

“Practical Application for the Five S's”

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Abstract

The Five S's are rules for workplace organization which aim to organize each worker's work area for maximum efficiency. The Five S's are (**Sort – Straighten – Scrub or Shine – Standardize – Sustain**).

This study will taken inside each department before and after the development project underneath each of them some comments about what happened, its reasons and results. The mentioned beneath departments are Finished Fabrics Inspection, Maintenance and Warehouse. All modifications were supported by an updated SOP (Standard Operating Procedure) was introduced inside each department. The purpose of the update SOP is to assure the labor continuous abiding by the newly added or modified procedures and precautions which were accompanied by the development project. The researchers were just participants in this project which was achieved by a great team of more than 50 people.

The main results of practical application for the 5s are: increasing efficiency of machines from 89 % to 96 % , 7 % Electricity Saved , 8.5 % Gas Saved , 10 % Transportations Cost saved , 9 % Lead Time Saved , increasing of Time Delivery from 90 % to 97.5 , increasing of Customer Satisfaction from 92 % to 98 %.

The Five S's

The Five S's are some rules for workplace organization which aim to organize each worker's work area for maximum efficiency.^(1,2)

1. **Sort** – Sort what is needed and what is not needed so that the things that are frequently needed are available nearby and as easy to find as possible. Things which are less often used or not needed should be relocated or discarded.

2. **Straighten (or “Set in order”)** – Arrange essential things in order for easy access. The objective is to minimize the amount of motion required in order for workers to do their jobs. For example, a tool box can be used by an operator or a maintenance staff who must use various tools. In the tool box, every tool is placed at a fixed spot that the user can quickly pick it up without spending time looking for it. This way of arrangement can also help the user be immediately aware of any missing tools.
3. **Scrub (or “Shine”)** – Keep machines and work areas clean so as to eliminate problems associated with un-cleanliness. In some industries, airborne dust is among the causes of poor product surface or color contamination. To be more aware of dust, some companies paint their working places in light colors and use a high level of lighting.
4. **Stabilize (or “Standardize”)** – Make the first 3 S’s a routine practice by implementing clear procedures for sorting, straightening and scrubbing.
5. **Sustain** – Promote, communicate and train in the 5 S’s to ensure that it is part of the company’s corporate culture. This might include assigning a team to be responsible for supervising compliance with the 5 S’s.

Lean 5s Application

The below study is about 5s development project at Cloverbrook Textiles S.A.E.

The below snapshots were taken inside each department before and after the development project underneath each of them some comments about what happened, its reasons and results. The mentioned beneath departments are Finished Fabrics Inspection, Maintenance and Warehouse. All below modifications were supported by an updated SOP (Standard Operating Procedure) was introduced inside each department. The purpose of the update SOP is to assure the labor continuous abiding by the newly added or modified procedures and precautions which were accompanied by the development project. The researchers were just participants in this project which was achieved by a great team of more than 50 people.^(3,4)

Inspection

External covers were put for external inspection machine gears to avoid man injuries and fabrics jamming up while inspection. (See Exhibit 1).



Exhibit 1: External covers were put

Customer hangers (pieces of cloth which represent the appearance and shade which is approved by customer for a certain type of fabrics) were put in a cupboard. Marks were put on the floor to indicate cupboard places. (See Exhibit 2).



Exhibit 2: Customer hangers

Other carts were introduced for the transportation of finished fabrics rolls in the floor which saved time, effort and man injuries. (See Exhibit 3).



Exhibit 3: the transportation

Places were set for parking the carts and marks were put on the floor to indicate those places. (See Exhibit 4).

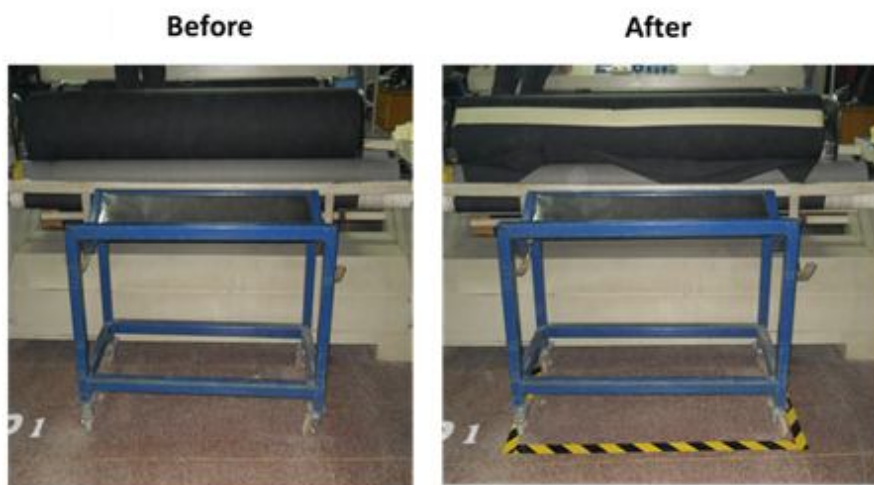


Exhibit 4: Places were set for parking

Maintenance

Tools inside the drawers were distributed correctly to make them reachable any time. (See Exhibit 5).



Exhibit 5: Tools inside

Extra drawers were made to put in all kits in. In order to have more control on spare parts inventory a sheet was made for the inventory of the spare parts of each type of machines. Those sheets are updated on daily basis indicating the place of each spare part and kit inside the maintenance department. (See Exhibit 6).

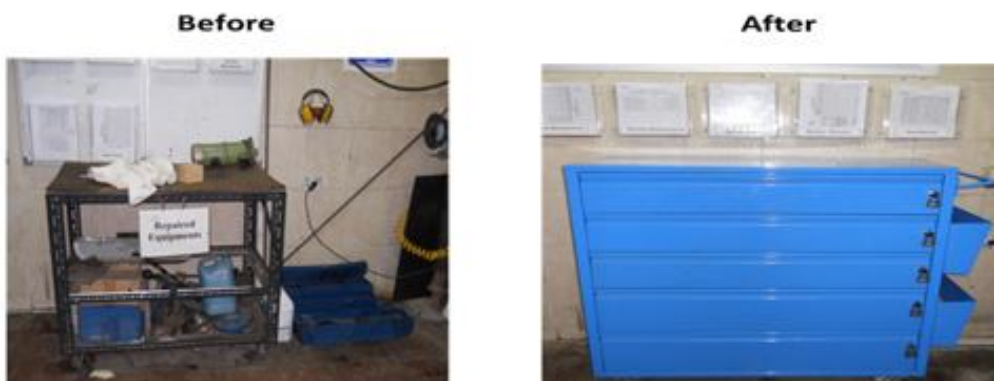


Exhibit 6: Extra drawers were

Spare parts and tools were better organized in the cupboards. (See Exhibit 7).



Exhibit 7: Spare parts and tools

Boxes with labels were put in the cupboards to include small kits and spare parts. Boxes were brought to include spare parts and kits outside cupboards and labels were put on them to show their contents. (See Exhibit 8).



Exhibit 8: Boxes with labels were put

No spare parts or tools should be kept outside cupboards unless they are being used. And nothing should be kept on the workbench unless it is being maintained. (See Exhibit 9).



Exhibit 9: No spare parts or tools kept outside

Broken chairs were replaced with new ones. (See Exhibit 10).

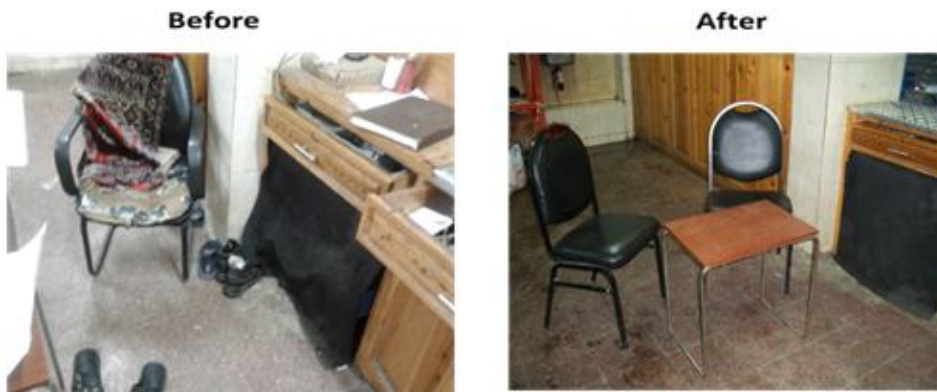


Exhibit 10: Broken chairs were replaced

Warehouse

Clear labels of names for finished fabrics warehouse racks were put at high positions above them to be clear for everybody. Those labels assure better and quicker reach ability for finished fabrics rolls inside the warehouse. (See Exhibit 11).



Exhibit 11: Clear labels in warehouse racks

Wooden sheets were put to separate the places where dyestuff and chemicals kept away from yarn and finished fabrics. (See Exhibit 12).



Exhibit 12: Wooden sheets were put to separate the places

Guidelines were put on the ground of the warehouse bay and arrows were drawn on the ground for showing emergency exits (See Exhibit 13).

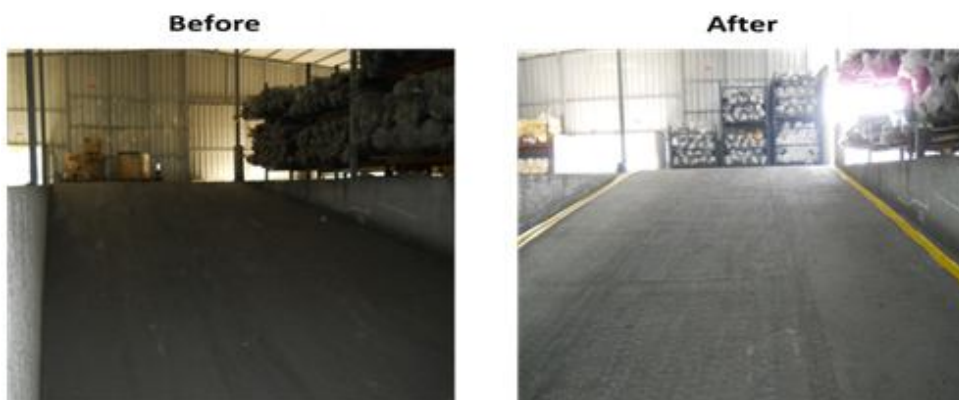




Exhibit 13: Guidelines were put on the ground

The warehouse layout was modified to add more racks for finished fabrics rolls to avoid putting finished fabrics on the ground which reduced the percentage of lost rolls and added more space for the inventory of finished fabrics rolls. The modification saved floor space for two new racks which led to an increase in the capacity of fabrics storage of rolls by 576 roll. The new layout was supported also by new documentation and reporting system for the stocks and buffer stocks of finished fabrics and raw materials, which enhanced subsequently the level of on time deliveries. It also reduced the level of unnecessary stocks of raw materials and goods and provided more space for necessary ones. (See Exhibit 14).

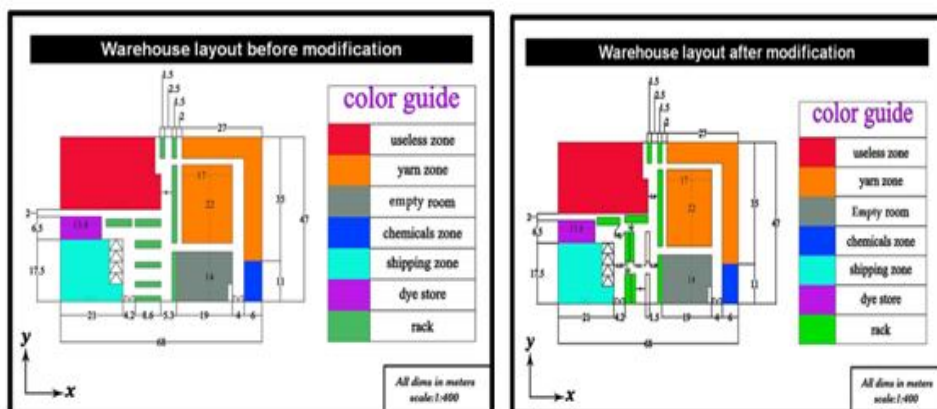


Exhibit 14: The warehouse layout was modified

The (Exhibit 15) below shows the main results of the 5s development project at Clover brook textiles S.A.E. These results are about the average of three months before starting the 5s development project and the average of the three months after finishing the project.

Exhibit 15: Main results of practical application for the 5s

Involved Department(s)	Point of comparison	Before	After	Some of the procedures that were taken
Warehouse	<ul style="list-style-type: none"> Waste in dyestuff and Chemicals due to bad storage and bad handling 	4%	1%	<ul style="list-style-type: none"> Dyestuff and chemicals packages are kept away from humidity Standard number of packages to be put on each other and standard direction. Handling through carts instead of man. An updated SOP (Standard Operating Procedure) was introduced to include all precautions and procedures necessary for storing chemicals and dyestuff.
Warehouse	<ul style="list-style-type: none"> Waste in yarn due to bad storage and bad handling 	6%	2%	<ul style="list-style-type: none"> Yarn packages are kept away from chemicals and dyestuff Standard number of packages was determined to be put on each other and standard direction. Handling through carts instead of man.
Warehouse	<ul style="list-style-type: none"> Lost and damaged rolls in finished fabrics 	3%	0.2%	<ul style="list-style-type: none"> Extra racks were added through the modification of the warehouse layout Labels were added to have names for racks. Guidelines were put on the ground of the warehouse to assure more steady motion inside it.

Knitting and Maintenance	<ul style="list-style-type: none"> • Knitting machines efficiency 	85%	93%	<ul style="list-style-type: none"> • Knitting Machines get a quick test at the end of each shift in addition to breakdowns and stoppages of each machine are noted in a performance history sheet which was introduced through the project. • Regular maintenance is done for all machines according to analysis got from the system connected to LED electronic banners which is updated also by the analysis got in the history sheets. • Walls and floors are cleaned regularly to reduce the rate of dirt on grey fabrics caused by floating fibers mixed with dust while knitting. This dirt subsequently led to machines stoppage to be cleaned. • The modifications done in the maintenance department led to a better response to breakdowns.
Knitting	<ul style="list-style-type: none"> • Missing faults of grey fabrics Inspection 	5%	2%	<ul style="list-style-type: none"> • Grey fabrics rolls reached inspection faster than before due to carts usage which reduced pressure upon inspection as rolls come to it once they are produced. • An updated SOP was introduced to grey fabrics inspection including detailed procedures for inspecting all types of fabrics.
Knitting	<ul style="list-style-type: none"> • Waste in grey fabrics due to bad storage and bad handling 	3%	0.5%	<ul style="list-style-type: none"> • Standard number of rolls to be put on each other and standard direction. • Handling through carts instead of man. • An updated SOP was introduced to include all procedures and precautions related to handling and storage.

Dye house and Maintenance	<ul style="list-style-type: none"> Dye house machines efficiency 	87%	95%	<ul style="list-style-type: none"> Dye Machines get a quick test at the end of each shift and noted in a machine performance history sheet which was introduced by the development project. Regular maintenance is done to all machines according to the analysis of machine performance history sheets. The breakdowns time was reduced due to the quick response of maintenance which happened due to the modification done in the maintenance department. Grey fabrics rolls reached the dye machines faster than before because of the usage of the carts. A small elevator was built to elevate dyestuff and chemicals to the dye kitchen which reduced the transport time and bad handling subsequently that reduced dye machines stoppages awaiting dyestuff and chemicals.
Finishing	<ul style="list-style-type: none"> Stenter Efficiency 	83%	95%	<ul style="list-style-type: none"> Each stenter gets a quick test by the end of each shift. Test results and stenter breakdowns are noted in a performance history sheet which was introduced through the development project. Regular Maintenance is done to all stenters according to the analysis of data mentioned in the history sheets.
Dye house	<ul style="list-style-type: none"> Percentage of refinishes due to dye house faults 	5.5%	2.5%	<ul style="list-style-type: none"> Due to previously mentioned procedures.
Knitting	<ul style="list-style-type: none"> Percentage of refinishes due to knitting faults 	5%	1%	<ul style="list-style-type: none"> Due to previously mentioned procedures.
Finishing	<ul style="list-style-type: none"> Percentage of refinishes due to stenter faults 	3.5%	0.5%	<ul style="list-style-type: none"> Due to previously mentioned procedures.
Dye house, Knitting and Finishing	<ul style="list-style-type: none"> Total Percentage of refinishes 	14%	4%	<ul style="list-style-type: none"> Due to previously mentioned procedures.

Dye house	• Percentage of seconds due to dye house faults	2%	0.9%	• Due to previously mentioned procedures.
Knitting	• Percentage of seconds due to knitting faults	1.5%	0.8%	• Due to previously mentioned procedures.
Finishing	• Percentage of second due to stenter faults	1%	0.3%	• Due to previously mentioned procedures.
Dye house, Knitting and Finishing	• Total percentage of Seconds	4.5%	2%	• Due to previously mentioned procedures.
Inspection	• Missing faults for final inspection	6%	2%	• An updated SOP was introduced to include all instructions and procedures about inspecting all types of fabrics.
Inspection and Maintenance	• Inspection machines efficiency	89%	96%	• Due to previously mentioned procedures about inspection and maintenance.
ALL	• Electricity Saved after applying 5S	....	7%	• Due to the reduction in the number of seconds and refinishes.
ALL	• Gas Saved after applying 5S	....	8.5%	• Due to the reduction in the number of seconds and refinishes.
ALL	• Transportations Cost saved after applying 5S	....	10%	• Due to the reduction in the number of seconds and refinishes. • Handling through carts instead of man saved time and effort.
ALL	• Lead Time Saved after applying 5S	....	9%	• Due to all the previous modifications.
ALL	• On Time Delivery	90%	97.5%	• Due to all the previous modifications.
ALL	• Customer Satisfaction	92%	98%	• Due to on time delivery and no missing faults.

References

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