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EFFECTS OF 5S IMPLEMENTATION ON PERFORMANCE OF ORGANIZATION

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ABSTRACT

The aim of this paper is to enhance the understanding of the relationship between the lean practices and the operational and financial performance of the organization. A sample of 100 manufacturing firms shows direct effects of 5S on the performance. Many manufacturing firms are adopting 5S activities as a daily practice, but understanding its effects on the performance of an organization is important. Also, effect of 5S implementation on the employee of the organization is carried out in the research.

The study is carried out on around 100 manufacturing firms which have implemented lean activities and used 5S tool. The results of study are promising and shows a considerable positive effect on both operational and financial performance, also it is helpful for the employees of the organization.

KEYWORDS: *Lean, Operational, Financial, 5S, Employees*

Article History

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INTRODUCTION

In today's dynamic and ever changing world, the survival of any organization depends on its competitiveness and pioneering in its products and services. Companies have to improve themselves on a continuous basis to meet the needs of the market and remain competitive. Two major decision areas for the managers in this scenario are – choosing best methods to achieve their organizational goals and improve the performance.

Need of the hour is not only the performance but also the quality of performance. 5S is a technique which helps companies in this direction. This quality initiative was introduced by Japan. 5S are five Japanese language words starting with English alphabet and are related to safety and environmental issues. This study has focused on the aspect that increased competition and customer expectations require organizations to gain powerful competitive advantages in the globalized marketplace. Although a variety of tools and methods that can be used to increase competitive advantages, lean production principles and methods have been shown to be one of the most effective

With the contemporary market being more and more competitive worldwide, manufacturing organizations are under immense pressure to pursue operational excellence and improve their performance in order to reduce their costs and provide products of higher quality in shorter lead times. Lean manufacturing principles and techniques have been widely used by manufacturing organizations to achieve these and gain a competitive advantage over their rivals. Lean manufacturing is a management approach to manufacturing that strives to make organizations more competitive in

the market by increasing efficiency and decreasing costs through the elimination of non-value-added steps and inefficiencies in the process. Various methods and tools that aim to improve the operational performance of organizations are comprised under the lean strategy's umbrella. [18]

Table 1: Lean Manufacturing Essential Tools and Methods

JIT	TPM	Automation	VSM	Kaizen/CI
One Piece flow	Overall Equipment effectiveness	Poka yoke	Current state map	5S
Pull System	5S	Visual control system	Future state map	Brainstorming
Takt Time	Autonomousmaintenance	Full work system	Flow diagrams	Continuous flow
Levelled Production	Planned maintenance			Kanban
Kanban	Quality maintenance			Parato chart
JIT purchasing				Run chart
Cell Manufacturing				Gantt chart

5S Overview

The philosophy of 5S represents a way of thinking and focusing in order to organize and manage workspace in an organization by eliminating 8 types of wastes as per lean manufacturing concept. 5S was invented in japan and it stands for 5 Japanese words, they are

- Seiri- Sort
- Seiton- Set in order
- Seiso- Shine
- Seiketsu- Standardize
- Shitsuke- Sustain

Sort

The step focuses on elimination of unnecessary material at the workplace. In the process of red tagging the material is sorted and the one which is not used necessary for completing the task are red tagged. Once the supplies, material, tools and equipment have been tagged they are then sent to the holding area for a follow up evaluation.The idea is to ensure that everything left at the workplace is related to work. Seiri is a simplification of tasks and effective use of space.

Seiton

In this step, the goal is to examine methods of storage that are effective and efficient which is referred as visual management and then create a work environment that is organized, easily navigable, uncluttered and ergonomic. If everyone has access to an item or material work flow becomes easy and productive. The correct place, position for every tool must be chosen carefully. Every item should be allocated to own place for safekeeping and each location must be properly labelled for easy identification.

Seiso

When the unwanted material is gone and the storage is organized, the next step is to properly clean work area every day. This step is critical as a way of sustaining steps taken at sort and set in order phase. No area should be kept uncleaned.

Everyone should see the workplace as a visitor and try to clean it to make a good impression. Employees will feel more comfortable in this cleaned environment, which will increase their ownership towards organizational goals and vision.

Seiketsu

The step consists of defining standards by which person must maintain and measure cleanliness. It covers both personal as well as environmental cleanliness. Personnel should practice seiketsu starting with its personal tidiness. When the new standards and best practices are implemented, the old bad habits will soon die and will be replaced by more efficient new habits. Adopting new standards will take some time, reminders such as visuals and emails can be used to make these standards set in stone.

Shitsuke

The final step is more challenging; remaining disciplined to sustain changes made in the first three steps. It denotes commitment to maintain orderliness and to practice 4S as a way of life. Regular training and communication, employees will be able to comfortably able to conform to 5S procedure. Once true shitsuke is achieved, employee observes cleanliness at all times without having reminded by the management.

OBJECTIVES

The foremost objectives of the study is to investigate the impact of 5S practices on employees as well as organizations performance. Accordingly, the main objective of the research of this research is:

1. To determine the effect of 5S implementation on Operational performance
2. To determine the effect of 5S implementation on Financial performance
3. To determine the effect of 5S implementation on worker.

Lean production is a multi-faced concept that includes both people and process components. It is an integrated system composed of highly integrated elements that focuses on the elimination of all forms of waste and non-value added activities.

RESEARCH METHODOLOGY

The primary objective of this paper is to investigate the role of 5S on the performance of organization. For finding out the effect of 5S on the performance of organization, 100 firms were selected which have a good lean practice in the organization.

Research Design

Descriptive research design was adopted for the study. Based on the respondents capacity to understand the questionnaire personally or self-administered survey was adopted in which questionnaire was handed over to the respondents and were filled by them.

Sampling Method

Simple random sampling method is used.

Data Collection

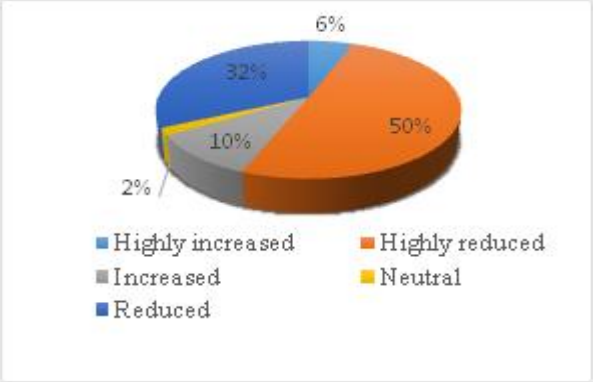
Data is collected through primary and secondary sources. In order to determine effect of 5S, data from 100 organizations is collected. Primary data is collected through questionnaire method.

Analytical Tools

Average, graphs, chi square test.

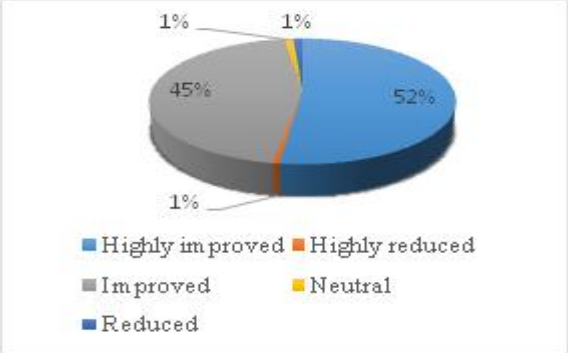
DATA ANALYSIS-

1. Does 5S Implementation have an Impact on Material Handling?



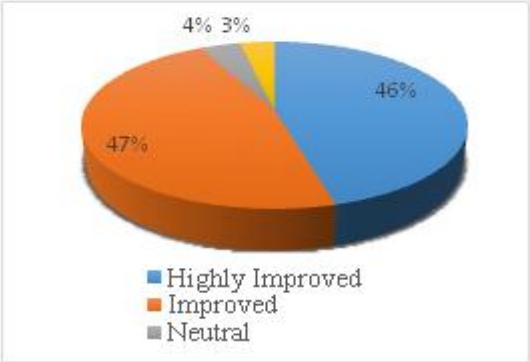
Particulars	Value
Highly Reduced	88
Highly Increased	10
Reduced	56
Neutral	3
Increased	18
Total	**175**

2. Is Safety at Workplace Improved at Workplace after 5S Implementation?



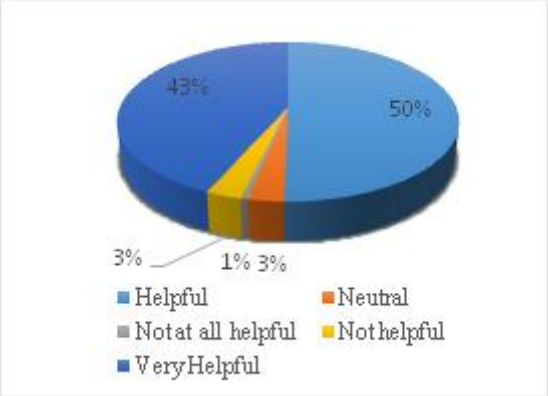
Particulars	Value
Highly Improved	91
Improved	79
Highly Reduced	1
Reduced	2
Neutral	2
Total	**175**

3. What is Impact of 5S Implementation of Usage of Equipment?



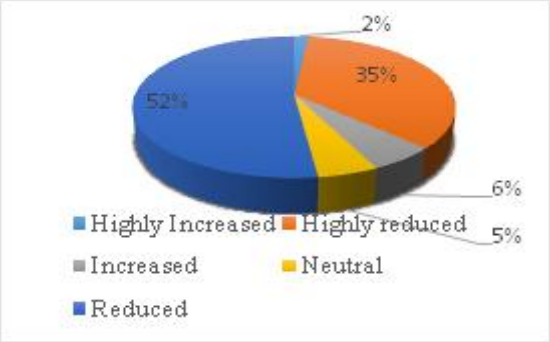
Particulars	Value
Highly Improved	80
Improved	82
Neutral	7
Reduced	6
Total	**175**

4. Is 5S Contributing to Achieve Cost KPI of Your Organization?



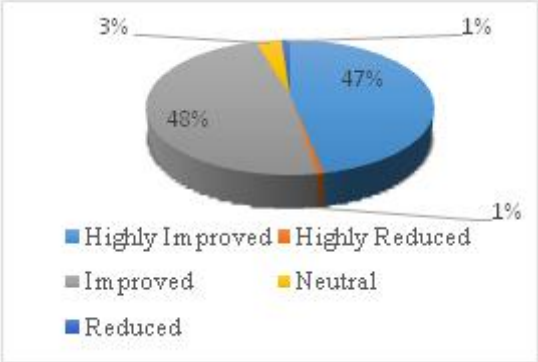
Particulars	Value
Very Helpful	76
Helpful	88
Not Helpful	5
Neutral	5
Not at all Helpful	1
Total	**175**

5. What Can You Say about the Lead Time after Implementation of 5S?



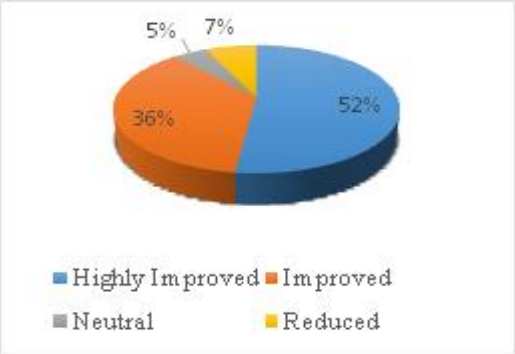
Particulars	Value
Highly Reduced	62
Reduced	91
Increased	10
Highly Increased	3
Neutral	9
Total	**175**

6. What is Effect of 5S on Comfort at Working Area?



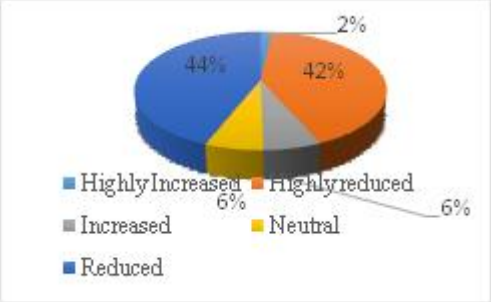
Particulars	Value
Highly Improved	82
Improved	84
Neutral	6
Reduced	2
Highly Reduced	1
Total	**175**

7. Is Quality of Product Affected by Implementation of 5S?



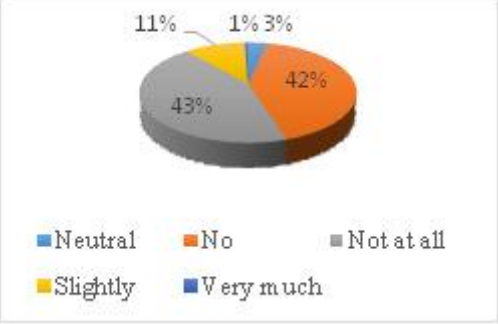
Particulars	Value
Highly Improved	91
Improved	64
Neutral	8
Reduced	12
Total	**175**

8. What is Impact of 5S on Maintenance?



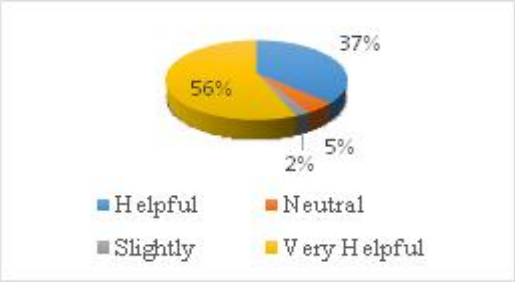
Particulars	Value
Highly Reduced	73
Reduced	77
Neutral	11
Increased	11
Highly Increased	3
Total	**175**

9. Is it Difficult to Follow Guidelines of 5S?



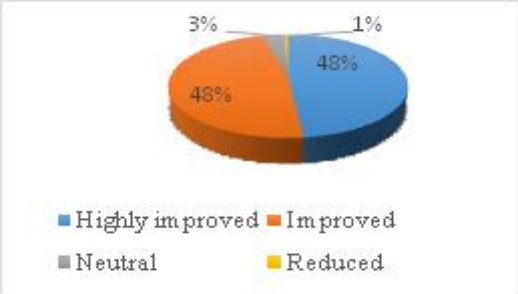
Particulars	Value
No	73
Not at all	76
Slightly	19
Neutral	6
Very Much	1
Total	**175**

10. Does 5S helps n Identification of Parts and Equipment?



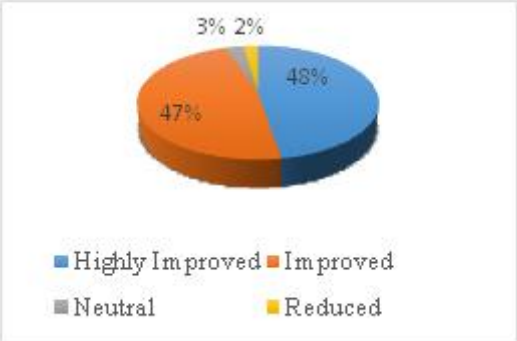
Particulars	Value
Very Helpful	98
Helpful	65
Neutral	8
Slightly	4
Total	**175**

11. How is Efficiency of Space after 5S Implementation?



Particulars	Value
Highly Improved	83
Improved	82
Neutral	6
Reduced	4
Total	**175**

12. Does 5S have an Impact on Self-Discipline?

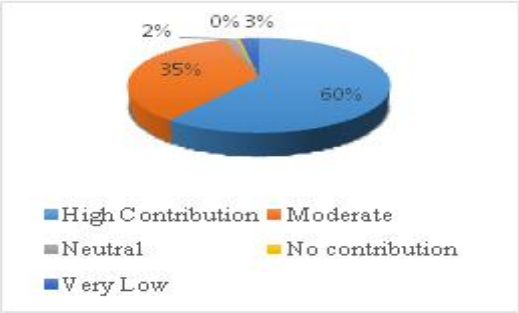


Particulars	Value
Highly Improved	83
Improved	83
Neutral	5
Reduced	4
Total	**175**

13. What is Effect of 5S Implementation on Customer Satisfaction?

Particulars	Value
Highly Satisfied	80
Satisfied	81
Neutral	12
Not satisfied	2
Total	**175**

14. Does 5S Implementation Contribute to Values of Organization?



Particulars	Value
Highly Contribution	105
Moderate	61
Neutral	3
No Contribution	1
Very Low	5
Total	**175**

Hypothesis Testing-

Chi Square Test

Table 2: Effect of 5S Implementation on Material Handling

Experience Group	Highly Reduced	Reduced	Neutral	Increased	Highly Increased	Total
1 to 6	32	30	1	13	6	82
7 to 14	44	14	0	2	2	62
14 to 28	12	12	2	3	2	31
Total	**88**	**56**	**3**	**18**	**10**	**175**

Table 3

Experience Group	Highly Reduced	Reduced	Neutral	Increased	Highly Increased	Total
1 to 6	38.42	26.24	1.4	8.43	4.68	79.17
7 to 14	31.177	19.84	1.06	6.37	3.54	61.987
14 to 28	15.58	9.92	0.53	3.188	1.77	30.988
Total	**85.177**	**56**	**2.99**	**17.988**	**9.99**	**172.14**

Table 3

fo	fe	fo-fe	(fo-fe)2	(fo-fe)2/fe
35	39.28	-4.28	18.3184	0.4663544
30	26.24	3.76	14.1376	0.5387805
1	1.4	-0.4	0.16	0.1142857
13	8.43	4.57	20.8849	2.4774496
6	4.68	1.32	1.7424	0.3723077
44	31.177	12.823	164.4293	5.2740587
14	19.84	-5.84	34.1056	1.7190323
0	1.06	-1.06	1.1236	1.06
2	6.37	-4.37	19.0969	2.9979435
2	3.54	-1.54	2.3716	0.6699435
12	15.58	-3.58	12.8164	0.8226187
12	9.92	2.08	4.3264	0.436129
2	0.53	1.47	2.1609	4.0771698
3	3.188	-0.188	0.035344	0.0110866
2	1.77	0.23	0.0529	0.029887
			Total	**21.067047**

Calculation of DOF(Degree of Freedom)-

(R-1)*(C-1) Where R= Number of rows, C= Number of columns

= (3-1)*(5-1)

= (2)*(4)

=8

For DOF 8 the table value at 95% accuracy is 15.507

Ho- There is no effect of experience level on the understanding about effect of 5S on material handling.

H1-There is a significant effect of experience level on the understanding about effect of 5S on material handling.

Calculated value is greater than table value therefore there is significant effect of experience level on understanding about effect of 5S on material handling.

Table 4: Effect of 5S on Quality of Product

Experience Group	Highly Improved	Improved	Neutral	Reduced	Highly Reduced	Total
1 to 6	39	26	7	10	0	82
7 to 14	40	20	1	1	0	62
14 to 28	12	16	0	3	0	31
Total	**91**	**62**	**8**	**14**	**0**	**175**

Table 5

Experience Group	Highly Reduced	Reduced	Neutral	Increased	Highly Increased	Total
1 to 6	42.64	29.0514	3.74857	6.56	0	82
7 to 14	32.24	21.9657	2.83428	4.96	0	62
14 to 28	16.12	10.9828	1.41714	2.48	0	31
Total	**91**	**62**	**8**	**14**	**0**	**175**

Table 6

fo	fe	fo-fe	(fo-fe)2	(fo-fe)2/fe
39	42.64	-3.64	13.2496	0.3107317
26	29.05142857	-3.05143	9.311216	0.320508
7	3.748571429	3.251429	10.57179	2.8202178
10	6.56	3.44	11.8336	1.8039024
0	0	0	0	0
40	32.24	7.76	60.2176	1.8677916
20	21.96571429	-1.96571	3.864033	0.175912
1	2.834285714	-1.83429	3.364604	1.1871083
1	4.96	-3.96	15.6816	3.1616129
0	0	0	0	0
12	16.12	-4.12	16.9744	1.0530025
16	10.98285714	5.017143	25.17172	2.2919102
0	1.417142857	-1.41714	2.008294	1.4171429
3	2.48	0.52	0.2704	0.1090323
0	0	0	0	0
			Total	**16.518873**

Ho- There is no effect of experience level on the understanding about effect of 5S on quality of product.

H1-There is a significant effect of experience level on the understanding about effect of 5S on quality of product.

Calculated value is greater than table value therefre there is significant effect of experience level on the understanding about the effect of 5S on quality of product.

Table 7: Effect of 5S Implementation on Customer Satisfaction

Experience Group	Highly Satisfied	Satisfied	Neutral	Not Satisfied	Disappointed	Total
1 to 6	33	38	9	2	0	82
7 to 14	31	29	2	0	0	62
14 to 28	16	14	1	0	0	31
Total	**80**	**81**	**12**	**2**	**0**	**175**

Table 8

Experience Group	Highly Reduced	Reduced	Neutral	Increased	Highly Increased	Total
1 to 6	37.48571429	37.95429	5.622857	0.9371429	0	82
7 to 14	37.48571429	28.69714	4.251429	0.7085714	0	71.14286
14 to 28	14.17142857	14.34857	2.125714	0.3542857	0	31
Total	**89.14285714**	**81**	**12**	**2**	**0**	**184.1429**

Table 9

fo	fe	fo-fe	(fo-fe)2	(fo-fe)2/fe
33	37.48571429	-4.48571	20.12163	0.5367814
38	37.95428571	0.045714	0.00209	5.506E-05
9	5.622857143	3.377143	11.40509	2.0283449
2	0.937142857	1.062857	1.129665	1.2054355
0	0	0	0	0
31	37.48571429	-6.48571	42.06449	1.1221472
29	28.69714286	0.302857	0.091722	0.0031962
2	4.251428571	-2.25143	5.068931	1.1922888
0	0.708571429	-0.70857	0.502073	0.7085714
0	0	0	0	0
16	14.17142857	1.828571	3.343673	0.2359447
14	14.34857143	-0.34857	0.121502	0.0084679
1	2.125714286	-1.12571	1.267233	0.5961444
0	0.354285714	-0.35429	0.125518	0.3542857
0	0	0	0	0
			Total	**7.9916632**

Ho- There is no effect of experience level on the understanding about effect of 5S on customer satisfaction.

H1-There is a significant effect of experience level on the understanding about effect of 5S

on customer satisfaction.

Calculated value is less than table value therefore there is no effect of experience level on the understanding about effect of 5S on the customer satisfaction.

CONCLUSIONS

During the research process, after getting familiar with 5S practice, its implementation and its benefits for industrial organizations, the results showed that the technique is very useful, applicable and beneficial. The first objective of the study was to determine the effect of 5S implementation on operational performance of organization, it was found that 5S implementation improved the operational performance of the organization.

The second objective of the study was to determine the effect of 5S implementation of financial performance of the organization, it was found to be helpful after the study. The last objective of the study was to find out the effect of 5S implementation on the staff working in the organization, it is found that it has a favorable effect on the staff.

According to the achieved results from the study, performed on target industrial organizations, it could be concluded that 5S has a positive effect on overall performance and could improve the quality, efficiency and productivity of industrial organizations.

On the other hand, this study has been performed in different companies with different kind of products and services and showed that 5S has had an effect on organizational performance of all of them. It could be concluded that 5S is a useful quality management tool causes to improve performance in any organization without any limitation on different kinds of products or services.

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