

5S: Study and Implementation in a Company

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Abstract : This paper gives the study of implementation of 5S in Digital Control Equipment's Company. Basically, 5S is a systematic technique which is used by any organizations. 5S has five Japanese words and also referred as steps are Seiri (sort), Seiton (set in order), Seiso (shine), Seiketsu (standardize), and Shitsuke (sustain). By applying all these steps in correct way we get better result with increasing efficiency of organization with reduced in total time of assembly, less work space use, proper cleanliness, the things at right place, employee get good working environment. In this company 5S is implemented with PDCA cycle i.e. Plan-Do-Check-Act. It has been observed that introducing the 5S, helps to company to reduce storage area, reduce total time and also reduced the time which required for searching necessary things. This paper contains some images of work place which was taken before and after of implementation of 5S.

Keywords – 5S, better result, reduce storage area, PDCA cycle.

I. INTRODUCTION

Now-a-days small-scale industries and medium scale industries facing some challenges because of competitions between the national and international market. To beat such some challenges and to withstand in market, company need continuous improvement. This can be achieved with the help of implementation of 5S. Implementation of 5S was is done at Digital Control Equipment's Company. In this company different control panels are assembled. The 5S methodology is applied in this company on the basis of problems suggested by all employees. Hiroyuki Hirano was the first who developed 5S is a technique in 1980s in Japan. It has five Japanese words Seiri, Seiton, Seiso, Seiketsu and Shitsuke. The 5S philosophy focuses on effective workplace organization, reduction of waste and simplification of the work environment with improving safety and quality of work.

Table 1: Summary of 5S

5S	Meaning of it	Advantages
Seiri (Sort)	All items which are not in use or not needed for current operations should be removed.	Resources like money, time, energy, Space, and other can be managed and also used most effectively. Increases product quality. Improves communication between workers.
Seiton (Set in order)	Needed items should be arranged. Label items properly so that anyone can find them or put them at their place.	Eliminates searching time. Eliminates waste due to difficulty in returning items. Improves work flow.
Seiso (Shine)	Everything should be clean and clear	Improves good working environmental condition, which increases worker efficiency to do work. Healthy working environment.
Seiketsu (Standardize)	Integrates and maintain above 3S with use of some methods.	Easy to access above three 3S to get good result.
Shitsuke (Sustain)	Make a habit to maintain above 4S.	Self-discipline among the employees of the organization to follow the rules regarding 5S.

II. PROBLEM DEFINATION

Employees of the company faces some problems during their work time.

- The location of tools & useful materials & some other spaces are not defined.
- Tools & materials need to be searched.
- Improper storage hence searching of material is little time consuming work.
- There is no naming (labelling) or numbering on some shelf.
- Less cleanliness & some loosely hanging wires.
- Worker get frustrated due to missing or searching of materials.
- There are no proper rules designed by management so worker did not get appropriate knowledge regarding work management.

III. LITERATURE REVIEW

Henisha B. Raut et al. (2017) stated that, this system helps to organize a workplace for efficiency and optimize quality and productivity and decrease wasting via monitoring an organized environment. The study highlights the contributions of 5S & Kaizen strategies to identify employee performance and their attitude towards it as well as the effectiveness of the organization.[1]

Rajkumar Devkar et al. (2017) Stated that, with the implementation of '5S', Tool searching time from shop floor has been reduced to 6 minutes from 25 minutes. At the end of the project, 5S audit score has been increased. 5S is powerful tool and can be implemented in various industries whether it is large, medium, micro or small. [2]

Vipulkumar C. Patel et al. (2014) stated that, The research work carried out to apply the 5S methodology of lean manufacturing, this was done to solve the problems of a ceramic industry in India, with the aim to elimination of losses in the company and increase the efficiency of all processes. The objectives of the paper is to smooth the process flow and maintain proper quality control, improve storage facilities, safety, security and process cost savings, to reduce the process wastes in a company through case study. After implementing of 5S in the storage department the space saving is 12.91% . [3]

Harsha Lingareddy et al. (2013) this paper involves the study and change in the work place of a manufacturing industry to implementation of 5S. The solution found by 5S approach solely minimizes several kinds of wastes and which finally helps in the development of the organization. An Inspection process has been executed on the basis of 5S check lists and the results analyzed to confirm great changes like improves safety ,increasing efficiency in production and quality. [4]

P. M. Rojasra et al. (2013), this paper explain the implementation of 5S methodology in the Krishna Plastic Company, Udhogynagar, Amreli, Gujarat. Out of the available various lean manufacturing techniques, 5S offers good potential for required improvement. Ten week study is carried out in the company. The results after the 5S implementations states that production system efficiency is improved from 67% to 88.8% in the successive week. [5]

Prof. S. B. Khedkar et al. (2012) stated that, This research is dealt with the implementation of 5S methodology in the S. P. Plastic Industry MIDC, Nagpur. 5S implementation impacts the workman and instructors of industry. By following the 5S methodology, this research effort shows significant improvements to morale, housekeeping, efficiency, safety, and productivity.[6]

Shahryar Sorooshian et al. (2012) They have experienced of implementing a 5S philosophy and paper involves presentation of a real case study, specifically the influence of 5S on some basic work environment problems and the compensation power on the choice of implementation of 5S. This paper is simply representation of basic information with all pros and cons about the concept of 5S. [7]

Skaggs et al. (2010) described some benefits of implementing 5s as a source of reduction of wastes and no value adding work activities while simultaneously increasing the productivity and efficiency of the workplace. The most interesting aspect of 5s is that it doesn't require specialized personnel for its implementation. [8]

Gheorghe Dulhai et al. (2008) stated that, This paper presents a process-oriented and aiming to improve manufacturing and a continuous improvement strategy at auto car exhaust. The efficient implementation of the "5S" strategy leads to a subsequent improvement of the exhaust's quality. The improvement of auto car exhausts quality, using the "5S" rules, is accomplished at the initiative of the inferior levels of the organization coordinated and helped by the superior management. [9]

J. Michalska et al. (2007) stated that, In this paper 5S implementation results in increasing of quality, safety, an efficiency, and reduction of the industry pollution. The training of workers about the 5S rules is very essential. It is important to understand the need of to execute the routine inspections of usage the 5S rule. This inspection is executed by helping of check list and created on its basis the radar graph of the 5S, which serves to estimation of the workplace [10].

IV. STUDY AND METHODOLOGY

The systematic implementation of 5S is done with PDCA cycle as follows.

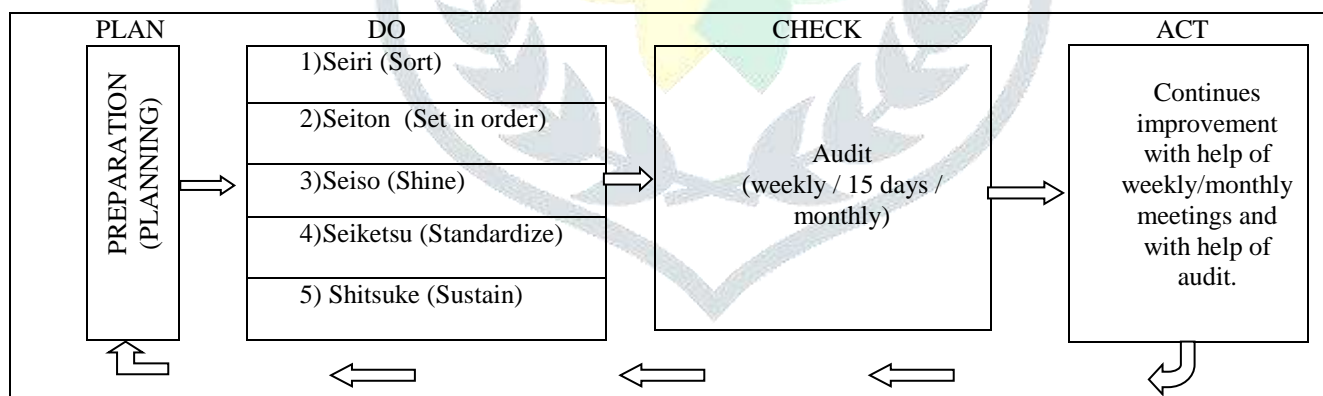


Figure 1: PDCA cycle

4.1 Plan

In first phase that is in 'Preparation or Planning Phase' we have collect all data regarding our study and implementation of 5S. we will prepare a plan according to available data. First of all we have given the knowledge and some training to all employee on 5'S concept. Then we will make a 5'S council for its better execution. The 5'S council divided into three parts in which Co - coordinator, Team leader and Team members. All employees should know their responsibilities very well and they should know all the instructions regarding the execution of plan.

4.2 Do

In second phase that is in 'Do Phase' actual implementation started with available data and on the basis of what we have implemented in planning phase.

All the 5S are implemented step by step in second phase.

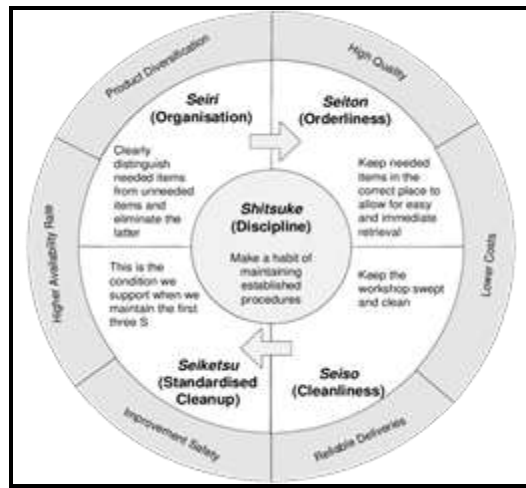


Figure 2: 5S Methodology

Seiri: It means sorting and organizing the all items as important, useless, frequently used items, or items that are not need as of now. Some items are not needed will be moved to red tag area.
 Seiton: It means set in order and it is focusing on tanging (labeling) all items in the company which will promote work flow. The items should be placed back after usage at their given place.
 Seiso: It means that to clean and clear. This step focuses on to clear and clean workstation or machines or floor area.
 Seiketsu: It means standardize. It helps to keep the first three S in good working with better result. The best way to standardize is to make a list of each area. Document the location, the condition of the area and the items there for checking of equipment and cleanliness.
 Shitsuke: This 5th ‘S’ stands for self-discipline or sustain which makes habit to maintain all 4S.

Flow chart of 5S

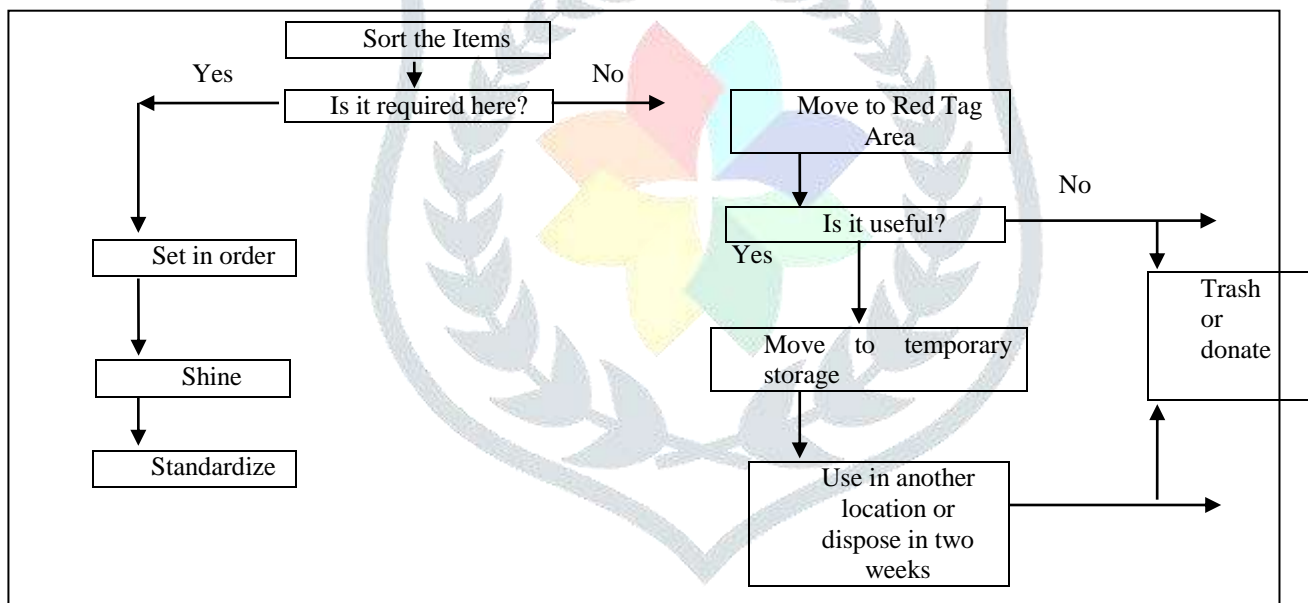


Figure 3 : Flow chart of 5S

On the basis of above strategy, 5S is implemented and took some before and after pictures for better understanding purpose.

i) Seiri:

- All useless things (like wire, remaining material etc.) which are not in used have been sorted.
- After sorting useless materials/items from workplace, they are shifted to red tag area with red tags card attached to that material/items.
- The appropriate action is taken after reading the Red Tag.
- Unwanted items are eliminated.
- Search time for material/items is reduced.



Figure 3: Red Tag Card

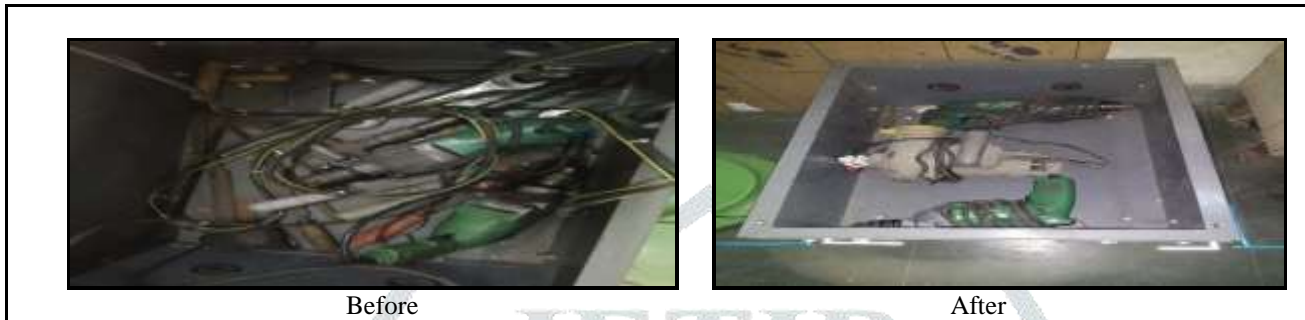


Figure 4 : Small equipments and tools are sorted.



Figure 5 : Unwanted material removed from storage area.

ii) Seiton:

- The location of all necessary objects have been defined and marked.
- Vertical racks are used for storage, heavy items occupy the bottom position in the racks.
- All the storage areas are given addresses and are marked with indicators of location.
- Numbering is done on the shelf.
- The arranging way has been set according to use of storage items.
- All the tools and items have defined allocated locations for their storage.



Figure 6 : Labeling is given to some storage area

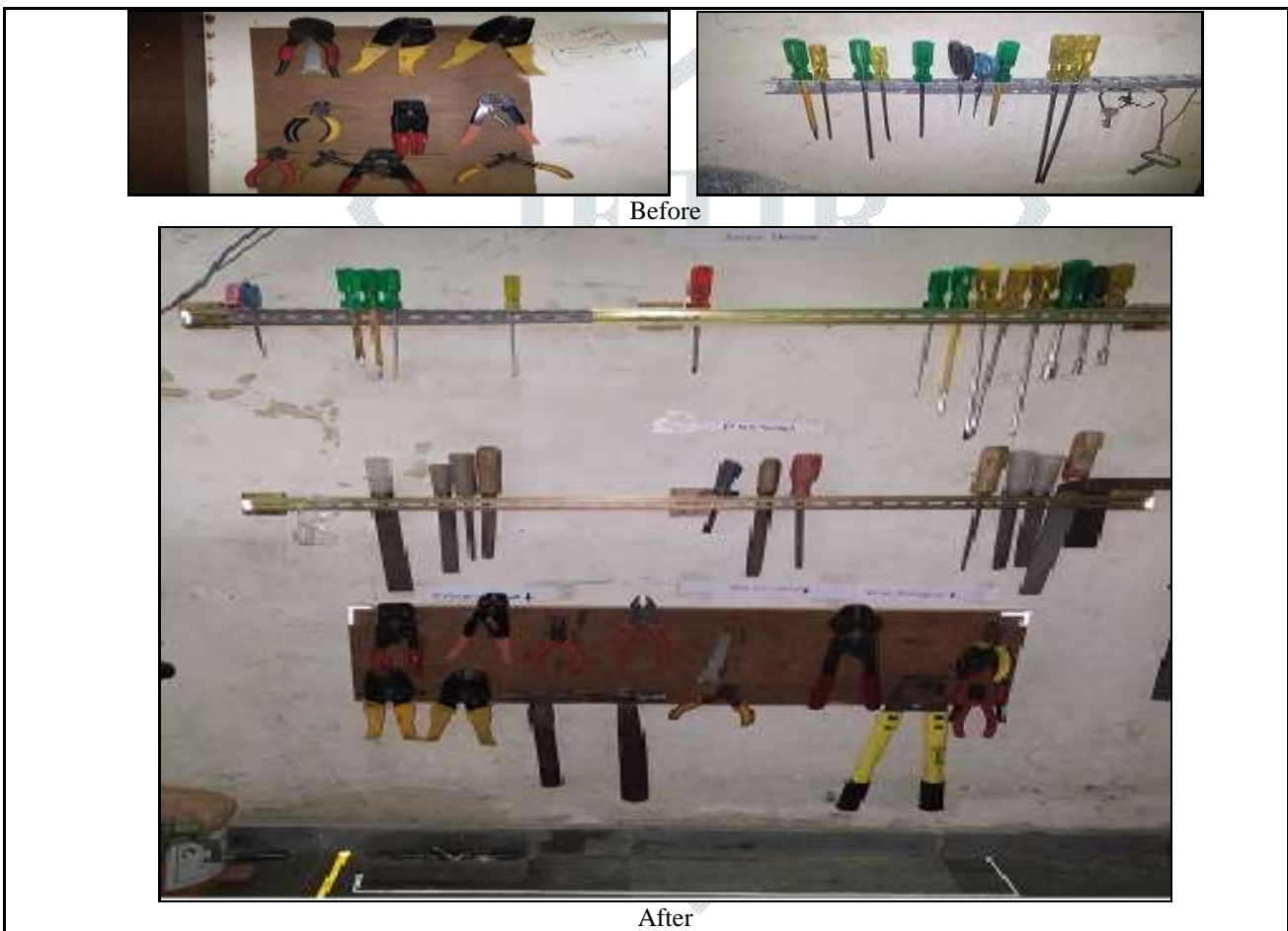


Figure 7 : Location and labeling to tools.



Figure 8 : Proper location for work material is done.



Figure 9 : Numbering is given to drawers.



Figure 10: Numbering given to shelf.





After

Figure 11 : Position of note pad & Switch box is fixed(loosely hanging wires are moved and fixed), location of ladder is fixed.

iii) Seiso :

- Cleaning of floors was done.
- Storage was cleaned.
- No loosely hanging wires.
- The supply wiring has been re-done.
- There is waste free environment.



Before

After

Figure 12: Cleaned workplace.



Before

After

Figure 13: Cleaned Machine.

iv) Seiketsu:

Standardize aims for the preparation of methods which are standards to continue to follow the first 3S effectively.

- The tag register is maintained,
- Made the habit to conduct 5S meetings after 2 weeks.
- It helped to improvement in operation and workflow.

v) Shitsuke:

- It gives a scope for workers participation in the work area design and maintenance.
- Team spirit and discipline were developed.
- Workers absenteeism has been lowered down.
- 5S slogans and posters were introduced.
- Management rules are displayed on wall and these rules are implemented to maintain discipline.



Figure 14 : Posters at work place.

4.3 Check

In this third phase that is ‘Check Phase’, we have checked the assessment to see that 5S Implementation has effective or not. In which we have did one audit sheet showed in figure 15. Audit was taken weekly for better improvement and understanding the status of the 5S in company.

		Date: _____ Name of Person: _____		(0-Worst, 1-Bad, 2-Average, 3-Good, 4-Very Good, 5-Excellent)					
5S	No.	Points to be checked	Assesment Criteria	Marks					
				0	1	2	3	4	5
1S-Sort	1	Equipments	Proper Position						
	2	Material	No unneeded material or part						
	3	Apparatus	No unused tools,wires are present.						
	4	Red tag area	Disposal or correct action for Parts & equipments with date.						
2S-Set in order	1	Location identifiers.	location of storage,office & other things should be easily known.						
	2	Items identifiers.	Each shelf should have proper numbering.						
	3	Quantity identifiers.	Quantity of items should be easily known.						
	4	Separation lines(Floor lines)	Floor lines Should be proper.						
3S-Shine	1	Pannels & workstation	Should be kept away from dust and unused wires.						
	2	Floors	Should be free of waste, unused wires and scrap.						
	3	Cleaning responsibility	Individually responsibility assigned						
	4	Cleaning & control	Cleaning inspection and actions regarding it.						
4S-Standardize	1	Lightning	There is adequate lightning.						
	2	Ventilation	There is adequate Ventilation.						
	3	Working clothes	Employees clthes shoud be clean and free of dust.						
	4	3S	There is a proper system for protecting and managing the first 3'S.						
5S-Sustain	1	Interaction between people	Good understanding environment related work among employees.						
	2	Safety	Work Safety equipment is compulsory.						
	3	Training	Regular training program for employees.						
	4	Rules	All rules and regulations have been adapted and well used.						
				Total out of 100: _____					
				Signature: _____					

Figure 15 : Audit sheet

4.4 Act

In this fourth phase the documents and record that shows the improvement of 5S or related to 5S are discussed and again it is used for next phase that is planning phase, Again some planning and preparation done to overcome previous drawbacks and problems related to 5S.In this way continuous improvement can achieved.

IV. RESULTS AND DISCUSSION

Implementation of 5S is done with first step that is 'sort'. Proper action is taken with help of red tags. This leads to clean area as well removal of unwanted items.

Clear visibility of needed items reduces the effort of searching material, which increases employee's positive behavior towards his work. Hence time is reduced for assembly the panels. Workplace is outline by the coloured line. So the transportation of men, materials, in the company is very easy which reduces the product damage and accidents.

Awareness regarding cleanliness is created with help of posters and also explaining importance of cleanliness. Not only cleanliness but also explained about scrap separation like plastic scrap, Chanel scrap, which helps to sort at the time of garbage collection. Also some posters are located to maintain awareness of cleanliness. Clean area also improves the work environment.

Standardize achieved by giving some responsibilities to some employee regarding cleaning of workplace, cleaning of storage, cleaning related trash bins/scrap. Daily clean-up was done by employees. This helps to lower the accidents, zero defects, also increases the employee's work satisfaction.

In every two weeks meeting is arranged. Suggestion schemes regarding 5S is introduced in company. So every employee is attached to 5S and tried to follow all 'S'.

V. CONCLUSION

5S is seen as technique which can improve environmental performance, safety, health and reduces fatigue to employees. The successful implementation of 5s is completely depend upon all the members which includes management committee and all the employees of company. The implementation of 5S in company gives some advantages are better usage of workplace, prevention of losing tools, time which required for searching necessary things is reduced, Improved working conditions for workers, customer satisfaction achieved and some number of customers get increased, improvement in safety has supported in reducing injuries to the workers, material handling time is reduced, it gives a scope for workers to participation in the work area, improvement in the inter human relations.

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