

# Contrivance of 5s System to Effectuate Higher Productivity in Apparel Industries

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## Abstract

Bangladesh is the second largest exporter of readymade garment (RMG) products in the world after China. Above 80

**Index terms**— productivity growth, apparel industry, inventory, visual control management

## 1 I. Introduction

he apparel industries in Bangladesh are mainly export-oriented. Knit and woven garments are the main products. During the past two decades, the success of readymade garment exports from Bangladesh has exceeded the most optimistic standards. In terms of country employment, foreign exchange earnings and its contribution to real GDP, this RMG sector has rapidly gained immense importance. To sustain this rapid growth and satisfy customer demand, the companies need to create some new work practices instead of traditional practices. Applying LEAN techniques like the 5S system can result in improved productivity, cost savings, and workflow efficiency. Productivity. ? To contemplate the pursuance in terms of manufacturing and environmental key performance indicators namely productivity, efficiency, quality, work in progress among 5S initiated and non-5S initiated apparel units. ? Elimination of waste like and create an action plan for continuous improvement.

## 2 II. Literature Review

5S is a simple tool of the LEAN management for organizing your workplace in a clean, efficient and safe manner to enhance productivity, visual management and to ensure the introduction of standardized working of an organization. The 5 phases are:

- ? Sort (Seiri)-"When in doubt, throw it out".
- ? Straighten (Seiton) -"A place for everything, and everything in its place".
- ? Shine (Seiso) -"The best cleaning is to not need cleaning".
- ? Standardize (Seiketsu) -"See and recognize what needs to be done".
- ? Sustain (Shitsuke) -"The less self-discipline you need, the better".

The system creates an environment where all objects are easier to find and any deviation from the normal situation becomes apparent by visual management methods. In the same time, 5S techniques maintain quality, promote a significant costs reduction by eliminating the losses and provides the best framework for progress throughout the organization.

These five phases of 5S system has a great impact in reducing the seven deadly wastes or MUDAS of an organization. These seven deadly wastes are:

## 3 III. Methodology

This section describes different areas related to the study and also the tools and techniques used in this study. It is a basic technique to enhance workplace appearance and give a pleasant work environment.

During our research on the project, we have visited some renowned garments manufacturing companies named Epyllion Styles Ltd. There we have met with the authority to perform our research on the 5S system. There we follow some of the steps to implement the research work: ? Discussed with the top management about the ways they follow to implement 5S system in their apparel industry. ? Used survey method and questionnaire

method to collect necessary data and information from the IE department for the research work. ? Made effective analysis and survey of each department to gather some valuable data and photos which is needed for the project research work. ? Made some search from these company's web sites to collect necessary information, comparable data etc. ? All the necessary task were done for the project work during the time period from June to August, 2016.

### 4 a) Data collection and analysis

The five concepts, which have to be checked, introduced and implemented in the workplace by the garments industries, where we have made our research are:

- i. Seiri (Sort) -Take some photos which are needed to analyze the study. We divided the whole space available into six zones and then we identified the unwanted materials in those zones using red tags. After removing those unwanted items from the zones, can save 51.21 m<sup>2</sup> space. Table ?? Shown the improvement in saving space on the factory floor. In zone 1, save no space due to the removal of small quantities of items from that zone which occupied a little space. Allocate all store rooms to zone 5 and zone 6. Found the most unwanted items in those store rooms. A comparatively a massive amount of space had been saved from zone 5 and zone 6. This saving space resulted in an additional cost savings of 4764.09US dollars or 376363.11 Taka, which is shown in a table. Set in order was also applied in the fabric store. Before the implementation of 5s, there was no sequence of arranging the racks for storing fabrics. But during the study period, racks were rearranged according to the order volume of the buyer. Fabrics of higher quantity ordered were placed in initial racks while fabrics of lower quantity ordered were placed in last racks so that fabrics could be delivered with least delivery time. Rack allocation was subjected to change each month with change of buyer and order quantity. This resulted in a reduced movement of 22.95%. Table 3 gives a clear representation of this scenario. The same experiment done in the accessories store; a new layout was proposed and implemented based on the average quantity required/day. This experiment also resulted a reduction in overall movement of 27.13%. The previous and new allocation of the accessories in the store is shown in table 4.

### 5 Table 1: Zone wise saving space

### 6 c) Time Consuming Analysis

Time utilization took each time the personnel or staff needed the tools or any item from the inventory places. To know how long it carry looking for the different sizes of tools before running 5S, Table ?? used to collect time in looking for a different amounts of threads. Table 2 is the data collection chart used for looking for sewing section. This data collected by the average number of 2 cycles. After the implementation of 5S, from the proposed improvement proposal, 51.21-meter square space was saved, which resulted in a cost savings of 376363.11 Taka. Overall reduced movement of almost 25% was achieved in the fabrics and accessories room resulting in more than a 13% increase in multifactor productivity.

After the implementation of 5S on the factory floor, it resulted in average labor productivity from 3.46 to 7.66. This experiment showed an overall improvement of 45.17%. Labor productivity calculated for one month period before, and after the implementation of 5S and the result shown in the following figure: Material productivity remained almost constant over the study period though it slightly peaked after the implementation of 5S. Average material productivity increased from 2.69 to 2.92 over the study period and resulting in a more than 15 % increase in multifactor productivity. Before the implementation of the 5S system, the multifactor productivity of EPYLLION STYLES LTD. was 52.16%, and after the implementation of 5S, the multifactor productivity assumed 59.98%.The reason behind it was that implementation of 5S during the study mainly focused on making tools and materials more easily accessible to workers, which enhanced labor productivity rather than trying to reduce the wastage and material cost.

This slight increase in material productivity came as by the implementation of 5S as labor productivity became significantly high after the application of 5S in the factory it had a positive impact on the multifactor productivity of The result shown in the following figure:

## 7 V. Conclusion

The above activity performed on some of the renowned garments factories, and through 5S Japanese principles, some great results come in very short period. It is required to continue the audit activity on a regular basis and allocated resources and budget to maintain the 5S. The 5S committee needs to propagate the philosophy to every employee by training and awareness program, and a continuous improvement activity is required to enhance the production and reduce the wastages. It can also be a part of the yearly appraisal. The Japanese 5S System is a very essential system for ensuring systematic discipline. Moreover, this is a world-wide acceptable formula which helps in a great deal in solving the managerial level problems. 5S can be considered a philosophy, a way of life, which can raise morale and create a good impression to customers and enhance efficiency. 5S is a

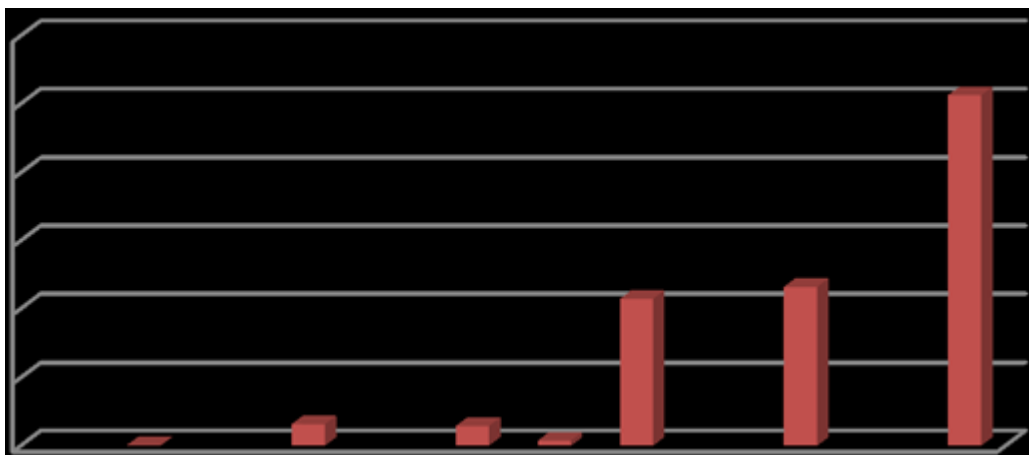
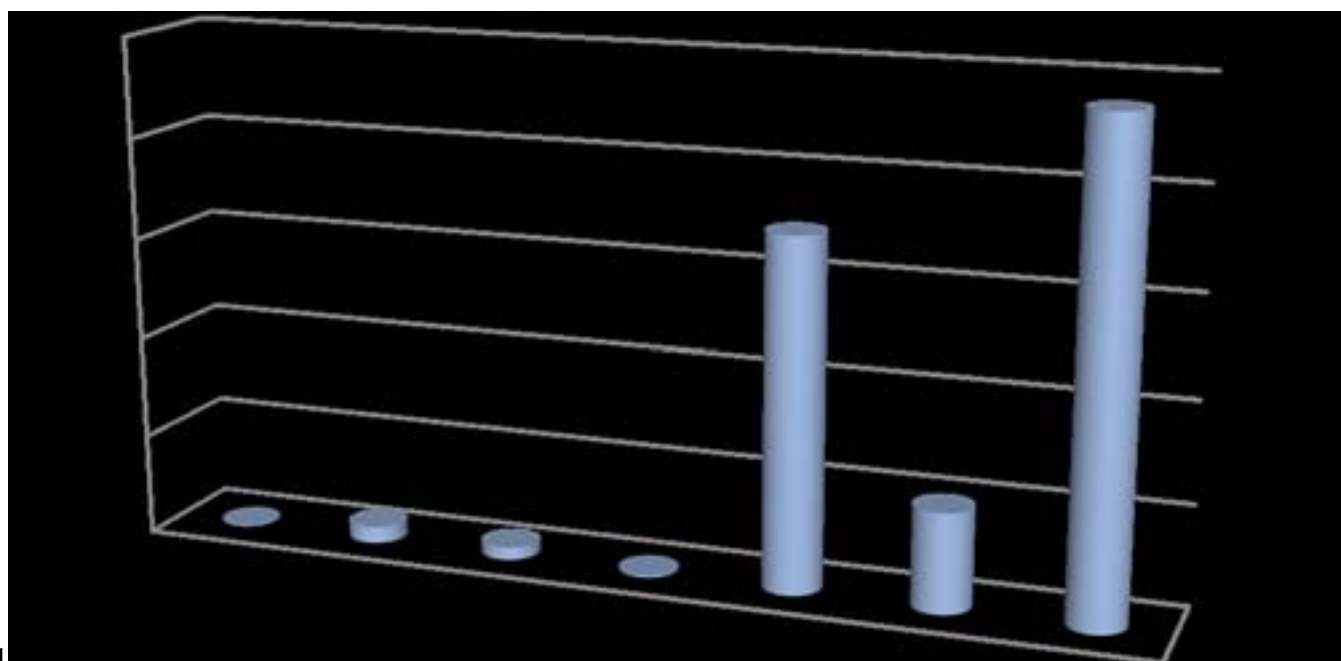


Figure 1: ?



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Figure 2: Figure 1 :

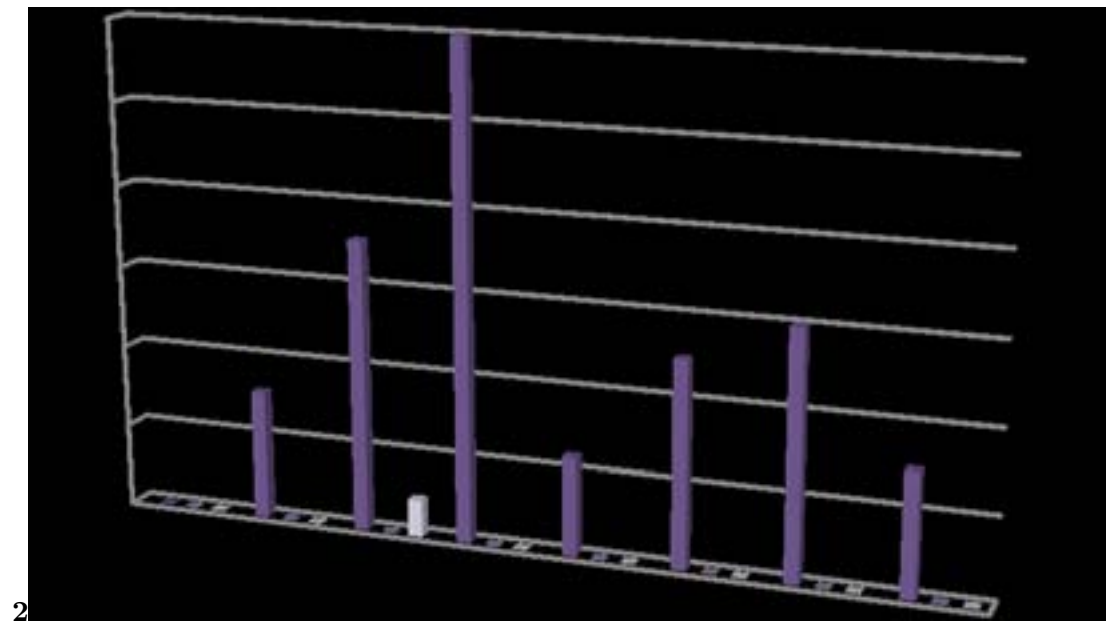


Figure 3: Figure 2 :

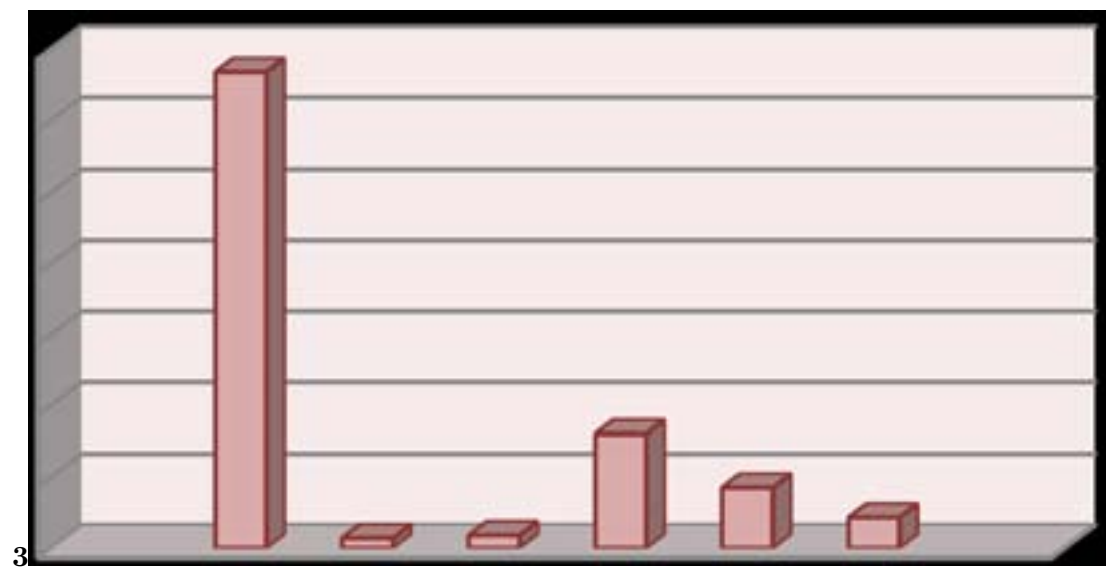


Figure 4: Figure 3 :

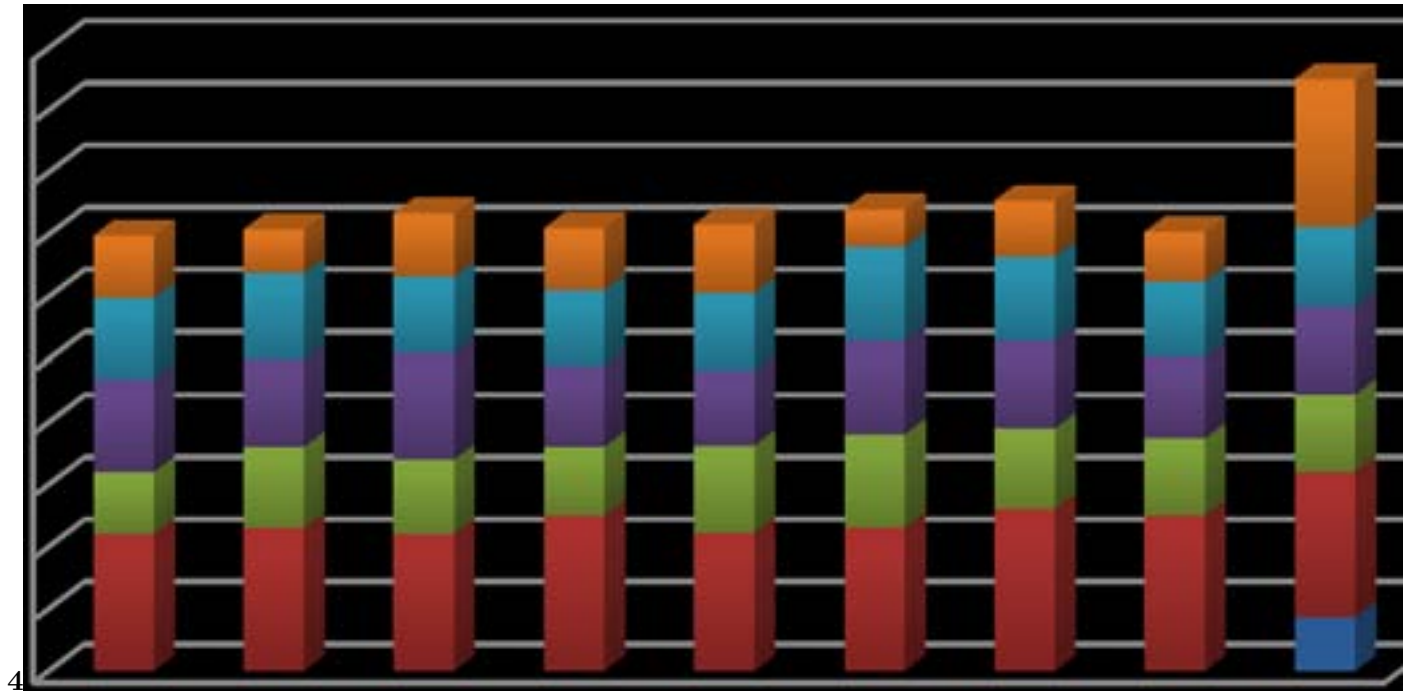


Figure 5: Figure 4 :

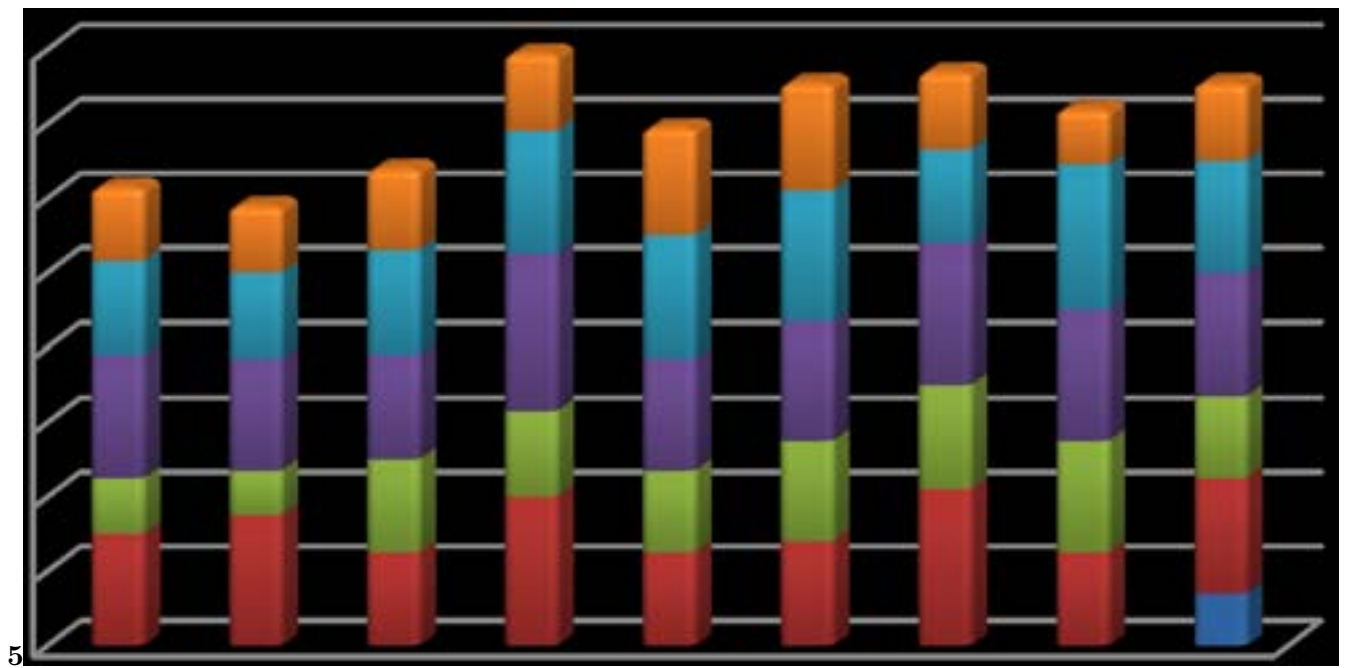


Figure 6: Figure 5 :

6 

Figure 7: Figure 6 :

7 

Figure 8: Figure 7 :

- Design a suitable storage place/parking slots and fix the place for storing each item depending on the frequency of usage
- iii. Seiso (Shine)
  - Prepare cleaning schedule for all zones covering.
  - The areas of cleaning
  - The items of cleaning
- iv. Seiketsu (Standardise)
  - Make a list of the various activities of 5S for implementation.
  - Follow the significant guidelines for floor marking in the industry.

[Note: -The following things to be standardized.v. Shitsuke (Sustain)-Monitor all the activities of 5S continuously.- Create work discipline with the help of employees working in the particular area in order to suit the requirement  
b) Case study]

Figure 10: -

2

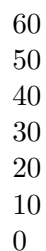


Figure 11: Table 2 :

3

Figure 12: Table 3 :

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Thread of various machines	Staff 1	Staff 2	Staff 3	Staff 4	Staff 5	Staff 6	M/C 1 (sec)	M/C 2 (sec)	M/C 3 (sec)	M/C 4 (sec)	M/C 5 (sec)	M/C 6 (sec)	74	65	50	70
							45 sec	50	110	3						
							40 sec	50	115	50						
							35 sec	110	65							
							44 sec	125	60							
								111	55							
								115	70							
									75							
Staff 7							40 sec	130	65	70	67	45				
Staff 8							42 sec	125	62	65	60	40				
Total(average)							43	117	62	70	64	119				

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Figure 13: Table 5 :

4

3500  
3000  
2500  
2000  
1500  
1000  
500  
0

Figure 14: Table 4 :

6

Figure 15: Table 6 :

## 7 V. CONCLUSION

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98 proven methodology and gives remarkable results all over the world. Bangladesh's industry needs to adopt it as  
99 an initial step toward modern management approaches. <sup>1 2 3</sup>

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