Faculty of Engineering

Department of Textile Engineering

PROJECT REPORT

Comparison of Sewing Productivity Among Different Sewing Floors

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Submitted by:

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A thesis submitted in partial fulfillment of the requirements for the degree of

Bachelor of Science in Textile Engineering.

Advance in Apparel Manufacturing Technology

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DECLARATION

We openly declare that,

This Industrial Attachment has been completed to proper works by us. We also declare that the information neither of this Industrial Attachment or any part of it didn't submit elsewhere for offer of any degree.

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Approval Sheet

This report entitled "**Comparison of sewing productivity among different sewing floo**rs "is prepared and submitted by **Md. Ashik Khandakar (ID# 181-23-453)** in partial fulfilment of the requirement for the degree of BACHELOR OF SCIENCE IN TEXTILE ENGINEERING has been examined and hereby recommended for approval and acceptance.

Kazi Rezwan Hossain

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Acknowledgement

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Dedication

We dedicate this project to Allah Almighty my creator, my powerful pillar, my source of the greatest inspiration, knowledge and understanding. He has been the creation of our strength throughout this attachment and on His wings only have we soared. We also dedicate these works to our forthcoming employee and to our dignified honorable parents, teachers. Our respect for yours all can never be quantified. May God bless us & long live

ABSTRACT

This project is the greatest importance of any RMG industry. This paper represents the use of various tools and techniques for taming apparel sewing section efficiency throughout the production process. Now a day's apparel manufacturing industries are annoying to improve their current production system and situation and continuously looking for new production tools and techniques in order to keep quickness with the quick changes of a trend in consumers of apparel products. There is no doubt that the sewing section in the apparel industry is the most vital and teeming department that plays a vital role in the whole firm. In time study, Standard Minute Value has been calculated for each process or work. Here, by applying these systems significant progress in the sewing section have been accomplished such as SMV, man power, bottleneck, capacity achievable, production/hr, performance rating, balance % and line efficiency.

1st day when compare 2nd and 3rd floor, 2nd become high SMV and complex process so production and efficiency% is low. 2nd floor production 8591 pcs and efficiency 41%. 6th day when compare 4th & 5th and 3rd here every floor SMV is same. Here SMV, production and efficiency% 4th floor 11.50, 11974 pcs & 54%, 5th 11.85, 13181 pcs & 59%, 2nd 11.30, 11375 pcs and 58%. If it should that here 2nd floor SMV is low other two floor. None the less due to various factor in this floor production efficiency is comparatively low. Like- comparatively unskilled operator, improper line balancing, Delay cutting output, High non-productive time, alter % high, Machine break down etc.

Initially we know that if the SMV is low that's mean this process simply. So, in this process production and efficiency is high but some factors proved that my concept was wrong. By the capacity study find out the bottle neck point, accept to large quantity order, working sharing, proper layout, line balancing to helps achieved production and efficiency**%.**

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CHAPTER-1
Introduction

1.1 Introduction:

The Ready-Made Garments (RMG) industry conquers a unique position in the Bangladesh economy. It is the largest exporting industry in Bangladesh, which experienced prodigious growth during the last 25 years. Since the late 1970s, the RMG industry started developing in Bangladesh primarily as an export-oriented industry although the international market for RMG has been increasing fast due to increase in personal not reusable income and change in life style. The sector rapidly attained high importance in terms of employment, foreign argument earnings and its contribution to GDP. In 2006, the industry employed directly more than 2.1 million workers, about 80% of whom were female. With the growth of RMG industry, linkage industries providing fabrics, yarns, accessories, packaging materials, etc. have also comprehensive. In addition, demand for services like transportation, banking, shipping and coverage has increased. All these have formed additional employment. The total indirect employment created by the RMG industry in Bangladesh is estimated to be some 250,000 workers. In 1983-84, RMG exports earned only $31.57 million, which was 3.89% of the total export incomes of Bangladesh. Total Export Incomes from Textile & Garments was about US$ 20.13 billion (during FY 2011-12) accounting for 78.60% input in the national export earnings. This Sector provides employment to around 5 million (3.5 million in RMG & 1.5 million in Primary Textile Sector) people, making it the major source of industrial employment in Bangladesh.

Both external and internal factors contributed to the outstanding growth of RMG sector. One external factor was the application of the GATT-approved Multi-fiber Organization (MFA) which accelerated international relocation of garment production. Under MFA, large retailers of RMG like USA and Canada imposed quota restrictions, which limited export of apparels from countries like Hong Kong, South Korea, Singapore, Taiwan, Thailand, Malaysia, Indonesia, Sri Lanka and India to USA and Canada. On the other hand, application of MFA worked as a sanctification for Bangladesh. As a least established country, Bangladesh received preferential management from the USA and European Union (EU). Primarily Bangladesh was granted quota-free status. To maintain competitive edge in the world markets, the traditionally large suppliers/producers of apparels followed an approach of relocating RMG factories in countries, which were free from quota precincts and at the same time had enough trainable low-priced labor. So RMG industry industrialized in Bangladesh. But there are numerous weaknesses of the RMG industry of Bangladesh. Labor productivity in the RMG sector of Bangladesh is lower than many of its challengers. Bangladeshi workers are not as competent as those of Hong Kong, South Korea and some other countries and in most factories, operational systems, expertise used are not the latest. So, day by day RMG of Bangladesh is facing cut throat co-operation and challenge in the global market. This is because of reduction in buyer's price but demanding tinier Lead times with good Quality, and increase in manufacturing cost. In this vital moment factory management techniques of yesterday must be replaced by more efficient methods that greatly minimize waste, reduce costs, lead time and improve quality bringing in maximum value to customers. Lean Manufacturing System doesn't tolerate any kind of waste such as overproduction, waiting, WIP, processing waste, transportation, motion, making defective products, underutilized people etc. Lean Manufacturing is a whole-systems policy that creates a culture in which everyone in the organization continuously increases processes and production. So, we can say Lean is the ultimate solution. A number of measures should be undertaken to substantially

improve productivity. One of the most important tools to be implemented is Cellular Manufacturing (Team work) approach that helps build a variety of products with as little waste as possible. This is in line with Lean Manufacturing philosophy also 3. The thesis work aims at the application of different Lean Manufacturing concepts, including the establishment of Cellular Manufacturing system in the Garments Industry.

1.2 Objective:

The specific objectives of the present research work are as follows:

*Reduces idle time in production line through line balancing.

*Reduce the movement time of the equipment by changing the layout of the facility.

*Quantity is the amount of value status through quantitative indicators.

*The amount of productivity.

*Detection Continue to implement the necessary measures to implement cellular manufacturing systems to maximize labor use and minimize waste (invaluable-integrated activities).

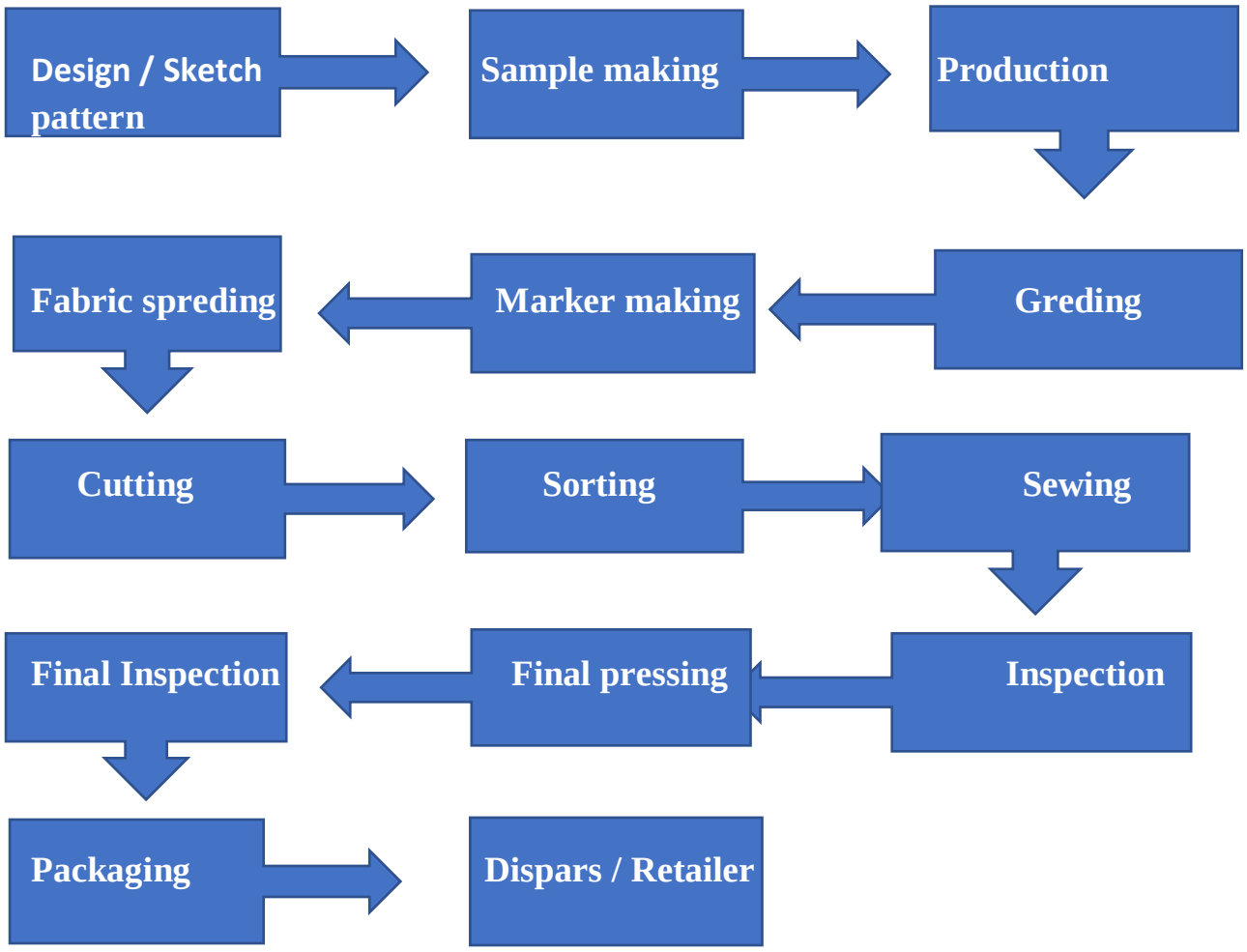
CHAPTER-2

LITERATURE REVIEW

2.1 Garments Manufacturing:

A complete garment must face many processes from its order receiving to cargo. Throughout clothes producing, a method flow chart should be required to finish an associate in nursing order simply. Also, a method flow chart helps to know a garment-producing technic that however the raw materials square measure reborn into the wearable clothes.

2.2 Flow Chart of Garments Manufacturing Process / Technology:



2.2.1 Design:
A design is a product that is enhanced by performing special functions such as embroidery, printing, etc. in a particular style of product. The same style of product may have different designs

2.2.2 Pattern Making:
By following technical sheet and art-work, pattern of each garment style should be made. It's done by both manually and by using computerized method.

2.2.3 Sample making:
The main target of making a fit sample is to follow the details instruction about that garments style. After making it's sent to the buyer to rectify. It's done by manually.

2.2.4 Production pattern:
For bulk production, allowance added here with net dimension. Production Pattern Making is done by both manually and by using the computer.

2.2.5 Greding:
During an order confirmation, the buyer suggests about the size ratio of that order. So that order should be graded according to the buyer's instruction. Grading is done by manually or by using computer.

2.2.6 Marker making:
Marker is a very thin paper which contains all the parts of a particular garment. To make the cutting process easy, it's must be needed. Marker making process can be done by both manually and by using computer.

2.2.7 fabric spreding:
To cut the fabric properly fabric is spread inlay form. Fabric Spreading is done by manually or by using a computerized method

2.2.8 Cutting:
Fabrics have to cut here according to the marker of garments. Fabric Cutting process is done by using the manual method or computerized method.

2.2.9 Sorting:
Here, cutting parts have to sort out or make bundling to send these easily into the next process. This process is done manually.

2.2.10 Sewing:
All the parts of a garment are joined here to make a complete garment. The sewing process is done manually.

2.2.11 Garments Inspection:
After completing sewing, inspection should be done here to make fault free garments. Garments Inspection is done by using the manual method.

2.2.12 Garments Ironing and Finishing:

Here garments are treated by steam; also required finishing should be completed here. This process is done by using the manual method.

2.2.13 Final Inspection:

Finally, the complete garments are inspected here according to the buyer's specification. Final Inspection is done by manual method.

2.2.14 Garments Packing:

Complete garments are packed here by using buyers instructed poly bag. Garments packing are done by using the manual method.

2.2.15 Cartooning:

To minimize the damages of garments, all the garments have to cartooned by maintaining buyers instruction. This process is done manually.

2.2.16 Shipment:

After completing all the required processes it's finally sent to the buyer.

2.3 Industrial Engineering:

Industrial Engineering is concerned with the design, improvement, and installation of an integrated system of men, material, and machines for the benefit of humankind. It draws upon specialized knowledge and abilities in the mathematical and physical sciences together with the principles and methods of engineering investigation and design to specify, predict and evaluate the results to be obtained from such systems.

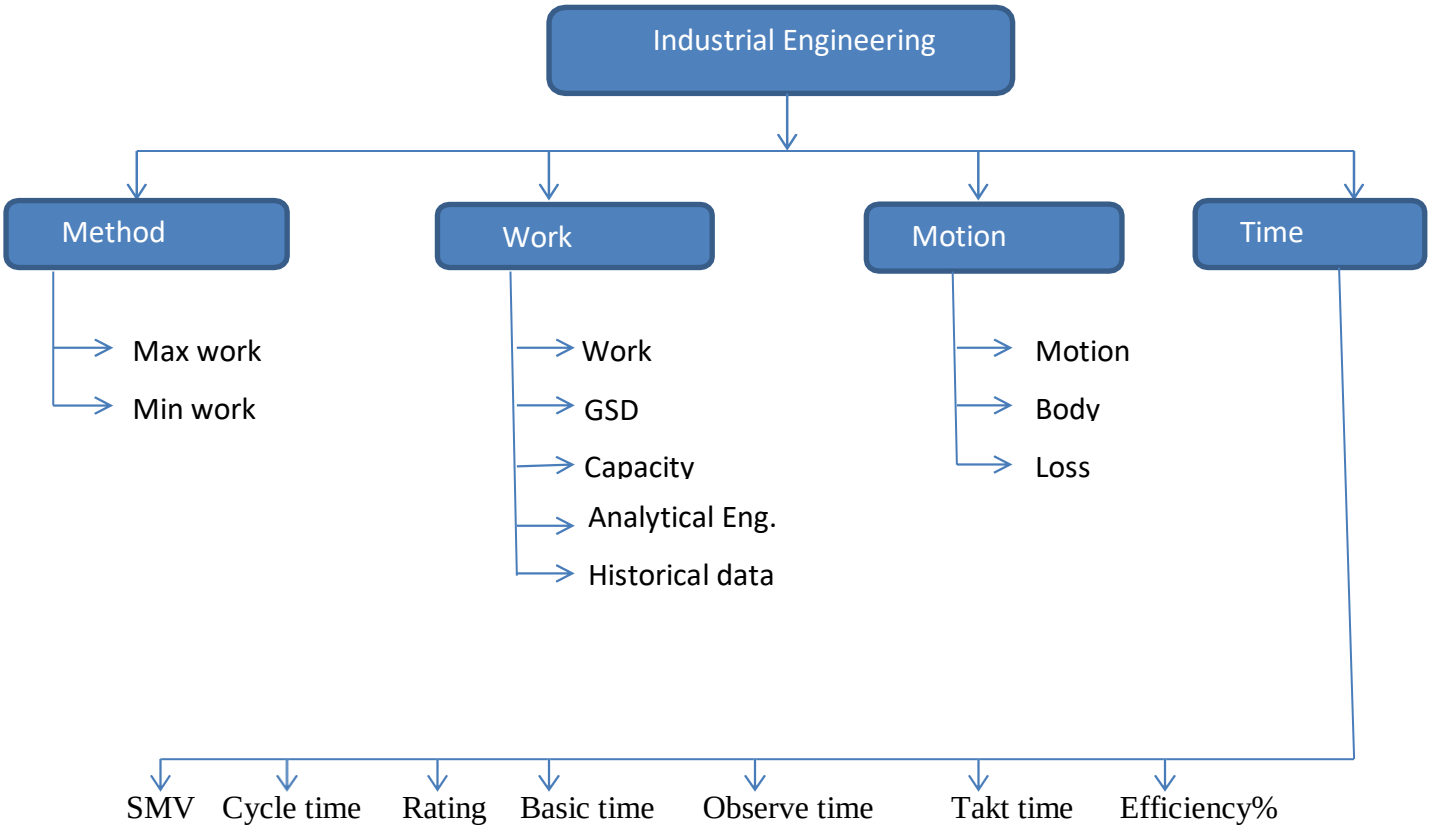
Industrial Engineering (IE) = production↑ cost↓ proper use of all elements↑ Efficiency↑ Revenue↑

2.4 Responsibilities of an Industrial Engineer:

- Operation breakdown.
- Machine Layout.
- Buyer & Style-wise operation Layout.
- Create Man-machine report.
- Buyer & style-wise capacity study.
- Buyer & style-wise line balancing
- Production Monitoring.
- Achieve the line Target.

- Hourly, Daily, Weekly, Monthly line-wise Target setup.
- Wastage resistor at the production floor.
- Arrange trims & accessories in just time.
- Prepared daily Crisis report
- SMV calculation.
- Follow up daily output per production line.
- Follow up daily output per achieve the line.
- Method study and Motion Study to improve the process.
- Data collect & create efficiency report.
- Non-productive time (Lost Time) record and create report.
- Monthly production and shipment closing report create.

2.5 Process flow of Industrial Engineering:



2.5.1 Method Study:

Method Study is a study that systematically examines all the details and critiques in detail and in this way helps to improve the work in a simple and beautiful way.

2.5.2 Work Study:

Work study is the study by which minimum utilization of man, machine, materials is possible.

Importance/purpose of work study-

- To decrease unnecessary work or excessive work or the non-productive time.
- Systematic study where no issues of production is overlooked.
- Reduce cost.
- Minimum use of resources.
- Upturn profitability.
- Upturn productivity.
- Decrease time.
- To find out the best possible method.
- Create work easier.

2.5.3 Motion study:

Motion study is a technique of analyzing the body motions employed in doing a task in order to short out or reduce ineffective movements and facilitates effective movements. By using motion study and the principles of motion economy the task is redesigned to be more operative and less time consuming.

Classification of body movement-

Operators use their body for different operations and spend their supreme time. The motion time is high but sewing time is low. So, body movement is classified by 5 divisions. They are as below-

- **Knuckle:** only using finger movement
- **Wrist:** using hand and finger movement
- **Elbow:** For arms, hand and finger movement
- **Shoulder:** Upper arm, forearm hand and finger movement.
- **Trunk:** For so upper arm, for arm hand and finger movement.

2.5.4 Time Study:

Time Study- is a technique of measuring work where work is done by recording time. A Time Study is an analysis of whether all components of a task are working properly to perform a specific task or under certain conditions.

Fig. Stop Watch

2.6 Line layout:

A line layout operates on the standard that each unit is produced exactly the same and those operations are performed in an identified sequence. Work often flows from the back of the layout to the front and from workstation to work station till the garment is completed. Line layout is most efficient with long runs (high volume of identical products) when the sequence of processes and equipment does not have to be changed repeatedly. Depending on the volume required, a plant may have some lines making the same style or several lines each making dissimilar styles. Line layout does not essentially mean each m/c is different. Several workers and helpers may perform the same operation. The objective is steady work movement through succeeding operations. If a style requires only one operative to hem the pockets and three operators to set pockets in order to keep work in the process moving slickly, then engineers will form that into the layout. Advantages of line layout may be less work in method than a skill centre configuration and fewer handling between operations. This means faster output time and less buildup of parts between operations with high quality. Disadvantages of a line layout include possible bottlenecks (work buildup) and workload difference. Each operation depends on the previous one, and downtime, absenteeism, and slow operators may interfere with the workflow. To counter these problems, some operators may need to cross-trained to perform more than one operation, and substitute machines must be cheerfully available for immediate replacement if equipment breaks down. New trainees may be predictable to meet production standards before being placed in a line position. Failure to meet creation schedules for whatever reason may

create a need to reroute work, shift personnel, or schedule to avoid further days. The managerial wants of operation design in the PBU relate to the need for operators to be highly

trained on the exact tasks that form the sequence of operations in the assembly of a particular garment style, and for the flow of work through these operators to be forcefully controlled and well balanced.

2.7 Capacity Study:

Capacity Study is a study where a complete picture or idea of how much work a machine operator can complete per hour is available. Working on this capacity helps to improve the situation a lot.

2.7.1 Procedure:

1. Use of a stopwatch
2. Measure the exact time study
3. Calculate average the time cycle

2.8 Cycle time:

Total time is taken to do all works to complete one process, i.e. time from pick up part of the first piece to next pick up of the next piece.

2.9 SAM (Standard allowed minute):

The amount of time required to complete an exact job or operation under an existing condition, using the specified & standard technique at a standard pace when there is plenty of repetitive work.

Standard time = (Average observed time X Rating %) + Allowance%.

2.10 Allowance:

Dissimilar types of allowances are allowed in the apparel production floor. Such as special time allowance, Delay allowances, Fatigue allowances etc.

2.11 Balance:

Balance is an important factor. In the traditional performance measurement line, the most important goals of evaluation are performance measurement while the modern approach has focused on evaluated growth and increase capacity. Peter Drucker in 1954 argued that one potential solution was to introduce „balanced" sets of measures. Market standings, innovation, productivity, physical and financial resources, profitability, manager performance and development, worker performance and attitude, and public responsibility are proper performance standards. Modern estimate system results in satisfaction improvement, efficiency improvement, and finally improvement in the effectiveness of organizational activities.

2.12 Bottleneck:

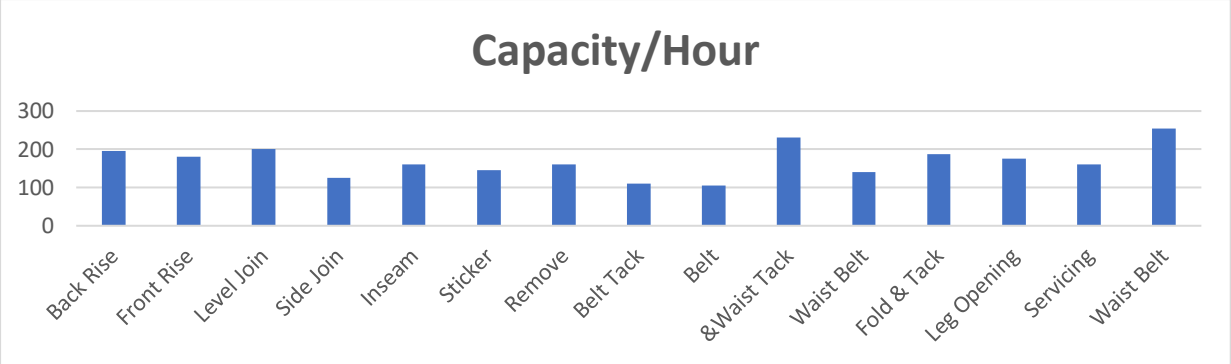
A restraint for smooth flow of operation limits the flow of production rate, productivity, efficiency is usually termed as a bottleneck.

2.13 Capacity Study:

Buyer Name: Care four
Style No: I841673
Item: Bottom
Table 2.13.1 Capacity study

S/ L	Operation Description	M/ C Type	SMV	Cycle Time			Avg.Time in (Sec)	Shared Process	Capacity/ Hour	Bottle Neck Rank
01	Back Rise	O. L	6	20	18	19	19		195	
02	Front Rise	O. L		22	18	20	20		180	
03	Level Join	P.M		18	19	18	18.33		200	
04	Side Join	O. L		48	52	49	49.67	48.84	125	
05	Side Join	O. L		46	48	50	48		60	
06	Inseam	O. L		36	34	36	35.33	39.67	160	
07	Inseam	O. L		31	37	34	44		85	
08	Sticker Remove	H/P		20	18	22	20		145	
09	Belt Tack	P.M		21	19	21	22.66		160	
10	Belt &Waist Tack	P.M		33	35	36	34.66		110	1st
11	Waist Belt Join	O. L		36	34	37	35.66		105	
12	Level Join	P.M		14	16	14	14.67		230	

13	Waist Belt Fold & Tack	P.M		26	29	25	26.67		140	
14	Leg Opening Servicing	O. L		21	20	17	19.33		188	
15	Waist Belt Top Seam	F. L	5.98	21	19	22	20.67		175	
16	Bottom Hem	F. L		25	20	24	23		160	
17	Excessive Thread Cut	H/P		17	15	15	15.67		255	



Graph Chart 2.13.2- Capacity study

2.14 Some Important Formula Industrial Engineering:

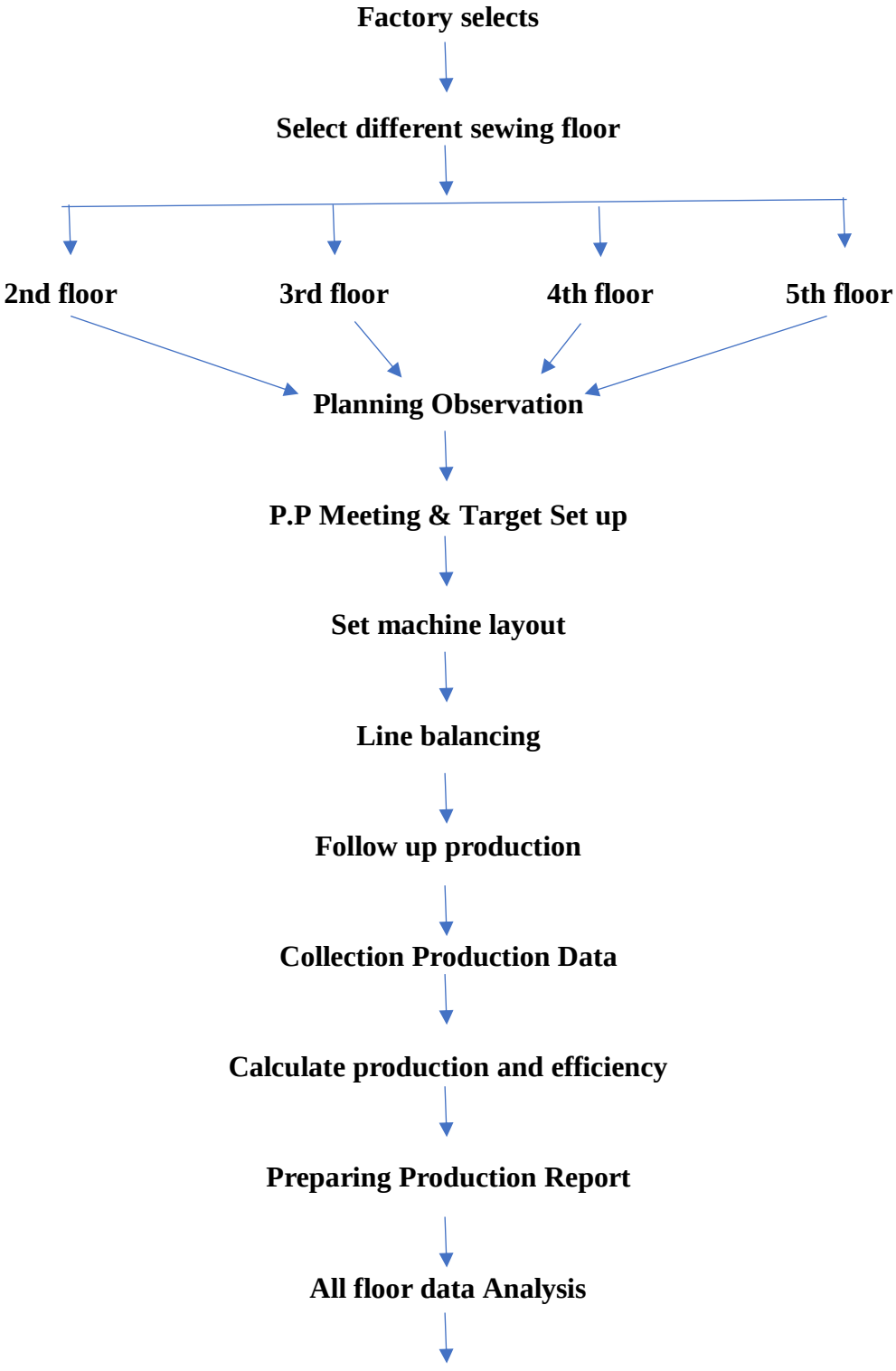
- **GSD** = (Man power * Work hour) / Target
- **SMV** = Basic time + (Basic time * Allowance)
- **Basic time** = Observed time * Rating
- **Observed time** = Total Cycle time / No. of cycle
- **Basic pies time** = Total garment SMV / Total Man-power
- **Capacity** = 60 / Capacity time in minute
- **Cycle Time** = 60 / Team target

- **Standard Pitch Time** = Basic Pitch Time + Allowances (%)
- **Efficiency%** = $\frac{\text{Total Production} * \text{SMV}}{\text{Total Man Mower} * \text{Working Hours}} \times 100$
- **Production**= $\frac{\text{Total Man Mower} * \text{Working Hours} * \text{Efficinecy}}{\text{SMV} * 100}$

CHAPTER-3
METHODOLOGY

3.1 Methodology:

The project work was done by collecting necessary information step by step. The data were collected by monitoring and recording throughout the period of implementation for analysis purposes. The impact of cut panel (faulty) replacing system was analyzed via discussing and observation of the personnel who were directly involved in the implementation process.



3.2 Procedure:

1. A literature review has been made by studying journals, books, articles, report, blog, website, online newspaper and online magazine.

2. Then a suitable factory has been selected wherein Inters off apparels like 2nd, 3rd, 4th & 5th floor. According to the procedure doing to the task. The material used in the following orders are given below-

Table 3.2.1 2nd floor:

	Buyer Name	Vertbaudet
	Style No.	70230-0220
	Item	Hoody
	Color	Black
	Size Range	S, M, L, XL
	GSM	300

Table 3.2.2 2nd floor:

	Buyer Name	Kariban
	Style No.	K 395
	Item	Hoody
	Color	Grey
	Size Range	S, M, L, XL
	GSM	280

Table 3.2.3 3rd floor:

	Buyer Name	M&S
	Style No.	3109-E
	Item	Long Sleeve T shirt
	Colour	White
	Size Range	S, M, L, XL, XXL
	GSM	150

Table 3.2.4 3rd floor:

	Buyer Name	M&S
	Style No.	1004.E
	Item	Polo Shirt
	Colour	White
	Size Range	S, M, L, XL
	GSM	140

Table 3.2.5 3rd floor:

	Buyer Name	M&S
	Style No.	5515.P
	Item	Long Sleeve Polo Shirt
	Colour	White
	Size Range	S, M, L, XL, XXL
	GSM	160

Table 3.2.6 3rd floor:

	Buyer Name	M.care
	Style No.	TB-260
	Item	Bottom
	Colour	White (AOP)
	Size Range	S, M, L
	GSM	220

Table 3.2.7 4th floor:

	Buyer Name	M.care
	Style No.	TA-890
	Item	B. T shirt
	Colour	Black
	Size Range	S, M, L, XL, XXL
	GSM	150

Table 3.2.8 4th floor:

	Buyer Name	M.care
	Style No.	TB-156
	Item	Long Sleeve Pocket T shirt
	Colour	White
	Size Range	S, M, L, XL, XXL
	GSM	210

Table 3.2.9 4th floor:

	Buyer Name	M.care
	Style No.	TB-145
	Item	Baby boys long Sleeve polo shirt
	Colour	Ash
	Size Range	2-3yrs,4-5yrs
	GSM	230

Table 3.2.10 5th floor:

	Buyer Name	Tesco
	Style No.	AN.925425
	Item	Bottom
	Colour	Grey
	Size Range	S, M, L, XL
	GSM	200

Table 3.2.11 5th floor:

	Buyer Name	Tesco
	Style No.	AG939430
	Item	Top
	Colour	Black
	Size Range	S, M, L, XL
	GSM	130

Table 3.2.12 5th floor:

	Buyer Name	Tesco
	Style No.	KM-9264
	Item	Baby Jumpsuits
	Colour	White
	Size Range	1-2yrs,2-3yrs,4-5yrs
	GSM	200

3. Production target should be set here according to buyer requirement; it helps to respect the shipment date.
4. Machine layout is set here according to the total process needed to complete a garments item.
5. This process actual line balancing should properly be done to utilize the garments worker. If it takes more time in line setup then garments production decreased.
6. To minimize the number of work station, cycle time, line balancing is done, it is a very important process to achieve the production target.
7. Production data should be collected then analysis production report.
8. Calculate the target efficiency, target production and achieve efficiency using below formula-

- **Efficiency%** = $\frac{\text{Total Production} * \text{SMV}}{\text{Total Man Mower} * \text{Working Hours}} \times 100$
- **Production**= $\frac{\text{Total Man Mower} * \text{Working Hours} * \text{Efficinecy}}{\text{SMV} * 100}$

9. Compare sewing productivity and efficiency among old 2nd floor, 3rd floor, 4th floor and 5th floor.

Chapter-4

RESULT AND DISCUSSION

4.1 1st day Compare of sewing productivity and efficiency between 2nd floor and 4th floor-

Table 4.1.1 Sewing production & efficiency report 2nd floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
2nd floor	Vertbaudet	70230-0220	Hoody	22	700	9	8591	7000	50%	41%

Target= $\frac{total\ man\ power * working\ hours * target\ efficiency\%}{SMV * 100}$

= $\frac{700 * 9 * 60 * 50}{22 * 100}$

=8571pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

= $\frac{7000 * 22}{700 * 60 * 9} * 100$

= 40.74% or 41%

Table 4.1.2- Sewing production & efficiency report 4th floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency %	Achieved Efficiency%
4th floor	M-Care	TB-260	B.Top & bottom	7	315	9	18225	17000	75%	70%

Target= $\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$

$= \frac{315 * 9 * 60 * 75}{7 * 100}$

=18225pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

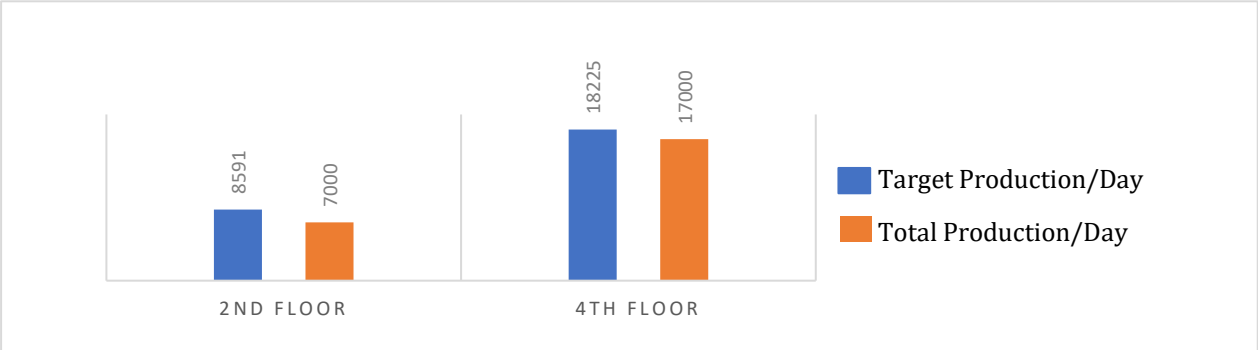
$= \frac{17000 * 7}{315 * 60 * 9} * 100$

= 69.95% or 70%

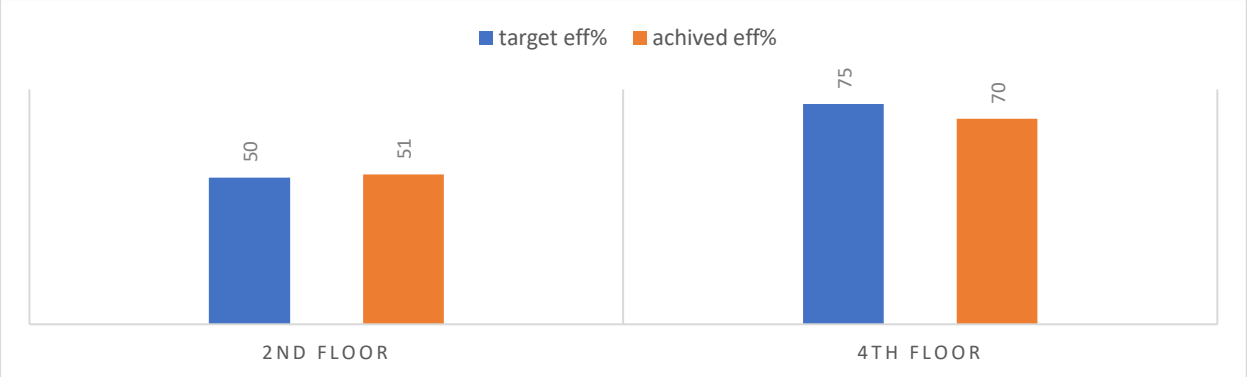
4.1.3 1st day comparison between 3rd old and New 4th floor in Production and Efficiency:

Floor no.	Item	Target Production/Day	Total Production/Day	Target Efficiency	Achieved Efficiency
2nd floor	Hoody	8591	7000	50%	41%
4th floor	B. Top & bottom	18225	17000	75%	70%

4.1.4 Production graph chart:



4.1.5 Efficiency graph chart:



Remarks:

- The 2nd floor manufactured more complex or critical process than 4th floor.
- 2nd floor becomes a critical process, so line balancing is difficult than 4th floor.
- 2nd floor order quantity is short than 4th floor.

4.2.2 nd day Compare of sewing productivity and efficiency between 5th floor and 3rd floor-

Table 4.2.1 Sewing production and efficiency report New 5th floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
5th floor	Tesco	AN. 925420	B.Top & bottom	6.25	240	9	14100	14500	68%	70%

Target= $\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$

$= \frac{240 * 9 * 60 * 68}{6.25 * 100}$

=14100pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

$= \frac{14500 * 7}{240 * 60 * 9} * 100$

= 69.93% or 70%

Table 4.2.2 Sewing production and efficiency report 3rd floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
3rd floor	M&S	3109.E	Polo, Top & bottom	6.70	238	9	11509	12000	60%	63%

Target= $\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$

$= \frac{238 * 9 * 60 * 60}{6.70 * 100}$

=11509pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

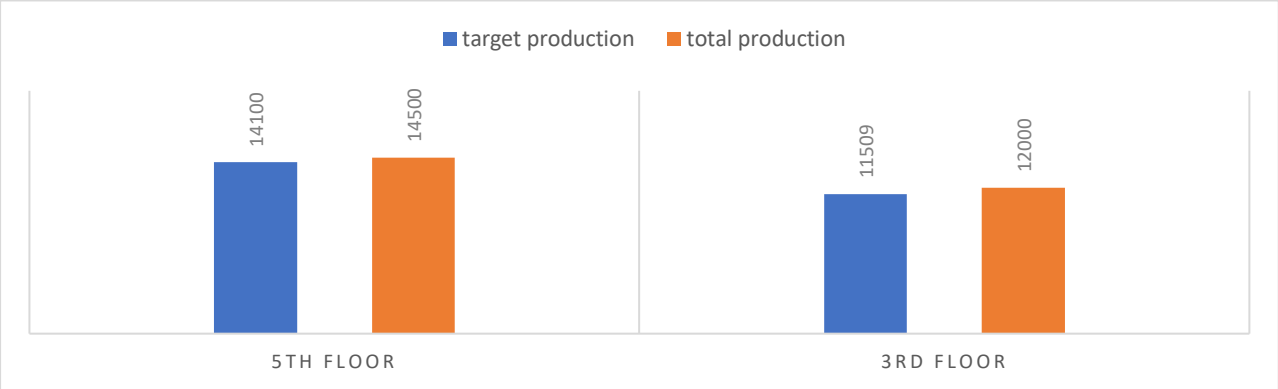
$= \frac{12000 * 6.70}{238 * 60 * 9} * 100$

= 62.55% or 63%

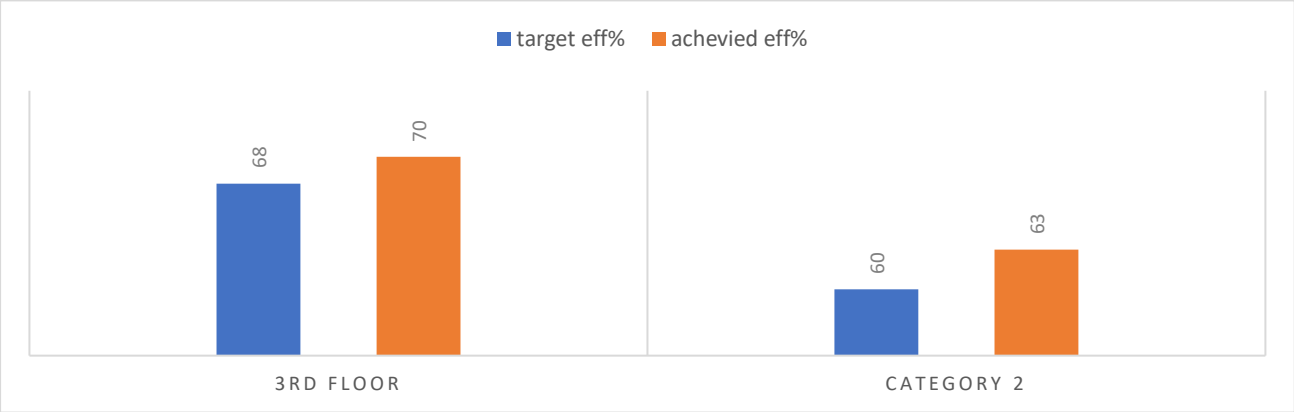
4.2.3 2nd day comparison between New 6th and Old 4th floor in Production and Efficiency:

Floor no.	Item	Target Production/Day	Total Production/Day	Target Efficiency	Achieved Efficiency
5th floor	B. top & Btm	14100	14500	68%	70%
3rd floor	B. top & Btm	11509	12000	60%	63%

4.2.4 Production graph chart:



4.2.5 Efficiency graph chart:



Remarks:

- 5th & 4th floor operator skill effs% is high so achieved production is higher than the target production.
- 5th floor & 4th floor order quantity are same.

4.3 3rd day Compare of sewing productivity and efficiency between 2nd floor between before line balancing and after line balancing-

4.3.1 Before line balancing & work sharing:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
2nd floor	Kariban	K-395	Hoody,polo	16	500	9	6750	5500	40%	33%

Target= $\frac{total\ man\ power * working\ hours * target\ efficiency\%}{SMV * 100}$

$= \frac{500 * 9 * 60 * 40}{16 * 100}$

=6750pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

$= \frac{5500 * 16}{500 * 60 * 9} * 100$

= 32.59% or 33%

4.3.2 After line balancing & work sharing:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
Old 3rd floor	Kariban	K-395	Hoody,polo	16	500	9	6750	6000	40%	36%

Target= $$\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$$

$$= \frac{500 * 9 * 60 * 40}{16 * 100}$$

=6750pcs

Achieved Efficiency = $$\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$$

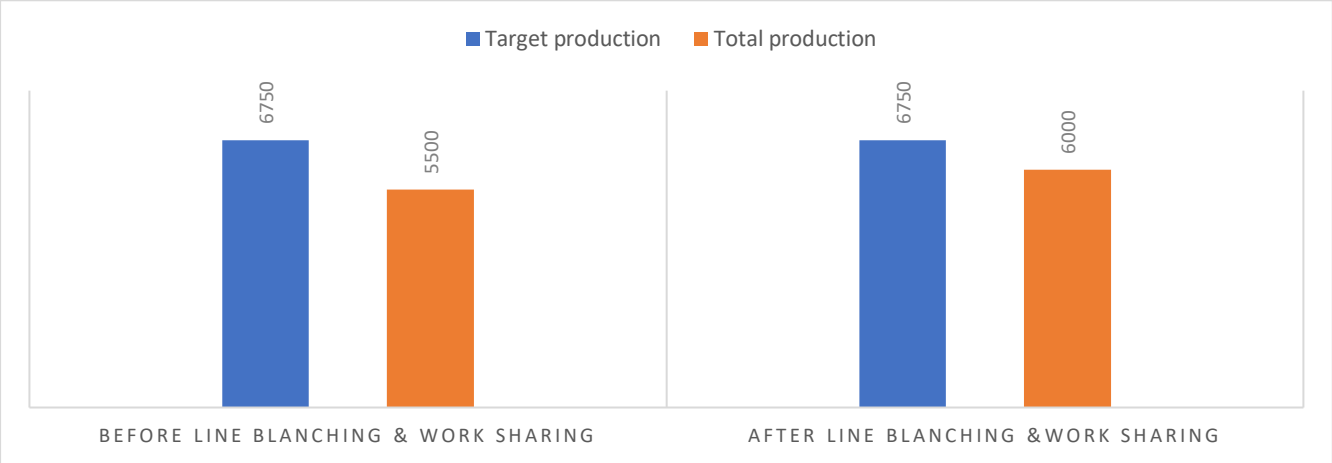
$$= \frac{6000 * 16}{500 * 60 * 9} * 100$$

= 35.55% or 36%

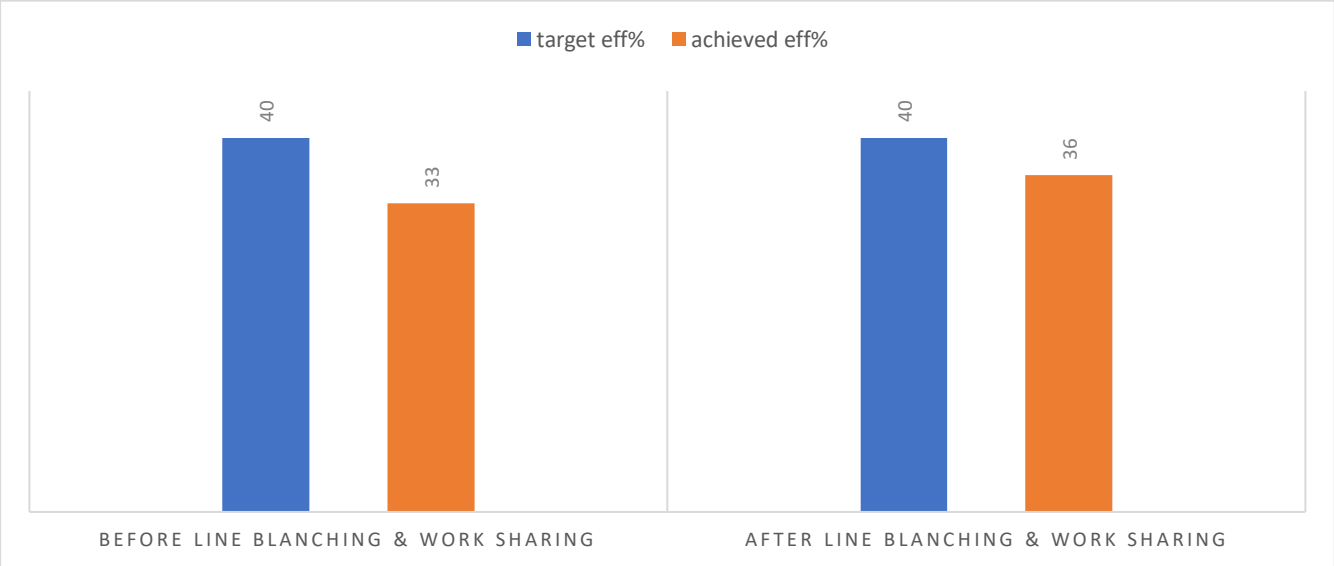
4.3.3 3rd day 2nd floor production and efficiency comparison between before and after line balancing & work sharing:

Floor no.	Process	Target Production/Day	Total Production/Day	Target Efficiency	Achieved Efficiency
2nd floor	Before line balancing & work sharing	6750	5500	40%	33%
2nd floor	After line balancing & work sharing	6750	6000	40%	36%

4.3.4 Production graph chart:



4.3.5 Efficiency graph chart:



Remarks:

- Proper line balancing.
- Work sharing.
- Find out bottleneck point

4.4. 4th day Compare of sewing productivity and efficiency between New 5th floor and 4th floor-

Table 4.4.1 Sewing production and efficiency report 5th floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
5th floor	Tesco	AG-939430	B.Top & bottom	9	360	9	14040	13000	65%	60%

Target= $$\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$$

$$= \frac{360 * 9 * 60 * 65}{9 * 100}$$

=14040pcs

Achieved Efficiency = $$\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$$

$$= \frac{13000 * 9}{360 * 60 * 9} * 100$$

= 60.18% or 60%

Table 4.4.2 Sewing production and efficiency report 4th floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
New 4th floor	M-Care	TA-890	B.Top & bottom	8	330	9	15147	13500	68%	61%

Target= $\frac{total\ man\ power * working\ hours * target\ efficiency\%}{SMV * 100}$

$= \frac{330 * 9 * 60 * 68}{8 * 100}$

=15147pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

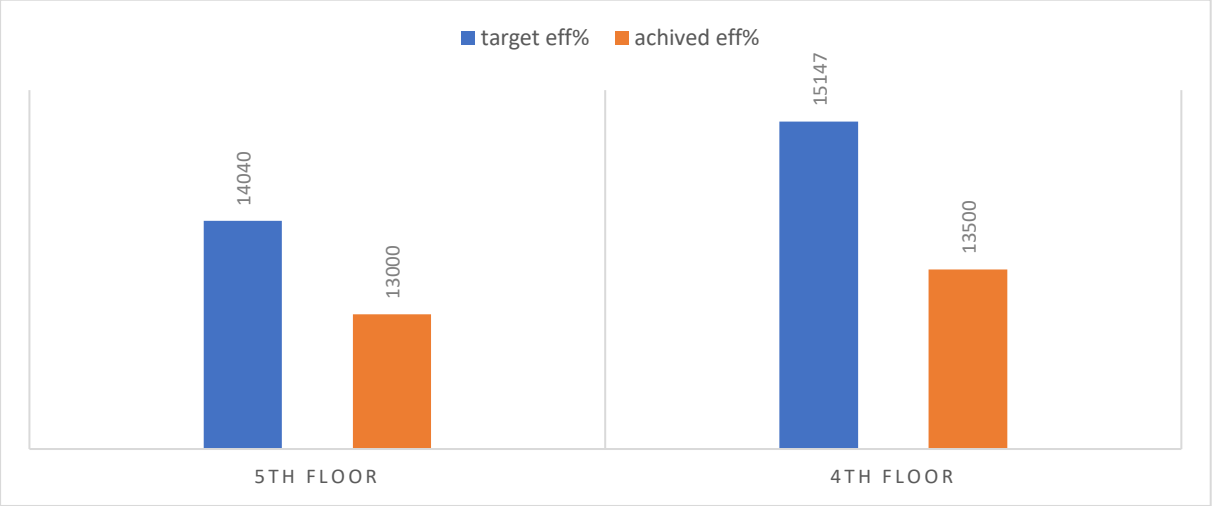
$= \frac{13500 * 8}{330 * 60 * 9} * 100$

= 60.61% or 61%

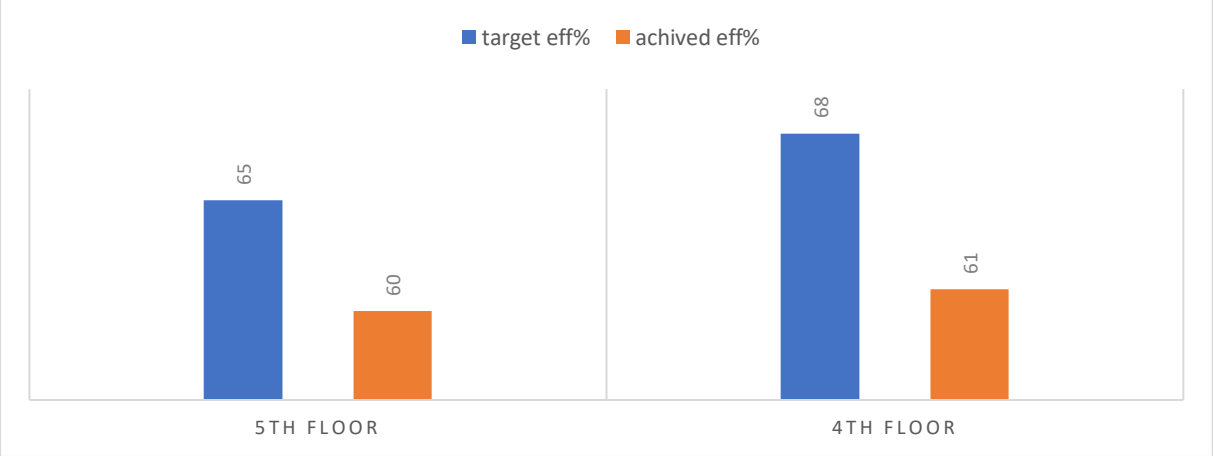
4.4.3 4th day comparison between 5th and 4th floor in Production and Efficiency:

Floor no.	Item	Target Production/Day	Total Production/Day	Target Efficiency	Achieved Efficiency
5th floor	B. top & Btm	14040	13000	65%	60%
4th floor	B. top & Btm	15147	13500	68%	61%

4.4.4 Production graph chart:



4.4.5 Efficiency graph chart:



Remarks:

- 5th floor alter percentage is less than 4th floor.
- 5th floor non-productive time is less than 4th floor.
- 5th bottle neck is less than 4th floor.

4.5 5th day Compare of sewing productivity and efficiency between 3rd floor and 4th floor-

Table 4.5.1 Sewing production and efficiency report 3rd floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
3rd floor	M&S	3109.E	Polo, Top & bottom	10	380	9	12722	11000	62%	54%

Target= $\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$

$= \frac{380 * 9 * 60 * 62}{10 * 100}$

=12722pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

$= \frac{11000 * 10}{380 * 60 * 9} * 100$

= 53.60% or 54%

Table 4.5.2 Sewing production and efficiency report 4th floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
4th floor	M-Care	TB-260	B.Top & bottom	6.50	280	9	17446	14292	75%	71%

Target= $\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$

$= \frac{280 * 9 * 60 * 75}{6.5 * 100}$

=17446pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

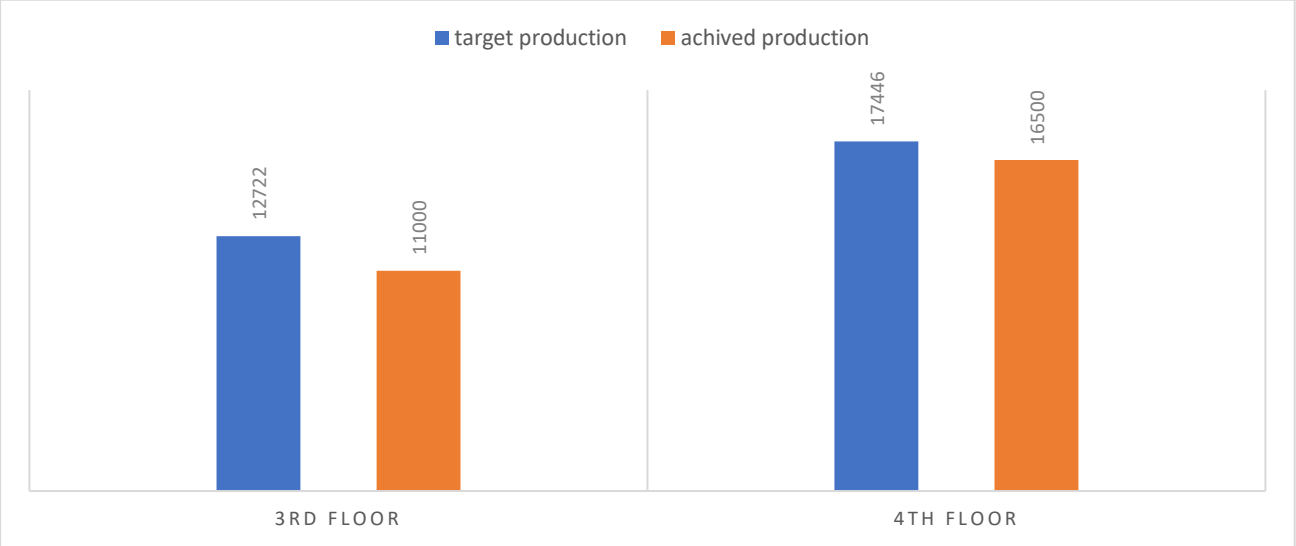
$= \frac{16500 * 10}{280 * 60 * 9} * 100$

= 70.93% or 71%

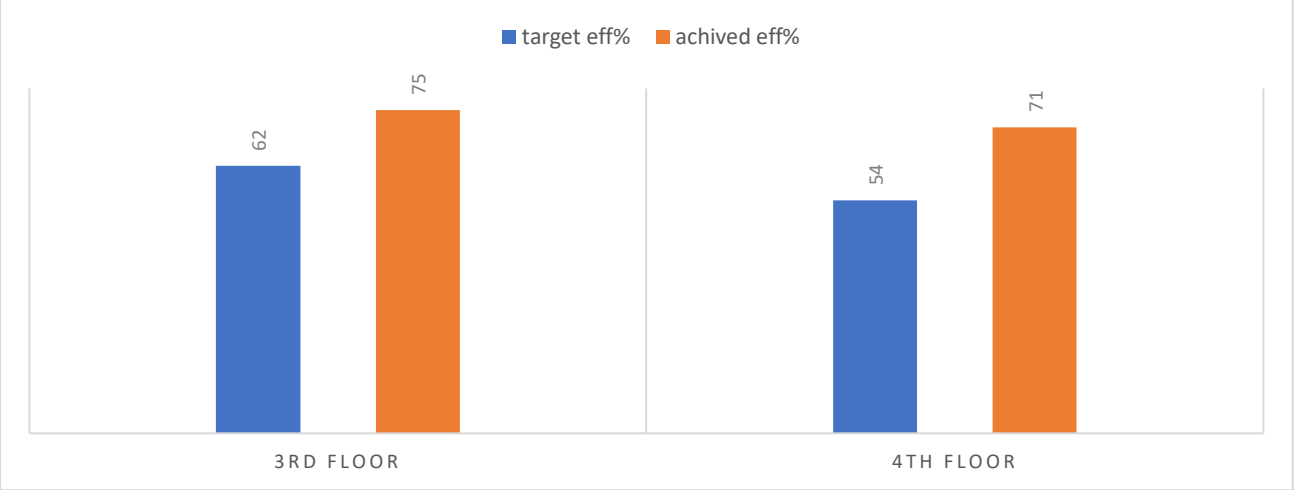
4.5.3 5th day comparison between 3rd floor and 4th floor in Production and Efficiency

Floor no.	Item	Target Production/Day	Total Production/Day	Target Efficiency	Achieved Efficiency
3rd floor	Polo, Top & bottom	12722	11000	62%	54%
4th floor	B. top & Btm	17446	16500	75%	71%

4.5.4 Production graph chart:



4.5.5 Efficiency graph chart:



Remarks:

- Over lock machine break down.
- 3rd floor Alter percentage is less than 4th floor.
- 3rd floor comparatively high skilled operator than 4th floor

4.6 6th day Compare of sewing productivity and efficiency between 4th floor, 5th floor & 3rd floor-

Table 4.6.1 Sewing production and efficiency report 4th floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
New 4th floor	M-Care	TB-156	B.Top & bottom, polo, Baby-wear	11.50	425	9	11974	10750	60%	54%

Target= $\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$

= $\frac{425 * 9 * 60 * 60}{11.50 * 100}$

=11974pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

= $\frac{10750 * 11.50}{425 * 60 * 9} * 100$

= 53.86% or 54%

Table 4.6.2 Sewing production and efficiency report 5th floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
5th floor	Tesco	KM-9264	B.Top & bottom,Polo,B. Jumpsuit	11.85	445	9	13181	12000	65%	42%

Target= $\frac{total\ man\ power * working\ hours * target\ efficiency\%}{SMV * 100}$

$= \frac{445 * 9 * 60 * 65}{11.85 * 100}$

=13181pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

$= \frac{12000 * 11.85}{445 * 60 * 9} * 100$

= 59.17% or 59%

Table 4.6.3 Sewing production and efficiency report 3rd floor:

Floor no.	Buyer Name	Style No	Item	Avg. SMV	Total Man-power	Avg. Working hrs	Target Production/Day	Total Production/Day	Target Efficiency%	Achieved Efficiency%
3rd floor	M&S	5515.P	Polo, Long sleeve T shirt,Short Pant	11.30	410	9	12735	11375	65%	58%

Target= $\frac{total\ man\ power * working\ hours * target\ effciency\%}{SMV * 100}$

$= \frac{410 * 9 * 60 * 65}{11.30 * 100}$

=12735pcs

Achieved Efficiency = $\frac{total\ production * SMV}{total\ man\ power * working\ hours} * 100$

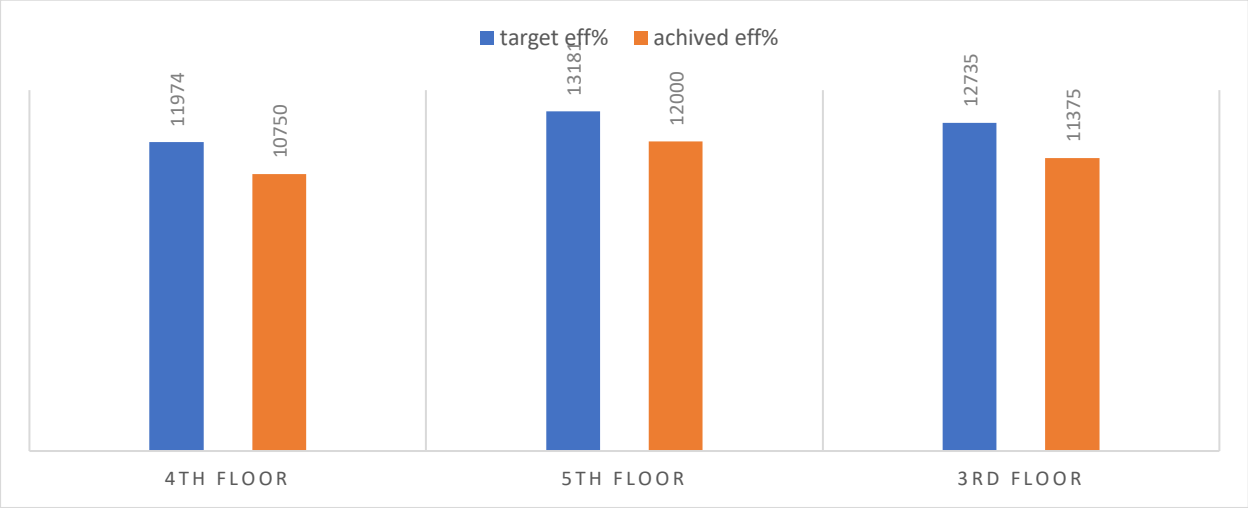
$= \frac{11375 * 11.30}{410 * 60 * 9} * 100$

= 58.05% or 58%

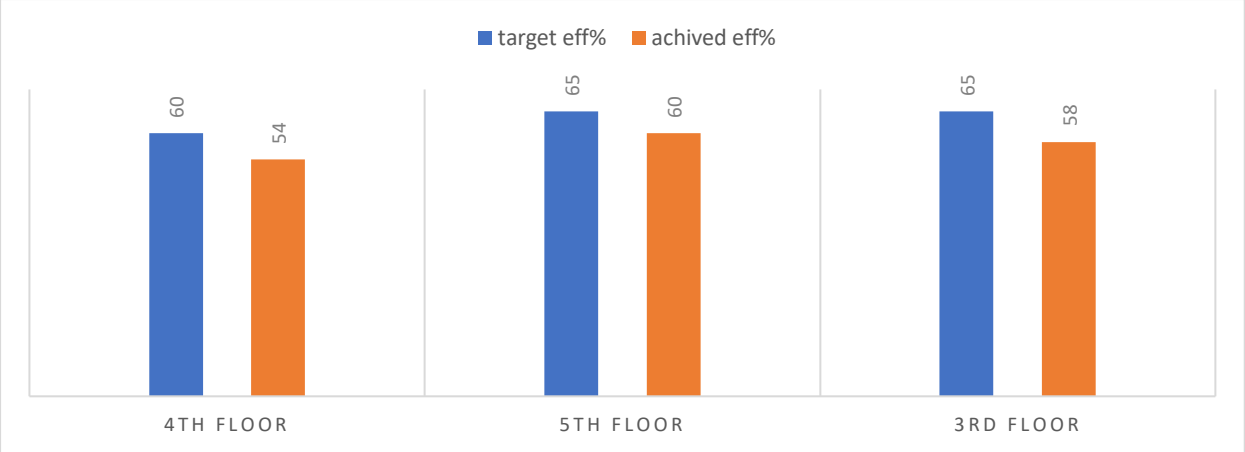
4.6.4 6th day comparison between 4th floor, 5th floor & 3rd floor in Production and Efficiency:

Floor no.	Item	Target Production/Day	Total Production/Day	Target Efficiency	Achieved Efficiency
4th floor	B.Top & bottom, polo, Baby- wear	11974	10750	60%	54%
5th floor	B.Top & bottom,Polo,B. Jumpsuit	10545	9250	65%	56%
3rd floor	Polo, Long sleeve T shirt,Short Pant	12735	11375	65%	58%

4.6.4 Production graph chart:



4.6.5 Efficiency graph chart:



Remarks:

- 3rd floor comparatively high bottle neck point than floor 4th and 5th.
- Thread Supply delay due to production loss.
- 3rd floor comparatively low skilled operator than floor 4th and 5th.
- 3rd floor some line O/L machine breakdown.
- Alter percentage and quality issue due to production loss of 3rd floor.

Chapter-5
CONCLUSION

5.1 Limitation:

- ➢ Project The work of this project was carried out in different factories. The operator sometimes didn't stay on the machine when we started studying our abilities, studying time. It hurts some of our precious time.
- ➢ First, when we collect data, the language of the operator does not match the language of the book. It was like the first time for us.

  The required information and data could not be found due to the busy schedule of the responsible persons.
- ➢ Due to the busy schedule of the responsible persons, some necessary information and data was not available.
- ➢ This study could not be applied for further orders due to time constraints and lack of permission and assistance of the director.

5.2 Conclusion:

The importance of material use by clothing users has long been recognized. Garment production is affecting the cost of SMV garments. Ingredients usually account for the largest share of the cost of a garment. By increasing productivity and efficiency a significant value of increased profits can be brought.

5.3 Future Scopes:

This methodology is very effective compared to the productivity and efficiency of sewing garments on different floors and the following formula easily find production and efficiency. We have conducted this study only for different item garments to choose top, bottom, hoodie, s-suit. If the SMV is similar then all the processes are ok but the production and efficiency will be equal. Due to line balance, short order quantity, output delay, bottle neck, layout, machine breakdown, quality problems, unproductive time issue floor production and efficiency increase and decrease. So these factors are so necessary for goal production and skill acquisition.

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