

Efficiency Enhancement by 5S Implementation– A Case Study

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Abstract

5S technique is a world-known work place organisation method. It is based on set of five standard principles or 'S' that allow step by step approach in achieving and maintaining workplace transformations for efficiency, value and waste reduction. The concept of 5S is necessary for TPM .In fact implementation of all the pillars of TPM is on this sound base of 5S. Considering the home as a workplace for all family members, a case study, for applying 5S principle at our home, has been discussed in this paper. We have applied 5S principles to reorganise our home to leave competently.

Keywords: 5S, TPM, Segregation platform

INTRODUCTION

5 S is a Japanese Technique used mainly for workroom management. It provides guidelines to effectively clean organize and maintain a workplace. The constituents S of this philosophy are 'SEIRI', 'SEITON', 'SEISO', 'SEIKETSU' and 'SHITSUKE'. They are sometimes translated to closest English as 'SORT', 'STRAITEN', 'SHINE', 'STANDARDISE', 'SUSTAIN'[1,2]. 5S is also referred as CAN DO philosophy based on first five letters of cleanliness, arrangement, neatness, discipline, order [3]. The concept of 5S is necessary for TPM .In fact implementation of all the pillars of TPM is on this sound base of 5S. As this principle is very explicit yet universal terms they can be applied to any workplace, schools, banks or even homes.

Considering the home as a workplace for all family members, a case study, for applying 5S principle at our home, has been discussed in this paper.

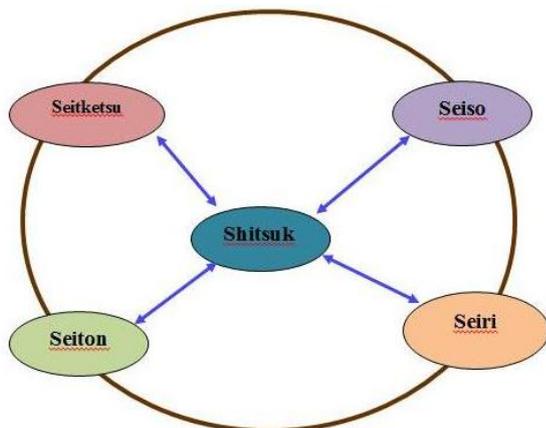


Figure 1: Elements of 5-S (Source Minh[4])

BACKGROUND

We are a family of four people. Elder daughter Sai is currently working in USA. Father and Mother both are faculty in engineering colleges and younger daughter just returned from Mumbai having completed her graduation. Parents' busy schedule, constant changeability in assignments of different academic courses, mother's deputation for some duration at a distant engineering institution for some assignment, engrossing occasions like elder daughter's marriage *etc.* had resulted in accretion of various possessions that were germane at time but inapt now. House was not untidy but required serious organization. Because we were staying in different locations -we had saved many sets of same day to day stuff that needed to be focused and removed. The developments in technology further gave us a moral responsibility to minimize the material possessions. It became very necessary to arrange the home in order to live efficiently. To save time and make maximum output of the effort we decided to take advantage of engineering knowledge and apply 5S technique.



Figure 2: Photograph of Office bag and cupboard (before)

TARGETS

The key motive was to live efficiently. The core element of living effectively is saving time finding day to day objects. To achieve this it was necessary to keep everything accessible and manageable. This is possible only by minimizing the existing stuff.

Our quick ultimate goals for the task were-

- 1) Reduce the time required for finding daily required items.
- 2) Increase open space in house for pleasant experience.
- 3) Discard items, reduce documents, furniture and all possible material that is not required.
- 4) Make a definite space for everything.
- 5) Create a cleaning schedule of everything.
- 6) Eliminate and replace Plastic.

DELIMITATION

Considering the requirements we decided to focus on immediately vital sections and delimit the kitchen area. Kitchen was much organized and not affecting the causes mentioned earlier. Focus was on three rooms, hall and garden.

METHODOLOGY

We began with a quick survey tour to understand which things can be quickly removed and made a rough plan to deal with remaining areas. We realized that team work is important to implement 5S fruitfully. We three gathered and decided to work together equally. At the same time we avoided that everyone is focusing on the same zone or room leading to excessive futile time.

We allocated among ourselves areas or cupboards depending on the predominance of a particular individual's belonging in it. We followed a platinum rule - items that are not used for last 3 years are to be examined critically without considering its price, size or emotional entanglement. In the home there were some items that needed a group decision and some persuasions before removing it. In order to minimize the dwelling time we decided to assign a platform or 'Chavhata' (as we called it in Marathi- a word- that translates to 'making open') or Segregation platform to keep such items. A large centralized bed of 7 by 6 feet was used for this purpose. Any item whose decision was pending used to kept on it. Frequent intermediate time in every 2 days for all team members to unite and take conclusive decisions on items of this platform was assigned. Similarly we kept reviewing our progress time to time throughout the task.



Figure 3: 'Chavhata' or 'Segregation Platform'

CONCEPT OF 5S & HOW WE USED IT

As mentioned earlier 5S technique is very explicit yet universal. It provides an approach to create a habitation that is efficient, organized, well arranged clean and agile to be in. It utilizes teamwork as well as individual efforts to carry out the tasks. It is based on simple essential steps that are easy to

follow even for a novice. The technique focuses on waste discerning and reduction. 5S technique not only provides guidelines for recreation of workplace and more importantly for sustaining the achieved target. It helps in building and adapting the values essential for organization in every team member. 5S is said to provide a continuous process of improvement, a primary reason to why it is endorsed worldwide. This business philosophy can be extended and applied to many areas of life. By employing it in home we could witness the transformation in less time, efforts and resources.

Following are the five principles involved in the philosophy.

1) SEIRI or Sorting -

It involves a guideline to start classifying existing items into main categories Required, Not required (Red tag material) and Items needing collective decisions (Yellow tag material) before discarding. Specific categorization helps in taking quick decisions. While implementing it members could take rapid decisions in their own areas.

Firstly scrapped evident big items to begin with for example old bikes, unused washing m/c. Then work of sorting house items began. Things that were to be discarded without a thought were kept on floor (Red tag material) while things needing more discussion were kept on the 'Chavata' (Yellow tag material). We avoided actually tagging the things with colors as the team was small enough to eliminate possible confusions and we could save time and resources to be spend on tagging material.

The ultimate segregation was (UPRDS) –

- 1) To be **Used** daily
- 2) To be **Preserved**
- 3) To be **Repaired**
- 4) To be **Donated**
- 5) To be **Scrapped**

Following were the items that were removed with a quick glance in overall task time.

- 1) Unused vehicles – two motor cycles, one Kinetic Honda.
- 2) Sporadically used Television set.
- 3) Academic notes and books that are not requisite now and those whose references can be found using internet easily.
- 4) DVDs or CDs that store songs or videos that is more conveniently accessible using YouTube.
- 5) Extra sets of same items like stationary
- 6) Plastic bags, boxes
- 7) Outdated Documents –Bills, old Income tax docs, Newspaper cuttings
- 8) Very old and outdated visiting cards

- 9) Photos – Negatives and damaged.
- 10) Memories like old handwritings, drawings from daughters' childhood that could be digitized.
- 11) Unwanted cosmetics or jewelry.



Figure 4: Some discarded or donated items

- 12) Outdated plugs, chargers and earphones, extra but now unwanted wire connections.

Significant material was separated and reduced from home in this step. This created a space and ease for the next step.

- d) Travel bags and extra bags were kept below market bags prioritizing accessibility.

Instruments required for gardening, electric work were separated and kept in corridor.

- e) Travel locks were separated and numbered with proper keys.
- f) Dad and daughters exchanged cupboards so that all the things belonging to a person were in a particular room closer to his/her bed. **Storage at point of use.(POUS)**

Once we were fully done with this it was time to flourish the change. Then we proceeded for next step.



Figure 5: Files and books (After)

2) SEITON or Straighten

This step gives more specific guideline to organize the existing items. The common scheme as it is quoted is "A place for everything and everything in place" (**PEEP**). It is impossible to swiftly find an item if there is not a definite place for it. Similarly if items that are not required often are mixed with those that are required daily add to the hindrance. Thus it is required to organize everything.

We decided to make two broad categories one that are required daily/ occasionally like clothes, stationary and once that are requires seasonally/ less frequently like extra sets of curtains, old projects/PhD reports, some clothes those are spare.

According to it, we reorganized the home in following steps.

- a) Daily needed stuff was kept handy or in cupboards closer to hand levels – clothes, current semester notes, daily medicines.
- b) Occasionally or seasonally required material was kept in attics – Extra set of curtains, Photo albums, next semester notes or books, gift objects.
- c) Cupboards that have materials that are required daily were kept in more accessible places than those that are required intermittently.

3) SEISO or Shine -

Not taking timely action results into damaged items. This S provides a valuable principle by ensuring that each member is actively involved in cautiously cleaning the work place. According to this principle even CEOs and MDs are required to clean their own offices. The foremost benefit is that each member in team becomes aware of the fact that if a failure or mud is neglected in initial stages it results in failure that is much more difficult or straining to overcome. Many a times a machine has to be replaced only because it becomes too costly to maintain. We realized similar things even at home with the kinetic bike. Hence we grasped the importance of this step.

As everything was kept in its place recently there was less items that needed actual scrubbing. So we decided to make a cleaning schedule. Responsibility of specific areas was allotted to members to look after it even after the task is over.

Areas allotted are –

- A) Hall + one bedroom – daughter
- B) one Room + one bedroom- father
- C) Garden, kitchen + washroom - mother

SN	Name	Primary Responsibility
1	Balcony	Ila
2	Baithak (Welcome Room)	Ila
3	Gallery	Ila
4	Study Room	Ila
5	Hall (Drawing Room)	Abhay
6	Bedroom	Abhay
7	Devghar	Abhay
8	Kitchen	Vandana
9	Passage	Vandana
10	Veranda	Vandana
11	Staircase	Vandana
12	Terrace	Vandana
13	Garden and Yard	Vandana
14	Bathroom	Vandana
15	Toilet Indian	Vandana
16	Toilet Western	Vandana

Figure 6: Cleaning Region-Distribution Chart

In this step we also decided to repair certain damaged items like cupboards. Some books that had pages slackened were fixed. Old bicycles were fixed. Lights and fans were cleaned.

Definite places for brooms and cleaning material allotted. Specific cleaning routine was made for cleaning the rooms and even cleaning brooms.

Electric wires and ropes used for drying clothes were fixed. Fire extinguisher was mounted in house. This added to safety. If the technique is named as 6S, here we achieved 4th S [5]

It is necessary to extend cleanliness beyond the actual area to the environment, thus we also dressed the garden area. Trimming of grass and some overgrown plants was done.

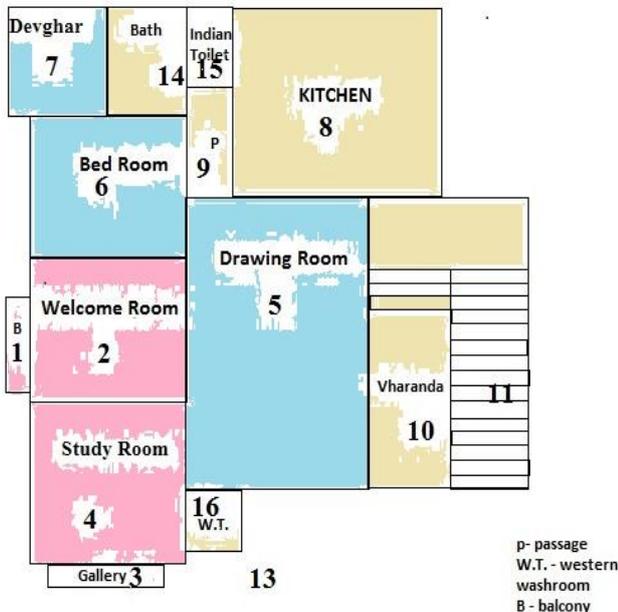


Figure 7: Cleaning Region Plan

4) **SEIKETSU or Standardize**

It is said that a sudden change seldom lasts. Similarly any change is a wasted effort if it is not maintained properly. Every step involved in achieving it should become a part of behavior of each member. Only then actions will turn into habits and effect will be lasting and useful. Thus firm steps should be taken to ensure the desired standards.



Figure 8: Cleaning and repair(Before and After)

It should become a tradition to keep things in place. Thus visual aids prove to be the best answer for this.



Figure 9: Visual Management for switches and Medicines

We tried to implement 'Lakhina' method in which every file is arranged and prioritize using color coded files. Due to budget constraints and limitations to colors available to cloth bags we could not implement it to its fullest extent. But every file was sorted and kept in a red or blue cloth bag with a name title written on it.

Named tags were stick to switch boards. Books were arranged in a way that names are clearly visible.



Figure 10: Visual Management for files

SN	Activity	Cleaning Frequency	Remark
1	Sweeping of Rooms	6 days/week	
2	Wait cleaning of rooms	1 day/week	
3	Dusting of furniture, phone, cupboard	6 days/week	
4	Deep cleaning of every corner of room	1day/Fortnight	
5	Staircase cleaning	1 day/Fortnight	
6	Terrace cleaning	1 day/2 months	
7	Veranda and Gallery cleaning	1 day/week	
8	Balcony cleaning	6 days/week	
9	Garden watering and cleaning	5 days/week	Alternate area
10	Inside cleaning of cupboards	1 day/month	
11	Water tank cleaning	1 day/ 3 months	
12	Colouring of inside walls, doors and windows	Every 4 years once	Approx. as per budget
13	Outside colouring	Every 8 years	Approx. as per budget
14	Dust clothes/dustbins cleaning /changing	1 day/week	
15	College bag/purse cleaning	1 day/week	
16	Ventilators cleaning	1 day/3 months	
17	Doors and windows cleaning	1 day/fortnight	
18	Wooden Devghar	Every Friday	
19	Car cleaning	6 days/ week	
20	Car cleaning deep	1 day/week	
21	Car washing	1 day/3 months	
22	Cycle cleaning	1 day/week	
23	Laptop/Mobile/TV cleaning	6 days/week	
24	Attics cleaning	1 day/6 months	
28	Toilet cleaning	6 days/week	
29	Bathroom cleaning	3 days/week	
30	Electrical bulb, tube light and fan	1 day/month	
31	Outside lamps, dish antenna cleaning	1 day/month	
32	Electrical fittings and switches cleaning	1 day/6 months	
33	Curtain washing	1 day/month	
34	Cushion covers washing	1 day/2 months	
35	Foot board/matting (पायपूसणी) cleaning	1 day/week	

Figure 11: Frequency of cleaning schedule

BENEFITS OF USING 5S

There were number of tangible and intangible benefits of implementing this methodology in house.

Tangible Benefits –

- 1) Time: Saving of minimum 10 minutes daily per member time approx. amounting yearly at least 180 man hours. (Calculated on very Minimum side)
- 2) Financial Benefits

Received by selling of old items

Motorcycles 2 sold Rs 7000

Kinetic sold Rs 1500

Old documents sold Rs 800

 Total Rs 9300

Less purchases almost of same amount

(Stickers, Marker, dustbins, fire extinguisher etc.)

Intangible Benefits –

- 1) First time we worked almost for one month as a team. We, formally, are participating as one team. Joy of this is uncountable.
- 2) Fatigue due to searching is eliminated.
- 3) Sense of pride.
- 4) We all three will be different and better persons after 5S implementation.
- 5) Family bonding reached at higher level.
- 6) Quarrels due to not getting the things stopped.
- 7) Aging effect on two elder members has reduced significantly and feeling active and healthy. At the same time daughter gained professional maturity.
- 8) People around became happy due to donated items.

CONCLUSION

Five housekeeping principles popularly known as 5S's, come from the first five letters of the five Japanese terms, namely Seiri, Seiton, Seiso, Seiketsu, and Shitsuke. 5 s principles are the concepts that are systematic and has a broad scope. They can be applied to any workplace, schools, banks. Even it can be implemented in rearranging home. Its practice can boost morale of every person and that of the family as a team.

5) SHITSUKE or Sustain-

Shitsuke means self-discipline. It is impossible to sustain the benefits of any revolutionary task if self-discipline is not a part of everyday conduct. Thus to sustain the change it is now our responsibility of to practice 5S technique even after the task is over[6].

To figure out better we conducted a why-why analysis. Asking why a misplacing or intermixing will occur.

We realized even for sincerest team member busy schedules and emergencies are unavoidable. So to avoid any losing or intermixing we came up with two 'Recycle Bins'. If something cannot be placed in its actual position on account of rush we would keep it in 'Recycle Bin'. Secondly some receipts, bills or such documents are immediately worked on they will be placed in 'WIP' (Work In Progress) bag. These provisions will be examined, sorted and emptied weekly. For example a tailor receipt that was not used today but is definitely needed in this week.

Similarly as mentioned allotment of specific cleaning areas to each member ensures its maintenance and immediate feedback to other members.



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