Quality & Productivity Enhancement in the Garment Textile Industry: A Case Study

By: Ramesh N. Narkhedkar, V. A. Dorugade, and Pravin Gupta

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ABSTRACT

Productivity and quality are crucial factors to the welfare of the industrial firm as well as for the economic progress of the country. Highly productivity refers to doing the work in a shortest possible time with least expenditure on inputs without sacrificing quality and with minimum wastage of resources. Even though the modern technology is introduced in the garment industry till it is found that the garment industry is mainly depends on manpower efficiency. This study deals with productivity and quality by proper utilization of men. By increasing efficiency and lowering the cost of production with decreasing the waste. This will influence the efficiency of the processes with better quality product. This can be achieved by control over sewing line flow and reducing defect which are affecting the productivity and quality. In this context, a sewing line has capacity and is line balanced considering the bottleneck process after balancing, proper alignment of man to machine by skill matrix has been proposed and final capacity of each worker has been re-allocated.

INTRODUCTION

Today the term productivity has acquired a wider meaning. Originally, it was used only to rate the workers according to their skills. The person who produced more either faster or harder were said to have higher productivity. Subsequently emphasis was laid to improve the hourly output by analyzing and improving upon the techniques applied by different workers. A system of measurement was then evolved to compare the improvement made in relation to the rate of output and in order to improve productivity further, machines were introduced.

For improving the productivity and quality there first identify which are factor affecting on productivity and quality and by reducing these all we can easily achieve quality as well as the production in sewing line. For improving the productivity and efficiency use of line balancing technique in the sewing line which gives proper or smooth flow. Considering experience, capacity, one production line is selected from the sewing floor. One garment order is chosen which was started in that line, knowing total amount of order, style description, and fabric type and colour.

Following are some of the factors affecting the production of garment industry,

1. Machine break down

2. Imbalance line (WIP control)
3. Continuous feeding to the line
4. Quality problems
5. Individual operator performance level
6. Operator absenteeism

MATERIAL AND METHODS

In this research study for enhancing the productivity and quality of garment industry the following steps are followed.

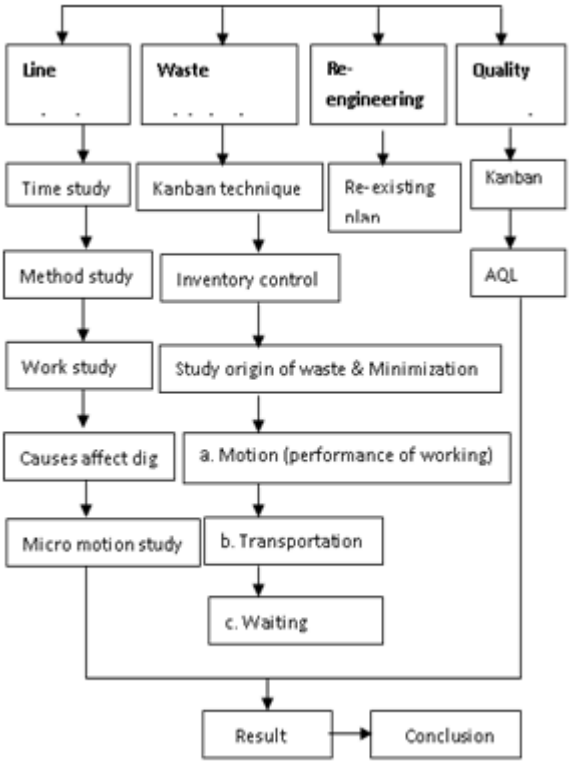

Figure 2

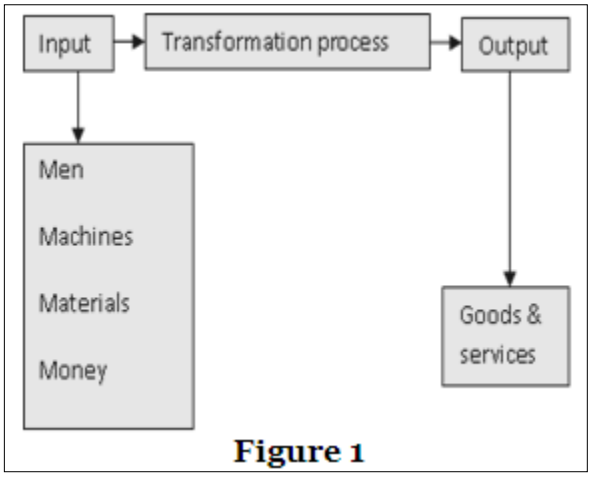

Figure 1

Above figure 2 shows the systematic planning to improve the quality and production of the garment industry. For Unit Production System it is required to balance the line properly. Improper line balance creates idle time or waiting time in the process. Which will bring down the total batch efficiency and end output will be lowest of the line operator who has lowest efficiency.

$$Sewing\ Line\ Efficiency = \frac{SAM\ of\ Garment\ X\ Number\ of\ Pieces\ produced}{Number\ of\ Operators\ X\ 60\ X\ 8}\ X100$$

Where,

SAM= standard allowed minute

RESULTS AND DISCUSSION –

1. *Production and Efficiency –*

In this research study after following the above mentioned steps for improvement the study has been conducted for daily production reports before and after the implementation of the study as shown in the following table no1.

Table 1: Daily production and efficiency of garment industry

Date	No of operator	Total man power	Input material	Total no of pieces	Efficiency	Productivity		
						Operator	Material	Labour
Before study data								
24th Nov	19	25	320	112	9.61%	5.89	0.35	4.48
25th Nov	17	33	544	203	19.47%	11.94	0.37	6.15
26th Nov	21	32	543	464	36.04%	22	0.85	14.53
28th Nov	21	32	650	517	40.15%	24.61	0.79	16.15
After study data								
29th Nov	21	33	577	600	46.60%	28.57	1.03	18.18
30th Nov	21	25	514	453	35.18%	21.57	0.88	18.12
1st Dec.	22	34	550	422	31.29%	19.18	0.76	12.41
2nd Dec	22	34	510	456	33.81%	20.72	0.82	13.41
3rd Dec	23	34	511	528	22.95%	37.44	1.03	15.52
5th Dec	22	34	465	950	70.44%	43	2.04	27.94
6th Dec	22	33	553	601	44.56%	27.31	1.08	18.21

Below figure 3 shows day wise production in pieces per shift, which is increasing except for the dates 1st, 2nd and 6th Dec this is due to very high rate of alteration%. Before the study the maximum production of this style is 517 pieces per shift which is found to be increased to 950 pieces per shift after the study. The same trend is found for the efficiency also so far before study the efficency is 40.15% but after study the maximum efficency reachs upto 70.44% by the proper allignment of man to machine & reduction of defects/day.

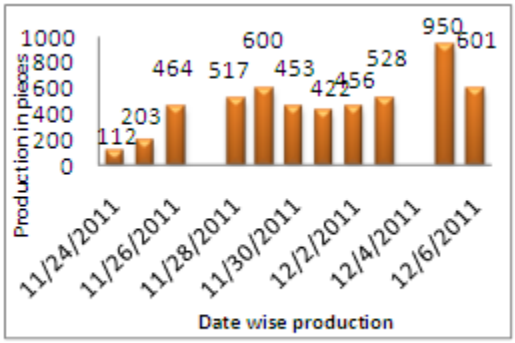

Figure 3

Figure 4

Table 2: production after and before the study

	Efficiency	Production		
		Operator	Material	Labour
Before study data	26.32	16.11	0.59	10.33
After study data	42.94	32.12	1.24	18.77

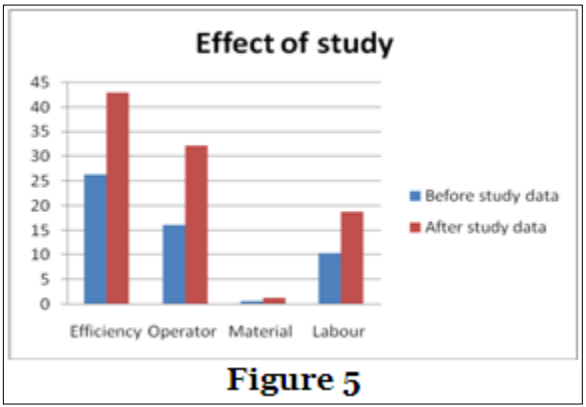

Figure 5

Above figure 5 and table 2 ravels that, after the planned arrangement in the garment industry the average efficency of production is increased by 16% as that of the efficency before the study. Statistical analysis shows that, the 'P' values for efficency, operator production, material production and labour production before and after the study are 0.025625, 0.01215, 0.016388 and 0.012219 respectively reflecting that there is significant difference in before and after study results.

2. *Date wise defects % -*

In this research study the defected garments are calculated date wise before and after the study and are tabulated in the following table 3.

Table 3: Garment defect %

Date	Alteration		Rejection	Mending	Stain	Total Defect	Total Sewing	Total	% defect
	In line	End line	End line	End line	End line				
Before study result									
24th Nov	162	158		0	6	326	112	438	**74**
25th Nov	173	131	0	0	13	317	160	477	**66.45**
26th Nov	186	114	2	17	60	379	464	843	**44.95**
After study result									
28th Nov	18	150	1	3	37	209	517	726	**28.78**
29th Nov	30	104	11	4	20	169	600	769	**21.97**
30th Nov	166	103	0	0	32	304	453	757	**40.15**
1st Dec.	131	80	0	6	32	251	422	673	**37.29**
2nd Dec	40	66	0	25	14	146	456	602	**24.25**
3rd Dec	41	67	0	8	19	139	528	667	**20.83**
5th Dec	28	72	4	9	16	129	950	1079	**11.95**
6th Dec	60	84	3	14	12	173	601	774	**22.45**

Above figure 6 shows that, date wise percentage defects after the study are found to be decreased by the proper allignment of man to machine & reduction of defects/day.

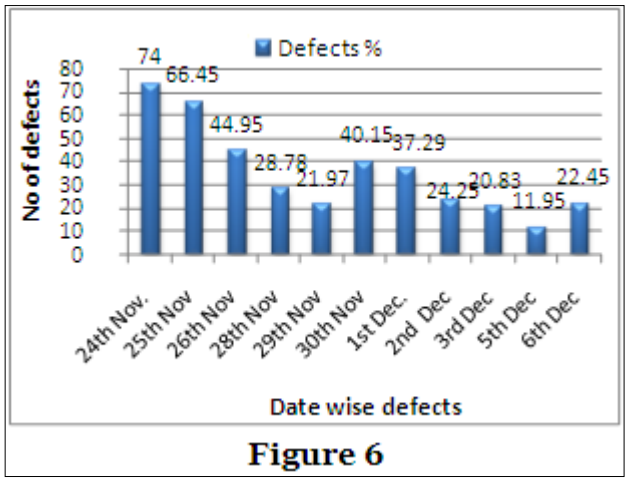

Figure 6

Conclusion

In this project for increasing productivity and quality in garment for lowering the costs, Cutting is done according to stitching line requirement. If stitching capacity per day become less then cutting for that particular order will be less for maintain the optimum WIP there should proper plan for cutting from production and cutting side.

It is also found that due to the proper planning in the garment industry the the average efficency of garment industry is increased by 16% as that of the efficency before the study. The Operator production, Material production and Labour production of the garment industry are also found to be increased because of proper planning of the resourcesduring the manufacturing of garment.

By this research study it is fonfirmed that, the alterations, rejections, stain and mending percentage is reduced by 19.41%, 0.06%, 1.18% and 5.63% respectively after the study condected in the garment industry which will reflect on improving the quality as well as productivity of the garment industry.

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