means of changing the status quo in an organization, then according the aforementioned combinations there are four ways of changing it , shown on following Figure 9 (43).

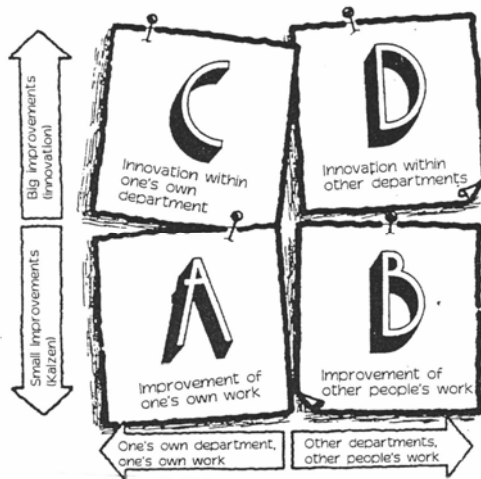


Figure 9 : There are four ways of changing the Status Quo

The Japanese think it is important to promote small improvements that focus on improving one's work area, targeting area A on figure2.9 and as Imai estimates as much as 99% of suggestions do not have much economic impact on their own, by they do effectively.

Evaluation of any idea irrespective of the employee level on hierarchy that should include a balance set of financially approved procedures and standards. Any idea must provide a net benefit versus as i.e. saving costs in one operation phase. As B. Sanders states (44), the financial benefits from a suggestion can be broken into 2 categories: 1) savings and 2) revenues. The suggestion programs historically cover the saving category. Looking at international statistics there can be seen that the majority of employee ideas, over 95% have focused on making improvements to existed situation rather having look at new services, products, opportunities markets etc, so the revenue generating ideas, category 2.

2.5.2 Teian and evaluating levels

In an organization a proposals system could be built on consequently levels(stages) where on each one there are different objectives and evaluated items. There are considered in bibliography (45) 4 levels (0 through 3) which are presented below followed by objectives for each one.

Level 0

No energy ,no interest , and no responsibility.

Level 1-Participation

Meaning developing and activating all the people of the organization pointing our problems .

Level 2-Development of skills

Improving the on the job performance, by encouragement for further skill development .

Level 3-Implementation effects

Looking at the results by aiming at targets with economic impact.

On Table 13 are presented the 4 levels with the objectives and evaluated items for each one

(46) .

Table for Evaluating Level and Objectives of Teian system			
Level		Objectives	Evaluated item
0	Indifference ,Irresponsibility Lethargy	--	--
1	Positive attitude,Problem awareness	Participation	Problem identification
2	Examining,research, ingenuity, planning, studying, devising solution	Skill development	Countermeasure idea
3	Implementation,consent, cocperation, followed by effect	Effect	Effect implementation

Table 13 : Evaluating levels and objectives of Teian system

For each one level that an organization is developed the quality of proposals is evaluated on how they serve and fulfill different objectives as, to promote participation, developing of skills and effectiveness. Firstly has to be encouraged people to submit low-level proposals through participation bonus, secondly to work towards tuning low level proposals into medium level ones. Then encourage people to be given chances to practice creative improvement activities every day on their job and to end up with to submit proposals But what gets to be a good (high level) proposal ?

2.5.3 Teian and rewards and recognition

On most types of proposal system there is a kind of bonus award, but the concept of an award depends on the system used. According some Japanese managers such an award might has with three meanings⁽⁴⁷⁾:

- compensation given to communicate a proposal's effect
- an incentive for encouragement for further development
- awards that expresses appreciation for participation

On the classic suggestion system or suggestion scheme used by Western companies takes employee ideas and passes them on to an expert (evaluator) for review. If the idea is feasible, it is then passed on for final review and implementation. The employee then often receives a cash award for their efforts, based on actual savings calculations (typically with a top award in the \$10,000 to \$20,000 range). These programs are still in effect in many organizations. They can be effective, if properly managed and promoted.

More modern idea processes directly involve the employee(s) with the solution and implementation process. The method of rewarding their efforts may be based more on recognition than actual cash awards.

2.6 Goals of Kaizen vs Quality, Cost and Delivery

In a market economy, the customer is king, and satisfying customers' expectations for products and services in terms of Quality, Cost, and Delivery (QCD) should be the ultimate goal of every business ⁽⁴⁸⁾. So the ultimate goal of Kaizen strategy and activities aim at improving Quality, Cost, and Delivery (QCD), thus QCD target has become a top priority for survival in business.

A market sensitive company must have a strong dissatisfaction with its status quo on existed QCD status. It should review its current competitive position on that and its strengths and weaknesses and take into account the changing environments and consumer behaviours. A company that is happy with the status quo is not qualified to stay on market, so it should answer the following questions the soonest possible:

- What are the targets to be achieved in terms of QCD?
- What will be the deadline for achieving such targets?

To do the above, one of the best ways is to motivate and challenge its employees ,to set clear targets with numerical values and a deadline to achieving such a target. On the targets must be involved activities improving quality during each process in terms of organization's internal customers until the process ends with external customers.

Quality runs throughout the process from purchasing, developing, designing, producing, selling, distributing, and servicing the products or services. According to Imai ⁽⁴⁹⁾ ,jobs of

developing a new product or service, or designing a new process, always start with paperwork or blueprints. Bugs or malfunctions can be rectified quite easily, instead of malfunctions that are identified later and can will be very expensive to be corrected. The Japanese management team uses the quality assurance system diagram or Quality Function Deployment (QFD) as a powerful tool.

Quality is followed by cost effectiveness, which refers to the overall cost of designing, producing, selling, and servicing the product or service. According to Imai, cost reduction in work place does not mean cost cutting. It is about cost management. The cost management teams oversee the process of developing, producing, and selling products or services of good quality while retaining a lower cost. A huge waste of resources can happen in the way a product is designed, made, and sold. The current business competition for quality and cost is intensifying. Thus, improving quality while reducing cost is the only option for survival . Cost reduction should come as a result of better cost management. The key is to build a management system that reduces cost while achieving quality. Cost management encompasses a wide spectrum of activities including: cost planning to maximize the margin between costs and revenues, overall cost reduction in Gemba by eliminating muda (waste). Cost reduction through waste elimination can be done with the methodologies based on waste elimination discussed before. Cost reduction is not synonymous with cost cutting. Reducing cost by firing employees, restructuring, and harassing suppliers will invariably disrupt the process of quality and usually ends in quality deterioration.

Delivery on the other hand, means delivering the requested volume in time, such as practicing a just-in-time production system. Delivery could be part of quality of product or service. So any diverge from prescribed standards can hurt the quality as well.

Management also encompasses such activities as policy deployment, standardization, training and education. Where training is concerned, most companies today have the tendency to put too much emphasis on teaching knowledge. In Kaizen, group learning places great emphasis on improving the fundamental values that are derived from common sense, self-discipline, order, and economy. Quality, Cost, and Delivery are closely related subjects .

2.7 Kaizen and successful applications

Realizing that the Kaizen methodology originated in Japan in response to the oil crisis in the early '70's, it is easy to understand why it developed so much. Also the kaizen attitude helps us to explain why Japanese firms are so exploiting new technology, even when they are not its originator. Kaizen-driven firms do not suffer from "not invented here" syndrome. Ideas are not the exclusive outcomes of R&D department, corporate planning, or market research; every new idea is welcomed and new 'channels' are forsaken. An example of Kaizen's effectiveness is Nissan's experience with welding robots. First introduced in 1973 and within a decade cut work time per unit by 60 percent and increased overall production efficiency by 20 percent. (50). These gains were achieved through a series of Kaizen programs that searched out improvements that cut time by as little as half a second. The programs, initiated within three to six months of one another, formed a staircase that each step was secured before the next to rise

Kaizen practices can deliver breakthrough improvements in the range of 40-60% (51). But what about Kaizen application elsewhere than in Japan? In U.S.A. some managers even now do not recognize the tremendous value that Kaizen can bring. Kaizen became a buzzword in U.S. industry in the 1980s when American companies tried to copy the quality assurance programs used by Toyota Motor Corp. and other Japanese manufacturing companies. However, to adapt its dramatic potential to the more creative and self-directed American and also European culture, it was developed a participative approach, customized for the circumstances, allows the team itself, and not the "Sensai" (Kaizen expert/facilitator) to problem-solve and decide on the solutions that are appropriate for the process. This puts more pressure on the facilitator to teach, coach and guide, rather than direct the team. The results of the participative Kaizen American Style (52) approach are that the results are better sustained because the people themselves make the key decisions, and the learning process is thus better reinforced, because it is active rather than passive. Some leading manufacturers in USA are now utilizing the process known as "Kaizen American Style" which results that companies are expanding its use to transform their businesses from end to end, becoming lean manufacturers. Kaizen American Style is the umbrella methodology that successfully embraces JIT, TQM, self-directed work teams, and modern industrial engineering approaches into a working system that achieves dramatic and sustainable breakthrough process improvements. Kaizen American Style's major tools are: Concepts of 'Takt', One-Piece-Flow, Standard Work, 5 S, Visual Systems, Kanban, 8 Wastes and Set-Up Reduction. Masaaki Imai, chairman of Japan's Kaizen Institute in Tokyo and author of the 1986 book Kaizen: The Key to Japan's Competitive

Success, said in an interview that kaizen applied in American companies today in isolated instances, such as within one plant, instead of company-wide. Also continues that kaizen appears in only one form, such as total quality management or just-in-time production. “The problem in most American companies is that the impetus for change is taken by middle management and often top management is not involved,” he said. “But middle management does not have enough resources.” Imai says top executives are to blame. He also warns that intensifying global competition will only make kaizen even more important. “In today’s world, competition is so tough that if you don’t have this kaizen spirit, you won’t survive,” Imai said. “This is a tough world. The customers are more and more demanding.”

In western style Kaizen a lot of researchers argue that the following elements must be included:

- Highly committed top management, to both rapid improvement and new ideas.
- Highly trained and experienced facilitators for the assessment phase, the event, and the follow-up.
- Specific goals and objectives with a well-developed and clear mandate.
- A balanced, multi-disciplinary team for the event and to sustain the momentum.
- Professional team education and preparation.
- Clearly defined roles of the participants; process owner, team leader and co-leader and Kaizen consultant.
- Commitment to follow-up and sustain the improvements made.

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