

5S Method and its Implementation in Company

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Abstract - Quality of both product and system in the organization are being felt to be the need of the hour. In organized workplaces, work performed safely and efficiently. 5S is a lean manufacturing technique for cleaning, sorting, organizing the workplace. It improved the productivity by decreasing the waste in manufacturing. 5s method target on fixate everything where it is concerned. This method help to work effortlessly and brief time taken to accomplished the work. In simple terms '5s' is Japanese technique consisting of five words namely Seiri (sorting), Seiton (set in order), Seiso (shine), Seiketsu (standardize) and Shitsuke (sustain).

In a progressing market environment, 5s method hit the good results for required improvement. All the companies used this method to raise the performance.

This paper carried out to understand the results of 5s method implementation in industry. Implementation of 5s method in companies reduce all types of wastes at product manufacturing to reduce product cost.

Key Words: Lean manufacturing, 5s method, productivity.

1. Introduction to Lean Manufacturing

Lean manufacturing is a methodology that target on reducing waste while simultaneously maximizing productivity in manufacturing process.

5S lead as part of the Toyota Production System; it aims to raise the value of products. Product improved by finding and eliminating waste from production processes. Many tools such as 5S, kaizen, kanban and poka-yoke etc. are involved in lean manufacturing. 5s is the silent informer of the organization's attitude towards quality. Hence 5s has gained paramount importance.

2. What is 5s method?

5s is an integrated Japanese concept of "Work Place Management". Through which it maintains work place quality that makes best products.

Seiri, Seiton, Seiso, Seiketsu, Shitsuke are the five steps in Japanese language of work place management. The pioneer of Five-S concept is Mr. Takashi Osada.

Five phases include in 5s are as follow:

SEIRI – Sorting

SEISO – Sweeping

SEITON – Systemizing

SEIKETSU – Standardization

SHITSUKE – Self Discipline



Five-S is a set of techniques providing a standard approach to housekeeping within Lean Manufacturing. It originate, as did most of the element of JIT, within Toyota. A cornerstone of Five-S is that untidy, cluttered work areas are not productive. The physical implication of junk and dirt compromising quality, we all are happier in a clean environment and hence more inclined to work hard and with care and attention.

The element of Five-S are all Japanese words beginning with letter 'S'. Since adoption of JIT or Lean Manufacturing, various anglicized versions have been adopted by different writers and educators. These are listed against individual element and it can be seen that none are entirely satisfactory. The individual items within Five-S are known as the "pillars".

2.1 Seiri (Sorting)

SEIRI is the identification of the successful physical organization of the workplace. It has been variously anglicized as Sort, Systematization or simplifies those wishing to retain the S as the initial letter of each element. We identify things which are being held in the workplace when they shouldn't, or are being held in the wrong place.

First identify a large area devoted to tools, some of which are needed regularly and some used infrequently.

All the JIT goals reduced movement and shorter cycle times. Keep inventory and WIP to a minimum. Involving cross-functional teams, or looking at each other area, is an obvious first step. People tend to be blind to failings in their own workplace and a fresh pair of eyes can be useful.

Element of the standard approach is 'red tagging' where items are given a tag which says what the item is and which location it is in. When it was identified in this location then leaves the area for a while and anybody using the item notes this. We go back some time later and can readily identify thing that haven't moved, or been used. Items which have not been used can then potentially be disposed of it.

2.1.1 Advantages of Seiri (Sorting)

- Saving in space, better utilization of available space.
- Removal of excess equipment.
- More space made available in filling cabinet
- Easy access to thing.
- Eliminate unsafe situation.
- Preventing rusting and damage to material.
- Reducing inventory by sate of scrap material/ excess materials.

2.2 Seiton (Systemization)

SEITON is the steps by which the organization identified in the first pillar are put in to place.

The standard translation is orderliness but again some wish to keep the initial 'S' and use sort Set in order, Straighten and Standardization.

The sorting out process is essentially continuation of that described in the SEIRI phase. Removing items to be discarded or held in an alternative location will create space. This space will be facilitating the alternative layout of the area.

In some case, of course, we are talking about what a filter will have on his bench, or in racks alongside bench. In other case we may be considering where we should locate a piece of plant- for example we may relocate a coin press to enable items to be completed in one work area.

This is something which we also undertake when adopting cellular manufacturing. We then look at how we can restructure the work content so that certain operation can be carried out a trimming operation on steel component while the press will produced it is busy creating the next one. Standardization includes all the elements of setting out a consistent way of doing this. This include standard manufacturing methodologies, standard equipment and tooling, component rationalization, drawing standardization, consistency in the documentation which accompanies work,

design for manufacture and standardization in the clerical processes which deliver work to the shop floor and track its progress. All of this could be said to be part of a basic quality approach.

The standard way of doing this should include poke-yoke or error proofing. Again it might be asked whether this is a part of 5S or one aspect of a broader programmed.

2.2.1 Advantages of Seiton (Systematizing)

- Help to reduce time consume in searching material for use.
- Easy to identify when material are taken out from their location.
- Create work effectiveness.
- Create safe atmosphere.
- Help in inventory control.
- Improve work place utilization.
- Better identification by using color coding.

2.3 Seiso (Sweeping/Cleaning)

Divide total area in to zones and educate employees on importance of cleanings. Allocate responsibility for each zone decide on the cleaning points, order of cleaning, types of cleaning, cleaning aid-required etc. There is a more practical element in it, that if everything is clean it is immediately ready for use. We would not like a precision product to be adjusted by the spanner that is covered in grease. Other issues are health and safety and machine tool damaged by coolant contaminated by grease and dust.

Task is established to the maintenance of a clean environment as an ongoing, continuous program. Sometime should be set for cleaning each day or each shift. We may have cleaners who come in a sweep office floor and in a production area, but they do not clean the Production equipment. Even they did, this would miss one of the opportunity available an operator cleaning lubricating his machine.

Cleaning critical components of a piece of equipment is already one element of the activity carried out under the PM banner. The implementation of SEISO revolved around two main elements.

2.3.1 Advantages of Seiso (Sweeping/ Cleaning)

- Neat and clean working places are always motivates for effective functioning.
- Increase the efficiency and equipment life.
- Create safe environment and working space.
- Helps in identifying the potential cause of problem.
- Helps in developing the skills of operator for doing autonomous maintenance.
- Reduction of wastage.

2.4 Seiketsu (Standardization)

This is well described as standardized clean up, but other name adopted include Standardization (not to be confused with the second pillar), Systemization and sanitization.

SEIKETSU can be thought by which we maintain the first three points. There is a danger in any improvement activity that once the focus is removed. SEIKETSU is the set of techniques adopted to prevent this happening. Basically this involve setting a schedule by which all the elements are revisited on regular basis-usually referred to as the Five S job cycle.

The first steps in the cycle are a periodic review of the area, perhaps involving red tagging but certainly involve people from other areas of the business. This will identify where standard have sleep. For example where pieces of tooling for fixtures which are used infrequently are no longer being put in the remote location agreed at the outset and consequently a bench is now cluttered with the regular item buried under a pile of irregular. In other words, the SEIRI phase is undertaken periodically-usually monthly, perhaps quarterly. The second step is to undertake SEITON activities are required that is as prompted by the first step.

2.4.1 Advantages of Seiketsu (Standardization)

- Proper and nice working area helps in synchronizing the activities of SEIRI, SEITON and SEISO.
- Helps in reducing educating the new person joining the area on standard method in practice.
- Reduce breakdown and increase mean time between failures (MTBF).
- Reduction in defects and breakdown.
- Visual management improves work efficiency.

2.5 Shitsuke (Self Discipline)

The final is that of discipline. For those who wish to retain the use of initial Five 'S' in English this is often listed as sustain or self-discipline. It ensure that the standard set up become a discipline and way life for everyone.

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There is a fundamental difference between SEIKETSU and SHITSUKE. The fourth pillar is the introduction of a formal, rigorous review programmed to ensure that the benefits of the approach are maintained. The fifth pillar is more than this; it is not simply the mechanical means by which we continue to monitor and refine, it is the set of approaches we use to win hearts and minds, to make people want to keep applying good practice in shop organization and housekeeping. In this sense, discipline is perhaps an unfortunate term as it implies people forced to do something, with consequent penalties if they do not.

The way in which management achieve this establishment of ongoing commitment within the workforce depends of course on the culture already in place. As with the adoption of kaizen (continuous improvement) or quality circle we have to press the right buttons to simulate people.

2.5.1 Advantages of Shitsuke (Self Discipline)

- Promotes habits for complying with work place rule and procedure.
- Creates healthy atmosphere and good workplace.
- Improves morale of the employees.
- Develops teamwork.
- Develops ability to think and analyze causes for improving control system.
- Improves of company culture, rules and safety devices.

3. Case Study on Five 'S' Implementation in

Mahindra & Mahindra Industry

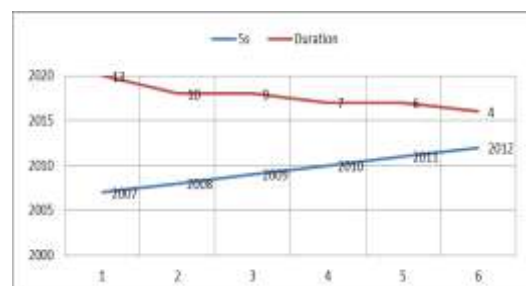
A case study for implementation of Five' S' observed at the Mahindra & Mahindra plant Tractor division at MIDC Nagpur. The systematic way in which the five 'S' strategies are implemented and followed in practice was studied. This case study covers the data collected for 2012:

1. Time required for one tractor (i.e. Time required to one assembly of complete tractor). Time (min) varied as per year:-

Since 2007

Year (5s evolution)	Duration
2007	13
2008	10
2009	9
2010	7
2011	6
2012	4

TABLE 1: Production in Mahindra and Mahindra



GRAPH 1: Production in Mahindra and Mahindra

4. Result:

Time as well as number of breakdown decreases with the implementation of 5'S because with the application

of 5'S standardization will get increase and also employee become perfect in their work because of monotonous work. And if some sort of problem occurs during working to the machine, employee itself solve this problem, because employees are able to identify potential cause of problem and also there is building of team work.

5. Conclusions

The Five 'S' is Japanese concept of workplace management. Five 'S' is a set of techniques providing a standard approach to housekeeping within organization. Management's general attitude toward the quality of work, product services rendered through workplace management practices adopted by organization. In short Five 'S' means silent informer of the organization's toward quality.

After seeing the Five 'S' implementation in Mahindra and Mahindra industries at Nagpur, following advantages of Five 'S' are noted.

- Improvement in workplace environment.
- Easy accessibility to the various facilities.
- Better utilization of space, equipment and even manpower resulting in to overall improvement in the productivity.
- Create work effectiveness.
- Increase efficiency and equipment life.
- Reduction in defects and breakdown.
- Improvement in moral of the employee and developed team work.
- Developed ability to think and analysis of causes for improving control system.
- Improved Quality.
- Increase in production.



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