



A Case Study on the Successful Implementation  
of 5s Process and its benefits

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## Contents:

1.Abstract	4
2.Introduction	5
• Origin & History of 5s Implementation	
• Development of 5s Implementation	
3.Terms and feature of 5s principle	6
• Diagram of 5s Principle	7
4.5s Implementation in Bangladesh	9
• Programme:	
• Facts and figures	
• Impact	
• Workshop	
• Audit and training	
5. Problem Statement	13
• Reasons why we should select 5s are	
6.Methodology	14
7.List of Industries visited	14
8. Questionnaire	16
• Sort	
• Set in order	
• Shine	
• Standardize	
• Shine	
9. FRAMEWORK FOR 5S IMPLEMENTATION	17
10. Examples of 5s Checklist	20
11. Actions which should be Imposed by our Government	24
12. ROADMAP TO 5S IMPLEMENTATION	24
13. Data Analysis of 5s implementation benefits	26
14. Conclusion	29
15.References	29

**Abstract:**

5S is amongst the first and fundamental steps implemented by an enterprise towards the path of implementing Total Quality Management and continuous improvement at the operation level. 5S is a process designed to organize the workplace, keep it clean, maintain effective and standard conditions. It inspires the discipline required to enable each individual to achieve and maintain a world-class environment. Many enterprises have practiced the 5S and derived significant benefits from it. In particular, this technique has been widely practiced in Japan. Most Japanese 5S practitioners consider 5S useful not just for improving their physical environment, but also for improving their thinking processes too. In Japan it is also called 'workplace management'.

## **Introduction:**

### **Origin & History of 5s Implementation:**

During the time of World War II, it virtually destroyed the production capability of Europe and Asia. On the contrary, the United States (U.S) production capability greatly expanded since their major emphasis was on quantity and not quality production. However, as poor as it was in quality, the U.S still produced the best in the world compared to other nations. In late 1940s, Dr. W. Edwards Deming, a U.S quality control expert began working with the Japanese and continued doing so periodically for several years.

The Japanese developed the quality circle concept during the early 1960 and 20 years later, the concept had expanded to more than a million organizations.

At the same time, Dr. Genichi Taguchi, a Japanese quality expert, introduced new statistical concept that was invaluable in improving process and product quality. Due to this improvement, Japanese industry ultimately has developed in various technologies all over the world. Following in their footsteps, U.S made some drastic changes in strengthening their power in the global age.

Besides all kinds of quality improvement techniques developed, one of the most famous is the 5S concept developed by the Japanese. [14]

### **Development of 5s Implementation:**

Takashi Osada in 1991 coined the original concept of 5-s. 5-s is the acronym for five Japanese words Seiri (organization), Seiton (neatness), Seiso (cleanliness), Seiketsu (standardization) and Shitsuke (discipline) respectively. 5-s has been introduced in Japan mainly in the manufacturing and service industries. Toyota, the major car manufacturer is one of the pioneering firms who adopted the 5-s principles. Japanese believe that 5-s Principles are not only valuable at their workplaces but also improves their cognitive sense. Osada refers to the 5-s as the five pillars to establish and maintain total quality environment in an organization.[1]

5-s Principles focuses on effective workplace organization, simplification of work environment and minimization of waste while improving quality and safety. Success of 5-s totally depends upon total employee involvement, its continuous monitoring and everyone should work in a team [2]

If this 5S is not taken up seriously, then it leads to 5D (delays, defects, dissatisfied customers, declining profits, and demoralized employees) [3]

5S is regarding to make the workplace is an organized one, as problems are really difficult to define in an unorganized organization [4].

5S effects on performance in similar organizations, review requirements of the implementation and deployment of 5S practice, and review of the key success factors for

organizations that have been successful in implementing of 5S and other quality management systems [5].

The 5S methodology relies on the creation and keeping well organized, clean, high effective and high quality workplace [6].

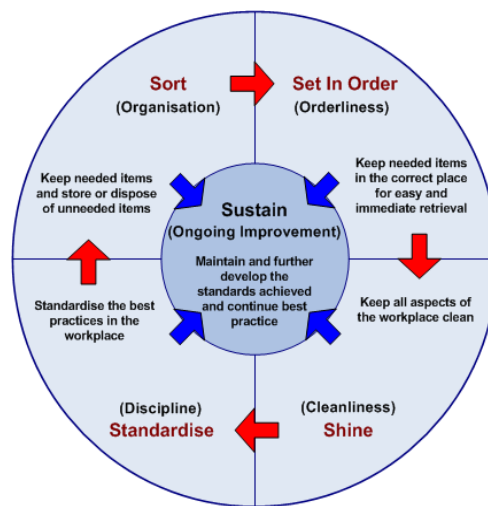
5S could only improve the result in the working environment, but it proved also to help the company to gain better efficiency [7].

TERMS AND FEATURE OF 5S PRINCIPLES[15]

Japanese Term	Equivalent 'S' term (5S)	Features
<i>Seiso</i>	Sweep or Shine	<input type="checkbox"/> Clean and polish all working places <input type="checkbox"/> Remove trash or dirt properly
<i>Seiketsu</i>	Standardize	<input type="checkbox"/> Maintain Cleanliness <input type="checkbox"/> Tested / Inspected randomly <input type="checkbox"/> Convert into high standard
<i>Shitsuke</i>	Self – Discipline or Sustain	<input type="checkbox"/> Motivate employee towards work <input type="checkbox"/> Generate Self discipline

Japanese Term	Equivalent 'S' term (5S)	Features
<i>Selri</i>	Sort	<input type="checkbox"/> Search useful and useless items <input type="checkbox"/> Separate both items & Classify them <input type="checkbox"/> Critical items should be kept for use nearby
<i>Seiton</i>	Systematize or Set in order	<input type="checkbox"/> Arrange useful items properly <input type="checkbox"/> Discard useless items <input type="checkbox"/> Gives color according to their use

Diagram of 5s Principle



Implementing the 5S rules should begin from trainings of productive workers in the range of the 5S's elements and advantages from their usage. It is important that all participants of

trainings will understand the need of using the 5S rules on the own workplace and will agree on the changes. During trainings it is essential to train the usage of all rules on the clear example, so that every participant can understand the methodology of realization of the 5S's elements. Very important fact is that these rules do not refer only to the productive positions, but also refer to the warehouse, office positions and others [8-11].

The 5S implementation requires commitment both from the top management and everyone in the organization.[12]

5S can be used in any environment to support work-place issues including process, delivery, safety, quality, stock, equipment control and improvement targets[13]

### **5s Implementation in Bangladesh:**

#### **Programme:**

**1.The Bangladesh Quality Support Programme (BQSP)** had two components, one implemented by **UNIDO** for strengthening the quality infrastructure and the other by **ITC** for export diversification.

#### **Agenda:**

- I. Initiating Quality Improvement in the **Light Engineering Sector (LES)** in Bangladesh.
- II. Support Export Diversification in Bangladesh.

#### **Facts and Figures :**

- EC contribution € 1.8 million (92.32% of total)
- ITC contribution € 0.15 million (7.68% of total)
- Project period: **2006 to 2009**

#### **Impact:**

- Two workshops** carried out for creating awareness about problem solving tools, good housekeeping practices (Japanese 5S) and quality control system (QCS).
- Direct assistance given to **six manufacturing enterprises** for implementing good housekeeping practices and quality control system.
- Experience sharing workshop carried out for disseminating to more enterprises and stakeholders.
- Knowledge on Basic Quality Concepts was imparted to **40 delegates** from small enterprises and other stakeholders and **15 potential Trainers-cum-Counsellors (TCC)** from Bangladesh.
- 15 participants from 6 participating enterprises** along with **6 TCCs**, selected for assisting the enterprises, received **two-day training** on quality concepts.



- ❑ Selected **6 enterprises** provided advisory support to implement 5S and QCS by International Consultant and TCC attached to each enterprise .
- ❑ **Five (5)** TcCs are now available for conducting training on 5S and QCS to other key players in the sector.
- ❑ The results achieved by the enterprises were disseminated in an experience sharing workshop attended by **51 delegates** from LES both from Dhaka and Bogra. [16]

## **2.Safe Motherhood Promotion Project (SMPP):**

It is a Govt. project supported by **JICA**.

On successful completion of SMPP-1 (2006-2011), SMPP-II (2011-2016) is being implemented in Satkhira, Narsingdi, & Jessore districts.

SMPP has two levels of interventions:

- ❑ **Hospital** : Quality improvement including **5S-Kaizen-TQM**.
- ❑ **Community** : Supports CC Project for development of Community Support Groups and strengthen Community Clinics & involvement of **local government**.
- ❑ 5S-Kaizen-TQM is a Govt. program supported by **JICA, UNICEF, WHO and GIZ**.
- ❑ The 5s process is being implemented in more than **120 hospitals** in Bangladesh.[17]

## **Arranging Seminars:**

- ❑ On Saturday, November 28, 2015 a '**Seminar on 5S-Kaizen-TQM: Gateway to Hospital Services Quality Improvement**' was organized by Department of Public Health of State University of Bangladesh with Major General (Retd.) Dr. M. Shahjahan, Advisor, School of Health Science, SUB in the chair.
- ❑ Dr. Md. Tajul Islam, Technical Advisor, Japan International Cooperation Agency (JICA) delivered the keynote paper in this seminar. [18]



**Workshop:**

**1) 5s orientation workshop at Rangpur Medical College Hospital:**

Date: May 25 to 27, 2015.

Venue: Rangpur Medical College Hospital.[21]



**2) Basic Orientation of Shaheed Suhrawardy Hospital QI committees:**

Date: July 6 to July 13, 2015

Venue: Shaheed Suhrawardy Medical College Hospital conference room





### **3) Workshop at Sher-E-Bangla Medical College Hospital, Barisal on '5S-CQI-TQM' Implementation for Improving Quality of MNCH Services**

Date: 26 - 28 July, 2015 | Venue: Conference Room, SBMCH. [22]



#### **Audit & Training:**

- SGS Bangladesh Limited
- Bangladesh-Japan Training Institute (BJTI)
- Quality Improvement Secretariat Ministry of Health & Family Welfare Bangladesh Govt. of the People's Republic of Bangladesh [19]

#### **Institutions who practices 5s:**

- Rahimafrooz

- ❑ Beximco Infusions [20]
- ❑ British American Tobacco Bangladesh

### **Problem Statement**

While analyzing the 5s Implementation condition in Bangladesh we have encountered a lot of difficulties, like:

- ❑ Insufficient data and information regarding 5s implementation in Bangladesh.
- ❑ Tough to retrieve information from the authority.
- ❑ It is certainly not possible to visit almost all the industries and observe the conditions directly.

Research at Lean Enterprise Research Centre (LERC) U.K. indicates that for a typical manufacturing company the ratio for activity could be broken down as value added activity-5%, non value added activity (waste)-60% and necessary non value added activity-35%. This implies that up to 60% of the activity at a typical manufacturing company could potentially be eliminated.[24]

All Lean manufacturing tools are not possible to implement in our country because of limited resources, i.e. finance, infrastructure, work force etc. The 5S, potential Lean manufacturing tool should be selected in this regard.

### **Reasons why we should select 5s are[24]:**

- It does not require the understanding of difficult terminologies.
- It is simple, driven by logic and natural to human behavior.
- It is within the reach of all type and size of industry or organization.

Now whatever the data and information available regarding the 5s conditions in Bangladesh are available suggest us that the implementation of 5s is not up to the mark at all. So, We have decided to visit some Food and beverage industries of our country and observe the conditions there and will try to give a 5s Implementation framework with the help of standard 5s Implementation process.

## **Methodology**

- Making a Standard 5s Questionnaire.
- Visiting some food and beverage industries in Bangladesh.
- Getting the Questionnaire's answers from the appointed persons regarding 5s Implementation.
- Analyzing the answers and finding out the overall conditions.
- Making a frame work by minimizing the lacking finding out from these visited industries.
- Discussion on the benefits of 5s implementations.

## **LIST OF INDUSTRIES VISITED:**

INDUSTRY NAME	LOCATION	PRODUCTS	CONSULTED PERSON
PERFETTI VAN MILLE	GILAR CHALA,GAZIPUR	CHOCOLATES	SYEEDUR RAHMAN
AST BEVERAGE LIMITED	SIMRAIL,SIDDIRGONJ, NARAYANGONJ	COLD BEVERAGE	MD. MOBARAK HOSSAIN
ABUL KHAIR CONSUMERS FOOD DIVISION	245/279,BAIZEED BOSTAMI ROAD,NASIRABAD INDUSTRIAL AREA,CTG.	MILK PRODUCTS,HOT BEVERAGE,COLD BEVERAGE,SNACKS, CANDY	PARTHO SAROTHI SAHA
TODAY FOOD INDUSTRIES	MIRPUR 11, SANGBADIK COLONY,DHAKA	SOFT DRINKS POWDER, WATER,VARIOUS OIL	MAHMUDUR RAHMAN
NIR FOOD INDUSTRIES	KHILKET, BOARDGHAT,DHAKA	NOODLES,SAUCE, CHOCOLATE,SEMAI	DIDAR UL ISLAM
ROSE DRINKING WATER	MIRPUR-2,DHAKA	DRINKING WATER	AMINUR RAHMAN
SMART FOOD&BEVERAGE	ASULIA,SAVAR	GLASS WATER,JUICE, LOLLYPOP,CANDY	MD. RUHUL AMIN



**Questionnaire : Sort**

CRITERIA	PERFETTI	AST	AKCGD	TFI	NFI	RDW	SMART
1. Develop sorting and disposition rules	YES	YES	YES	NO	YES	NO	YES
2. Use “Red tagging” for unwanted items	YES	NO	YES	NO	NO	NO	NO
3. Floor area free of unwanted items	YES	YES	YES	NO	YES	NO	YES
4. Using of quarantine zone	YES	NO	NO	NO	NO	NO	NO
5. All machines are in regular use	YES	YES	YES	YES	NO	NO	YES

**Questionnaire : Set in order**

CRITERIA	PERFETTI	AST	AKCGD	TFI	NFI	RDW	SMART
1. Eliminate unnecessary motion and time study	YES	YES	YES	NO	NO	NO	YES
2. Ergonomics and safety	YES	YES	YES	NO	NO	NO	NO
3. Identification labels for needed items	YES	YES	YES	NO	YES	NO	YES
4. The best location for remaining items	YES	YES	YES	NO	YES	NO	NO
5. A place for everything & everything in its place	YES	YES	YES	NO	NO	NO	NO

### Questionnaire : Shine

CRITERIA	PERFETTI	AST	AKCGD	TFI	NFI	RDW	SMART
1.Sources of contamination are identified and eliminated	YES	YES	YES	NO	YES	YES	YES
2.Develop daily/weekly/monthly checklists	YES	YES	NO	NO	YES	NO	YES
3.Create standard work instructions for all cleaners	YES	NO	YES	NO	NO	NO	NO
4.Identifying opportunities to improve cleanliness	YES	YES	NO	NO	YES	NO	NO
5. Cleaning schedules are available and displayed	YES	NO	NO	NO	NO	NO	NO

### Questionnaire : Standardize

CRITERIA	PERFETTI	AST	AKCGD	TFI	NFI	RDW	SMART
1.Develop a standard 5S Chart	YES	NO	NO	NO	NO	NO	NO
2.Create standard work instructions and train team on all workplace processes	YES	NO	YES	NO	YES	NO	YES
3.Develop 5S audit procedures	YES	YES	NO	NO	NO	NO	NO
4. Display board is used, organized and up to date	NO	NO	NO	NO	NO	NO	NO
5. Visual controls such as color coding, flow charts and labelling are used	YES	YES	NO	NO	NO	NO	NO

### Questionnaire : Sustain

CRITERIA	PERFETTI	AST	AKCGD	TFI	NFI	RDW	SMART
1. Everyone's role is explained and 5s becomes a habit	YES	NO	NO	NO	NO	NO	NO
2.Maintain a 5s audit calendar	YES	NO	YES	NO	NO	NO	YES
3.Display all 5S communications, audits and feedback locally in each area	NO	NO	YES	NO	NO	NO	NO
4. reward and appreciation scheme on place	YES	NO	NO	NO	NO	NO	NO
5. Improvement to the 5s system	YES	NO	NO	NO	NO	NO	NO



## **FRAMEWORK FOR 5S IMPLEMENTATION:**

### **1) Activities of Quality Assurance Department:**

- Establishment of a strong Quality Assurance Department.
- At least one or two persons are expert in 5s and good house keeping.
- Expertise in 5s Implementation process will co ordinate the whole implementation process.

### **2) “Red Tagging” of unnecessary items: Benefits of using “Red Tagging” are as follows**

- Reducing the sorting process time.
- More visual control over sorting process.
- To provide a systematic approach to Sort activities.
- If there are many employees or multiple shifts then to effectively communicate which items have been considered unnecessary.

The image shows a red rectangular form titled "5S Red Tag". At the top, it has two fields: "Name" followed by a horizontal line and "Date" followed by a horizontal line. Below these is a large rectangular box divided into two sections. The top section is labeled "Item" and the bottom section is labeled "Why Tagged?". To the right of this box is a white circle with a black outline. At the bottom of the form, there are two more fields: "Disposition Date" followed by a horizontal line and "Authorized" followed by a horizontal line.

### **3) Using of Quarantine zone and alternative locations:**

- Unwanted items need to be placed in a quarantine area.
- Other items may be deemed necessary, but used infrequently and so an alternative location needs to be found.

### **4) Properly organized Store & Storage area:**

- Items in stores and storage areas are kept in shelves, racks or bins and clearly marked.

- Shelf grid are marked with reference number/ names for easy retrieval of items.
- All stationeries in the cupboards are kept in places , identified with symbols and marks.
- Items are stored in alphabetical order and in a logical manner ( left to right, top to bottom).



### What we are suggesting



### 5) Maintaining Checklist: Importance of using Checklists are

- Save time and brain power
- Make delegating easier.
- To measure and improve 5s workplace organization.

- instill 5s philosophy, and evaluate success of 5s implementation.

**Evidence of Using Checklist in Quality Control**

**AST BEVERAGE LIMITED**  
Shimrai, Sidingoj, Nanayangonj  
**PRODUCT SAMPLE TEST (CSD)**  
DOC. NO. AST-MSP-8.2.4-01.F04

Date: 03.09.16 Shift: A Product: R Tiger  
Lot No. B-28202/7-04 Line: 02 Package Size 270ml

Time	Counter	Press. PSI	Temp. °F	GV	°Brix	pH	% TA	Taste/Odor/ App.	Remarks	Tested by
08:30 Pm	9000	36	55	3.7	16.0			OK		PA
09:00 Pm	18000	36	55	3.7	16.0			OK		PA
		"Batch End"		NEW	Batch B			R8 B02/F02	Adjustment with met.	
09:30 Pm	28000	36	55	3.7	16.0			OK		PA
10:00 Pm	37000	36	55	3.7	16.0			OK		PA
10:30 Pm	47000	36	55	3.7	16.0	292	0.25%	OK		PA
11:00 Pm	58000	36	55	3.7	16.0			OK		PA
11:30 Pm	68000	36	55	3.7	16.0			OK		PA
12:00 Pm	72000	36	55	3.7	16.0			OK		PA
		Production AB Production stop due to cap change								
		Bacul → Huskely.								
12:30 Pm	82000	36	55	3.7	16.0			OK		PA
1:00 Pm	97000	36	55	3.7	16.0			OK		PA
1:30 Pm	107000	36	56	3.7	16.0			OK		PA

SR. Manager-QC

**Examples of 5s Checklist**

Lean Six Sigma 5S Checklist											
Audit Date:			Area Audited:								
Date of Last Audit:			Area Rep(s):								
Auditor(s):											
Scoring Legend	Green	Yellow	Red	# of Problems Score	If item is not applicable to the area, score N/A and do not include in the final total	5	3-4	2	1	0	
	>=70%	50%-69%	<=49%			1	2	3	4	5	
Category	Item				N/A						
SORT	<b>Distinguish between what is needed and not needed</b>										
	Are unneeded equipment, tools, furniture, etc. present in the area?										
	Are any Red Tagged items more than 3 weeks old?										
SIMPLIFY	<b>A place for everything and everything in its place</b>										
	Are aisle/walk ways and workstations clearly marked and identified?										
	Are jigs, fixtures, tools, equipment, & inventory properly identified and in their correct locations?										
	Are items put away after use?										
SYSTEMATIC CLEANING	<b>Cleaning and looking for ways to keep the workplace clean/organized</b>										
	Are cleaning materials easily accessible?										
	Are equipment and work station kept clean and free of oil, grease and debris?										
	Are designated walkways/stairs free of dirt, oil, grease and dust?										
STANDARDIZE	<b>Maintain and monitor the first three categories</b>										
	Are lines, labels and signs clean and unbroken?										
	Are display boards used, organized, current and tidy?										
	Are employees dressed appropriately and prepared?										
Have specific cleaning tasks been assigned?											
Are trash bins and scrap/recycle containers emptied on a regular basis?											

#### 6) Cleaning schedules available and displayed:

- Keeping records that show what type of cleaning was completed, when it was completed, who did the cleaning and who checked and signed off the cleaning as acceptable.
- Clear instructions outlining the step-by-step process which staff responsible for cleaning.
- The frequency of cleaning e.g. daily, weekly, monthly or annually.

#### 7) Gap Analysis:

- Gap analysis needs to be done on monthly basis.
- Finding the difference between desired 5s score and achieved score.
- Sort out the reasons of the gap and minimizing it.

#### GAP ANALYSIS OF PERFETTI VAN MILLE

Name of Month	Audit score
January' 16	78.33%
February' 16	76.67%
March' 16	78.33%
April' 16	76.67%
Average	77.50 % (Target 80.00 %)

**8) 5s Internal Audit & Using of Audit Calendar:** For Audit purpose following criteria's are required

- An internal audit sheet needs to be maintained.
- A team needs to be appointed to conduct the internal audit.
- The internal audit is conducted once in a monthly basis.

Using of 5s Audit Calendar may help in these following regards:

- Making the total 5s process simplified.
- Degree of Standardization
- Making the first four S's a habit and part of the company's culture.

**Examples of Audit Calendar**

**AUDIT CALENDAR 2016**

S/N	Audit	Month											
		JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	Sustain												
2	Sort	Completed	Completed	Completed	Completed								
3	Set In Order	Completed	Completed	Completed	Completed								
4	Shine	Completed	Completed	Completed	Completed								
5	Standardize												

**9) Reward and appreciation scheme :**

- Assessment criteria for 5S competition are prepared and practiced
- An event to appreciate best employers is carried out annually.

- Assessment criteria to measure the performance is prepared to select best units and best workers.
- An event to appreciate best performing workers and executives needs to be carried out

Annually.

#### **10) Training of the workers and executives:**

- Training of both the workers and executives on 5s process needs to be done.
- The Quality department in charge will take the training of the executives.
- One or two selected executives will take the training of the workers.
- Training needs to be done on monthly basis.

#### **Training of the Executives**



#### **Training of the Workers**





### **11) Safety & Security Measures:**

- Electric wires needs to be sealed or bundled to prevent accidental contacts with human beings.
- All electric devices are required to be placed in safety manner.
- Danger sign needs to be applied.
- Functional fire extinguisher should be available.
- The guideline or protocol for the fire event should also be available.

### **Actions which should be Imposed by our Government**

- Establishment of an individual department which will monitor the 5s process thoroughly along with BSTI and other quality departments of our country.
- There needs to be certificate like ISO for 5s implementation process so that it encourages the owners of Industries to follow the 5s process properly.
- Implementation of more programs like BQSP.
- Increasing awareness by arranging seminars, discussion forums etc supervised by a local expert and also inviting experts from outside of the country.
- Arranging 5s Week, Using 5s Slogan and other motivational activities.
- Making Adds on the importance of 5s process and its benefits to increase adherence of people.

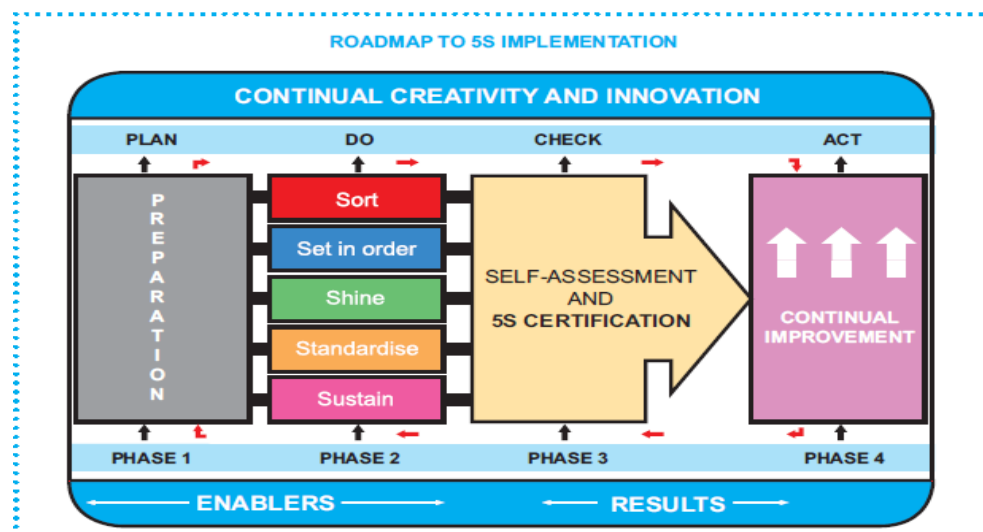
### **ROADMAP TO 5S IMPLEMENTATION**



Improving organization performance is an ongoing challenge and organizations benefit best from a holistic approach, and here is an extremely useful ROADMAP TO 5S IMPLEMENTATION.

It provides an excellent framework for establishing

- The fundamental process for Productivity and Quality Improvements
- A firm foundation for Continual Improvement
- Best Practices
- Key Performance Results



**1) Removing wastes:** 5S removes instances of the seven wastes within working environment :

- Transport
- Inventory
- Motion
- Waiting
- Overproduction
- Over Processing
- Defects

**2) Reduction in delays:** 5S will reduce delays in process.

- Visual management shows when products and tools are missing.
- Problems highlighted

- Materials out of place.
- Leaks and other machine problems.

**3) Reduced setups :** Setup times reduced through the same process as increasing production efficiency.

- Ergonomic workplace
- All tools to hand
- Standardized process

**4) Improved quality:**

- The right tools and equipment available
- Standardized processes
- Improved handling so less damage
- Improved reliability of equipment

**5) Safety and Ergonomics:**

- No clutter to create obstacles and hazards
  - Ergonomic stress free workplace
- No stretching or reaching
  - No lifting heavy objects
- Standardized ways of working

**6) Marketing :** A highly visual and tidy workplace can give a great impression to a current or potential customer.

**7) Morale and motivation :**

- Less stress for operators
- Safer work environment
- Involvement in making own improvements
- Empowerment to make changes

**8) Continuous improvement and problem solving :**

- Implemented correctly 5S will drive continuous improvement of products and processes.
- Abnormalities are immediately visible allowing action to be taken

## Data Analysis of 5s implementation benefits

Period	Activity	Work injuries	Productivity
1 (1950-1955)	2S	44.08 24.49	(1950) (1955) 1
2 (1956-1972)	4S	22.99 7.25	(1956) (1972) 3.6 times up from the previous period
3 (1973-1980)	5S	7.25 3.59	(1972) (1980) 1.4 times up from the previous period
4 (1981-1998)	6S	3.23 1.75	(1981) (1998) 1.5 times up from the previous period

Source: JISHA, 1999

- ❑ Research has been conducted in India measuring the effect of 5S system in performance improvement of a small scale industry (Rojasra and Qureshi 2013). The study found that, within weeks after the implementation of 5S, production system efficiency improved from 67% to 88.8%.[23]
- ❑ 5S along with some other lean strategies were introduced in a metal structures production system (Carvalho 2011). This resulted in a reduction of lead times, work in progress, transports, deliver delays, defects and errors in assembly line and production system.[23]

### Annex II: Applying 5S in a Quality Improvement Project in the Light Engineering Sector (LES) in Bangladesh

"We have been greatly benefited from BQSP assistance. By implementing 5S we not only have a better working environment but we have increased our productivity by 30%. By introducing better controls during casting and machining we have been able to reduce our product returns from market from 5% to 1% and our sales volume has increased by 20%. We are also proud to say that we have been recently selected by a big manufacturer to be their supplier of hand pump components. We have no words to convey our appreciations for the valuable advice given by ITC and regular support provided by the local Trainer cum Counsellor who helped us in implementing 5S and QCS in a short period of time." - Mr. Razul Karim, Proprietor, Reza Engineer's, Bogra.



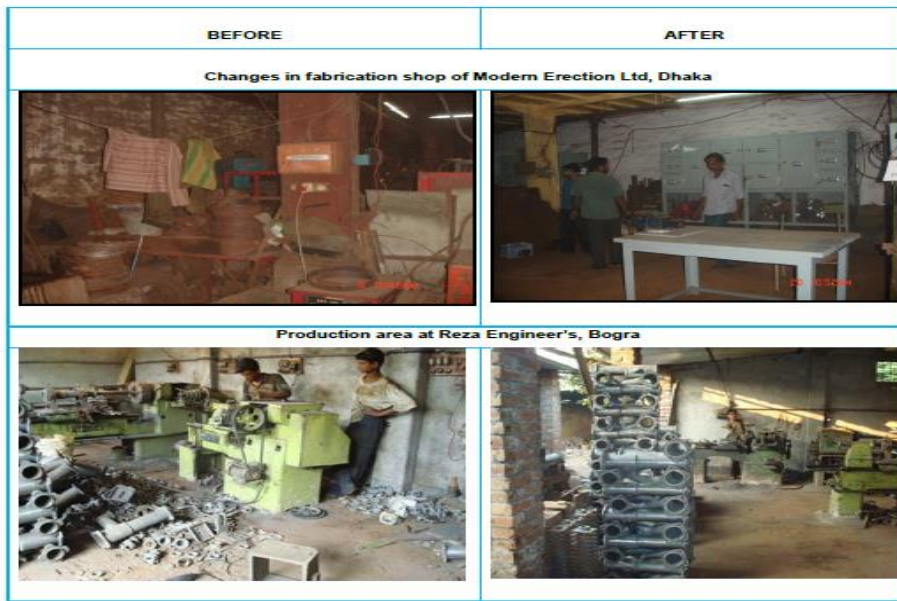
In Short benefits of Reza Engineer's, Bogra after 5s Implementation :

- ❑ Increased Productivity = 30%

❑ Reducing product returns from market from 5% to 1%

❑ Increased Sales Volume = 20%

5S: GOOD HOUSEKEEPING TECHNIQUES



❑ Battery failure within 90 days of purchase results in a replacement with no questions asked and from the 91st day up to the 365<sup>th</sup> day if any defects occur, a free-cost-repair is gladly provided in Rahimafrooz. [20]

❑ Benefits of 5s Implementation in Fashion Club Industry (FCI) Bangladesh :[23]

➤ **Space Saving**

Zone	Space saving (m <sup>2</sup> )
Zone 1	0
Zone 2	2
Zone 3	2.43
Zone 4	0.8
Zone 5	25.13
Zone 6	24.31
<b>Total saving space</b>	<b>54.67</b>

➤ **Money saving :**

Zone	Total cost (USD)	Total cost (BDT)
Zone 1	14.5	1160
Zone 2	142.3	11384
Zone 3	132.79	10623.2
Zone 4	26.4	2112
Zone 5	3541.43	283314.4
Zone 6	878.53	70282.4
<b>Total saving cost</b>	<b>4735.95</b>	<b>378876</b>

➤ **Reduced Movement:** Rack allocation resulted in an overall reduced movement of about 20%.

➤ **Increased Productivity:** 27% increase in labor productivity and 13% increase in the multifactor productivity level for the factory.

**Conclusion:**

The 5S is an effective management tool which can improve housekeeping, environmental conditions and health and safety standards. Results of 5S are visible within short period of time. Besides Employees in the organization become active and self disciplined. Though we have visited some Food and Beverage companies and make our framework on the basis of the findings there, this framework is so simple and easy that it can be implemented to any industry in our country.

**References**

1. Pheng, L.S. and Khoo, S.D. (2001), "Towards TQM-integrating Japanese 5-S principles with ISO 9001:2000 requirements", The TQM Magazine, Vol. 13, No. 5, pp. 334-341.
2. Korkut, D.S., Cackicier, N., Erdinler, E.S., Ulay, G. and Dogan, A.M. (2009), "5s activities and its application in a sample company", African Journal of Biotechnology, Vol. 8, No. 8, pp. 1720-28
- 3) By Melesse Workneh Wakjira, Ajit Pal Singh, *Total Productive Maintenance: A Case Study in Manufacturing Industry, Global Journal of researches in engineering Industrial engineering, Volume 12 Issue 1 Version 1.0 February 2012.*
- 4) T. Ahmed and S.M. Ali, M.M Allama, M.S. Parvez, *A Total Productive Maintenance (TPM) Approach to Improve Production Efficiency and Development of Loss Structure in a Pharmaceutical Industry, Global Journal of Management and Business Research, Vol. 10 Issue 2 (Ver 1.0), April 2010.*

- 5) Arash Ghodrati<sup>1</sup>, NorzimaZulkifli, *The Impact of 5S Implementation on Industrial Organizations' Performance, International Journal of Business and Management Invention, Volume 2, Issue 3, March. 2013.*
- 6) J. Michalska, D. Szewieczek, *The 5S methodology as a tool for improving the organization, Journal of Achievements in Materials and Manufacturing Engineering, Volume 24 Issue 2 October 2007.*
- 7) HungLin, Chi, *5S implementation in Wan Cheng Industry Manufacturing Factory in Taiwan, MS Technology Management (2011).*
- 8) J. Michalska, *The usage of the quality-cost analysis in a production process, Journal of Achievements in Materials and Manufacturing Engineering 16 (2006) 190-198.*
- 9) J.J. Dahlgard, K. Kristensen, G.K. Kanji, *Basis of Quality Management, PWN, Warsaw, 2000 (in Polish).*
- 10) T. Karkoszka, M. Roszak, *Quality and environmental aspects in the technological process management, Proceedings of Conference "Projecting & Managing of the realisation of the production", Zielona Góra (2005) 63-68 (in Polish).*
- 11) J. Michalska, *Factors creating quality management in the company, Proceedings of the Conference INTELLECT 2005: „Intellectual capital as a chance to improve the quality management in the global circumstances” UMCS, Lublin, (2005) 187-191 (in Polish)*
- 12) R. A. Pasale, Prof. J. S. Bagi, *5S Strategy for Productivity improvement: A Case Study, INDIAN JOURNAL OF RESEARCH, Volume: 2 | Issue : 3 | March 2013*
- 13) *5S Pocket Guide Copyright © Centurion Europe Ltd. 2010.*
- 14) Azwan Huzaimi Mazlan, Tan Hua An, Abdul Rashid Abdul Halim @ Jaafar, Mohd Fauzi Zainol Abidin, Azhar Aziz, and Munawir Ridzwan, *5S Concept and Usage*
- 15) Dr. Balwinder Singh Sidhu<sup>1</sup>, Vipran Kumar<sup>2</sup>, Amit Bajaj<sup>3</sup>, *THE "5S" STRATEGY BY USING PDCA CYCLE FOR CONTINUOUS IMPROVEMENT OF THE MANUFACTURING PROCESSES IN AGRICULTURE INDUSTRY.*
- 16) BGD/75/21A EC Partner International Trade Centre (ITC) Bangladesh Export Promotion Bureau.
- 17) *5S-CQI-TQM For Hospital Management Improvement by Dr. Md. Tajul Islam (MBBS, DTM&H, MCTM, MPH, Technical Advisor, SMPP, JICA)*
- 18) <http://www.sub.edu.bd/seminar-5s-kaizen-tqm-gateway-hospital-services-quality-improvement>.
- 19) [http://www.bjti.org/training\\_calendares/alltrainingcalendar](http://www.bjti.org/training_calendares/alltrainingcalendar)

20) Total Quality Management (TQM) Practices of the Bangladeshi and Thai Companies: A Comparative Analysis by Dr. Muhammad Ziaulhaq Mamun, & Mr. Nazrul Islam, Institute of Business Administration University of Dhaka, Dhaka 1000

21) Quality Improvement Secretariat Ministry of Health & Family Welfare  
Bangladesh Govt. of the People's Republic of Bangladesh e-newsletter | Issue # July 2015

22) Quality Improvement Secretariat Ministry of Health & Family Welfare  
Bangladesh Govt. of the People's Republic of Bangladesh E-Newsletter | Issue # June 2015

23) ) IMPLEMENTATION OF 5S AND ITS EFFECT IN A SELECTED GARMENTS FACTORY:  
A CASE STUDY by Kazi Aminul Haque, Sudipta Chowdhury and Abdullah Shahwath

24) R. S. Agrahari, P.A. Dangle, K.V.Chandratre, Implementation Of 5S Methodology  
In The Small Scale Industry: A Case Study