EFFECT OF WORK AIDS USE ON PRODUCTIVITY IMPROVEMENT IN APPAREL INDUSTRY

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Abstract: *In the garment industry the time saved in manufacturing a single product is as good as earning for the industry. SAM is standard allowed minute. SAM is nothing but the allowed time to perform a particular task. Even the targets to the operators are given on the basis of SAM. Also, the operator rating, efficiency is measured with the time taken by the operator to perform particular operation. In this study few of the important operations were selected and SAM was calculated after careful observation. Later, same operation was performed using suitable work aids mostly folders and attachments and SAM was recalculated. It has been observed that the use of work aids to perform sewing operations significantly reduces the SAM. Results of this study are reported in following points.*

Keywords: *Attachments, Folders, SAM, Placket Folding, Shoulder Attach, Sleeve Hemming, Sleeve Top Stitch etc.*

1. Introduction

In today's culture competitive and changing business world has brought changes in management practices to improve customer satisfaction as well as organizational effectiveness and efficiency. The rapid growing challenges like global competition, dependency on raw material, increased product variety, demanding customer and globalization have major influence on apparel industries. Apparel manufacturers need to produce the higher quality product reducing the difficulties in operations for acquiring demand, for higher value at lower price. In order to survive, organization should combat the constraints associated with operation. In order to improve the productivity, it is vital to identify and remove the constraint. The organization can gain the higher productivity and profitability with improved quality product by identifying and overcoming the problems that reduces the productivity, cost and improve internal throughout process.
Customers are demanding wide variety of quality products at a low cost with a fast delivery. They also expect more innovative products at competitive price as customer have more opportunities to choose variety of options, so productivity improvement tools: folders and attachments aims to reduce time, efforts, human labour in factory, and investment in machinery.

2. Experimental

2.1 Material

To carry out this study we have used several work aids which are nothing but folders and attachments.**2.2**

2.2 Method

This investigation was carried out in the garment factory which is manufacturing various types of shirt as well as ladies wear. In the garment factory there are 173 sewing machines, 4 straight knife cutting machines. Per day production of organization is 2000 pieces. In this investigation we have selected 5 garment manufacturing viz. short sleeve hemming, shoulder attach & top stitch, button placket folding & attach, button hole placket attach, sleeve top stitch. All these operations were observed and SAM i.e. standard allowed minute was calculated. SAM is the time required to do a particular task with some allowance. This SAM is useful to give production target to the operator. After calculating SAM, all those 5 operations were performed with the help of suitable folders and attachments. After this SAM for all those operations were calculated again and reported in this paper. SAM calculations are as follows:

SAM = SMV + Allowance %

Where, SMV is Standard Minute Value

SMV = (Cycle Time * Performance Rating) + Allowance %

Where, Performance rating is given based on operator performance is from 0.8 - 1.2. Allowance varies from 5%-25% which depends on type of operations and working environment.

In this study we have kept 10% allowance for all the operations and calculated cycle time, SMV and SAM.

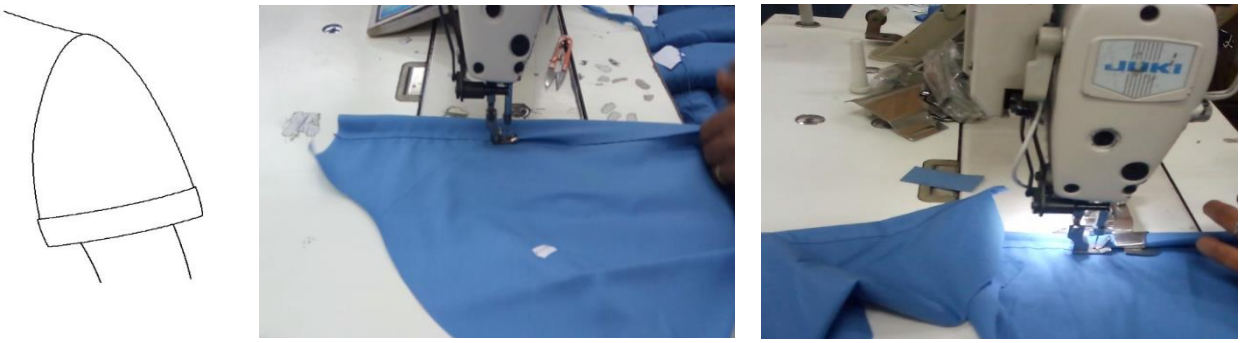
3. Results and Discussion

All 5 operations were analysed before and after the use of folders and attachments and cycle time, SMV and SAM are calculated for each operation after averaging 5 readings.

3.1 Operations

3.1.1 Short Sleeve Hemming

In short sleeve hemming process, the edge fabric is turned under and sewn. Method adopted for short sleeve hemming is Handling Stitching using folder Bundling. Previously this operation was performed by folding the fabric with hands then we implemented the folder for automatic folding. Implementation of this folder not only reduced the operation time but also increased the folding accuracy.



(a) Operation (b) Before use of Work aid (c) After use of Work aid

Figure 1 Short Sleeve Hemming

3.1.2 Shoulder Attach & Top Stitch

Previously shoulder attach and shoulder top stitch operations were separate and with the help of work aids we have combined these two operations. We have given the name for this operation as shoulder attach and top stitch. So, combination of these two operations into one itself reduced the time.

(a) Operation (b) Before use of Work aid (c) After use of Work aid

Figure 2 *Shoulder Attach & Top Stitch*

3.1.3 Button Placket Folding and Button Hole Placket Attach

In shirt both left- and right-hand side plackets were folded manually. Two separate work aids were attached near pressure foot of sewing machine to do the operation effectively in lesser time.

(a) Operation (b) Before use of Work aid (c) After use of Work aid

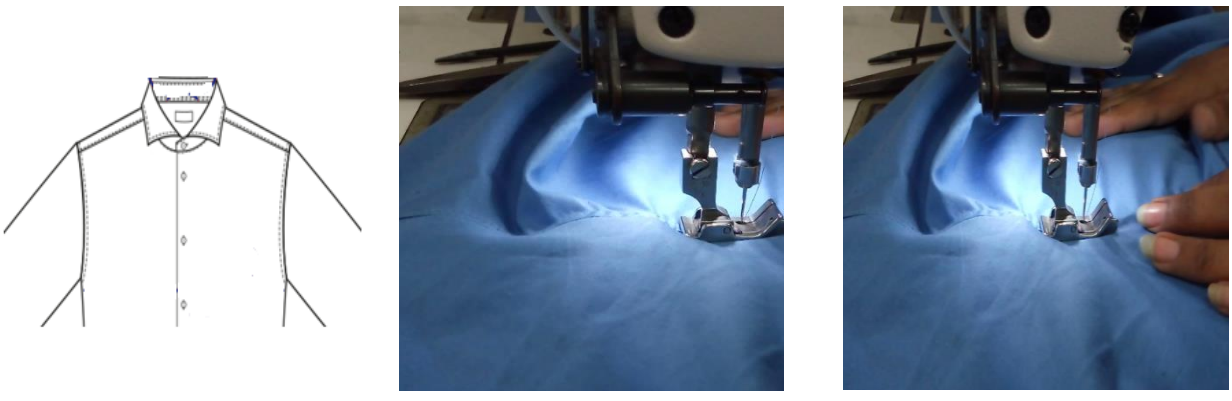
Figure 3 *Button Placket Folding*

(a) Operation (b) Before use of Work aid (c) After use of Work aid

Figure 4 *Button Hole Placket Attach*

D. Sleeve Top Stitch

Previously the sleeve top stich was given manually which is consuming a lot of time as one has to take care of direction and shape while stitching. Introduction of work aid assist in giving effortless direction and a required shape.



(a) Operation (b) Before use of Work aid (c) After use of Work aid

Figure 5*: Sleeve Top Stitch*

3.2 SAM Calculations

In this study few of the important operations were selected and SAM was calculated after careful observation. Later, same operation was performed using suitable work aids mostly folders and attachments

and SAM was recalculated. **Figure**6 and **Figure**7 exhibits the SAM of respective operation before and after use of work aid and percentage change in cycle time respectively.

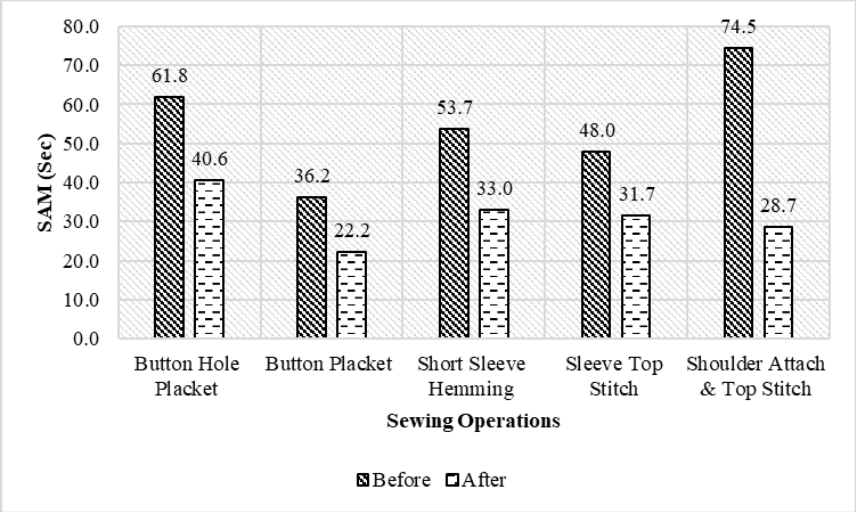


***Figure** 6 SAM of respective operation before and after use of work aid*

SAM is more for the Shoulder Attach & Top Stitch operations and lowest for Button Placket operation. Form figure 6 we can clearly see that irrespective of operation there is significant reduction in the SAM after the use of work aids.

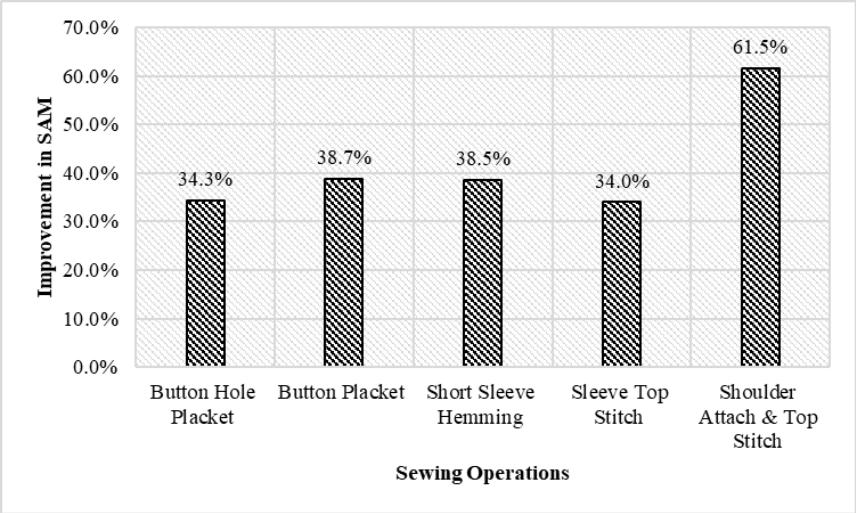


***Figure** 7 Percentage Reduction in SAM*

Also, from figure 7 we can see that highest reduction in SAM is there for shoulder attach & top stitch. This is because we have combined two different operations into one which intern responsible for drastic reduction in time required to perform them. On an average depending upon the product, operation and operator with the inclusion of work aids one can achieve 30% improvement in productivity.

Conclusion

Introduction of work aids increases the productivity; it helps in maintaining the garment quality also reduces the workload on the operator

3. References

[1] Pranjali Chandurkar, Madhuri Kakde, Abhishek Bhadane. Improve the productivity with Industrial Engineering Techniques. *International journal on Textile Engineering and processes*, **Vol:1** (2015)**,** No 4, pp. 35-41.

[2] Farhatun Nabi, Rezwan Mahmud, Md. Mazedul Islam. Improving Sewing Section Efficiency through Utilization of Worker Capacity by Time Study Technique*. International journal of Textile Science,* **Vol:4** (2015): No 1, pp.1-8.
[3] Roongrat Pisuchpen and Wongsakorn Chansangar. Modifying production line for productivity improvement: A Case Study of Vision Leans Factory, *Songklanakarin Journal of Science and Technology.* **Vol:36** (2014), No.3, pp. 345-357.
[4] S.Krishna Kumari, A.N.Balaji, R.Sundar, Productivity improvement of an industy by implementing lean manufacturing principles. *International journal of innovative research in science, engineering and technology*. **Vol:3** (2014), No.3, pp. 1442-1446.
[5] Mst. Murshida Khatun, Application of industrial engineering technique for better productivity in garments production. *International journal of science, environment and technology*, **Vol:2** (2013), No 6, pp. 1361 – 1369
[6] Saiman Akter, Farasat Raiyan Yasmin, Md. Ariful Ferdous. Implementation of kaizen for continuous improvement of productivity in garment industry in Bangladesh. *American Academic and Scholarly Research Journal.* **Vol:7** (2015), No.3, pp. 229-233
[7] Hemendra Nath Roy, Sudipta Saha, Prof. Dr. Tarapada Bhowmick and Sufal Chandra Goldar, Productivity Improvement of a Fan Manufacturing Company by using DMAIC Approach: A Six-Sigma Practice *Global journal of research in engineering industrial engineering*. **Vol: 13** (2013) No. 4, pp.1-6.
[8] Ghazi Abu Taher and M.d Jahangir Alam. Improving quality and productivity in manufacturing process by using quality control chart and statistical process control including sampling and six sigma. *Global journal of researches in engineering: G industrial engineering*. **Vol:14** (2014), No.3, pp. 9-25

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