

# Kaizen & Its Applications – A Japanese Terminology Referred to Continuous Improvement

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**Abstract**— This paper is all about the research done at the Bajaj Steels Pvt. Ltd. Nagpur by applying a methodology ‘Continues Improvement’ called as Kaizen. This paper includes the brief knowledge about the term Kaizen and case studies. It is a Japanese business phenomenon which tends to have a major impact on the current competitive situation of the market. The whole emphasis placed on the three vital elements named Teamwork, Flexibility and Quality. Kaizen management is dedicated continues improvement in every field (department) of the industry i.e. Productivity, Efficiency, Quality etc. In the mass-production based industry, even a small step of improvement to the key process can surely helps to generate the major positive difference in the profit & quality too. This study explains the key steps to be taken in industry many like Bajaj Steels Pvt Ltd. for improvement, which will surely builds its business success.

**Key words:** Continuous Improvement, Micro motion study, Kaizen etc.

## I. INTRODUCTION

### A. Brief Introduction:

First let us get familiar with the Kaizen concepts:



Fig. 1: Concept of Kaizen

The Japanese technology, here once again has proven to be successfully innovative technology. All over the world Kaizen techniques have been particularly discovered themselves as the best methods of performance improvement within companies since the financial status remains undisturbed because of minimal implementing costs.

### B. Implications:

The Kaizen methods are internationally acknowledged as methods of continuous improvement, through small steps. By setting the aim to keep things easy & simple while quality can have probable chance to improve, any committee can create their own chance to extend the business in positive pathway. Apart as in industries, it is now more than ever that the relationship between manager and employee is

crucial and the Kaizen techniques have a major contribution to the reinforcement of this relationship since the achievements of a company are the result of the mixed efforts of each employee. Kaizen can play the role even in the part of employee management, as maximum workers are not appointed on the basis of qualification and as their job need just physical efforts. So by allotting them the proper job by taking their honest replies on which kind of interest they have in any particular performance of job, every worker can perform their respective job by interest which can naturally increase the quality of work as comparing before.

As an industry, want to have performance, so it is must to keep their leading position on the market by increasing the quality level of the services provided, reducing costs and last but not least, motivating the whole staff in order to implement the concept of performance-oriented organization. Here the performance-oriented organization concept is nothing but the change in the basic mentality of the worker for his/her job in case of interest. At the time of performance, every industry manager must be confirming that the quality of the job that workers maintaining should be well enough to keep their job in competition with others. Within the present economical context, cost reduction is one of the major objectives. Now, we must permanently think of the fact that the way in which we fulfill even the daily tasks today is not the most efficient way to perform. Therefore, we must continuously look for new ways of achieving our objectives in the easiest manner and of course at the lowest cost. In the same manner each & every department of the industry has many such areas of improvement even in regular basis as everything related to finance is dependent on the change in market value of particular part/instrument.

## II. OBJECTIVE OF THE STUDY

The objective of the study is strongly set here is to find out as many areas where Kaizen can be applicable. It may be any department or store from the industrial area. Starting from the entry, continuous improvement is even applicable in parking lots as the industry area mostly starts from parking area which we can say gives the visitors first & important impression on mind, if which is improper so may give some negative thought about discipline of the industry.

In the study, the implementation of the concept of continuous improvement at Bajaj Steels Pvt. Ltd. involves:

- Continuous improvement of product quality and processes.
- Standard distribution of the performance stats of criteria previously set in order to identify the areas which need improvements.

- Continuous improvement of productivity, effectiveness and efficiency of all processes in the organization.
- Promotion of prevention-based activities.
- Education and instruction of each employee in order to be able to use the techniques of continuous improvement.
- Setting the objectives concerning improvement and the necessary measures to achieve them.

Regarding the above aspects, an industry can have milestone of success in the pocket.

"Kaizen is the means to achieve a corporate strategy, not the strategy." - Masaaki Imai

#### A. The History of Kaizen?

The term Kaizen was officially coined in quality-management-expert, Masaaki Imai's book *Kaizen: The Key to Japan's Competitive Success* in the mid 1980s. Since then, the philosophy has been wildly successful, thanks in large part to Imai's participation in preaching its Toyota-touted-virtues throughout the world. However, post-World War II United States had its hand in developing Kaizen techniques as well.

During World War II, the United States Department of war developed a system called Training Within Industry to increase its manufacturing capacity. TWI relied upon many of the tenants that would later form the basis of lean.

After World War II, for various reasons, the TWI program and its emphasis on quality and efficiency was abandoned in the United States, but crossed the Pacific to be received with wide acclaim in Japan. In particular the work of W. Edwards Deming was instrumental in the growth of Kaizen and other aspects of the Toyota Production System. These systems exploded in Japan during the 1950s.

#### B. Where Kaizen Can Be Applicable?

Publically in the society, to achieve the high quality life style, Kaizen can play role. As natural diseases are playing their role to every individual, health is important factor. So here even a nature can be the reason behind beginning of the open communication between people for improvement of the cleanliness in the society. By taking the own interest in social health every individual can suggest anything related to improvement in society.

In the apartments, there are many areas of improvement can be found out like parking, plant transformation, daily garbage disposal etc. but for all this implementation at that same time what is need is open communication and personal interest towards improvement between the members of society.

History says, During World War II, the United States Department of War developed a system called Training Within Industry to increase its manufacturing capacity. TWI relied upon many of the tenants that would later form the basis of lean. These systems exploded in Japan during the 1950s. Taking the inspiration from such big event anyone can change their thinking with respect to improvement.

A key part of Kaizen is the 'continual' aspect of its improvements, this is not a onetime event, but one that must be maintained and encouraged for years to come.

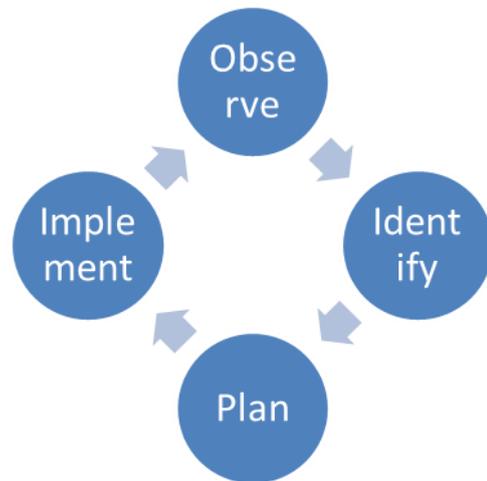


Fig. 2:

#### C. Misconceptions with Kaizen:

Improvements only happen when things are done right, so an improper implementation of Kaizen does only little good. It takes dedication, commitment and an underlying understanding to implement Kaizen properly.

One common misconception is that "Kaizen only works in Japan" or some line of similar ilk. But the fact says, Kaizen is based on the Training within Industry program, one developed and deployed to great success within the United States - in other words, Kaizen has worked around the world.

Kaizen needs to be supported from the bottom up and from the top down - it is a long term process, not a onetime event.

Kaizen is largely self-motivated. Because it's driven by individual input and execution, company results can vary.

#### D. Case Studied In Form Of Application Of Kaizen At Bajaj Steels Pvt. Ltd.

By setting the aim to keep things easy & simple while quality can catch probable chance to improve, any committee or industrial department can create their own chance to extend the business in positive pathway. The study is done on the basis of case given below;

##### 1) Actual Case Study Analysis:

As keeping continuous improvement concept in mind the observation concluded that the number of workers at Bajaj Steels Pvt. Ltd. performing assembly of roller shaft assembly & seed guard assembly are in excess in number than as per requirement.

The time taken to assemble one job was not the accurate one. Improvement in the system or performance was must there to increase productivity & decrease the man power requirement.

##### 2) Data Analysis: (Micro Motion Study)

After studying & observing the whole assembly process it is found that the workers are using only right hand or single hand to perform their respective job. This is the reason behind reduction in the quantity per day & increase in the number of workers required to do the assembly.

##### 3) Suggestion to Overcome the Problem:

In the case where workers are using only single hand to perform the job, the correction is being given to them that they should use both hand in at least 3:4 proportion where

they were using only one hand. The study concluded that using both hand in proportion can increase the productivity up to 50%. It is concluded that it can save up to 2-3 workers or up to 5-7 minutes per assembly.

4) *Output Profit:*

From table 1 to 4, it can be concluded that in both workers & time requirement is improved.

Sr. No.	Description	Quantity	No. of workers	Time Taken
01	Roller Shaft	02	06	25min
02	Tapper pin for roller shaft & its flanges	04	-	-
03	Chrome washer for roll	78/90/110	-	-
04	Roller flange	04	-	-

Table 1: Data Analysis for Roller shaft assembly (Before)

Sr. No.	Description	Quantity	No. of workers	Time Taken
01	Roller Shaft	02	06/04	18min/25min
02	Tapper pin for roller shaft & its flanges	04	-	-
03	Chrome washer for roll	78	-	-
04	Roller flange	04	-	-

Table 2: Data Analysis for Roller shaft assembly (After)

Sr. No.	Description	Quantity	No. of workers	Time taken
01	Holder for seed guard	02	07	20min
02	Bolts (5/16')	04	-	-
03	Hex head nuts (5/16')	04	-	-
04	Seed guard pin	04	-	-

Table 3: Data Analysis for Seed guard assembly (Before)

Sr. No.	Description	Quantity	No. Of workers	Time Taken
01	Holder for seed guard	02	07/05	16min/20min
02	Bolts (5/16')	04	-	-
03	Hex head nuts (5/16')	04	-	-
04	Seed guard pin	04	-	-

Table 4: Data Analysis for Seed guard assembly (After)

Workers required performing one assembly using both hands in 3:4 proportion is found less by 2-3 workers/ assembly than before. Even if using the same number of workers using the proper hand proportion then the assembly can complete with 30% reduction in time.

5) *Conclusion Shown To the Industry:*

Using Kaizen technique & micro motion study industry can improve productivity & efficiency of jobs per day. The implementation of Kaizen technique in the Bajaj Steels Pvt. Ltd. can surely make them ahead a step to success.

E. *Application:*

In Bajaj Steels Pvt. Ltd., the safety of workers and employees is necessary. From the improvement point of

view, Safety measurements or equipments that are necessarily required during the working process of company & production are studied. Study was observed and conducted in two stages.

In first stage, the communication is done with the workers to know their requirements as per their safety. In second stage, implementation of Kaizen comes in work & the recommendation for some improvement and the suggestions to the management is given.

It is concluded that the safety provided by the company is of good quality and every worker is satisfied by the safety guards. But still some more safety must have to be provided by company i.e. earthing must be provided to every machine, water cooler tanks should be shifted to other position, fire extinguishers should be introduced in every dept. (at least 5 per dept.), material should be handled by machines and not manually. Machines and arrangements should be handled by trained person only. Every operation should be observed by the supervisor regularly.

This case study gives the basic details of the marketing strategy of Bajaj steels Pvt. Ltd. As at last everything depends upon how candidly you can sell your product. Marketing can be done in three basic ways E marketing, paper marketing & marketing through brochures and last by advertising it on the hoardings or televisions.

This case study explain brief idea of how marketing is done by personal interest and what are the lacunas in marketing strategy and how it can be optimized so as to attract more customers. From the Kaizen point of view some suggestions regarding the improvisation of the marketing strategy of Bajaj steels Pvt. Ltd. is given. Marketing department should study the marketing appraisal strategy and apply it to their method so as to increase their customers. Market survey is necessary and they should also collect the secondary information. They should study the specific pattern in their customer response, from which area and in which season they are getting more buyers and accordingly they should more cautiously concentrate on that area so as to increase their consumers or customers. Marketing strategy should be periodically amended according to the season. Money invested on the marketing should also be varied season to season like odd season less marketing budget is feasible. They should also keep track of their competitors and focus more on those areas where their competitors are lacking. Various profitable deals or offers should be tried with regular customers that would improvise the profit of the company.

F. *Kaizen Management System Audit:*

1) *What Happens During The Audit?*

In keeping with the Kaizen approach, the audit is a practical activity involving people in all levels of the business. Improvement systems achieve real results only when they are maintained day-to-day by the people working to deliver the company's products and services. Consequently, if we want to assess the real situation we need to see what happens on a day-to-day basis rather than listening to specially prepared presentations. The Kaizen audit takes place in gemba. This is a Japanese word meaning 'the real place'. In a business context it means 'where the value is added'. During the audit we observe and talk to people in

their normal job settings. We ask lots of questions and listen to what they want to say.

#### G. Outcomes of the Kaizen Audit:

At the end of the audit, an organization understands results of the audit against the standard Kaizen Management System. Model opportunities for improvement then identified further priorities and recommendations given for next steps. This feedback is given to the management group and will be delivered in an interactive style with time for questions and discussion.

### III. CONCLUSION

As the Kaizen principle presumes a practical approach and low costs of improvement, conclusion came as management of the industry must be sure that when they take an action, their action will go on in the best possible way. Any action should not merely an intermediate action to generate a temporary result.

A regular inspection for improvement point of view should be done from good management of human resources in the organization. It should be one of the strategic objectives of the organization which should be clearly defined and accepted by all its members.

#### REFERENCE

- [1] Mihail Aurel Titu & constantin Oprean and Daniel Grecu: “Applying the Kaizen Method and 5S technique in the activity of post-scale services in the knowledge-based organization”, March 17-19, 2010, Hong Kong.
- [2] Sumit P. Raut, Laukik P. Raut, “Implementing total quality management to improve facilities and resources of departments in engineering institute”, International Journal of Engineering research and applications, ISSN: 2248-9622, Vol. 4, Issue 1(Version 2), January 2014.
- [3] Peter D. Wickens: “Production management: Japanese and British approaches”, Paper 6996A (M2), received 25th April 1989.
- [4] Robin C. Daniels: “Performance measurement at the sharp end Driving continuous improvement on the shop floor”
- [5] Andrew Williamson : “Target & Kaizen Costing”, Manufacturing Engineer February 1997.
- [6] Kate Mackle, Managing Partner, Kaizen Institute UK: “A Framework For Implementation Of The Kaizen @ Management System Audit”, Manufacturing Engineer February 1997.
- [7] Colin Ashmore: “Kaizen-And The Art Of Motorcycle Manufacture”, Engineering Management Journal October 2001.
- [8] Takeo Soed: “Every Day, And In Every Way, I'm Getting Better And Better...”, Manufacturing Engineer November 1991.
- [9] Ross Banerjee: “Celling The Japanese Method”, Manufacturing Engineer June 1993.
- [10] CHEN Xu: School of Accounting, Harbin University of Commerce, P. R. China, 150028: “The Implementation Framework And Path Research of Inter-organizational Cost Management In Supply Chain”, 2011 International Conference

on Management Science & Engineering (18th) September 13-15, 2011 Rome, Italy.

- [11] Alain Audenino: Kaizen & Lean Management Expert: “Kaizen And Lean Management Autonomy And Self-Orientation, Potentiality And Reality ...”, PSA Peugeot Citroen - Velizy - France 2012 IEEE.
- [12] <http://www.graphicproducts.com/tutorials, www.strategosinc.com>