Faculty of Engineering

Department of Textile Engineering

Project On

STUDY ON INDUSTRIAL ENGINEERING

Course Title: Thesis

Course code: TE-432

Submitted By

Pallab Kumar Mallick ID: 171-23-4911

Md. Parvez Hossain ID: 171-23-4992

Supervised By

Mohammad Abdul Baset

Assistant Professor

Department of Textile Engineering Daffodil International University

The Report presented in Partial Fulfillment of the requirement for the degree of

Bachelor of Science in Textile Engineering

Advance in Apparel Manufacturing Technology

Duration Time: October 05, 2020 to February 24, 2020

LETTER OF APPROVAL

To

The Head

Department of Textile Engineering Daffodil International University

102, Shukrabad, Mirpur Road, Dhaka 1207

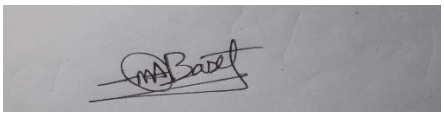
Subject: Approval of Thesis Report of B.Sc. in TE Program

Dear Sir,

We just write to let you know that the student is carrying the title of this project report titled Industrial Engineering Review. For final assessment**, Pallab Kumar Mallick, ID: 171-23-4911& Md. Parvez Hossain, ID: 171-23-992** are done. The entire thesis is prepared on the basis of an accurate investigation and an interference by crucial evaluating analytical findings with necessary elements, the student has been active in its project activities personally and the report is important to provide the readers with many useful details.

It is also welcomed if you accept this thesis paper and take it into account in the final assessment.

Yours Sincerely



……..

Mohammad Abdul Baset

Assistant Professor

Department of Textile Engineering

Daffodil International University

DECLARATION

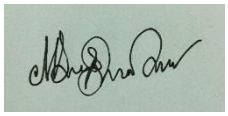
Hereby We state that, under the guidance of Mohammad Abdul Baset (Assistant Professor), Faculty of Technology, Department of Textile Engineering, Daffodil International University, we have done this industrial connection. We also state that, except where the necessary reference was made in the document, no such industrial attachment and no portion of such industrial attachment was presented elsewhere for graduation or certification.

Submitted By:

……

Name: Pallab Kumar Mallick ID:

171-23-4911



……

Name: Md. Parvez Hossain

ID: 171-23-4992

Department of Textile Engineering

Daffodil International University

DEDICATION

We would like to thank Allah above all, all-powerful. By the grace of God, our research paper is finished successfully. We would like to thanks **Mohammad Abdul Baset, Department of Textile Engineering, Daffodil International University** and his greatest contribution to our progress. Our father in particular, whose hard exhaustion aids in this situation. Frankly, my friends, cousins or kin, we want to tell to anyone who owes the loyalty.

ACKNOWLEDGEMENT

As for profession thesis is the first step of a student, especially on technical side. It's a part of study through practically running processing technology of an industrial unit for a student.

First of all, our gratefulness goes to almighty Allah who gave us strength and ability to complete the industrial training and attachment report; may your name be exalted, honored and glorified.

Now we wish to take this excellent opportunity to thank our honorable principal **Mr. Md. Mominur Rahman,** who permitted us to do an internship at a reputed company like ALIM KNIT and **Mohammad Abdul Baset,** our supervising teacher, to whom we are extremely indebted for his tremendous support and guidance throughout our training period.

Finally, we would like to thank the management of **ALIM KNIT (BD) LTD.** for giving us the opportunity to do the industrial training successfully and also their valuable suggestions. My deepest appreciation goes to **Rubel Mallik (Assistant Manager-HRD), ALIM KNIT (BD) LTD** for his permission to conduct our industrial training without which it would be uncompleted. His generous support is greatly appreciated. We would also like to thanks **AKL** for helping us to complete industrial training successfully. My gratitude also goes to all the employees of **AKL** specially **Mazharul Islam Maiful** (Manager, Merchandising), **Yasser Arafat Sojol** (Merchandiser**), Abdullah Al Mamun** (Manager, Sample**)** for their sincere co-operation, support and valuable advices.

Last but not least, go to my precious family for their never-ending love and inspire at every stages of my life. Without their continuous contribution, I would not be a person I am right now.

After all, we would like to acknowledge that we remain responsible for the in-adequacies and errors, which doubtless remain in the following report.

ABSTRACT

Textile education can't be completed without thesis paper. Because this industrial training minimizes the gap between theoretical and practical knowledge and make us accustomed to industrial environment.

We are lucky to get an opportunity to complete two-months long industrial training at **ALIM KNIT (BD) LTD.** a sister concern of **Mondol Group**, which is a 100% export-oriented composite Knit Dyeing Industry. It has well planned & equipped fabric dyeing-finishing and garments units in addition to facilitate knitting and knitwear manufacturing industry.

Firstly, I studied on the overall status of the industry. Learning about their well-organized manpower management and administrative system was the next task. I had started our technical works by the study on sourcing and manufacturing of Raw Materials and Storage and Inventory Control System of the industry.

We tried to concentrate more on those section by taking consideration of major technical parameters, according to the instructions of supervising professor. Floor planning, machine performance & controlling points, manufacturing methods and operation process, mechanism of working, evaluation and decision making, problem solving and analyzing these were the vital task. I had an opportunity to work in Fabric Dyeing and Finishing section of the industry.

Beside this we had training experience in the Sample section, cutting section, sewing section, knitting section, printing section, Dyeing section, R&D and Merchandising Section of the industry. We had only a short visit in the Utility & Maintenance sections too.

We have gained some idea about man, machine maintenance and raw materials selection for individual materials, Organogram of industry and the responsibility of several post.

This report will try to reflect the overall basic technical concept about the manufacturing chain of **ALIM KNIT (BD) LTD.** Some technical data, concepts and parameters will enrich the overall expression of this report.

Contents

List of Figure:

List of Table:

CHAPTER - 1: INTRODUCTION

1.1 Introduction:

The garment manufacturing industry faces many global challenges due to various factors including competition, increased production costs, less productivity/efficiency and labor attribution.

1.2 Nature of the work in IE:

Industrial engineers decide the most efficient ways in which a company may manufacture or handle a product or create a service using the simple manufacturing elements - humans, machine, resources, knowledge and energy. They are the link between management priorities and organizational achievement. Industrial engineers ensure potential for production and how to manufacture on schedule, cost savings, SMV reporting etc.

1.3 Objective of the project:

1. Improving efficiency.
2. Motion reduction enhancement of the operation.
3. Remove bottlenecks and reduce process function (WIP).
4. Improving operating quality.
5. Reduce the ratio of computer.
6. Improved mechanism for cost savings, waste management and refuse Minimize waste and defects.
7. Complete the goal for the Main Predictor of Success (KPI).

1.4 Daily Activities and Duties of an Industrial Engineer in the Apparel Industry:

1. collect loading plans from the Department of Planning.
2. Pre-production conference (PP) Membership.
3. Collect the specimen size and establish a related operations bulletin.
4. Collect and layout the Activity Bulletin.
5. Discuss computer, folder, connection and technical staff maintenance problems for inchange maintenance.
6. Discuss the architecture by paper layout with a responsible floor.
7. Check Regular Non-productive time (NPT) and cut down the downtime of computers.
8. Make template based on the style of the paper.
9. Make line balance for 2-3 days of layout by goal and capability analysis.
10. Search and overcome the bottleneck process.
11. If possible, do a needed 1-hour production analysis.
12. Monitoring of daily input and output.
13. Offer daily goals for production and track production output.
14. Every hour follow-up production.
15. Monitoring behaviors related to 5S daily

1.5 Importance of the project:

A mix of different papers, documents and calculations regarding our basic education & practical life.

- The clothing and garment industry earn around (80-85) percent of big foreign currencies
- The textiles and their subsectors are employed in vast numbers by industrial engineers.
- Bangladesh is now a developing nation with mostly foreign exchange dependency.

1.5 Scope of the project:

- Wonderful chances to do something in the IE textile business department.
- One day IE requested supply to increase.

- Virtually all RMG factory and recognize IE's output growth position.
- Writers of RMG industries will satisfy the existing requirement for the IE segment to increase their yields.

CHAPTER – 2: LITERATURE REVIEW

2.0 Definition:

Industrial Engineering is an engineering sector related to the optimization of dynamic structures or methods. There is no question about the creation, enhancement and execution of included

personnel systems, money, knowledge, understand exactly, power and assessment of the theories and constructs of engineering design, in addition to mathematical, body and social science, that it expects and assesses the results from certain structural styles.

2.1 Concept of IE:

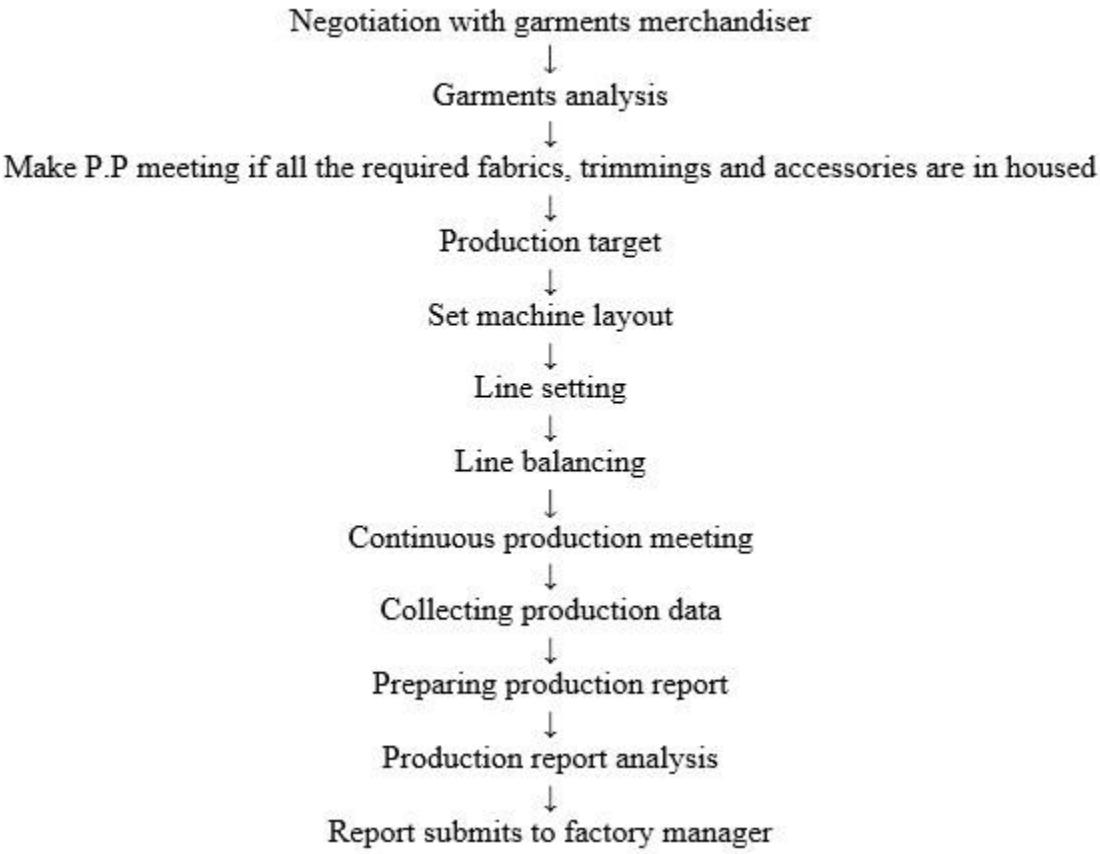
The commercial manufacturing approach desires intensive manufacturing but at the same time, it is necessary to combine certain factors: people, time, machinery and manufacturing area, company and fabrics in a coordinated and productive system. The technical gadget for the manufacture of garments should enable anticipated product quality, critical production distance, the transportation of prepared clothes within the time period foreseen and the most use with minimum fees of ability.

2.1.1 Objects of IE:

- Build strategies for continuous improvement and manufacturing costs management.
- Developing cost-cutting programmers.

2.1.2 Process Flow Chart of IE:

Process Flow Chart of Industrial Engineering (IE):



2.1.3 Functions of IE:

- To develop the right form of painting and to arrange a fun way of painting. Organizing the criteria for success according to common techniques.
- Designing sound salaries and benefits.
- Designing discount and charge systems to exploit and create a trendy costing scheme.

2.1.4 Activities of IE:

- Method selection and strategy assembly.
- System of cost management.
- Task appraisal device implementation and installation.
- Study on surgery.
- Study in algebra and statistics.
- Assessment of results.
- Processes and structure.

- Selection and appraisal of vendors

2.1.5 Role of Industrial Engineer in Garment Industry:

1. Protection.
2. Balancing of the rows
3. Perfect – manipulates process
4. training – training of new workers
5. Operator productivity – retains surplus efficiency and increases the capacities of low performance individuals.
6. Manipulating Loss – mitigating off-general loss
7. Waste management - in products, materials and facilities
8. Normal terminology – in the office, in the sewing process, inside the machines

As a leader, it can be a great model for everyone to demonstrate leadership. Each manager represents the organization, and all of its movements are an extension of the company

- Maintenance
- Towards jobs of excellence
- Towards efficiency

2.1.6 Techniques of IE:

Method Study:

To determine the existing mode of operation or process after an in-depth review of the works and install the production facility architecture in order to provide a standardized fabric waft without further supervision.

Time Study (work measurement):

This is a way to set up a trendy time for an operation or a way.

Motion Economy:

In this scenario, the gestures employed by the operators were evaluated. In mass processing or a short cycle repeated operation, criteria for economic movement machine and movement analyzes are very useful.

Financial and non-financial Incentives:

This tend to boost the efforts of the people by ensuring rational compensation.

Job Evaluation:

This is a means of assessing the relative good performance of the agency's workers through balancing jobs and staff and obtaining a sound pay cover.

Materials Handling Analysis:

To study the flow of material handling substances scientifically. to eradicate wasteful movements through different divisions in order to decorate the overall material efficiency.

Ergonomics (Human Engineering):

The analysis of the relationship between man and his running conditions decreases mental and body strain is very much involved. The man-gadget computer is involved.

2.2 Line Blancing:

Line Balance equalizes the operating load across all cellular or value movements in order to eliminate bottlenecks and surplus power. A limitation slows down the mechanism and occurs if the downstream operations are detected and extra power consequences are ready and continuous pricing absorbed.

2.2.1 Objectivies of Line Balancing:

In any case, wastes are deleted at any price in compliance with the output fee at any point.

- Continuous content movement.
- Man power and system capability full uses.
- Minimum duration of operation.
- Reduce slow time.
- The workstation is minimized.
- At the desired moment, optimum performance.
- Value clothes repair.
- Lower the cost of production.

2.2.2 Important of Line Blancing:

1. It also helps to assess the need for jobs.
2. Strong mix decreases the time of output.
3. By proper line balance, the benefit of a plant can be assured.
4. Adequate line balance assured maximum output at the negotiated quality.
5. The final product eliminates errors.

2.2.3 Efficiency:

Efficiency, while assessing success is especially useful and broad, is another means of communicating efficiency. Overall success statistics teach us how we reach a statistically established objective. As the target is articulated as an acceptable period or manufacturing degree, the result is measured quite cleanly.

The system for calculating performance regions fellow: efficiency % =

performance % = overall minutes produced × 100

Toral house labored × 60

Produced amount × one hundred production goal amounts

2.2.4 Cycle Checks:

A loop is a fast period to search for a target instantly, or to check whether an operator can or can not now hit an up-to-date moment.

The cycle time is the time the operator requires to perform the procedure in one cycle, i.e. the time between the collection and disposal.

Conduct a cycle test in compliance with the following steps:

• Choose the research operation/s and enter the best shape detail.

• Watch 5 activity periods, nothing time for each competition cycle.

• Measure each operation's total cycle time.

• Measure cycle time at the initial time given.

2.3 Standard Minute Value (SMV):

SMV is defined as the amount of time that can be successfully completed. Typically, the minute value is expressed. The total production of SMV is the normal value of minutes. The term SMV is commonly applied in the industrial field of clothes. The regular minute is also identified as the SMV (SAM). A trader wants to mount a proper SMV in the production floor of garments for regular and efficient dispatch of an export order.

2.3.1 Factors of Standard Minute Value in Garments:

- Types of garments.
- Types of fabrics.
- Garments size.
- Garment design.

2.3.2 SMV Calculation in Garments Industry:

The measurement of SMV within the company varies in accordance with the broad shape of nonlife-life, type of cloth, large number of staff, average performance of gadgets, etc.

SMV = quick time + Allowance

Where primary time = set time ×100 points

Allowance = rest allowance + quota permit + deferred allowance unit. Score = the speed or speed of the operator at which the obstacle is reached.

2.3.3 Bottleneck:

A bottleneck is a phenomenon where, with a single or restricted type of resources or resources the overall output or capacity of the entire system is constrained.

2.3.4 Bottleneck in the Production Line:

In the production line, the bottom processing element is a bottleneck. This is the bottleneck region of which output and delivery are capable.

2.3.5 Aries of Bottleneck:

In the production line there's so many explanations why a bottleneck occurs and is below mentioned

A. Until input in rows, bottleneck:

- Building incorrect.
- Fake question of production.
- Wait if the problem arises.
- Fault with the serial number.
- Model issue. B. Line bottleneck:

- Failure to produce.
- Non-equilibrium factor distribution.
- Absences of staff.
- Riots / out of control in the machine.

2.3.6 Way of Reduce Bottleneck:

- Finding the best candidates to work correctly.
- Hold the serial code.
- Don't forward refusing clothes.
- Sewing blast elimination.
- By strengthening the process.
- Supply after review should be forwarded.

2.4 Pitch Time:

Pitch-time is a ratio of a large SMV of apparel and a kind of mode-specific process in market engineering.

Period of pitch = SMV clothing Operations

No.

Pitch time is often used to position the line and to measure the street production intention. Score: Score:

In time, an evaluation is critical to the definition of the score (called in the US the grading). A sanctioned time checker separates an amateur from his ability to accurately price.

The average is the economic engineer's gadget used to examine the operator's real total production average and his high-level concept of the normal overall performance.

2.5 Work Study:

Jobs sports are conducted by the economic engineering sector in the garment and clothing industry. Pictures are certainly used to measure paintings. without a doubt. The sector is responsible for the work carried out in the garment business. Job is the most effective instrument for manufacture tracking and productivity enhancement. A new idea in the garment and garb industry is miles away. In the following way, we can describe job views.

2.5.1 Purpose of Work Study:

The targets or priorities of the work study are generally:

1. Set up the easiest way to do the job.
2. Set the time expected for a role at a certain success level. 3. Boost efficiency and productivity 4. Easier to work.
5. Set up equal assignments for everyone.

2.5.2 Importance of Work Study:

1. Job study is a way to improve the productivity of the company by removing duplication and activities that are redundant.
2. It is the strategy to classify non-value add-ons by analyzing all the variables impacting jobs.

2.5.3 Role of Work Study:

Six potential lines of action on issues of competitiveness can be listed as follows:

1. Boost fundamental science and production methods.
2. Improving existing procedures and improving plant and machinery provision.
3. Simplify, reducing and standardizing the product range.
4. Enhance career preparation and workforce use.
5. Enhance current plant operating procedures.
6. Increase the productivity of all workers.

2.5.4 Objectives of Work:

- Efficiency enhancement.
- Improved consistency of the items.
- Choose the fastest means of completing a mission.
- Boost the method of operating.
- Technicians and staff had less fatigue.
- Successful labor review.

2.6 Method Study:

Methods of research are a computer for systemic documentation and consideration of talents and proposed creative techniques to create and use less complicated and equally effective techniques. The reduction of the fees is commonly applied. Take a glance at it then very important for improved performance inside the apparel and textile industry technology. It is one of the essential to the growth of productivity. The technological skills observed within the manufacturing and textile sector are completed by the product of the industry.

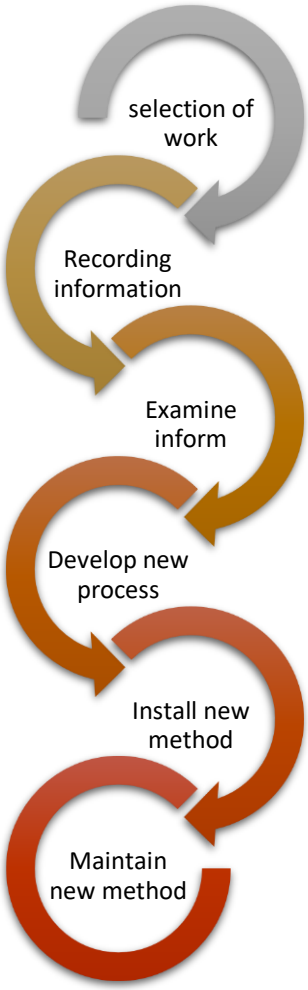
2.6.1 The Major aims of Method Study:

- Improved farm and construction architecture.
- Less tiredness or labor by preventing needless labor movements.
- Improved working practices and working/employee climate.
- Increased use of materials, machinery and workers and currency.

- Great standard.
- Quick and reliable machinery for handling items.
- Standardize, streamline, automate, and specification instructions.
- Successful segment preparation.
- Job processes are streamlined.

- Greater wages.
- Improve farm and office architecture.
- Superior safety and health practices.
- Optimize the workflow.
- Effective storage of products.
- Process and process quality.
- Maximize the correct use of capital.
- Optimum efficiency.
- Optimize management.
- Dismissal of pollution.

2.6.2 Steps of Method Study:



2.7 Time Study:

Time observation is a small-scale technique for the time of a big unique challenge, or for detailing a process that is carried out in goal scenarios and review of the details so that an operator can obtain the time to keep it at a described success point.

2.7.1 Steps of Making Time Study:

1. Standard process research. Study.
2. Document organizational and environmental requirements for the research at the moment, which may influence the way the work is performed and thus the time taken to do it.
3. Record a full overview of the work underway and break down the project or operation into independently defined time components.
4. Sample size assessment.

2.7.2 Notes of Time Study:

- Be warm and welcoming, just don't speak to the operator excessively.
- Don't be in a less awkward position, such as on the hand or in the back of the operator.
- None of the time research sits down.
- Measure the effects of the period study at the conclusion of the date set.

2.7.3 Operator Performance:

Basically, the operator performance can be monitored with the help of three efficiency factors.

1. Single cycle efficiency.
2. On-standard efficiency.
3. Global efficiency.

2.7.4 Off-standard Time:

The time an operator spends on his job in an unproductive situation. Off-standard varieties,

- Breakdown of the unit.
- Time to wait. • • Issues of consistency.
- Don't eat.
- Family-friendly jobs.
- Training.

2.8 Capacity Study:

The provider is only as big as its power for kilometers. The operator may perform the general output assessment with the help of an inspection by the technique. The key purpose of the functionality analysis is to create quotas, to encourage and calculate the output segment capacity of both the operator. The manager will determine the top reasons of his stage by calculating the operator's ability. It's the amount of the functionality of the person.

2.8.1 Calculation Method of Sewing line Capacity in Apparel Industry:

An industrial engineer required the following details to measure the sewing lines of a textile factory capability

- No. on the line of sewing machines.
- The amount of the worker missing from the rows.
- Factory's daily operating hours.
- The factory's line performance.
- Normal permitted (SAM) minutes for the manufacturing component.

2.9 Allowance:

It is important to make a number one positive allowance faster than the desired time for interest will be achieved.

It was because the paintings have an eye on the engineer that the efficiency paintings of the operator were regarded at first-rate and the period of rest, which may be needed to use the operating system to encourage the operator to surpass its force, has not now taken into account the time that it intends to allow hobby to fulfill personal needs.

Chapter-3: Experimental Details

3.0 EXPERIMENTAL DETAILS:

We collected this operation breakdown & format sheet from Alim Knit BD. Ltd. The accumulated date fourth October 2020. We finished a record by way of following steps like format have a look at, capacity, SMV, production target, etc.

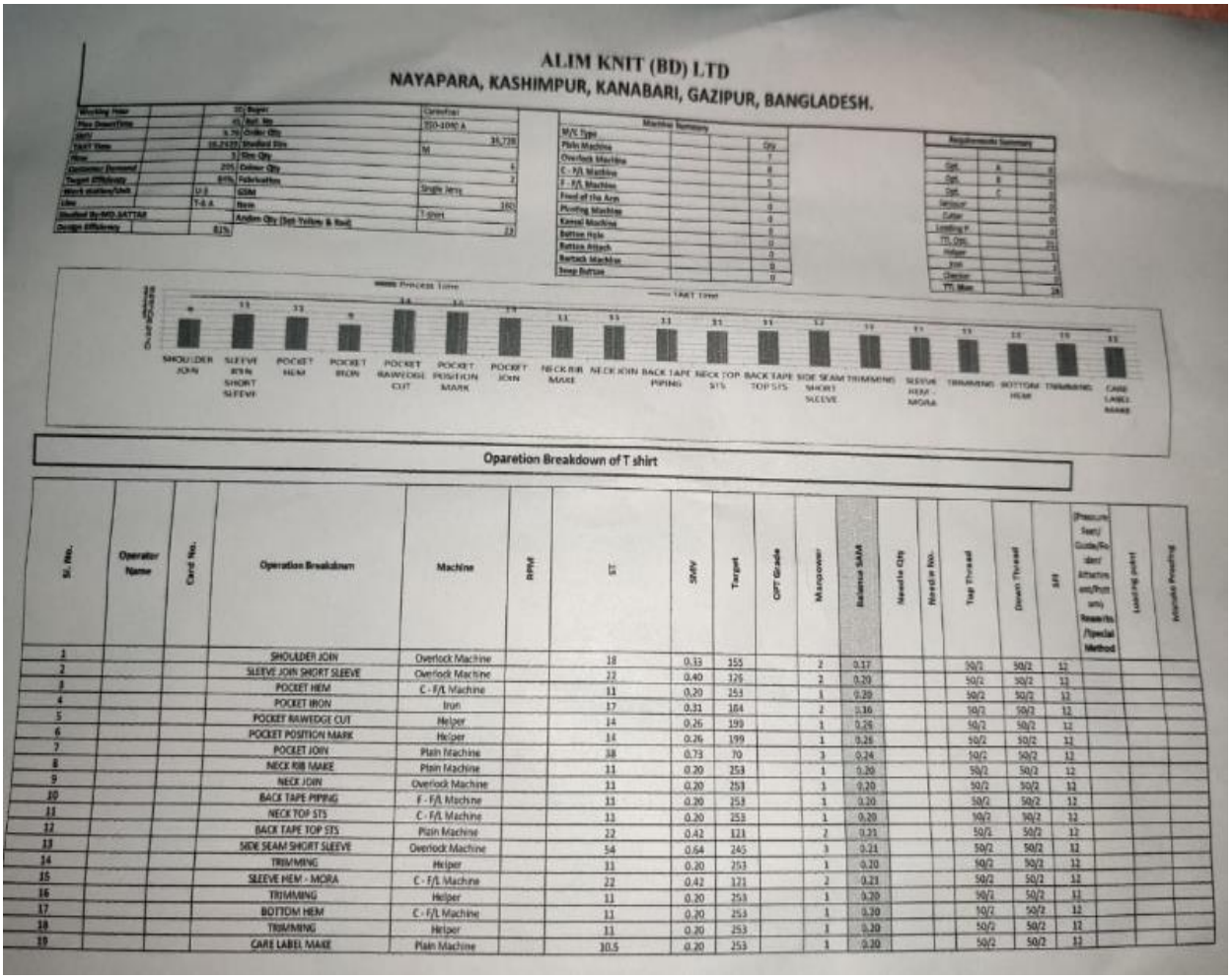
3.1 Operation Breakdown of Basic T shirt:

Alim Knit Bd Ltd.

Buyer: Carrefour

Ref No.: 350-1040A

Item: T- shirt



ALIM KNIT (BD) LTD

NAYAPARA, KASHIMPUR, KANABARI, GAZIPUR, BANGLADESH.

Oparetion Breakdown of T shirt

Sl. No.	Operator Name	Card No.	Operation Breakdown	Machine	RPM	ST	SMV	Target	OPT Grade	Manpower	Balance SAM	Needle Qty	Needle No.	Top Thread	Down Thread	SPI	[Pressure Feet/ Guide/Binder/ Attachment/Presser etc] Remarks /Special Method	Looping point	Machine Pitching
1			SHOULDER JOIN	Overlock Machine		18	0.33	155		2	0.17			50/2	50/2	12			
2			SLEEVE JOIN SHORT SLEEVE	Overlock Machine		22	0.40	126		2	0.20			50/2	50/2	12			
3			POCKET HEM	C - F/L Machine		11	0.20	253		1	0.20			50/2	50/2	12			
4			POCKET IRON	Iron		17	0.31	164		2	0.16			50/2	50/2	12			
5			POCKET RAWEDGE CUT	Helper		14	0.26	199		1	0.26			50/2	50/2	12			
6			POCKET POSITION MARK	Helper		14	0.26	199		1	0.26			50/2	50/2	12			
7			POCKET JOIN	Plain Machine		38	0.73	70		3	0.24			50/2	50/2	12			
8			NECK RIB MAKE	Plain Machine		11	0.20	253		1	0.20			50/2	50/2	12			
9			NECK JOIN	Overlock Machine		11	0.20	253		1	0.20			50/2	50/2	12			
10			BACK TAPE PIPING	F - F/L Machine		11	0.20	253		1	0.20			50/2	50/2	12			
11			NECK TOP STS	C - F/L Machine		11	0.20	253		1	0.20			50/2	50/2	12			
12			BACK TAPE TOP STS	Plain Machine		22	0.42	121		2	0.21			50/2	50/2	12			
13			SIDE SEAM SHORT SLEEVE	Overlock Machine		54	0.64	245		3	0.21			50/2	50/2	12			
14			TRIMMING	Helper		11	0.20	253		1	0.20			50/2	50/2	12			
15			SLEEVE HEM - MORA	C - F/L Machine		22	0.42	121		2	0.21			50/2	50/2	12			
16			TRIMMING	Helper		11	0.20	253		1	0.20			50/2	50/2	12			
17			BOTTOM HEM	C - F/L Machine		11	0.20	253		1	0.20			50/2	50/2	12			
18			TRIMMING	Helper		11	0.20	253		1	0.20			50/2	50/2	12			
19			CARE LABEL MAKE	Plain Machine		10.5	0.20	253		1	0.20			50/2	50/2	12			

3.1.1 Operation Breakdown of T-Shirt:

Operation Breakdown	Machine	ST	SMV	Target	OPT Grade	Manpower	Top Thread
SHOULDER JOIN	Overlock Machine	18	0.33	155		2	50/2
SLEEVE JOIN SHORT SLEEVE	Overlock Machine	23	0.42	121		2	50/2
NECK RIB MAKE	Plain Machine	11	0.21	242		1	50/2
NECK RIB JOIN	Overlock Machine	13	0.23	223		1	50/2

BACK TAPE PIPING	F - F/L Machine	11	0.21	242		1	50/2
NECK TOP STITCH	C - F/L Machine	11	0.21	242		1	50/2
BACK TAPE TOP STITCH	Plain Machine	22	0.42	121		2	50/2
SIDE SEAM SHORT SLEEVE	Overlock Machine	54	0.94	245		3	50/2
TRIMMING	Helper	11	0.20	253		1	
BODY REVERSE	Helper	11	0.20	253		1	
SLEEVE HEM	C - F/L Machine	22	0.42	121		2	50/2
TRIMMING	Helper	13	0.24	214		1	
BOTTOM HEM	C - F/L Machine	11	0.21	242		1	50/2
TRIMMING	Helper	11	0.20	253		1	
CARE LABEL MAKE	Plain Machine	12	0.23	222		1	50/2

Table: 3. 1 Operation Breakdown of T-Shirt

3.1.2 Requirement of operators:

Requirements Summary		
Opt.	A	0
Opt.	B	0
Opt.	C	0
Scissor		0
Cutter		0

Loading P.	0
TTL Opt.	21
Helper	5
Iron	2
Checker	0
TTL Man	28

Table: 3. 1 Requirement of operators

3.1.3 Requirement of machine:

Machine Summary	
M/C Type	**Qty**
Plain Machine	7
Overlock Machine	8
C - F/L Machine	5
F - F/L Machine	1
Feed of the Arm	0
Picoting Machine	0
Kansai Machine	0
Button Hole	0
Button Attach	0
Bar tack Machine	0
Snap Button	0

Table: 3. 2 Requirement of machine

3.1.4 Calculation:

Here,

Allowance is =15%

Total no. of Operator = 28

SMV calculation

SMV= Basic time+ Allowance of basic time

Basic Time = (Observe time x Observe rating %) /Standard rating

Observe time = Cycle time /No. of cycle

SMV Calculation for Side Seam for short sleeve T shirt Observed

Time=Cycle Time/No of Cycle

= (54+55+55+56+54)/5

=274/5

=54.8

Basic Time== (Observe time x Observe rating %) /Standard rating%

= (54.8x90%)/100%

=49.32

=49.32 +15 %(Allowance)/60

=0.94

Other operation SMV can be calculated same way

Basic Pitch time calculation

Basic Pitch time=Total Garments SMV/ NO of Operation

Total Garments SMV=5.79

NO of Operation=15

Basic Pitch time=0.386 minute

Capacity Calculation

Capacity = 3300 /Operation time

=3300/54.8

=60

Efficiency Calculation

Efficiency = [(Production output x SMV) / (60 x Manpower x working hour)] x100

= [(79 x 5.79)/ (60 x 28 x 1)] x 100

= 84 %

- Working Hour = 10
- Plan Downtime = 45
- SMV = 5.79
- Flow = 5
- Target Efficiency = 84%

3.2 Operation Breakdown of Long Pant:

Buyer: Carrefour

Ref no.: 350-1032 Item:

Long Pant.

Alim Knit Bd. Ltd.

3.2.1 Operation Breakdown of Long Pant:

Operation Breakdown	Machine	RPM	ST	SMV	Target	OPT Grade	Manpower	Balance SAM	Needle Qty	Needle No.	Top Thread
BACK RISE	Overlock Machine		15	0.28	185	B	1	0.23			50/2

BACK RISE TOP STS & ONE STICKER REMOVE	C - F/L Machine		15	0.29	177	B	1	0.29			50/2
FRONT RISE	Overlock Machine		15	0.28	185	B	1	0.28			50/2
FRONT RISE TOP STS & ONE STICKER REMOVE	C - F/L Machine		16	0.31	166	B	1	0.31			50/2
FLY POSITION MARK	Helper		15	0.28	185		1	0.28			
FLY TOP STS	C - F/L Machine		14	0.27	190	B	1	0.27			50/2
FLY BOX & TOP STS SCECURITY TUCK	Plain Machine		20	0.38	133	A	2	0.19			50/2
SIDE SEAM LONG PANT	Overlock Machine		50	0.92	56	A	4	0.23			50/2
INSEAM LONG PANT	Overlock Machine		42	0.77	66	A	3	0.26			50/2
CROTCH POINT TUCK & BODY ARRANGE	Plain Machine		12	0.23	222	A	1	0.23			50/2
ELASTIC CUT & MARK	Helper		12	0.22	232	B	1	0.22			50/2
ELASTIC TUCK	Plain Machine		12	0.23	222	B	1	0.23			50/2
ELASTIC JOIN WITH BODY	Overlock Machine		22	0.40	126	A	2	0.20			50/2
STICKER REMOVE & BODY REVERSE	Helper		12	0.22	232		1	0.22			

BODY HOLE	Button Hole		18	0.32	159	B	2	0.16			50/2
ELASTIC FOLD TUCK WITH BELT	Plain Machine		23	0.44	116	A	2	0.22			50/2
BELT TOP STITCH	Kansai Machine		14	0.28	182	A	1	0.28			50/2
TRIMMING	Helper		12	0.22	232		1	0.22			
LEG HEM	C - F/L Machine		22	0.42	121	A	2	0.21			50/2
TRIMMING	Helper		12	0.22	232		2	0.11			
LABEL JOIN (PATCH LABEL)	Plain Machine		15	0.29	177	A	1	0.29			50/2
DOSTING MAKE - F/L & CUT	F - F/L Machine		12	0.23	222		1	0.23			
DOSTING INSART	Helper		22	0.40	126		2	0.20			
DOSTING MIDDLE TUCK	Plain Machine		15	0.29	177	A	1	0.29			50/2
DOSTING MOUTH TUCK	Plain Machine		20	0.38	133	A	2	0.19			50/2
CARE LABEL MAKE	Plain Machine		13	0.25	205	C	1	0.25			50/2
BODY MATCH	Helper		15	0.28	185		1	0.28			50/2

Table: 3. 3 Operation Breakdown of Long Pant

3.2.2 Requirement of operators:

Requirements Summary		
Opt.	A	21
Opt.	B	9
Opt.	C	1
Scissor		0
Cutter		0
Loading P.		0
TTL Opt.		31
Helper		9
Iron		0
Checker		0
TTL Man		**40**

Table: 3. 4 Requirement of operators

3.2.3 Requirement of Machines:

Machine Summary	
M/C Type	**Qty**
Plain Machine	11
Overlock Machine	11
C - F/L Machine	5
F - F/L Machine	1
Feed of the Arm	0
Picoting Machine	0
Kansai Machine	1
Button Hole	2
Button Attach	0

Table: 3. 5 Requirement of operators

3.2.4 Calculation:

Here,

Allowance is =15%

Total no of Operator = 40

SMV calculation

SMV= Basic time+ Allowance of basic time

Basic Time = (Observe time x Observe rating %) /Standard rating

Observe time = Cycle time /No. of cycle

SMV Calculation for Back Rise

Observed Time=Cycle Time/No of Cycle

= (15+16+15+14+16)/5

=76/5

=15.2

Basic Time== (Observe time x Observe rating %) /Standard rating%

= (15.2x90%)/100%

=13.68

=13.68 +15 %(Allowance)/60

=0.23

Other operation SMV can be calculated same way

Basic Pitch time calculation

Basic Pitch time=Total Garments SMV/ NO of Operation

Total Garments SMV=9.08

NO of Operation=28

Basic Pitch time=0.324 minute

Capacity Calculation

Capacity = 3300 /Operation time

=3300/15.2

=217.105

Efficiency Calculation

Efficiency = [(Production output x SMV) /(60 x Manpower x working hour)] x100

= [(185 x 9.08)/ (60 x 40 x 1)] x 100%

= 70%

- Working Hour = 10
- Plan Downtime = 45
- SMV = 9.08
- Flow = 5
- Customer Demand = 168
- Target Efficiency = 70%

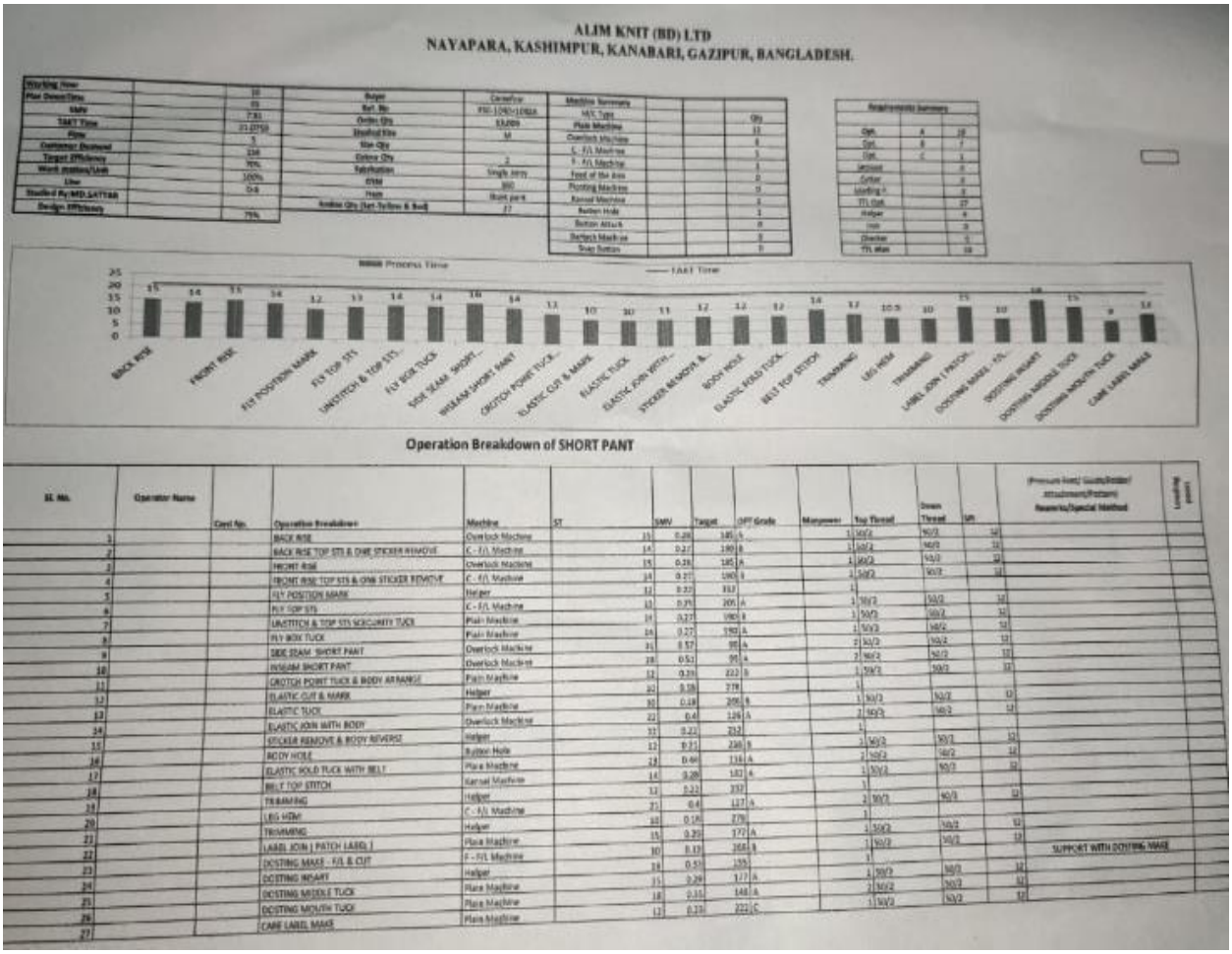
3.3 Operation Breakdown of Short pant:

Buyer: Carrefour. Ref. no:

350-1040+1082A Item:

Short Pant.

Alim Knit Bd Ltd.



ALIM KNIT (BD) LTD
NAYAPARA, KASHIMPUR, KANABARI, GAZIPUR, BANGLADESH.

Operation Breakdown of SHORT PANT

3.3.1 Operation Breakdown of Short Pant:

Operation Breakdown	Machine	RPM	ST	SMV	Target	OPT Grade	Manpower	Balance SAM	Needle Qty	Needle No.	Top Thread
BACK RISE	Overlock Machine		15	0.28	185	A	1	0.28			50/2
BACK RISE TOP STS & ONE STICKER REMOVE	C - F/L Machine		14	0.27	190	B	1	0.27			50/2
FRONT RISE	Overlock Machine		15	0.28	185	A	1	0.28			50/2
FRONT RISE TOP STS & ONE STICKER REMOVE	C - F/L Machine		14	0.27	190	B	1	0.27			50/2
FLY POSITION MARK	Helper		12	0.22	232		1	0.22			
FLY TOP STS	C - F/L Machine		13	0.25	205	A	1	0.25			50/2
UNSTITCH & TOP STS SCECURITY TUCK	Plain Machine		14	0.27	190	B	1	0.27			50/2
FLY BOX TUCK	Plain Machine		14	0.27	190	A	1	0.27			50/2
SIDE SEAM SHORT PANT	Overlock Machine		31	0.57	90	A	2	0.28			50/2
INSEAM SHORT PANT	Overlock Machine		28	0.51	99	A	2	0.26			50/2
CROTCH POINT TUCK & BODY ARRANGE	Plain Machine		12	0.23	222	B	1	0.23			50/2

ELASTIC CUT & MARK	Helper		10	0.18	278		1	0.18			
ELASTIC TUCK	Plain Machine		10	0.19	266	B	1	0.19			50/2
ELASTIC JOIN WITH BODY	Overlock Machine		22	0.40	126	A	2	0.20			50/2
STICKER REMOVE & BODY REVERSE	Helper		12	0.22	232		1	0.22			
BODY HOLE	Button Hole		12	0.21	238	B	1	0.21			50/2
ELASTIC FOLD TUCK WITH BELT	Plain Machine		23	0.44	116	A	2	0.22			50/2
BELT TOP STITCH	Kansai Machine		14	0.28	182	A	1	0.28			50/2
TRIMMING	Helper		12	0.22	232		1	0.22			
LEG HEM	C - F/L Machine		21	0.40	127	A	2	0.20			50/2
TRIMMING	Helper		10	0.18	278		1	0.18			
LABEL JOIN (PATCH LABEL)	Plain Machine		15	0.29	177	A	1	0.29			50/2
DOSTING MAKE - F/L & CUT	F - F/L Machine		10	0.19	266	B	1	0.19			50/2
DOSTING INSART	Helper		18	0.33	155		1	0.33			
DOSTING MIDDLE TUCK	Plain Machine		15	0.29	177	A	1	0.29			50/2

DOSTING MOUTH TUCK	Plain Machine		18	0.35	148	A	2	0.17			50/2
CARE LABEL MAKE	Plain Machine		12	0.23	222	C	1	0.23			50/2

Table: 3. 6 Operation Breakdown of Short pant

3.3.2 Requirement of operators:

Requirements Summary		
Opt.	A	19
Opt.	B	7
Opt.	C	1
Scissor		0
Cutter		0
Loading P.		0
TTL Opt.		27
Helper		6
Iron		0
Checker		0
TTL Man		**33**

Table: 3. 7 Requirement of operators

3.3.3 Requirement of operators:

Machine Summary	
M/C Type	**Qty**
Plain Machine	11

Overlock Machine	8
C - F/L Machine	5
F - F/L Machine	1
Feed of the Arm	0
Picoting Machine	0
Kansai Machine	1
Button Hole	1
Button Attach	0
bar tack Machine	0
Snap Button	0

Table: 3. 8 Requirement of machines

3.3.4 Calculation:

Here,

Allowance is =15%

Total no of Operator = 33

SMV calculation

SMV= Basic time+ Allowance of basic time

Basic Time = (Observe time x Observe rating %) /Standard rating

Observe time = Cycle time /No. of cycle

Observed Time=Cycle Time/No of Cycle

Observed Time=Cycle Time/No of Cycle

= (15+16+15+14+16)/5

=76/5

=15.2

Basic Time== (Observe time x Observe rating %) /Standard rating%

= (15.2x90%)/100%

=13.68

=13.68 +15 %(Allowance)/60
=0.23

Other operation SMV can be calculated same way

Basic Pitch time calculation

Basic Pitch time=Total Garments SMV/ NO of Operation

Total Garments SMV=7.81

NO of Operation=26

Basic Pitch time=0.30 minute

Capacity Calculation

Capacity = 3300 /Operation time

=3300/15.2

=217.105

Efficiency Calculation

Efficiency = [(Production output x SMV) /(60 x Manpower x working hour)] x100

= [(185 x 7.81)/ (60 x 26 x 1)] x 100%

= 85%

- Working Hour =10
- Plan Downtime = 45
- SMV = 7.81
- Flow = 5

- Customer Demand = 158
- Target Efficiency = 75%

CHAPTER – 4: RESULT AND DISCUSSION

4.1 Analysis of Capacity Study of Different Operation for T-Shirt

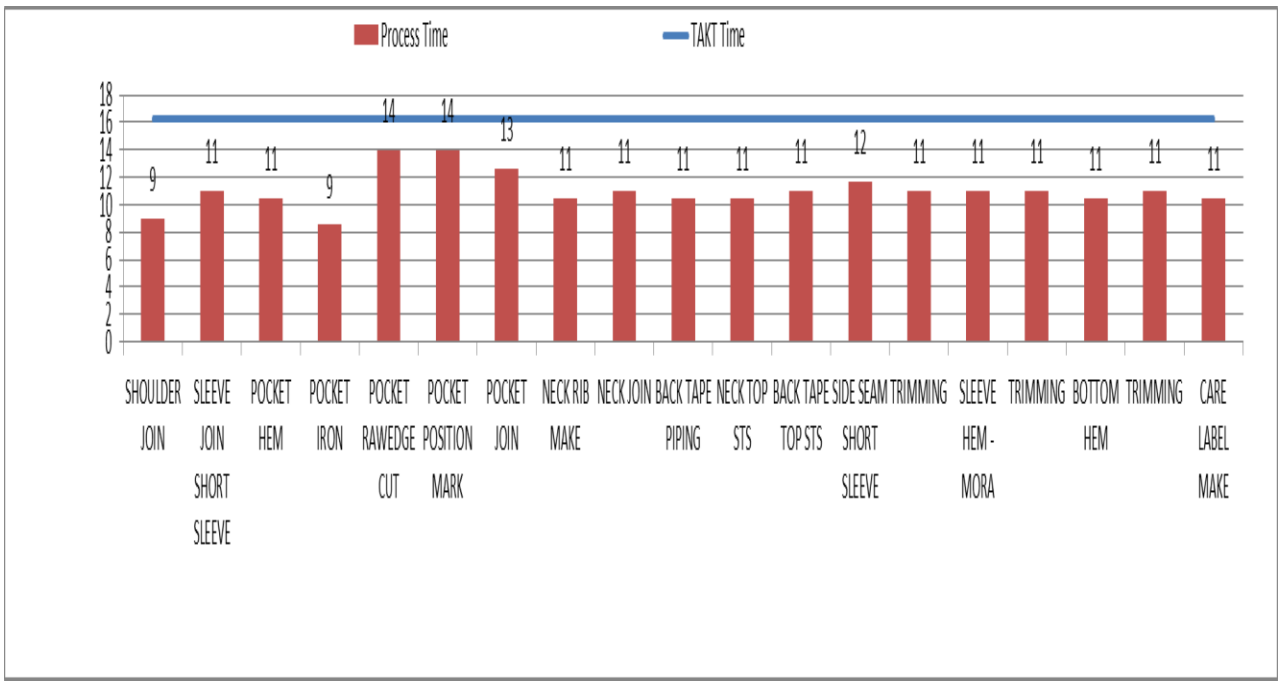


Figure: 4. 1 Analysis of Capacity Study of Different Operation for T-Shirt

4.2 Analysis of Capacity Study of Different Operation for Long Pant

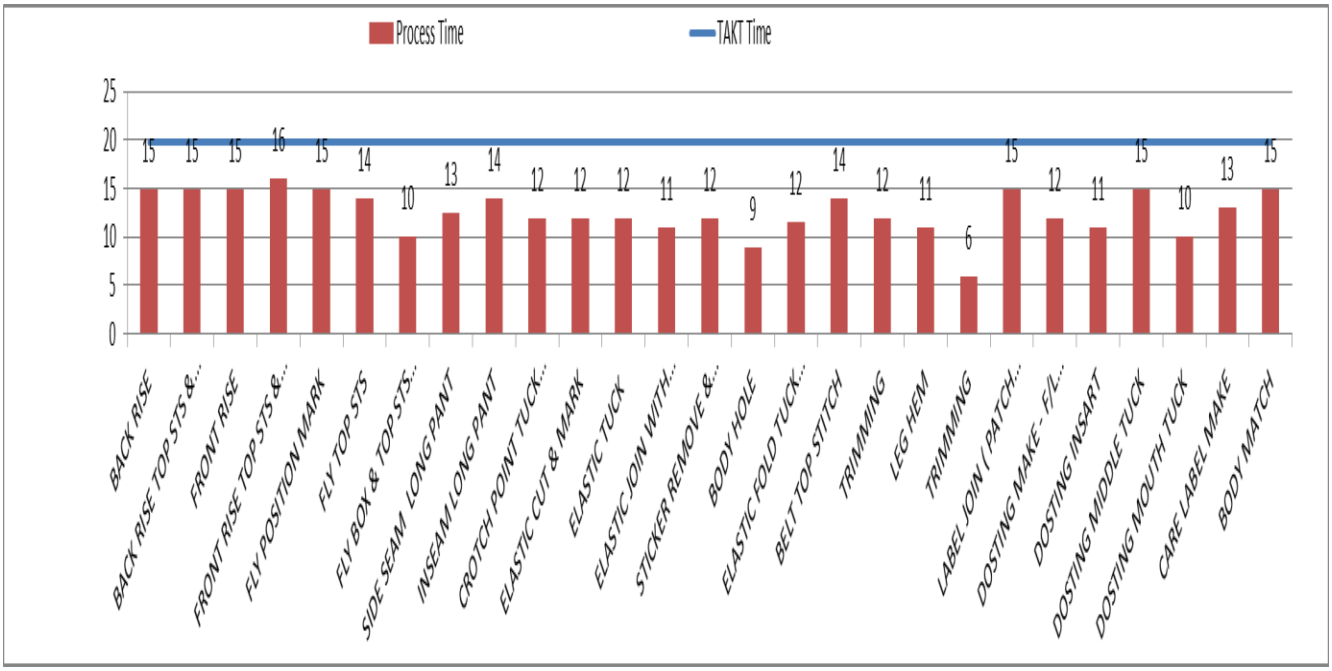


Figure: 4. 2 Analysis of Capacity Study of Different Operation for Long Pant

4.3 Analysis of Capacity Study of Different Operation for Short Pant

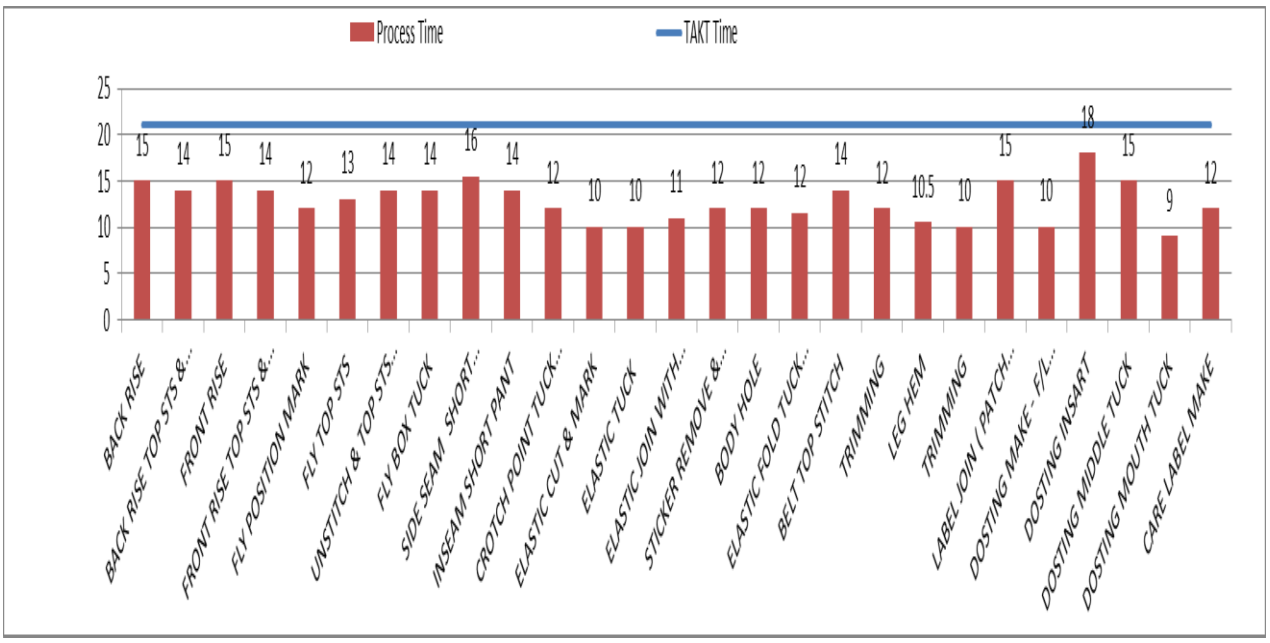


Figure: 4. 3 Analysis of Capacity Study of Different Operation for Short Pant

4.4 Analysis of Total SMV of Different item from Data 3.1, 3.2, 3.3

ITEM	TOTAL SMV
T-SHIRT	5.79
LONG PANT	9.08
SHORT PANT	7.81

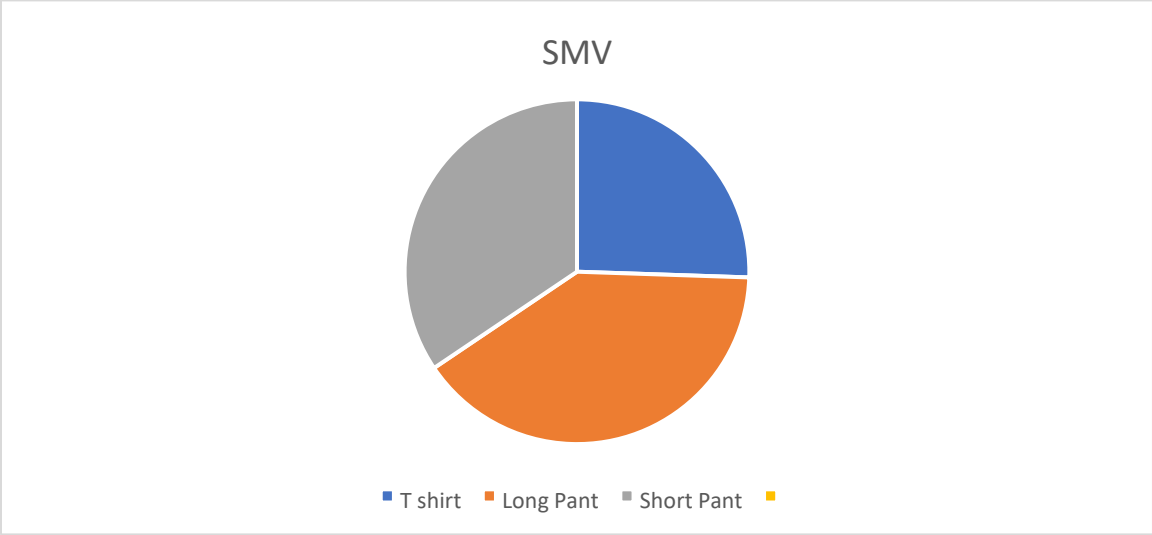


Figure: 4. 4 Analysis of Total SMV of Different item from Data 3.1, 3.2, 3.3

Description:

On this pie chart, we confirmed the only of kind gadgets of usual SMV which we calculated financial ruin-03. Right here we evaluation T-shirt, Short pant, long PANT. This pie chart indicates the overall SMV. The overall SMV of T-shirt is 5.79, Long pant 9.08 and short pant 7.81. Right here we're able to see a higher SMV in the pie chart is long pant is 22.10 and the lowest SMV in the pie chart is TANK pinnacle is T-shirt.

4.5 Analysis Efficiency% of Different item from Data 3.1, 3.2, 3.3

ITEM	TOTAL Efficiency%
T-SHIRT	84%
TANK TOP	70%
LONG PANT	75%

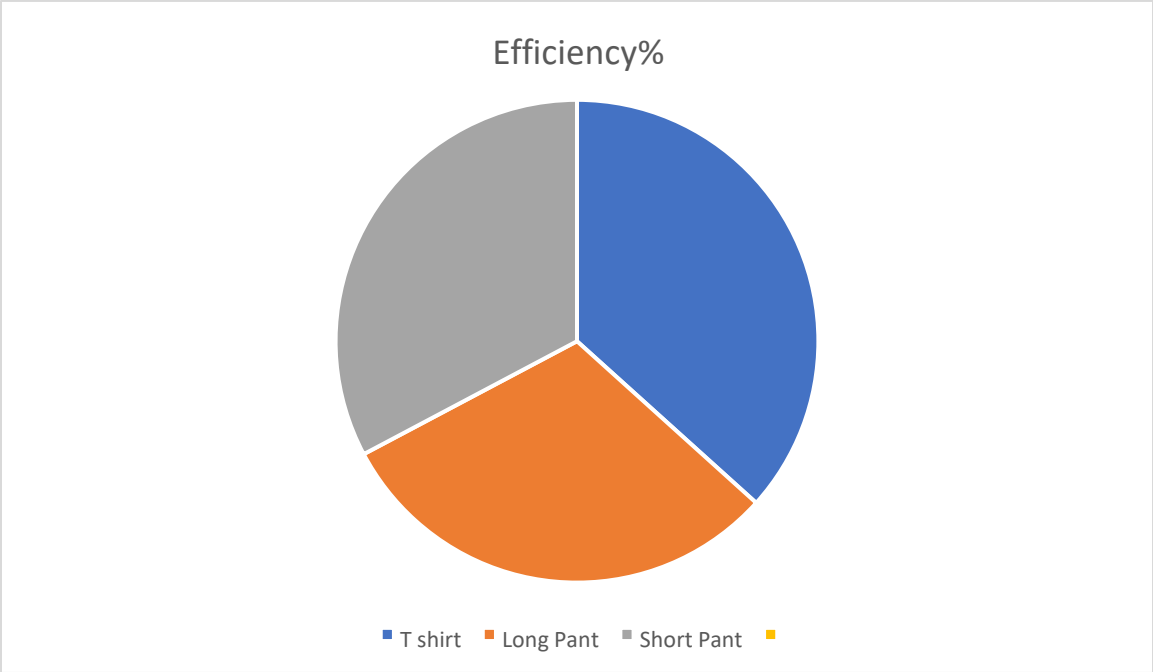


Figure: 4. 5 Analysis of Total SMV of Different item from Data 3.1, 3.2, 3.3.

Description:

On this pie chart, I confirmed the first-class-of-a-kind object common overall performance% which we calculated bankruptcy-03. Proper right here I evaluation T-shirt, long pant and short pant. This pie chart shows the performance%. Overall performance% of the T- shirt is 84%, the long pant 70% and short pant 74%

%. Proper right here we're able to see better general overall performance% within the pie chart is T shirt 84% and the lowest usual performance% inside the pie chart is the extended pant is 70%.

CHAPTER – 5: CONCLUSION

5.1 Conclusion:

With the assistance of collecting SMV map and service bulletin we have concluded our project with its related Alim Knit Bd Ltd. manner documents. This challenge makes it possible to know about output, SMV time looks at the corresponding components and their corrected process in addition. We gather information from this business about numerous styles of knitters, teasing systems, writing, finishing, mercerizing, spinning, scale, twisting, weaving, clothes, ETP, overlocking, undeniable systems etc.

Reference:

http://textilelearner.blogspot.com/2014/05/what-is-biopolishing-of-textiles.html (Retrieved date 05/11/20, Retrieved time 10.13 pm)

http://www.indiantextilejournal.com/articles/FAdetails.asp?id=3085 (Retrieved date 22/11/20, Retrieved time 9.50 am)

https://www.fibre2fashion.com/industry-article/6436/biopolishing (Retrieved date 12/12/20, Retrieved time 10.13 pm)