

A Study on 5S Principles

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Abstract – This study is intended to investigate the issues affecting resources of production, quality in production, in any production system, based on the 5S principle formulated by Toyota production system, its recommendations to improve quality towards excellence in production.

Key Words: Toyota Production System (TPS), quality, 5S (five S), “Muri”, “Mura”, and “Muda”.

1. INTRODUCTION

The word “5S (five S)” was generalized in 1980’s in manufacturing sector in Japan, as Toyota Production System (TPS) became famous in the sector and “5S activities” were set as one of the bases of TPS. Service industry started to use “5S” in 1990’s

5S is a philosophy and a way of organizing and managing the workspace and work flow with the intent to improve efficiency by eliminating waste, improving flow and reducing process unreasonableness.

5S activities are to create good working environment through reduction of “Muri”, “Mura”, and “Muda”

It helps to have a basis of strong management of workplace

Table: 1 – meaning of 3M

Muri: overburden, unreasonableness or absurdity	Mura: unevenness or inconsistency, primarily with physical matter and the human spiritual condition
Muda: activity which is wasteful or doesn’t add value	

Table: 2 – meaning of 5s in Japanese and English.

S	JAPANESE	ENGLISH
S-1	SEIRI	SORT
S-2	SEITON	SET
S-3	SEISO	SHINE
S-4	SEIKESTU	STANDARDIZE
S-5	SITSUKE	SUSTAIN

2. WHY IMPLEMENT 5S

- Team work improvement through everyone’s participation
- Identify Abnormalities

- Identify wastes and reduce the wastes
- Improves safety and ergonomics
- Promotes flow
- Reduces searching
- Reduces unplanned downtime
- Improve quality
- Encourages visual control
- Enhances teamwork
- Improves productivity
- Eliminates distractions
- Reduces inventory and space
- Instills the discipline to follow standard work
- Exposes problems
- Tackles waste
- Enhances self-management

3. THE SEVEN WASTES IN PRODUCTION

- Overproduction
- Inventory
- Waiting
- Movement or Motion
- Transportation
- Rework
- Over processing

4. 5S approach

A wholistic 5S approach is shown in the figure below

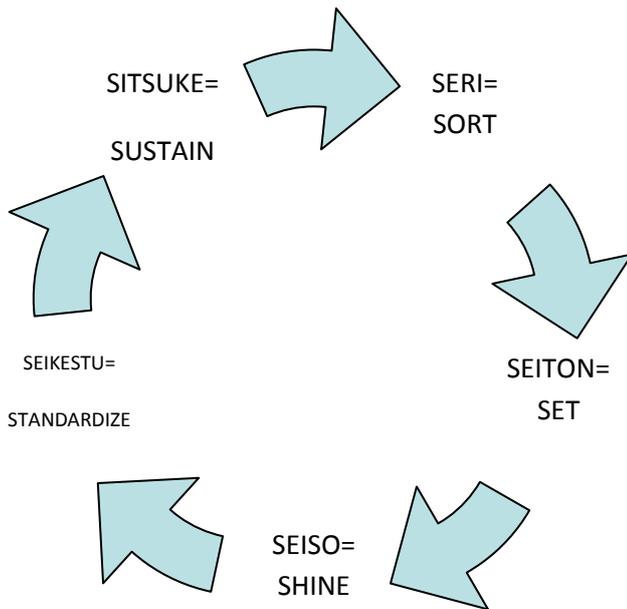


Figure: 1 5S approach

5. SEIRI - SORT

- Focuses on eliminating unnecessary items from the workplace
- Categorize equipment, furniture, tool in your working place into the following 3 categories
 - Necessary- Items often used
 - Unnecessary - Items not used in current work process
 - May not necessary- Items only used occasionally
- This step will also help with the “just in case” attitude

ACTIVITIES

- Move unnecessary items (broken tools, obsolete jigs and fixtures, scrap and excess raw material etc.) to central stored area
- Free up valuable floor space (Space utilization) • Finding abnormality of equipment and tools (Out of order, missing parts etc.)

6. SEITON - SET

- Set necessary items matching with workflow to minimize unnecessary movement and transportation time
- “Set” is based on finding efficient and effective storage of necessary items

- Apply “Can see, can take out, and Can return” philosophy
- This will save time and energy to look for something
- Need to consider workflow and arrange items

ACTIVITIES

- Use 5S tools for proper Organization of items such as
 1. Labeling
 2. Color coding
 3. Numbering
 4. • Zoning etc.
- Arrange them properly based on “Can see, can take-out, can return” Philosophy

7. SEISO - SHINE

- Cleaning up one’s workplace daily so that there is no dust on floors, machines or equipment.
- It will create ownership and build pride in the workers

ACTIVITIES

- Clean floor, windows and walls.
- Clean and Maintain office automation machines, medical equipment and tools, office furniture
- Develop and follow regular cleaning and Maintenance schedule
- Periodical check for changes in equipment and the service area such as: leaks, vibration, misalignment, breakage etc.

8. SEIKESTU - STANDARDIZE

Standardization is useful for;

- Easy implementation of S1 to S3 activities
- Equalization process output
- Everyone’s participation
- Standardization will lead equalization of activities = “Production leveling and smoothing”
- Develop mechanism to standardize S1-S3 implementation for continuation
- Maintain an environment where S1 to S3 are implemented in the same manner throughout the organization

- Give opportunities to employees to take active part in the development of these standards.

ACTIVITIES

- Work instructions, Standard Operating Procedures (SOPs)
- Checklist development and regular usage for SOPs
- Mechanism and format development for ordering supplies, reporting etc
- Color coding for waste segregation
- Standardized common symbols

9. SITSUKE- SUSTAIN

- Need to develop a mechanism to make staff exited and motivated
- Measure improvement with proper periodical monitoring
- Maintain S1-S4 through discipline, commitment and empowerment
- It focuses on defining a new mindset and a standard in workplace

ACTIVITIES

- Regular progress reporting
- Refresher training
- Periodical evaluation of 5S activities with proper advices for continuation and further improvements
- Appreciation, recognition and awarding on good 5S activities
- Reminder using 5S corner, new letters, good practice sheet etc.

10. TARGET OF 5S

- Zero changeovers leading to product/ service diversification
- Zero defects leading to higher quality
- Zero waste leading to lower cost
- Zero delays leading to on time delivery
- Zero injuries promoting safety
- Zero breakdowns bringing better maintenance

11. REASON FOR POPULARITY OF 5S

- Visible results enhance the generation of more and new ideas
- The workplace gets cleaned up and better organized
- Results are visible to everyone - insiders and outsiders
- People are naturally disciplined
- People take pride in their clean and organized workplace 7. As a result, the company's good image generates more better

12. CONCLUSIONS

- 5S is a process and method for creating and maintaining an organized, clean, and high-performance workplace.
- 5S enables anyone to distinguish between normal and abnormal conditions at a glance.
- 5S is the foundation for continuous improvement, zero defects, cost reduction, and a safe work area.
- 5S is a systematic way to improve the workplace, our processes, and our products through production line employee involvement.
- 5S is accomplished by following all the steps. DO NOT SKIP A STEP.
- 5S must become part of everyone's job.
- 5S is a team-oriented process between the members of the work area.

To conclude, some of the benefits of 5S include:

- Improved safety
- A clean, orderly workplace
- Improved efficiency
- Increased employee morale
- Standardized work methods

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REFERENCES

- [1] 5S Training of Trainers for Training Institutions Training material

BIOGRAPHIES

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