

A Study of Implementation of 5S for the Betterment in Workflow

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Abstract:- In the modern era, New and advanced technologies are introduced to produced good quality and with high quantity. Surroundings also be a factor that causes and effect the whole productivity and quality of the work. 5S is the technic of lean management that deals with working surroundings i.e. Sorting, Shining, Set in order, Standardization, and Sustain everything conclude to the end with betterment in the work flow. 5S is a quality technic that helps in reduction in waste, time and enhances productivity etc. In this paper, we have improvised the standards and improve productivity.

INTRODUCTION

5s: 5s is a technique that end up in a well-organized workplace complete with visual controls and order. Basically an environment that has a place for everything and everything its place, when you need it.

5s provides workplace which is:

- Clean
- Uncluttered
- Safe
- Organized

Since workplace begins to speak by linking people and product, processes, begin to flow at the drum beat of customer.

5s stands for

- Sieri – sort
- Seiton – set in order
- Seiso- shine
- Seiketsu- standardization
- Shitsuke- sustain

Why it is important?

Visual order is foundation of excellence. When it is in place, work gets done efficiently and effectively, when it is not work still gets done, but at a cost which is hard to justify.

ORIGIN OF 5S

5s methodology has come out of techniques within

- Total productive maintenance
- Toyota production system

But its roots lie in works of taylor i.e. Scientific management and Frank Gilberth’s “Time and motion studies”

Frank Gilberth showed that by improving the ergonomics of a brick layers working method he could reduce number of individual movements required and increase the hourly output from 120 to 350 bricks each hour.

ORIGINATED BY FORD

CANDO

- Clean
- Arranging
- Neatness
- Discipline
- Ongoing improvement

5s is a way to organize workplace and working practices as an overall philosophy and way of working.

INCREASES	DECREASES
MORALE	INJURIES
SAFETY	PRODUCTION COSTS
EFFICIENCY	DOWNTIME
QUALITY	DEFECTS
LEAD TIME	SUPPLIES MISTAKES
CREATIVITY	UNDER UTILIZED WORKERS
EQUIPMENT LIFE	INEFFICIENT TRANSPORTATON
	INVENTORY STORAGE COSTS
	UNDER UTILIZED FLOOR SPACES

Diagram

It aims at: improved safety, waste removal, increased quality.

- Organizing not just tidying
- Efficient
- Ergonomics
- Waste removal means more than just scrap.
- Creates an environment for continuous improvement
- Gives a firm foundation on which to build other improvements

BENEFITS OF 5S

Keeping detailed records

- Collect data to track and correct inefficiencies
- Management uses collected data to make appropriate changes
- Focus on routine work area duties
- Take before and after pictures to support data

Visual Communication

- In 5s, it is used to bring organization to the system and help guides workers through various steps.
- Using effective signage to give workers clear, accurate identification of location, procedures hazards equipment and tools.
- It is the key to successful 5s implementation

IMPLEMENTATION

PDCA Approach

P (PLAN) Program committee is organized. A program for each 5 steps is set	D (DO) Announce the program publically, training, education of workers program starts on a particular date.
A (Act) Self-examination is done and corrective and preventive measures are taken	C (CHECK) Evaluate the results.

Team building

- Create internal committee of 5s team leaders
- This group manages and supports the system from sorting and sustaining
- Team size depends upon facility size
- Consider individuals with strong leadership skills
- Once team is organized they have to draft formal 5s plan
- Train and educate employees
- Define roles of employees in 5s plan

SORT (SIERI)

(Action required)

1. Look around the workplace, discover items which are not needed
2. Develop disposal criteria for unneeded items
3. Take before photographs
4. Tag items not required
5. Find holding area to put red tagged items
6. Classify the items by frequency of use
 - Item used hour by hour or day to day should be kept within arm reach
 - Items used once a week or within a month should be kept within work area
 - Items other than that should be stored at a distant
7. Unneeded items should be stored in holding area
8. Each individual department should have holding area

9. Holding area should be clearly marked visible and clearly marked
10. Display picture of items in holding area on a public board
11. One member of team should be assigned responsibility of holding area
12. Items in holding area should not be kept for more than 3 months
13. Items should be moved to company level holding area before final disposal
14. Take after photographs.

SET IN ORDER (SEITON)

Focus: Dedicate storage areas for all work place items

- Create a comprehensive system of organization by finding permanent storage locations for every items and visually identifying their locations
- A place for everything
 1. Every time forklift, any tool should have dedicated place of storage, this eliminates wasteful searching
 2. Install modular shelves and cabinets
 3. Non-essential items will continue to be discovered so go to sort phase and red tag them

Review Storage

- Team leaders must evaluate existing facility visual communication to ensure new storage locations are properly labelled and accurately display their contents
- Establish in house label and sign standards
- Goal is to provide uniformity and visibility to help workers
- Follow national safety sign design standards

Work flow:

- Indicate work flow direction with signage
- Place facility maps at strategic locations
- Provide signage to simply instructions

Procedure/inspections

- Label electrical equipment for fast recognition
- Describe equipment operations with signage
- Keep labels consistent across work area
- Use electronic visual and auditory alerts when, where beneficial

Inventory and Material

- use modular shelving / cabinets to improve organization
- use flexible storage to changes are easy
- mark warehouses floors to show storage boundaries
- clearly identify contents of pipes valves, storage cylinder
- identify new storage locations
- ensure hazardous substances are properly marked

Required action

- recheck to verify if all unnecessary items are eliminated from the workplaces
- take into account the work flow, decide which things have to be placed
- take before photographs
- discuss with workers to decide where things should be placed for efficient operations
 1. frequency of use
 2. things required to perform duty
 3. how many items are required
- make a plan and place things accordingly
- locate things so that they can be retrieved in minimum time and minimum steps
- inform everybody at workplace about positioning of items
- make clear lists of items and their locations and display them
- label lockers, drawers and cabinets
- outline locations, equipment, supplies, safety zones with line
 1. divide line – define aisle ways and work stations
 2. marker line – show position of equipment
 3. range lines – indicates range of operations of doors and equipment
 4. limit lines – show height limits related to items stored in work place
 5. tiger markers to show safety hazards

3. Cleaner work environments motivate workers to maintain work area
4. Overlooking tiny defects amounts to growing problems
5. Absolute elimination of all forms of contamination is essential

Action Required

1. Take a before photograph
2. Cleaning should be part of daily activity and inspection
3. Cleaning indirectly leads to inspection, do not make it habit
4. Find ways to prevent dirt, contamination, defects
5. Identify and tag every item that causes contamination
6. Use root cause analysis to find causes of contamination and take preventive and corrective actions
7. Keep log of all places to be improved
8. Take after photograph

Putting shine to action

ITEM NAME AND NO.	CHECKS	FREQUENCY	PERSON NAME
MACHINE 1	OIL LEVEL RESIDUE FROM VALVES	DAILY	X
MACHINE 2	APPLYING GREASE	EVERY MONDAY	X

Track storage locations with log book

- keeping written records prevent lost or misplaced storage
- educate workers to recognize locations

- Photograph of workplace
- Explain shine to worker and set goals
- Develop a uniform test to evaluate cleanliness
- Stock appropriate cleaning supplies
- Post shine calendar
- Post duty times

SHINE (SEISO)

Focus: maintain a clean and safe work environment

- Team perform critical cleaning and Basic maintenance
 1. Poorly kept work place is sign of inefficiency
 2. Machine and worker working in dirty environment do not function at peak performance, resulting in losses in production and money
 3. True cleaning requires more than sweeping and dusting
 4. All debris and contamination that do not belong to work place should be eliminated
- Go beyond clean
 1. Workers should participate in making basic repairs to all visible surface.
 2. Repairing equipment, walls, floors, any visible work area surface

STANDARDIZE (SEIKETSU)

Aim: To establish formal 5s system
 This step is backbone of 5s implementation
 Task to be performed to program previous steps into routine tasks.

Formulate standards

- Team leader should meet to formulate facility wide 5s standards
- Developing formal duty lists
- Duty lists should share with workers
- Document the standards and post them at strategic locations.

Color coding

- Color convey information rapidly
- Create standardized color scheme
 1. **Green** – safety (safety equipment, first aid, recycle containers)
 2. **Blue** –equipment and inventory (machine, inventory line inspection point, notices)
 3. **Standard yellow or oranges** – (Machine guards, Walkways, handrails, caution and warnings)
 4. **Red**- Defects and fire (scraps containers, fire-fighting equipment)
 5. **White**- Total process management (Repair tests, Total process management material, cleanliness)
 6. **Grey**-racks and storage (Racks, ware houses, etc.)
- Encourage workers to familiarize with new standards
- *Continual Application*
 1. All steps should be applied continuously
 2. Adapt to changes
 3. Involve workers
 4. Display program charts, achievements and set goals.
- 1. *Action Required*
 1. Take before photograph
 2. Check if first 3's have been implemented properly
 3. Display work logs
 4. Establish routine
 5. Standardize procedures
 6. Standardize procedures for creating shadow boards, position lines, labelling
 7. Standardize cleaning schedules
 8. Create single point documents to communicate 5s procedures
 9. Assign duties
 10. Regular inspection/ audit
 11. Praise good practices
 12. Take after photographs
 13. Check complete workstation
- *Clearing Red Tags*
 1. on review day, search crime watch room and production area and examine red label comments
 2. review comments and decide whether to
 - dispose
 - transfer to deep sleep storage
 - reexamine for use
 3. agreed decisions are written on red labels
 4. deal with items as instructed
 5. no red labels should remain at the end of review and crime watch room should be empty
 6. summarize on a one side A4 report (with specified destroy date)

SUSTAIN (SHITSUKE)

Aim: Formalize 5s system work area policy

Visual Progress

- Use collected data to standardize goals for individual and team
- Use data to create program graphs and place them at strategic locations
- Role of team leaders and management is critical
- Expand use of 5s
- Communicate success immediate
- Track progress of each 5s steps
- Post the status report and achievements goals

Action required

1. Training to ensure 5s standards are understood
2. Periodic facility management involvement is required to check if all 5s are implemented perfectly
3. It must be part of daily routine
4. Involvement of senior management
5. Periodic reviews
6. Continuous inspections, displaying results
7. Problem solving techniques should be used to find out common causes of problem
8. Check lists should be used to control factors that accelerate deliration of equipment
9. Provide workers with formal calendar for work area inspections and meeting
10. Had scheduled work area meeting
11. Communicate 5s successes using internal publications, sign, awards and banners
12. Record duties to task times compare it to earlier task times.

CASE STUDY

Implementation of 5s in an organization

A 5S system (sort, set in order, shine, standardize and sustain) creates a disciplined, clean and well-ordered work environment.

- Many organizations implement only the first three steps and then wonder why the system doesn't work.
- Lack of a robust 5S system makes other lean tools ineffective.

Earlier the organization does not deals with 5S of lean. Unorganized allocation of items found as shown in the figure1.

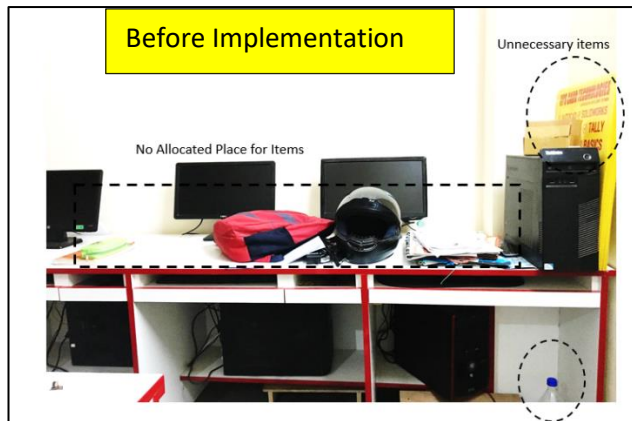


Figure1. Before Implementation of 5S



Figure2. After Implementation of 5S

After the implementation of 5S

- Sieri – sort
- Seiton – set in order
- Seiso- shine
- Seiketsu- standardization
- Shitsuke- sustain

All the items sorted out and unnecessary items are thrown out. Every items are placed on their respected places. Working table is cleaned properly for well and hygiene working area. Every item comes under standardization and become sustain.

Effects of implementing 5S in work place

- Workplace looks clean and tidy
- Work flow is hassle free
- Every items are at allocated place
- Every items are in set of order

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