

## Implementation of 5S Practices in a Small Scale Organization: A Case Study

<sup>1</sup>Prof. Saad Shaikh, <sup>2</sup>Ansari Noor Alam, <sup>3</sup>Khan Naseem Ahmed, <sup>4</sup>Sawant Ishtiyak, <sup>5</sup>Sayyed Ziaul Hasan,

<sup>1</sup>Faculty of Mechanical Engineering, Anjuman-I-Islam Kalsekar Technical Campus School of Engineering, Panvel, Mumbai University, Maharashtra, INDIA

<sup>2,3,4,5</sup> B.E. Mech.(Students), Anjuman-I-Islam Kalsekar Technical Campus School of Engineering, Panvel, Mumbai University, Maharashtra, INDIA

### ABSTRACT

A small scale industry plays an important role in Indian economy. In an organization the prime importance is given to the quality and productivity. Since a problem come across due to the defects in materials, down time in production, working conditions, housekeeping etc. This case study deals with the 5S implementation in an industry, Implementation of 5S can result in considerable improvements in environmental performance beside with improved housekeeping and health and safety.[5]5S can improve the quality, productivity and working conditions in organizations.[5]

**Keywords**---- 5S, Strategic Planning, Down Time, Change

which means "change for the better". It allows the enhancement of efficiency and productivity in the industry. The 5S technique is a program to achieve total organization cleanliness, and standardization in the workplace for better productivity. The benefit of 5S technique is improvement in productivity, quality, health and safety. Term of 5S given as:

SEIRI(sort): Removal of all unwanted & unnecessary materials in the workplace.

SEITON(set in order): Putting everything in an assigned place so that it can be accessed quickly as well as returned in that same place quickly.

SEISO(shine or clean): Cleaning up the workplace and giving it a 'shine'.

SEIKETSU(standardize): Defining the standards by which one must measure and maintain cleanliness.

SHITSUKE(sustain): Maintain orderliness and to practice the first 4S on regular basis.

### I. INTRODUCTION

In this changing business it is important to win hearts of customer though quality and cost of the product or service. It is also required to have productive production with continuous improvement. The present need of the organization is to deliver high quality product through continuous improvement. To fulfill these requirement, 5S technique emerged for better production in the industries. 5S is a technique originated from Japan and it was first developed by Hiroyuki Hirano. It include five words of S i.e. Seiri, Seiton, Seiso, Seiketsu and Shitsuke, which means Sort, Set in order, Shine, Standardize and Sustain respectively. The 5S technique is derived from "Kaizen"



Figure 1: 5S Cycle

## II. PROJECT PLANNING

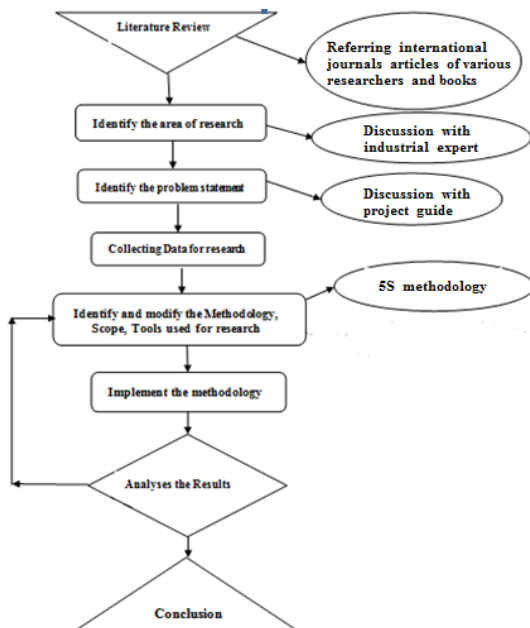


Figure 2: Project Planning

In this paper, project planning has been done by referring international journals articles of various researchers and books. After referring journals and having discussion with industrial expert, we found area of research. Once identifying the area of research problem was defined with the help of project guide. After discussion, the data related to the research area was collected. By understanding the reliability process methodology, scope, tools used were identified. After this 5S methodology was implemented and result was analyzed.

## III. LITERATURE REVIEW

(7) Chakraborty et al. (2011) studied the critical problems facing by small scale industries while selling their product. SSE (Small Scale Enterprise) is not having huge financial backup and therefore they are depending upon the revenue earned after selling their product. The product sales can only be increased by reducing the cost of the product. (8) Upadhye et al. (2010) studied the importance of small and medium scale industries in Indian context. Medium size manufacturing industry plays an important role in Indian economy. Their contribution to the economic development of the nation is indeed significant. But the productivity level of these industries is quite low as compared to other country. (9) Palaniappan (2010) described the performance and benefits of small scale manufacturing industry in India. Small scale industries form an important sector constituting 40% of the total output to the private sector and much more significant is the employment generation capacity of small scale sector. (10) Chauhan et al. (2010) shows the problem to sustain in global market for an organization. Lean manufacturing is hymn of survival and success of any organization. The goal of lean manufacturing is to minimize all types of waste so cost of the product can be reduced. (11) Hudli and Inamdar (2010) described the development of key areas which could be used to assess the adoption and implementation of lean manufacturing practice also presented some of the key areas developed to evaluate and reduce the most optimal project so as to enhance their production efficiency. (12) Lucas et al. (2010) focused on implementation of lean on small manufacturer of all 4-wheel drive vehicles, through implementation of basic lean tool, the small manufacture rapidly increase output and reduce quality defects by 80%. (13) Dalgobind and Anjani (2009) presented methodology for determining the real problem associated with industries in implementation of lean. They also presented selection of required lean tools in the light of company's long term vision. (14) Kumar and Kumar (2010) described the steps undertaken for the implementation of 5S emphasizing on the benefit of an organization. Also described the initiation and benefit of implementing the 5S. (15) Gheorghe (2008) presents a continuous improvement strategy aiming to improve manufacturing at Auto car Exhaust. The implementation of 5S has immediate and significant effect on the sequence of activities in the work post, thus influencing the performance of process in the analyzed company. (16) Khedkar et al. (2012) worked on implementation of 5S on plastic moulding industry. 5S is used in small industry and also showed the advantages and benefits of 5S implementation. (17) Prashant koli (2012) presented the methodology for calculation of each S in 5S system.

### IV. COMPANY BACKGROUND

A one of the leading company in M.I.D.C Ambernath Maharashtra India relatively new to lean concepts. The company is engaged in manufacturing of Filters such as Air Filter, Cartridge Filter Coolant Filter, Sand Filter, Slot Tube Filter, Bar Filter, Basket Filter, Strainer Filter etc.

In company employee were working in uncomfortable, dirty, messy environment, no rules and regulation, employee do not worry about safety storeroom was usually full of unused materials. Because of this condition, it was difficult to find the proper tools which were needed in production.[5]

### V. PROBLEM STATEMENT

In that leading company, much time was wasted in set up than machining time and material and equipment handling time. So to increase the productivity, it was necessary to reduce the non productive time on production line and tool handling time[5].

### VI. 5S STRATEGY

5S is a strategy for attaining workplace organization and cleanliness, and it will improve quality, productivity and moral than any other lean manufacturing improvement.

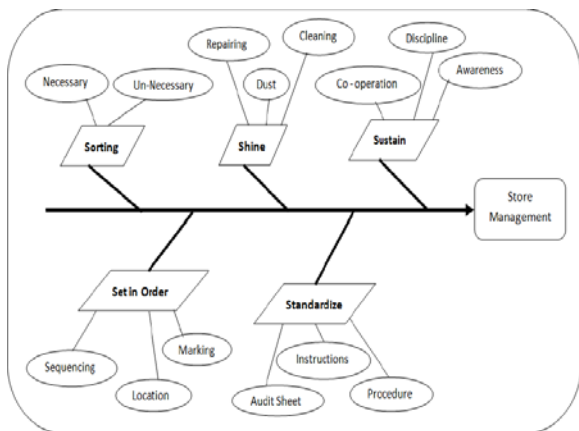


Figure 3: Fish Bone Diagram

Above fishbone diagram shows various phases of 5S methodology. In each phases we have describe the problem by using this phases we have solved the store management problem.

The first 'S' stand for seiri (Sort)

It is a waste reduction step; all materials are separated as necessary and unnecessary. Sorting elimination of waste materials (raw materials, tools and material), and damaged tools. To sort out necessary and unnecessary materials red tag is used. Its helps to maintain the clean workplace and improves the

efficiency of searching and receiving things, shortens the time of running the operation.[5], In sorting we distinguished the useful and scrap items. Then scrap items were kept all aside at one location and we named the location as scrap yard which is just located besides the entrance of storeroom.



Figure 4: Scrap Area and Store Room Entrance

The above image is of the company's storeroom where we have segregated the scrap and placed it besides the entrance and named it as scrap yard. In this scrap yard we placed all the scrap at one time and some of the scraps are placed at different location due to shortage of space.

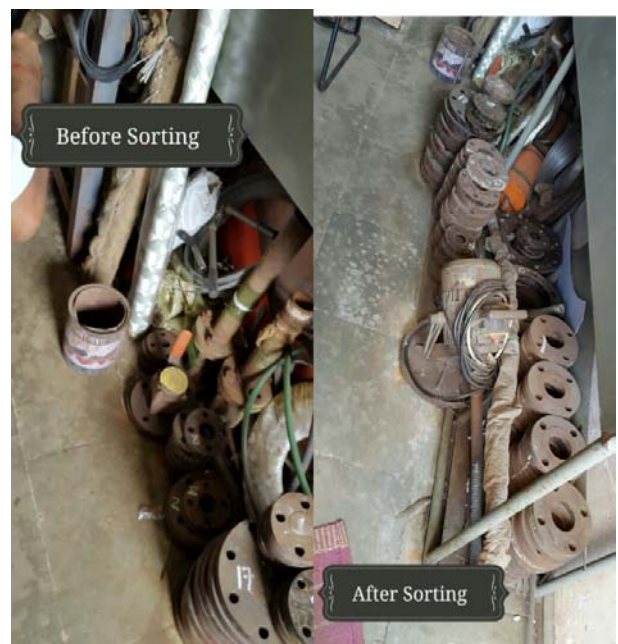


Figure 5: Sorting Before and After

The second 'S' stands for Seiton (Set in order)

The materials that were separated in earlier stage is stored orderly and labeled, so as to it will easily found when ever required. It will reduce the time required for searching the materials and tools.[5]



Figure 6: Shows Orderliness of Cutting Wheels



Figure 7: Orderliness of Flanges

Sorted and arranged the flanges in accordance to their sizes i.e 20NB, 25NB, 50NB, 80NB, 65NB, 100NB

The third 'S' stands for Seiso (shine),

It is related to the cleaning, shine and sweeping of work place and machinery. During cleaning, it is checked the cleanness of machine, workplace area, and sources of light, preventive maintenance of the machinery and equipment etc.[5], we implemented this method as we were proceeding with the sorting method. As we were proceeding the sorting, we were differentiating used & not used items and then we cleaned the whole work place, then after this we reached every racks & then cleaned every racks for cleaning method. For cleaning we removed all the items from their racks and cleaned racks. While cleaning we also fixed the air conditioner leaked pipe.

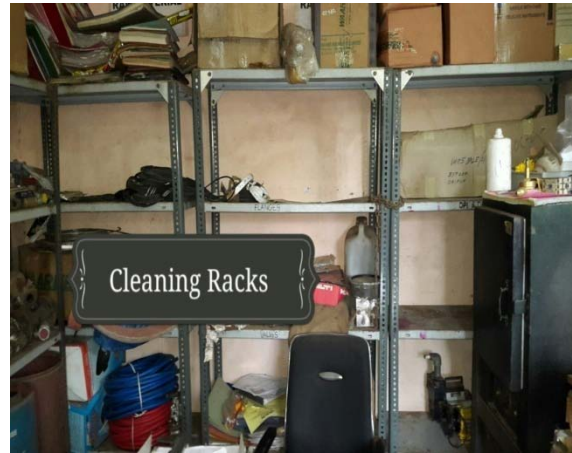


Figure 9: Removing All Un-Necessary Things Shine

The fourth 'S' stands for Seiketsu (standardize),

In this step standard procedure, audit sheet and work instructions are prepared to maintain Sieso. Before starting of work to check and correct the sorted items, placing equipments at its place and cleaning etc. and give proper reading on audit sheet and create awareness in employee to maintain this thing on production line or on non productive line.[5]

The fifth 'S' stands for Shitsuke (sustain),

Sustain is about the mental and physical disciplines required to maintain the other Seiketsu items. It is done with help of co - operation between employees, store keeper, engineer and manager.[5]

## VII. RESULTS AND DISCUSSION

### Time Analysis Of Implementation Of 5S

Time analysis or Time comparison play an important role in a company or industry to improve working and productivity efficiency. Time analysis nothing but comparison of operation time means how much time take by the process, manufacturing of product, searching of tools and materials, etc., We have implement 5S in Filter Leading company, what is effectiveness after implementation of 5S we have recorded and compared it with old record, effectiveness of 5S before and after implementation is given below Table.1, Since effectiveness reading is given out of 1, for example effectiveness of material searching is taken 0.7 out of 1 before implementation of 5S now after it is 0.9 out of 1, similarly the effectiveness reading is given to other processes. From that comparison we conclude that overall change is 75% means we have increased it up to 20% after implementation of 5S. Since it also increase productivity.

TABLE.1, PROCESSES EFFECTIVENESS AFTER AND BEFORE IMPLEMENTATION OF 5S

Sr. No.	Processes	BEFORE	AFTER
1	Material Searching Time	0.7	0.9
2	Tool Arrangement	0.6	0.8
3	Tool Sequence	0.5	0.7
4	Material Arrangement	0.4	0.5
5	Process Path Cleaning	0.4	0.8
6	Working Environment	0.5	0.8
7	Safety	0.7	0.8
8	Working Efficiency	0.6	0.7
9	<b>Overall Change In Percentage</b>	<b>55%</b>	<b>75%</b>

### TIME COMPARISON OF Y-STRAINER



Figure 9: Y Strainer

After applying 5S we analyzed a product called y-strainer and studied that how much time is required for making a product before implementing 5S and after 5S and we made graph on that.

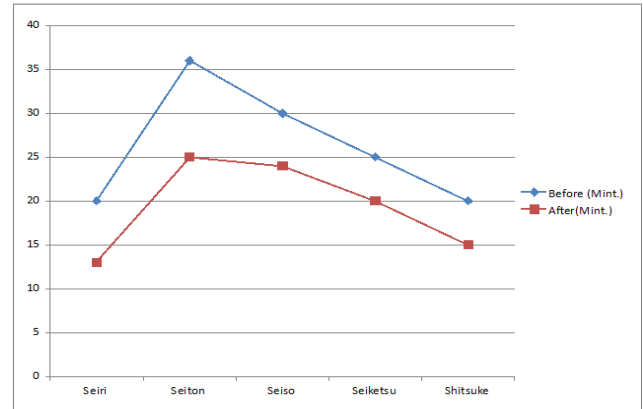


Figure 10: Line Graph

In above Line Graph diagram ,we did time comparison of industrial product "Y STRAINER". Before implementation, it takes more time for production of one product. But after implementation of all phases of 5S, it takes less time for production of Y Strainer.

### VIII. CONCLUSION

The 5S is an effectiveness to manage tools and materials which can improve housekeeping, environmental conditions and health and safety standards and increase productivity and quality. 5S sort stage eliminates unused, unwanted material from the storage room which reduces clutter. Set in order allocates space for components, due to this it give more space for storing more material and tools and results in reduction in searching time. 5S reduce the searching time and improve the production and quality of the products and employees and organization become self disciplined.[5]

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