A STUDY OF IMPLEMENTATION OF 5S IN EDUCATIONAL INSTITUTE

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ABSTRACT

"5S" is a systematic technique used by manufacturing as well as service organisations. "5S" comes from five Japanese words - Seiri (sort), Seiton (set in order), Seiso (shine), Seiketsu (standardize) and Shitsuke (sustain). "5S" was implemented in educational institute focusing on the better management of students, teaching and non-teaching members. This system helped to organize the workplace and due to which there was decreased wastage, optimized quality as well as productivity was increased via monitoring and organized environment. It also provided visual evidence to obtain more results for organization. The effective following of "5S" in the institute by various students, faculties and non-teaching members strengthened the work ethics between them resulting in the motivation towards team work. The successful implementation of "5S" transformed the organization by increasing the interest of the students in their studies and increased the faculty members’ work satisfaction.

This study was carried out in three model cells namely: Class room, Staff room and Library. Some tools and techniques used in the study are Brainstorming, Problem Stratification, PDCA Cycle, Why – Why Analysis, 4 W 1 H Analysis, Mile stone Chart, Check sheet

Keywords: "5S", Educational Institute, organized environment, productivity

INTRODUCTION

5S is an integrated concept for workplace management developed by Hiroyuki Hirano, in Japan. It consists of five Japanese words seiri, seiton, seiso, seiketsu, and shitsuke. It is a workplace organization method that aims at improving the operational efficiency of a place by maintaining a clean, safe and organized work area. By identifying, reducing and eliminating the wastes, 5S provides a better working environment. It also enhances the team work, as everyone in the organization from the shop floor level to the top most person is a part of this system. On-going commitment and involvement from the top management is the cornerstone for the successful implementation of 5S system.

FEATURES OF 5S

1. Inbuilt good manufacturing and maintenance practices.
2. Total employee involvement in the development of the system.
3. Easy to understand and practice.
4. Develop teamwork and effectiveness in work due to participation of each person in improvement processes.
5. Minimum records are required to be maintained.
6. Attitudinal change towards positive direction.
7. It is the gateway for “Total Quality Management Systems”.

The list describes how to organize a work space for efficiency and effectiveness by identifying and storing the items used, maintaining the area and items, and sustaining the new order.

1) Seiri (Sorting): A picture is worth more than a thousand words. 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.
   - Segregate required, usable, reworkable and obsolete items.
   - Dispose off the unwanted items.
   - Clear off walkways.

2) Seiton (Systematizing): A place for everything and everything in its place. It is also known as stabilizing or straightening out. The place for each item should be clearly indicated.
   - Use labels, colour codes for easy identification.
   - Use index for files, records, drawings etc. to facilitate retrievability.
   - Plan storage with accessibility.

3) Seiso (Shining): Spic and span leads to zero breakdown. It is also known as sweeping or shining. 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.
   - Inspect and clean the supply lines, godowns, scrapyards and gardens.
   - Clean up workplace, machines and tools after use.
   - Identify root causes of loud noise, vibration, heat build up in equipment and take remedial action.

4) Seiketsu (Standardizing): Actions speaks louder than words. 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.
   - Develop standards.
   - Establish checking procedures.
   - Create visual controls.
   - Devise ways and means to expose problems.
Shitsuke (Self Discipline): Be a self starter. It is also called sustaining the practice. It aims at maintaining and reviewing the 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. It should be made as a habit and be continually improved.

- Develop action plan for maintaining the set standards.
- Give unambiguous advice / instructions to your work associates.
- Carry on 5S activities as a matter of habit and enthuse others to practice 5S.
- Conduct self-audit.

OBJECTIVES

1. To study the implementation of 5S in an educational institute.
2. To study the benefits of 5S implementation.
3. To identify effectiveness of 5S implementation on the organization performance.

When activities are to be free of problems and failures, it requires the development of a proper system. One such system used in 5S is visual management. Use of displays is very popular as a simple, attractive tool for visual management. They help people from making functional errors. They can be lights, signals or alarms for alerting against danger. Indications and directions are provided to put things in the right place and in the right way. To avoid confusion, standard terminology is used. All these are very simple to understand and follow. Compared with the conventional workplace, visual management ensures that the message becomes more convincing. A visual control system is an excellent communication channel between the top management and the shop floor workers, so that every one knows what procedures to follow. This form of communication helps the organization to become more transparent.

The charts used should be displayed properly and be visible to anyone passing through that unit. Messages should be clear. Colors should be used effectively. A 5S manual is made by organizations to standardize the visual management process for proper implementation and follow-up.

LITERATURE REVIEW

The 5S system helps to organize a workplace for efficiency and optimize quality and productivity by monitoring an organized environment. It also provides useful visual evidences to obtain more firm results. This paper identifies the effectiveness of 5S implementation on organizational performance. The results show that 5S is an effective tool for improvement of organizational performance, regardless of organization type, size, its production or its service. Consequently, 5S techniques would strongly support the objectives of organization to achieve continuous improvement and higher performance [1].

The aim of this paper is to review the implementation of 5S methodology as one of the tools of lean management in the services sector. It is one of the fastest-growing sectors of the Indian economy. The 5S process is most fundamental component of lean philosophy. It is widely applied in various manufacturing and business sectors. The system helps to organize a workplace for increased efficiency, decrease waste, optimize quality, improves productivity and more satisfied customers. Results have shown that 5S can be applied to the service industry with beneficial effects [2].

5S is a tool for cleaning, sorting, organizing and providing the necessary groundwork for workplace improvement. This paper dealt with the implementation of 5S methodology in the small scale industry. By following the 5S methodology, it shows significant improvements to safety, productivity,
efficiency and housekeeping. It also intends to build a stronger work ethic within the management and workers who would be expected to continue the good practices [3].

5S is a step wise method to remove unnecessary items, reduce the searching time of the items, standardize arrangement to avoid misplacing and sustain all the above through self discipline. This simple housekeeping methodology has helped effectively reduce waste and improve productivity. It has gained popularity in India through the past decade and has helped many industries improve without much capital investment. This paper highlights the step by step implementation guideline required for successful exercise of 5S as a part of the daily management practices. It shows the method to implement each pillar of the 5S Methodology- Seiri, Seiton, Seiso, Seiketsu and Shitsuke in the industry in order to bring about an overall improvement in its performance [6].

It can be observed that introducing the 5S rules bring the great changes in the company, like process improvement by cost reduction, increasing of effectiveness and efficiency in the processes, maintenance and improvement of the machine efficiency, safety and quality. 5S helps to ensure a well organized, clean, high effective and high quality workplace. This system can be used in all sectors. It results in the effective organization of the workplace [5].

RESEARCH METHODOLOGY

Research methodology is a method to collect an evidence to test the theories by collecting the data from the concerned resources. Moreover there are different methods that can be used in an academic research, these methods commonly uses questionnaires studies, interviews, and experiments. These methods can be a collection of qualitative data or quantitative data.

Research design constitutes the blueprint for the collection, measurement, and analysis of data. Research design is the plan and structure of investigation so conceived as to obtain answers to research questions. The plan is the overall scheme or program of the research.

This research paper uses case study as a strategy to collect the data. Basically, a case study is an in depth study of a particular situation rather than a sweeping statistical survey. It is a method used to narrow down a very broad field of research into one easily researchable topic. The case study research design is also useful for testing whether scientific theories and models actually work in the real world. Case study was chosen to study the implementation of 5S in an Educational Institute and to find the benefits in the real-life context.

CASE STUDY

Even though 5S has originated in manufacturing organizations and has shown excellent results in that sector, it is widely being practiced in the service sector as well. This study focuses on the implementation of 5S in an educational institute. An institute is also like a factory and it needs the 5S to eliminate the inefficiencies, to prevent mistakes, and to keep things running smoothly.

This study was carried out in a Management Institute of Aurangabad. The trust was established with a futuristic vision to provide quality education by creating an academic environment where aspirations of society and students are met implicitly. Since inception, the Trust has focused on providing higher education with utmost dedication and commitment. The Institute is an AICTE approved, NAAC accredited (Grade A) and ISO 9001:2008 certified institute affiliated to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. Pride of place which the institute has earned is evident from the outstanding record of placements and the heartening feedback from the industry and the alumni. The institute enjoys very healthy and fruitful relationship with Industry and industrial organizations like Confederation of Indian Industries (CII), Chamber of Marathwada Industries and Agriculture (CMIA), Aurangabad Management Association (AMA), Quality Circle Forum of India (QCFI) and National Institute of Personnel Management (NIPM). The vision of the institute is to create academic environment where the highest standards of scholarship and professional practices are observed and where responsibilities towards stakeholders are consciously met.
The following steps of problem solving were followed.
1) Problem identification
2) Problem selection
3) Problem defining
4) Analysis of problem
5) Finding the causes
6) Root cause analysis
7) Alternative selection
8) Foreseeing probable resistance
9) Development of solution.
10) Trial Implementation
11) Result checking OR Regular Implementation
12) Follow up & Review

Identification of Problems was done by generating a list of problems using the brainstorming technique. For problem identification, the problems has to defined correctly first. It is the gap between the desired or expected condition and existing condition. It is anything which deviates from it's status quo.

For this three model cells were identified in the institute: Model cell -I Classroom, Model cell -II Staff room, and Model cell –III Library.

Identification of Problems for Staff room

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Problems Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No fixed position for Telephone, Dustbin, Printer and Cupboards as the staff room is shared by two faculty members.</td>
</tr>
<tr>
<td>2.</td>
<td>No fixed position for Monitor, CPU and Keyboard.</td>
</tr>
<tr>
<td>3.</td>
<td>No Labeling for drawers due to which mismatch of documents.</td>
</tr>
<tr>
<td>4.</td>
<td>No fixed position for stationary that is pen stand, stapler, punching machine etc.</td>
</tr>
<tr>
<td>5.</td>
<td>Wall magazine was not updated.</td>
</tr>
<tr>
<td>6.</td>
<td>No proper compartment made in wall magazine for various notices and news.</td>
</tr>
<tr>
<td>7.</td>
<td>No labeling for tube and fans in the office</td>
</tr>
</tbody>
</table>

Identification of Problems for classroom.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Problems Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No fixed position for Podium.</td>
</tr>
<tr>
<td>2.</td>
<td>Wall magazine was not updated.</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Problems Identified</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>1.</td>
<td>More time required to find the books by new students.</td>
</tr>
<tr>
<td>2.</td>
<td>No segregation of used cards and unused cards.</td>
</tr>
<tr>
<td>3.</td>
<td>No fixed position for Monitor, Keyboard and CPU.</td>
</tr>
<tr>
<td>4.</td>
<td>No segregation of cards for first year students and second year students.</td>
</tr>
<tr>
<td>5.</td>
<td>More time required by librarian to make transactions for books.</td>
</tr>
<tr>
<td>6.</td>
<td>No labeling for tube and fans in the library.</td>
</tr>
<tr>
<td>7.</td>
<td>No labeling for drawers due to which mismatch of documents.</td>
</tr>
<tr>
<td>8.</td>
<td>No segregation of CDs in the library.</td>
</tr>
<tr>
<td>9.</td>
<td>No fixed position for dustbin in the library.</td>
</tr>
<tr>
<td>10.</td>
<td>No color coding done for highly transaction books.</td>
</tr>
<tr>
<td>12.</td>
<td>No labeling for cupboards.</td>
</tr>
<tr>
<td>13.</td>
<td>No separate racks in the library for keeping files and important documents.</td>
</tr>
<tr>
<td>14.</td>
<td>No labeling for books alphabetically.</td>
</tr>
<tr>
<td>15.</td>
<td>No labeling for drawers due to which mismatch of documents.</td>
</tr>
</tbody>
</table>

For problem selection, the problems have to be stratified in Class A, Class B and Class C. Class A problems are those that can be solved by the team themselves; class B problems require the help from other departments and class C problems require resources from top management to find the solution. Out of the 32 problems identified in the three model cells, 17 were class A, 9 were class B and only 6 were class C.

Stratification of problems is first step of prioritization. After this step we can use tools or techniques for selection. In this case the UOM (unit of measurement) of the problems were different, hence the 5W and 1H method is used. The method works as follows:

1. **What**: To reduce the searching time and elimination of wastages.
2. **Where**: In the three model cells – Staff room, class room and the library.
3. **Who**: Team members.
4. **When**: Through daily routine activities.
5. **How**: By implementing 5S.

An integral part of every quality improvement activity is the use of the Deming Wheel, also known as the PDCA cycle. This Plan-So-Check-Act is the wheel that takes any organization closer to its objectives.

- **Plan** – Segregation of wanted and unwanted items through “1S”, followed by disposal.
- **Do** – Place for everything and everything in its place. Implement Mistake Proofing systems.
- **Check** – Check whether objectives are met.
- **Act** – Devise a sustenance plan. Use suggestion boxes and check sheets.

Figure 1(a) shows 1S-Seiri in the classroom. Figure 1(b) shows 1S-Seiri in the library.

![Before and After Images of Seiri](image1)

![Before and After Images of Seiri](image2)

Figure 2(a) shows the before and after images for 2S-Seiton for arrangement of the computer system in the staff room. Figure 2(b) shows the before and after images for 2S-Seiton in the staff room for the stationary items.

![Before and After Images of Seiton](image3)

![Before and After Images of Seiton](image4)

Figure 2(c) shows the 2S-Seiton in the wall magazine (notice board) in the Staff room and Fig 2(d) shows the 2S-Seiton in the wall magazine (notice board) in the library.
Figure 3 shows 3S – Seiso in the class room.

Figure 4(a) shows 4S–Seiketsu for the class room and Fig. 4(b) shows 4S-Seiketsu in the library.

Figure 5(a) shows 5S-Shitsuke sustenance action check sheet for class room. Figure 5(b) shows 5S-Shitsuke sustenance action check sheet for staff room.
Figure 5(c) shows 5S- Shitsuke sustenance action check sheet for library.

To identify the root cause of the problems, why-why analysis is done. This is a simple technique of asking the question why five times. The last answer is the root cause of the problem. Very often we reach the root cause in the second or third round.

**Why-Why analysis -1 for Library.**

<table>
<thead>
<tr>
<th>Why</th>
<th>Why unclear identification of Library cards?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>Due to lack of proper arrangement/position.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Why</th>
<th>Why wrong position of library cards?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>Due to undefined position and no separate arrangement.</td>
</tr>
</tbody>
</table>

**ROOT CAUSE:** Undefined position and no separate arrangement.

**Why-Why analysis -2 for Library.**

<table>
<thead>
<tr>
<th>Why</th>
<th>Why more time is required to find books in the library?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>Unclear identification of books racks.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Why</th>
<th>Why Unclear identification of books racks?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>Because of there is no color coding for highly transacted books.</td>
</tr>
</tbody>
</table>

**ROOT CAUSE:** No color coding for highly transaction books.
Why-Why analysis for staff room.

<table>
<thead>
<tr>
<th>Why</th>
<th>Why unclear identification of office items/commodities?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>Due to lack of proper arrangement/position.</td>
</tr>
<tr>
<td>Why</td>
<td>Why wrong position of office items?</td>
</tr>
<tr>
<td>Answer</td>
<td>Due to undefined position.</td>
</tr>
</tbody>
</table>

ROOT CAUSE: Undefined position.

Why-Why analysis for class room.

<table>
<thead>
<tr>
<th>Why</th>
<th>Why more time is required to find information /notice on wall mag?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer</td>
<td>Random pinned notices.</td>
</tr>
<tr>
<td>Why</td>
<td>Why notices are pinned randomly?</td>
</tr>
<tr>
<td>Answer</td>
<td>Because of there is no clear specified area and tags for notices.</td>
</tr>
</tbody>
</table>

ROOT CAUSE: No specified area and tags for notice.

The process of problem solving does not stop at the regular implementation. A follow up for a stipulated time is necessary to check whether some changes to the system are needed. Since the organization is ISO certified, necessary changes to the documentation are made. Check sheets from sustenance action in the three model cells was made and routine check up was done every week.

At the end a Gantt chart is prepared to indicate the planned versus the actual time taken for completion of an activity. A Gantt chart is a type of bar chart that illustrates a project schedule. Gantt charts illustrate the start/stop dates of a program’s individual activities. It provides information about the original plan, the status of the activity, and any forecasted changes to the plan. It is used to plot the planned versus the actual completion of any event.

GANTT CHART FOR MODEL CELL I & II

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP</strong></td>
<td><strong>ACTIVITY (DAYS)</strong></td>
</tr>
<tr>
<td>1</td>
<td>IMPLEMENTING '1S' IN CLASS ROOM &amp; STAFF ROOM</td>
</tr>
<tr>
<td>2</td>
<td>IMPLEMENTING '2S' IN CLASS ROOM &amp; STAFF ROOM</td>
</tr>
<tr>
<td>3</td>
<td>IMPLEMENTING '3S' IN CLASS ROOM &amp; STAFF ROOM</td>
</tr>
<tr>
<td>4</td>
<td>IMPLEMENTING '4S' IN CLASS ROOM &amp; STAFF ROOM</td>
</tr>
<tr>
<td>5</td>
<td>IMPLEMENTING '5S' IN CLASS ROOM &amp; STAFF ROOM</td>
</tr>
<tr>
<td>6</td>
<td>FEEDBACK FROM TEACHERS &amp; STUDENTS, MAKE NECESSARY CHANGES</td>
</tr>
</tbody>
</table>

**PLANNED** | **Actual**
This study focused only on the implementation of 5S in the three selected model cells. But horizontal deployment can be done in the other class rooms, staff rooms, reference library, computer labs, seminar halls, administrative office and even in the corridors of the Institute.

**BENEFITS OF 5S IMPLEMENTATION**

1) Removal of unwanted things.
2) Elimination of searching time.
3) Elimination of waste of inventory and movement.
4) Better usage of the working area,
5) The place looks neat and clean. This increases the morale of the people.

**TOOLS AND TECHNIQUES USED**

1) Brainstorming
2) Problem Stratification
3) PDCA Cycle
4) Why – Why Analysis
5) 4 W 1 H Analysis
6) Gantt Chart
7) Check sheet

**CONCLUSION**

The 5S system helped to organize the workplace and due to which there was decreased wastage, optimized quality as well as productivity was increased via monitoring and organized environment. It also provided visual evidence to obtain more results for organization. The effective following on "5S" in the institute by various students, faculties and non-teaching members strengthened the work ethics between them resulting in the motivation towards team work. The successful implementation of "5S" transformed the organization by increasing the interest of the students in their studies and increased the faculty members’ work satisfaction.
FUTURE STUDY

In this research only three model cells were included for 5S implementation. The next step would implementing 5S throughout the institute. The system should be made a part of the daily routine of the students and staff. Further scope for activities in the institute, include the implementation of Kaizen. Kaizen means continuous improvement or change for the better. Engagement of the students and staff can be increased by involving them in small group activities like Kaizen.

The next logical step would be identifying cross functional teams to form a Quality Circle. Quality Circles are groups of workers who follow a systematic process of problem identification, root cause analysis, solution generation and implementation. The approach has been credited with making a substantial contribution to the improvement of quality and productivity. The Quality Circle method exemplifies the policy of people building, respect for human beings, and creates a participative management culture.

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