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## **A Study of 5S Principles in Residential Practices as a Part of Indian Culture : An Empirical Study Conducted in Coimbatore and Bangalore**

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### **Abstract:**

*Purpose: The study is to examine the 5S Philosophy in residential practices as 5S states more on cultural transformation and discipline as a part of the way we live.*

*Design/methodology/approach: In the frames of own research it has been analyzed and identify the 5S rules in the residential practices.*

*Findings: It has been found that the 5S philosophy exists in the residential practices in one or the other form without the knowledge of the 5S philosophy*

*Research limitations/implications: The 5S philosophy focuses on setting and maintaining effective work place organization, simplifies work environment, reduce waste while improving quality and safety.*

*Practical implications: The study showed that 5S philosophy is a part of the way we live. It is very essential that refresher training of workers about the 5S rules is mandatory in correlation with residential practices.*

*Originality/value: The 5S philosophy is the fundamental for any excellence programme and insists on cultural transformation. The study identifies and highlights 5S philosophy in our day to day activities in the residential culture and proves as existing practices and not a new beginning for creating an effective workplace in the organization.*

**Key words:** 5S, Cultural transformation, 5S in way we live

### **1. Introduction**

5S is an approach that can be easily applied in all organizations. Its simplicity and easy recognition are the superior side of 5S. The 5S are prerequisites for any improvement program. As waste is potential gain, so eliminating waste is a gain. 5S Philosophy focuses on effective work place organization, simplifies work environment, reduces waste while improving quality and safety.

### **2. Definition of 5S**

The 5S is the methodology of creation and maintaining well organized, clean, high effective and high quality workplace.

### **3. Literature Review**

5S is the name of a workplace organization method that uses a list of five Japanese words:

#### *3.1. Sorting (Seiri)*

Eliminate all unnecessary tools, parts, and instructions. Go through all tools, materials, and so forth in the plant and work area. Keep only essential items and eliminate what is not required, prioritizing things per requirements and keeping them in easily-accessible places. Everything else is stored or discarded.

#### *3.2. Set in Order (Seiton)*

There should be a place for everything and everything should be in its place. The place for each item should be clearly indicated. Items should be arranged in a manner that promotes efficient work flow, with equipment used most often being the most easily accessible. Workers should not have to bend repetitively to access materials. Each tool, part, supply, or piece of equipment should be kept close to where it will be used – in other words, straightening the flow path. *Seiton* is one of the features that distinguish 5S from "standardized clean up". This phase can also be referred to as *Simplifying*.

### 3.3. Shine (Seiso)

Clean the workspace and all equipment, and keep it clean, tidy and organized. At the end of each shift, clean the work area and be sure everything is restored to its place. This makes it easy to know what goes where and ensures that everything is where it belongs. Spills, leaks, and other messes also then become a visual signal for equipment or process steps that need attention. A key point is that maintaining cleanliness should be part of the daily work – not an occasional activity initiated when things get too messy.

### 3.4. Standardizing (Seiketsu)

Work practices should be consistent and standardized. All work stations for a particular job should be identical. All employees doing the same job should be able to work in any station with the same tools that are in the same location in every station. Everyone should know exactly what his or her responsibilities are for adhering to the first 3 S's.

### 3.5. Sustaining the Practice or Self Discipline (Shitsuke)

Maintain and review standards. Once the previous 4 S's have been established, they become the new way to operate. Maintain focus on this new way and do not allow a gradual decline back to the old ways. While thinking about the new way, also be thinking about yet better ways. When an issue arises such as a suggested improvement, a new way of working, a new tool or a new output requirement, review the first 4 S's and make changes as appropriate.

### 3.6. Simplified approach for 5S

5S Principle	Concept	Practice	Simplified Approach
Sort	Clear out	Setting the Standard	Difference between necessary and Unnecessary
Set in Order	Configure		Place for everything and everything in its place
Shine	Clean & Check		Cleaning with Meaning
Standardize	Conformity	Maintaining the Standard	Standardizing the practices of 1S, 2S and 3S
Sustain	Custom & Practice		Self-Discipline for sustaining the practices

## 4. Need for the Study

The method of 5S is one way to engage people and contribute to culture change in the organization. 5S is a method used to build a strong cultural foundation and rapidly enhance product flow while improving quality and reducing total lead time of the product. The cultural changes have become more complex and most of the organizations are struggling to integrate each and every employee in the cultural change chain. The study identifies a method to check the cultural change process as a way of living in the residential practices and integrate them with 5S principles for easy communication and implementation in the organization.

## 5. Objective of the Study

- To understand the 5S philosophy and rules
- To identify the 5S philosophy in the Indian residential practice

## 6. Data Collection

Primary data was collected through well-structured questionnaire and interview method from the residential housewives in Coimbatore and Bangalore. The research questions are elaborated and made them understood in focus with the 5S principles during survey. Secondary data was collected from internal records of the company such as library records, trade journals, manuals of the 5S practicing organization and attending training programs.

## 7. Limitations of the study

This research work is mainly focused on 5S principle and adherence in residential practices which is carried out with housewives in Coimbatore, Tamilnadu and Bangalore, Karnataka. Because of the resource constraint of time, money and 5S experts, 100 samples with housewives residing in different types of residence.

## 8. Research Methodology

The research survey conducted in Coimbatore, Tamilnadu and Bangalore, Karnataka with hundred samples with housewives with six questions on three scale rating of “No Practices as 1, Occasionally Practices as 2 and Standard Practices as 3” to understand the practicing level of 5S principles in their residences. The research data collection was classified in to two groups among the housewives according to Age and Education factor as shown in table – 1 and 2 to examine the role of age and education towards 5S practicing in the residences

Age	No. of Respondent	Percentage	Education	No. of Respondent	Percentage
25 – 35	31	31%	Below PUC	25	25%
36 – 50	37	37%	PUC	28	28%
60 and above	32	32%	Graduation	47	47%
Total	100	100%	Total	100	100%

Table – 1 Age verses No. of Respondent

Table – 2 Education verses No. of Respondent

8.1. Research Questions

- Do you have a method of sorting the material for identifying necessary and unnecessary? (Seiri)
- Do you have a method of storing the material as per frequency of use? (Seiri)
- Do you have a regular storage position (Home Position) for regularly used material? (Seiton)
- Do you regular cleaning your house and households? (Seiso)
- Do you have a practice of monitoring the consumables like LPG, Provisions, etc., and Monthly budgeting practice? (Seiketsu)
- Do you review the provisional consumption / Budget regularly and improve accordingly? (Shitsuke)

9. Data Analysis and Interpretation

9.1. Inferences

Age	1S			2S			3S			4S			5S		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Scale	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
25-35	7	11	9	0	12	22	0	17	13	13	22	0	8	14	15
36-50	10	14	12	0	14	17	0	18	14	11	19	0	11	9	9
50 and above	11	12	14	0	15	20	0	21	17	20	15	0	13	9	12
No. of Respondent	28	37	35	0	41	59	0	56	44	44	56	0	32	32	36
Percentage	28%	37%	35%	0%	41%	59%	0%	56%	44%	44%	56%	0%	32%	32%	36%

Table – 3 Inferences Age verses 5S scoring

From the Table 3, it is inferred that 7 percentage of respondents come under age group of 25-35 years, 10 percentage of respondents come under age group of 36-50 years and 11 percentage of respondents come under age group of above 50 years, rates the scale -1, 11 percentage of respondents come under age group of 25-35 years, 14 percentage of respondents come under age group of 36-50 years and 12 percentage of respondents come under age group of above 50 years, rates the scale -2 and 9 percentage of respondents come under age group of 25-35 years, 12 percentage of respondents come under age group of 36-50 years and 14 percentage of respondents come under age group of above 50 years, rates the scale -3 in following 1S.

The practice of setting the standard, No respondent had rated scale – 1, 12 percentage of respondents come under age group of 25-35 years, 14 percentage of respondents come under age group of 36-50 years and 15 percentage of respondents come under age group of above 50 years rates the scale -2 and 22 percentage of respondents come under age group of 25-35 years, 17 percentage of respondents come under age group of 36-50 years and 20 percentage of respondents come under age group of above 50 years rated the scale -3 in following 2S.

In cleaning with a meaning to identify abnormalities, No respondent had rated scale – 1, 17 percentage of respondents come under age group of 25-35 years, 18 percentage of respondents come under age group of 36-50 years and 21 percentage of respondents come under age group of above 50 years rates the scale -2 and 13 percentage of respondents come under age group of 25-35 years, 14 percentage of respondents come under age group of 36-50 years and 17 percentage of respondents come under age group of above 50 years rated the scale -3 in following 3S.

The standardizing the good practices, 13 percentage of respondents come under age group of 25-35 years, 11 percentage of respondents come under age group of 36-50 years and 20 percentage of respondents come under age group of above 50 years, rates the scale -1, 22 percentage of respondents come under age group of 25-35 years, 19 percentage of respondents come under age group of 36-50 years and 15 percentage of respondents come under age group of above 50 years rated the scale -2 and No respondent had rated scale – 3 in following 4S.

For sustaining the good practices, 8 percentage of respondents come under age group of 25-35 years, 11 percentage of respondents come under age group of 36-50 years and 13 percentage of respondents come under age group of above 50 years, rates the scale -1, 14 percentage of respondents come under age group of 25-35 years, 9 percentage of respondents come under age group of 36-50 years and 9 percentage of respondents come under age group of above 50 years, rates the scale -2 and 15 percentage of respondents come under age group of 25-35 years, 9 percentage of respondents come under age group of 36-50 years and 12 percentage of respondents come under age group of above 50 years, rates the scale -3 in following 5S.

Education	1S			2S			3S			4S			5S		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Below PUC	7	15	15	0	15	19	0	23	12	15	21	0	13	7	11
PUC	9	12	11	0	15	16	0	15	13	12	20	0	10	11	9
Graduation	12	10	9	0	11	24	0	18	19	17	15	0	9	14	16
No. of Respondent	28	37	35	0	41	59	0	56	44	44	56	0	32	32	36
Percentage	28%	37%	35%	0%	41%	59%	0%	56%	44%	44%	56%	0%	32%	32%	36%

Table – 4 Inferences Education verses 5S scoring

From the Table 4, it is inferred that 7 percentage of respondents come under the education group of below PUC, 9 percentage of respondents come under the education group of PUC and 12 percentage of respondents come under the education group of graduation rated the scale -1, 15 percentage of respondents come under the education group of below PUC, 12 percentage of respondents come under the education group of PUC and 10 percentage of respondents come under the education group of graduation, rated the scale -2 and 15 percentage of respondents come under the education group of below PUC, 11 percentage of respondents come under the education group of PUC and 9 percentage of respondents come under the education group of graduation, rated the scale -3 in following 1S.

The practice of setting the standard, No respondent had rated scale – 1, 15 percentage of respondents come under the education group of below PUC, 15 percentage of respondents come under the education group of PUC and 11 percentage of respondents come under the education group of graduation, rated the scale -2 and 19 percentage of respondents come under the education group of below PUC, 16 percentage of respondents come under the education group of PUC and 24 percentage of respondents come under the education group of graduation rated the scale -3 in following 2S.

In cleaning with a meaning to identify abnormalities, No respondent had rated scale – 1, 23 percentage of respondents come under the education group of below PUC, 15 percentage of respondents come under the education group of PUC and 18 percentage of respondents come under the education group of graduation, rated the scale -2 and 12 percentage of respondents come under the education group of below PUC, 13 percentage of respondents come under the education group of PUC and 19 percentage of respondents come under the education group of graduation rated the scale -3 in following 3S.

The standardizing the good practices, 15 percentage of respondents come under the education group of below PUC, 12 percentage of respondents come under the education group of PUC and 17 percentage of respondents come under the education group of graduation rated the scale -1, 21 percentage of respondents come under the education group of below PUC, 20 percentage of respondents come under the education group of PUC and 15 percentage of respondents come under the education group of graduation, rated the scale -2 and No respondent had rated scale – 3 in following 4S.

For sustaining the good practices, 13 percentage of respondents come under the education group of below PUC, 10 percentage of respondents come under the education group of PUC and 9 percentage of respondents come under the education group of graduation rated the scale -1, 7 percentage of respondents come under the education group of below PUC, 11 percentage of respondents come under the education group of PUC and 14 percentage of respondents come under the education group of graduation, rated the scale -2 and 11 percentage of respondents come under the education group of below PUC, 9 percentage of respondents come under the education group of PUC and 16 percentage of respondents come under the education group of graduation, rated the scale -3 in following 5S.

9.2. Data Analysis

To study the relationship between 5S principle and adherence in residential practices the following hypotheses are setup

- H1 – 1S principle has no adherence towards residential practices
- H2 – 2S principle has no adherence towards residential practices
- H3 – 3S principle has no adherence towards residential practices
- H4 – 4S principle has no adherence towards residential practices
- H5 – 5S principle has no adherence towards residential practices

The data collected from the respondents are tabulated and then analyzed with the help of statistical tool (Minitab 16). The respondent’s responses were tested through Chi square test as shown in table – 5 and based on the result of the analysis; the current level of 5S principle practices in the Indian residence was decided with existing condition for industrial cultural transformation for achieving excellence

Scale	1S	2S	3S	4S	5S
1	12	0	0	44	32
2	51	41	56	56	32
3	37	59	44	0	36

N	100	100	100	100	100
DF	2	2	2	2	2
CHI- SQUARE VALUE	<b>23.42</b>	<b>54.86</b>	<b>52.16</b>	<b>52.16</b>	<b>0.32</b>
P-value	0.00	0.00	0.00	0.00	0.852

Table – 5 Chi-square test result

Table value at 5% significance for 2df - 5.991

Since the calculated values (23.42, 54.86, 52.16 and 52.16) have greater values than the table value (5.991) at 5% significance level, the null hypothesis was rejected for H1, H2, H3 and H4 and for H5 the calculated value (0.32) has lesser value than the table value (5.991) at 5% significance level, so failing to reject null hypotheses. Hence there is no variance between the current 5S practices in the Indian residence and the 5S principles in 1S, 2S, 3S and 4S and there is a minor variation between current 5S practices in the Indian residence and the 5S.

### 9.3. Result

- H1 to H4 – 5S principle has adherence towards residential practices
- H5 – 5S principle has minor variation towards residential practices

### 9.4 Findings

- There is a very less variation in respondent's response between age group, education and 5S principle practices. So, the age group and education has no significance impact on 5S principle practices in residential practices
- 1S, 2S and 3S focus more on setting the standards, 4S and 5S focus on maintaining the standard. Once the standards are set it becomes a habit and if the habits are maintained it becomes a culture. The study shows the first four "S"s are followed as a regular activities in residential practices
- In sustenance (5S) 32% of the respondents are not practicing as per the 5S principles and 68% of the respondents are practicing the 5S principle
- As a part of sorting of the necessary and unnecessary items, most of the housewives has a practice of cleaning the house and sort the necessary and unnecessary items once in a month and immediately dispose the unnecessary items
- The culture of locating the necessary parts are stored in the respective location as per the frequency of use and has a good identification and traceability for regularly using items
- Daily cleaning is the part of Indian residential culture and maintains the usable area spic and span
- Standardization is also a part of way we live in the residence and we can find the culture of relocating the respective items in their assigned place without fail and in variation the immediate action will be taken by one of the family member and relocate the same in their location without difficulty
- Teaching of good practices is in India culture in every area from school to elders. Elders take the responsibility of teaching and sustaining the good practices

## 10. Conclusion

Major 5S principles are followed in our residence without the knowledge of 5S and its principles from more than 50 years as we got positive responses from 32% of the respondents with the age group of above 50 in this research study. The concept of 5S can be taught to the organizational employees comparing with our routine activities which we follow in our residence.

An attempt has been made to correlate the 5S principles in routine activities of the residence to make an easy understanding of the 5S principles where the employee can implement in the organization. The basic research was carryout only in two cities of South India Coimbatore, Tamilnadu and Bangalore, Karnataka and suggests a knowledge factor of 5S principle exists in our day to day residential activities. Thus, more empirical insights are needed to test the 5S implementation in the organization point of view.

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