Faculty of Engineering

Department of Textile Engineering

Thesis Report On

"Study on the root cause analysis of lower productivity in Sewing Floor"

Course code: TE-4214 Course Title: Project (Thesis)

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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
Fall, 2022

LETTER OF APPROVAL

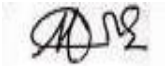
To
The Head
Department of Textile Engineering
Daffodil International University
Daffodil Smart City, Ashulia, Savar

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

Dear Sir
I'm just writing to let you know that this Thesis titled "**Study on the root cause analysis of lower productivity in Sewing Floor** has been prepared by the student bearing ID: 191-23-5545, 191-23-5563 & 191-23-5629 completed for final evaluation. The whole report is designed based on the factory data the with required belongings. The students are directly involved in their industrial attachment activities, and the message becomes vital to spark much valuable information for the readers.

Therefore, it will highly be appreciated if you kindly accept this report and consider it for final evaluation.

Yours Sincerely,



Mst. Murshida Khatun

Assistant Professor

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DECLARATION

We declare that the work which is being presented in this report entitled, "**Study on the root cause analysis of lower productivity in Sewing Floor"** is original work of our own, has not been presented for a degree of any other university, and all the resources of collected information for this report have been duly acknowledged.

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This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

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ACKNOWLEDGEMENT

"In the name of ALLAH, the Most Merciful and Beneficent."

We are deeply grateful to Allah for His blessings that have enabled us to complete this project successfully.

We extend our heartfelt thanks to our supervisor, **Mst . Murshida Khatun**, Assistant Professor in the Department of Textile Engineering at Daffodil International University. Her extensive knowledge and passion for textile dyeing and finishing inspired us to undertake this project. Her unwavering patience, expert guidance, constant encouragement, dynamic supervision, insightful criticism, valuable advice, and thorough review of multiple draft versions were essential in completing this project.

We are also thankful to **Md. Mominur Rahman**, Head (In-Charge) of the Department of Textile Engineering at Daffodil International University, for his support in completing this project.

We would like to acknowledge and appreciate the contribution of our course mates at Daffodil International University who participated in discussions and collaborations during the completion of the coursework.

Lastly, we would like to express our gratitude to our beloved parents and friends for their emotional support, encouragement, and assistance throughout the writing of this project report.

-The Author

Dedication to our
Respected Parents & Beloved Teachers.

ABSTRACT

This project **Study on the root cause analysis of lower productivity Sewing Floors.** Traditionally operated garment industries face problems like low productivity, longer production lead time, high rework and rejection, poor line balancing, low flexibility of style changeover, etc. This Study addressed these problems by implementing Kaizen work standardization, just-in-time production, etc. Moreover, in this study, we analyzed the lower productivity of the sewing floor. Also, analysis reasons behind for lower productivity in lower productivity. We talked about the study, which compared productivity before and after using a Kaizen method. This is still true today, with organizations wasting millions of dollars every day due to a lack of awareness of the need to constantly enhance efficiency. We analyze how the industry can more effectively decrease lower productivity on the sewing floor. After the implementation of the kaizen method, sewing floor efficiency increased from 66% to 70%. Also, we discuss first-hour and last-hour production loss. Moreover, we show that the comparison between Unit Production System and Progressive Bundle System. Furthermore, we show Unit Production System has a higher output capacity than the Unit Production System and Progressive Bundle System

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Chapter- I

Introduction

1.0 Introduction:

In practically every sector of the economy, competition has intensified under the current technical economic landscape. The manufacturer must create and produce well to meet the rising demands of as many customers as feasible. For industries to survive and expand, it is difficult to produce goods of theproper quality and quantity in a timely way and at the lowest possible cost. This necessitates the Organization's higher production efficiency. To analyze and enhance waste eradication, resource allocation, and appropriate use of resources, many industrial engineering techniques are applied. Thus, industries face the challenge of producing goods of the appropriate quality and quantity in the proper time and at the lowest possible cost to ensure their survival and growth. This necessitates an increase in the organization's productive efficiency. In order to boost productivity, industrial engineering will be essential. Several industrial engineering methods evaluate and enhance work processes, get rid of waste, and make sure resources are allocated and used effectively. Lean manufacturing is one of the efforts that businesses have been attempting to embrace to preserve competitiveness in the global market. Leanmanufacturing places a strong emphasis on cutting costs by getting rid of or reducing waste. The principle of kaizen is the basis for lean manufacturing. the tiny, incremental improvements made over a lengthy period of time that have a significant impact on business outcomes. Kaizen has a number of goals, including improving system quality as well as the quality of the system's equipment, people, process, and products. Kaizen helps a business by removing the unforeseen expenses brought on by theeight different categories of waste. Kaizen enhances the industrial process' value-added activities. Kaizen enhances the industrial process' value-added activities. went hand in hand. Kaizen also aids in boosting sewing floor productivity.

1.2 Objective of the project

a) To know about the different types of garment production systems
b) To know the reason for lower productivity in sewing floor
c) To know Kaizen method applies to the industry
d) To find the solution for lower productivity applied to the sewing floor

1.3 Importance of the project:

This report provides the information required to comprehend the systems employed in the sewing department to produce clothing. Those studying textiles in general, and those whose primary focus is on subjects linked to apparel in particular, will find some of the information in this report to be extremely helpful. Also, provide a suggestion for boosting sewing floor productivity. Additionally, given the understanding of Kaizen and how to use it in the textile industry

1.4 Aim of this project:

Find the problem behind the lower productivity on the sewing floor Moreover and using kaizen reduces lower productivity on the sewing floor.

Chapter- II

Literature Review

2.1 Previous Study:

Previously, Taposh Kumar Kapuria, Mustafizur Rahman, and Shuvo Haldar presented the research. The title was Root Cause Analysis and Productivity Improvement of An Apparel Industry in Bangladesh Through Kaizen Implementation. Tey sowing Total output per day per line =1534 pcs toincrease 1900 pcs and sowing improvement efficiency 44.22% to59.55% Using kaizen. Therefore, they sow using kaizen defects rate are reducing and efficiency of the line is increasing. It was the conclusion of the research.

2.2 Root cause analysis

Wilson et al. established the analytical technique known as the root cause analysis. He also noted how useful this tool is for doing a thorough system-based review of key flaws and performing corrective actions. The root for each individual fault and its contributing causes are really identified in the cause-and-effect diagram. It also focuses on developing an action plan with a measurement approach that aids in assessing the effectiveness of the plans and deciding on defect reduction tactics.

2.3 Sewing section

Different components of the cut pieces are attached during the sewing process. There are numerous operators performing the same task at this workplace. This determines which components of the other garment can be sewn at that time. thestitch The most crucial sector in the apparel industry is the sewing portion.

2.4 Product Analysis and set up a target for Line

By studying the product, one can usually determine which operations are crucial and which operators should focus on them. A per-hour production goal is established after assessing the product line. Line supervisor assessing whether or not target production is met.

2.5 Line balancing

A production tool used to enable the production flow line is line balancing. If the line is not appropriately balanced, the desired outcome will not be attained. There was a backlog in the line because certain jobs had larger workloads than others.

2. 6 End-line Quality check

To ensure that the clothing is defect-free, the entirety of the interior and outside are thoroughly inspected. If a flaw is discovered, have the person(s) who caused it to fix it. Here, you may compare the corpse count to see if the aim was met or not.

2.7 Body sends to finishing section

Following a quality check at the end of the production line, the body of the clothing is finished before being sent to the finishing area for shipment.

2.8 Garment Production System

The framework in which manufacturing activities take place is referred to as the production system. A production system consists of characteristics that have the ability to convert inputs into anticipated and desired outputs. The qualities could be tools, machinery, or human labor. The production system is described as "an integration of material management, production processes, employees, and equipment" for the garment sector.

The workflow-directing components of a garment production system include humans, machinery, materials management, and production procedures. It is a system that illustrates how a manufacturing system converts a two-dimensional fabric into a three-dimensional garment. The titles of the production systems are based on a variety of characteristics, including the number of machines used to construct a garment, how the machines are laid out, how many operators are required to manufacture a garment, and how many items move along a production line at once.

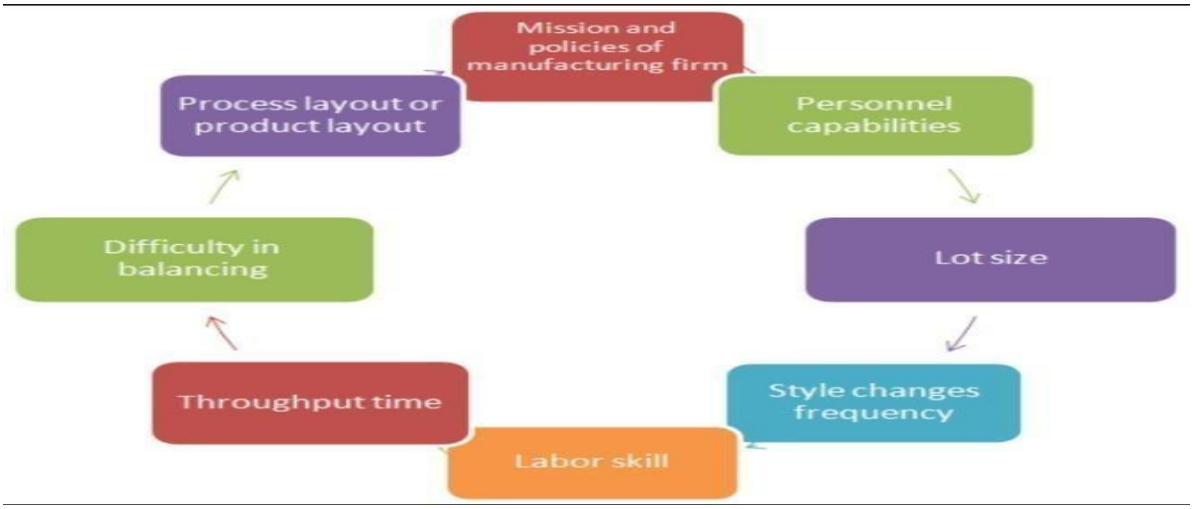
Goals of Production System: The goals of Garment Production systems are as follows:

✓ Analyze the characteristics of various garment production systems.

✓ Contrast and compare the various production systems

✓ Evaluate and critically compare the advantages and disadvantages of using various production systems under varying conditions.

Principles of Choosing a Production System in Apparel Industry:



2.9 Efficiency

Efficiency is the capacity to avoid wasting resources—including time, money, energy, and materials—while carrying out tasks or achieving desired results. In a broader sense, it is the capacity to carry out tasks effectively and efficiently. It is a gauge of how successfully input

is utilized for a task or function, to use more mathematical or scientific terminology (output). It frequently particularly refers to the ability of a particular application of effort to deliver a particular output with the least amount of waste, expense, or superfluous work. Efficiency covers a wide range of inputs and outputs across numerous disciplines and sectors.

Line Efficiency

Efficiency is sometimes described as a percentage of the ideal outcome, such as the scenario when no energy was lost due to friction or other factors and 100% of the fuel or other input was used to achieve the desired outcome.

2.10 Line Efficiency

In the category of ready-made garments, the phrase "line efficiency" is well-known. In order to generate the desired number of clothing items, line effectiveness plays a vital role. It is typica According to the operator or line efficiency, factory capacity is estimated. Efficiency is therefore one of the most used performance measurement tools. Ly completed by contemporary designers. As well as its importance in creating apparel.

2.11 SMV

SMV is defined as the window of time during which work may be satisfactorily completed. Often, it is expressed in minute amounts. Standard Minute Value is SMV in its complete form. SMV is a phrase that is often used in the apparel manufacturing sector. Also known as Standard Allocated Minute, SMV (SAM).

2.11 Target Efficiency

Target Production is connected to Target Efficiency. There are numerous lines in the clothes sector, and each line produces either the same or different quantities. An operator and a helper in a line each create a given amount of goods. There is a goal to create each day in a line. These goals are provided by the IE department. Every line of the target must be met. These target productions are used to compute the target efficiency.

2.12 Time Study

A method for estimating the amount of work to be done entails careful time estimation of the task using a period estimating tool, balanced for any observed variation from typical effort or

The pace and to allow adequate time for things like external components, unavoidable or machinedelays, rest to overcome weakness, and individual needs. For line adjustment and understanding bottlenecks, time study is a commonly used technique. The Hawthorne Effect, which shows that employees alter their behavior when they learn they are being estimated, is a problem with time studies.

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2.13 Productivity

Productivity refers to how effectively and efficiently organizational resources (inputs) are used to produce goods and/or services (outputs). Input utilization is measured along withthe question of whether or not input utilization is increasing more quickly than output.
When referring to a factory that makes clothing, "output" can be defined as the total quantity of products produced, while "input" refers to the labor force, equipment, and other factory resources needed to produce those products within a specific time frame. Making sure that the link between input and output is appropriately balanced is essential for cost-effectively increasing output, or "productivity."

2.14 Lean Manufacturing:

Lean Manufacturing is a set of practices and procedures with the primary goal of continually reducing waste in the production process. Reduced production costs, higher productivity, and shorter lead times for production are the main advantages. Correctly speaking, some of the most important aims are the

- **Defects and wastage:** Minimize flaws and unnecessary physical waste, such as excessive useof raw materials, avoidable errors, the cost of reprocessing damaged products, and product features that buyers do not need;
- **Decrease production lead** – minimizing the time between processing steps, the time neededfor method preparation, and the time needed for product/model conversion

- **Inventory levels** - Keep inventory levels as low as possible throughout the manufacturing process, especially between phases. reduced working capital requirements are also a result oflower inventories;

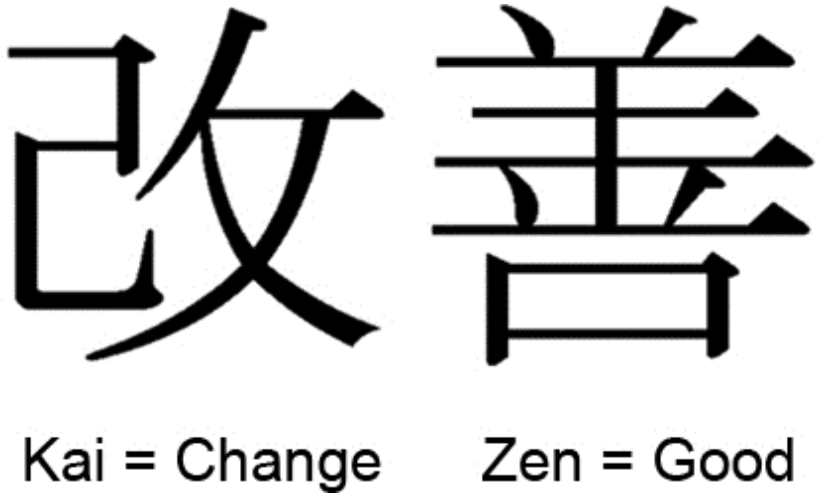
- **Labour productivity** - Reduce idle time and make sure that workers are as productive as possible when they are working to increase labor productivity (this includes striving to avoidsuperfluous work or motions);

- **Usage of machinery and space** -. Eliminate wastes and increase output using the currentlyavailable equipment in order to maximize manufacturing rates while reducing machine downtime.

- **Flexibility** - able to generate a wider variety of items with a minimal amount of cutover timeand expenditures.

- **Output** – Overall, by reducing cycle times, raising worker productivity, eliminating bottlenecks, and minimizing machine downtime, business owners can considerably enhanceproduction from their current operations.

- KAIZEN:



Kaizen is a Japanese phrase that translates to "continuous improvement."

Kai = to take apart

Zen = to make good

2.7.5.1-: KAIZEN WORKS HOW DOES IT

In the view of KAIZEN, there are ten critical principles for improvement:

- ✓ Toss off any preconceived beliefs you might have about how things should be done.
- ✓ Consider how the new way will work rather than fail.
- ✓ Don't give in to excuses. Deny the current quo completely.

Do not strive for perfection. A 50% implementation rate is acceptable as long as it is completed on the spot.

- ✓ Correct inaccuracies as soon as you notice them.
- ✓ Spending a lot of money on improvements is not a good idea.
- ✓ Problems force you to apply your intellect.

- ✓ Inquire "why" at least five times until you discover the root cause.
- ✓ The ideas often people are better than one people.
- ✓ There is no such thing as a limit to one's ability to progress.

2.7.5.2- PURPOSE OF KAIZEN:

i. Kaizen activities are focused on adding any value and reducing waste in every operation and process.

ii. The sequence of processes required to develop and make a product is referred to as the process.

iii. An operation is a single activity conducted by a single computer or person on that product.

2.7.5.3- TARGET OF KAIZEN:

- **Products** (Quantity, Rejects, etc.)
- **Equipment** (Changeover, Utilization, Breakdown)
- **Human** (Communication, Awareness, Stillness)
- **Processes** (Waiting Time, Bottleneck, Line Balancing, VCS)
- **System** (QC, Specification, Infection)

CHAPTER- III

METHODOLOGY

3.1 Data Collection:

In this project we present some data on lower productivity in the sewing floor and this data was collected from Aman Graphics & Designs Ltd. We show how to Aman Graphics & Designs Ltdreduces lower productivity in sewing floor

3.1.1 Line wise production report

Here we show the line wise production report of Aman Graphics and Design Ltd. We provided 15days line wise production report before and after Kaizen implementation in the sewing floor.

3.1.2 Before Kaizen implement Line wise production report

AMAN GRAPHICS &DESIGN LTD
LINE WISE PRODUCTION REPORT
LINE NO: 1

DATE	BUYER	STYLE	ITEM	SMV	TOTAL MEN	TARGET	ACHIEVE	EFF%	REMARKS
13/11/2021	TESCO	KD313448	SHIRT	16.35	43	1234	805	65%	
14/11/2021	TESCO	KD313448	SHIRT	16.35	42	1025	655	64%	
15/11/2021	TESCO	KD313448	SHIRT	16.35	46	1234	805	65%	
16/11/2021	TESCO	KD313448	SHIRT	16.35	45	960	625	65%	
17/11/2021	TESCO	KD313448	SHIRT	16.35	46	981	657	67%	
18/11/2021	TESCO	KD313448	SHIRT	16.35	45	1369	810	59%	
20/11/2021	TESCO	KD313448	SHIRT	16.35	42	1088	723	66%	
21/11/2021	TESCO	KD313448	SHIRT	16.35	45	1308	900	69%	
22/11/2021	TESCO	KD313448	SHIRT	16.35	43	1000	665	66%	
23/11/2021	TESCO	KD313448	SHIRT	16.35	45	793	534	67%	
24/11/2021	TESCO	KD313448	SHIRT	16.35	45	959	645	67%	
25/11/2021	TESCO	KD313448	SHIRT	16.35	44	959	665	69%	
27/11/2021	TESCO	KD313448	SHIRT	16.35	47	1254	810	65%	
28/11/2021	TESCO	KD313448	SHIRT	16.35	47	896	603	67%	
29/11/2021	TESCO	KD313448	SHIRT	16.35	48	848	556	66%	
30/11/2021	TESCO	KD313448	SHIRT	16.35	48	1025	655	64%	

Table 1 Line wise production report

AMAN GRAPHICS &DESIGN LTD
LINE WISE PRODUCTION REPORT
LINE NO: 2

Date	BUYER	STYLE	ITEM	SMV	TOTAL MEN	TARGET	ACHIEVE	EFF%	REMARKS
15/01/2022	KMART	16W23WLS003	SHIRT	23	52	814	569	70%	
16/01/2022	KMART	16W23WLS003	SHIRT	23	54	887	569	64%	
17/01/2022	KMART	16W23WLS003	SHIRT	23	58	1135	767	68%	
18/01/2022	KMART	16W23WLS003	SHIRT	23	58	908	623	69%	
19/01/2022	KMART	16W23WLS003	SHIRT	23	59	1154	778	67%	
20/01/2022	KMART	16W23WLS003	SHIRT	23	60	1174	807	69%	
22/1/2022	KMART	16W23WLS003	SHIRT	23	59	1231	788	64%	
23/01/2022	KMART	16W23WLS003	SHIRT	23	56	1169	799	68%	
24/01/2022	KMART	16W23WLS003	SHIRT	23	56	1169	760	65%	
25/01/2022	KMART	16W23WLS003	SHIRT	23	55	1119	766	68%	
26/01/2022	KMART	16W23WLS003	SHIRT	23	59	1231	787	64%	
27/01/2022	KMART	16W23WLS003	SHIRT	23	59	1231	807	66%	
29/01/2022	KMART	16W23WLS003	SHIRT	23	59	1154	778	67%	
30/01/2022	KMART	16W23WLS003	SHIRT	23	54	845	620	73%	
31/01/2022	KMART	16W23WLS003	SHIRT	23	60	1409	899	64%	

Table 2 : Line wise production report

AMAN GRAPHICS &DESIGN LTD
LINE WISE PRODUCTION REPORT
LINE NO: 3

DATE	BUYER	STYLE	ITEM	SMV	TOTAL MEN	TARGET	ACHIEVE	EFF%	REMARKS
1/12/2021	OKAIDI	685482	PANT	29.85	61	737	450	61%	
2/12/2021	OKAIDI	685482	PANT	29.85	63	886	600	68%	
4/12/2021	OKAIDI	685482	PANT	29.85	62	748	510	68%	
5/12/2021	OKAIDI	685482	PANT	29.85	62	748	513	69%	
6/12/2021	OKAIDI	685482	PANT	29.85	60	905	607	67%	
7/12/2021	OKAIDI	685482	PANT	29.85	60	905	625	69%	
8/12/2021	OKAIDI	685482	PANT	29.85	61	956	599	63%	
9/12/2021	OKAIDI	685482	PANT	29.85	62	997	645	65%	
11/12/2021	OKAIDI	685482	PANT	29.85	63	1013	688	68%	
12/12/2021	OKAIDI	685482	PANT	29.85	63	950	667	70%	
13/12/2021	OKAIDI	685482	PANT	29.85	63	1013	667	66%	
14/12/2021	OKAIDI	685482	PANT	29.85	61	981	634	65%	
15/12/2021	OKAIDI	685482	PANT	29.85	61	981	599	61%	

Table 3 : Line wise production report

3.1.3 After Kaizen implements Line wise production report

AMAN GRAPHICS &DESIGN LTD
LINE WISE PRODUCTION REPORT
LINE NO: 1

DATE	BUYER	STYLE	ITEM	SMV	TOTAL MEN	TARGET	ACHIEVE	EFF%	REMARKS
13/07/2022	TESCO	KD313448	SHIRT	16	40	1234	889	72%	
14/07/2022	TESCO	KD313448	SHIRT	16	41	1025	713	70%	
16/07/2022	TESCO	KD313448	SHIRT	16	44	1234	880	71%	
17/07/2022	TESCO	KD313448	SHIRT	16	44	960	670	70%	
18/07/2022	TESCO	KD313448	SHIRT	16	44	981	681	69%	
19/07/2022	TESCO	KD313448	SHIRT	16	45	1369	923	67%	
20/07/2022	TESCO	KD313448	SHIRT	16	42	1088	767	71%	
21/07/2022	TESCO	KD313448	SHIRT	16	43	1308	930	71%	
23/07/2022	TESCO	KD313448	SHIRT	16	42	1000	699	70%	
24/07/2022	TESCO	KD313448	SHIRT	16	45	793	561	71%	
25/07/2022	TESCO	KD313448	SHIRT	16	45	959	665	69%	
26/07/2022	TESCO	KD313448	SHIRT	16	44	959	670	70%	
27/07/2022	TESCO	KD313448	SHIRT	16	45	1254	898	72%	
28/07/2022	TESCO	KD313448	SHIRT	16	45	896	615	69%	
29/07/2022	TESCO	KD313448	SHIRT	16	46	848	615	73%	
30/07/2022	TESCO	KD313448	SHIRT	16	46	1025	725	71%	

Table 4 : Line wise production report

AMAN GRAPHICS &DESIGN LTD
LINE WISE PRODUCTION REPORT
LINE NO: 2

Date	BUYER	STYLE	ITEM	SMV	TOTAL MEN	TARGET	ACHIEVE	EFF%	REMARKS
15/08/2022	KMART	16W23WLS003	SHIRT	22.35	51	814	578	71%	
16/08/2022	KMART	16W23WLS003	SHIRT	22.35	52	887	623	70%	
17/08/2022	KMART	16W23WLS003	SHIRT	22.35	56	1135	796	70%	
18/08/2022	KMART	16W23WLS003	SHIRT	22.35	56	908	635	70%	
20/08/2022	KMART	16W23WLS003	SHIRT	22.35	58	1154	795	69%	
21/08/2022	KMART	16W23WLS003	SHIRT	22.35	59	1174	834	71%	
22/08/2022	KMART	16W23WLS003	SHIRT	22.35	57	1231	888	72%	
23/08/2022	KMART	16W23WLS003	SHIRT	22.35	55	1169	815	70%	
24/08/2022	KMART	16W23WLS003	SHIRT	22.35	54	1169	797	68%	
25/08/2022	KMART	16W23WLS003	SHIRT	22.35	54	1119	799	71%	
26/08/2022	KMART	16W23WLS003	SHIRT	22.35	58	1231	867	70%	
27/08/2022	KMART	16W23WLS003	SHIRT	22.35	57	1231	881	72%	
28/08/2022	KMART	16W23WLS003	SHIRT	22.35	56	1154	798	69%	
29/08/2022	KMART	16W23WLS003	SHIRT	22.35	53	845	620	73%	
30/08/2022	KMART	16W23WLS003	SHIRT	22.35	58	1409	984	70%	

Table 5 : Line wise production report

AMAN GRAPHICS &DESIGN LTD
LINE WISE PRODUCTION REPORT
LINE NO: 3

DATE	BUYER	STYLE	ITEM	SMV	TOTAL MEN	TARGET	ACHIEVE	EFF%	REMARKS
1/12/2022	OKAIDI	685482	PANT	29	60	737	525	71%	
3/12/2022	OKAIDI	685482	PANT	29	62	886	627	71%	
4/12/2022	OKAIDI	685482	PANT	29	61	748	520	70%	
5/12/2022	OKAIDI	685482	PANT	29	61	748	513	69%	
6/12/2022	OKAIDI	685482	PANT	29	59	905	630	70%	
7/12/2022	OKAIDI	685482	PANT	29	59	905	631	70%	
8/12/2022	OKAIDI	685482	PANT	29	59	956	666	70%	
10/12/2022	OKAIDI	685482	PANT	29	60	997	710	71%	
11/12/2022	OKAIDI	685482	PANT	29	61	1013	695	69%	
12/12/2022	OKAIDI	685482	PANT	29	61	950	675	71%	
13/12/2022	OKAIDI	685482	PANT	29	61	1013	696	69%	
14/12/2022	OKAIDI	685482	PANT	29	60	981	676	69%	
15/12/2022	OKAIDI	685482	PANT	29	60	981	686	70%	

Table 6 : Line wise production report

3.2.1 First hour and Last hour production loss price report.

Here we show the whole factory's First hour and Last hour report of Aman Graphics and Design Ltd. We provided 3 days line-wise production loss pieces report before and after Kaizen implementation in sewing floor.

3.2.2 Before Kaizen implements of sewing floor.

Day 1 : 11/12/2022

S/L	FACTORY NAME	RESPONSIBLE	1ST HRS LOSS PCS	LAST HRS LOSS PCS
1	FACTORY -1	Mr.Sohidul	45	90
2	FACTORY -2	Mr.Hasan	101	61
3	FACTORY -3	Mr.Amir	75	114
4	FACTORY -4	Mr. Mostofa	45	69
5	ALL FACTORY	TOTAL LOSS	266	364

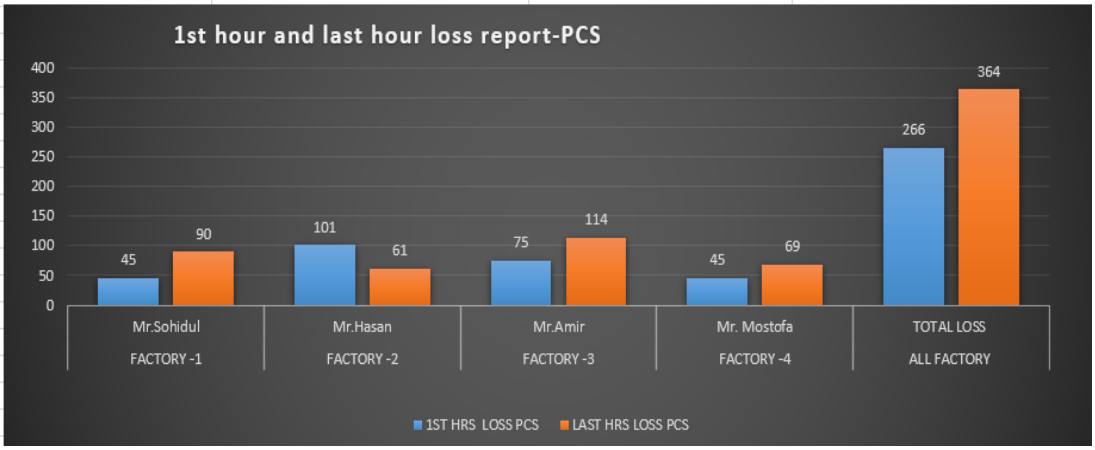


Table 7 :First hour and last hour loss report

Day 2 :12/12/2022

S/L	FACTORY NAME	RESPONSIBLE	1ST HRS LOSS PCS	LAST HRS LOSS PCS
1	FACTORY -1	Mr.Sohidul	75	30
2	FACTORY -2	Mr.Hasan	71	41
3	FACTORY -3	Mr.Amir	54	47
4	FACTORY -4	Mr. Mostofa	46	61
5	ALL FACTORY	TOTAL LOSS	246	169

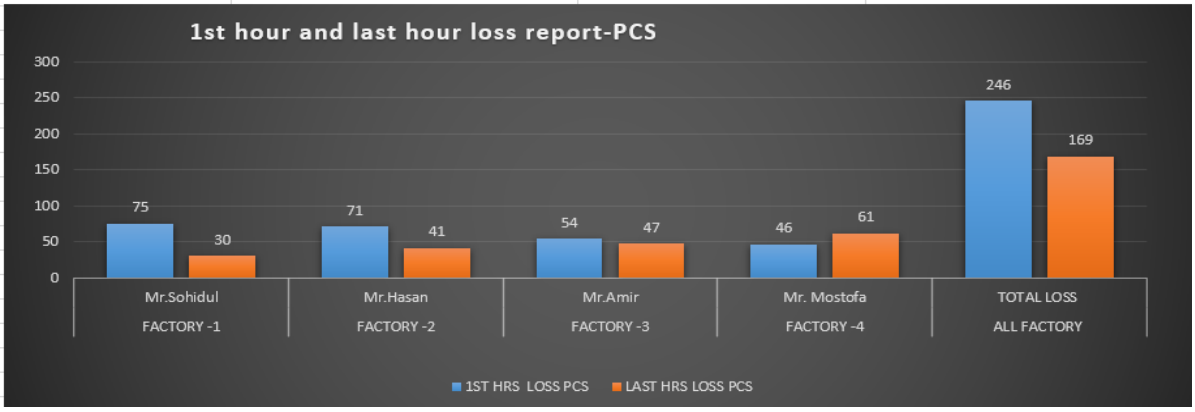


Table 8 :First hour and last hour loss report

Day - 03:13/12/2022

S/L	FACTORY NAME	RESPONSIBLE	1ST HRS LOSS PCS	LAST HRS LOSS PCS
1	FACTORY -1	Mr.Sohidul	70	25
2	FACTORY -2	Mr.Hasan	65	45
3	FACTORY -3	Mr.Amir	51	47
4	FACTORY -4	Mr. Mostofa	53	50
5	ALL FACTORY	TOTAL LOSS	239	167

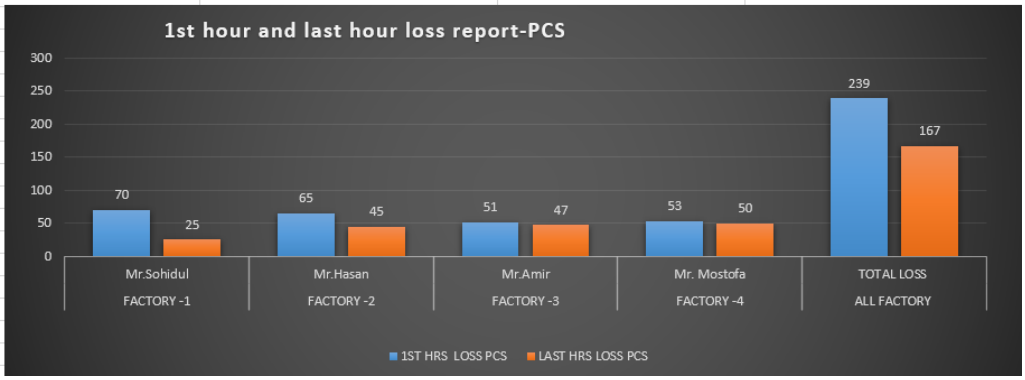


Table 9 :First hour and last hour loss report

3.2.2 After Kaizen implements of sewing floor.

Day 1 : 07/01/2023

S/L	FACTORY NAME	RESPONSIBLE	1ST HRS LOSS PCS	LAST HRS LOSS PCS
1	FACTORY -1	Mr.Sohidul	25	28
2	FACTORY -2	Mr.Hasan	25	31
3	FACTORY -3	Mr.Amir	23	17
4	FACTORY -4	Mr. Mostofa	31	35
5	ALL FACTORY	TOTAL LOSS	104	111

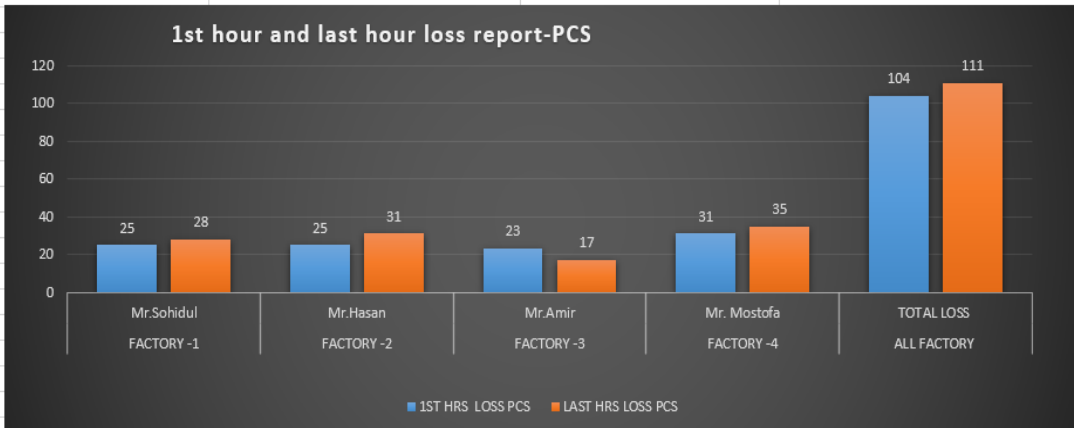


Table 10 : First-hour last hour loss report

Day 2 :08/01/2023

S/L	FACTORY NAME	RESPONSIBLE	1ST HRS LOSS PCS	LAST HRS LOSS PCS
1	FACTORY -1	Mr.Sohidul	20	29
2	FACTORY -2	Mr.Hasan	25	31
3	FACTORY -3	Mr.Amir	26	20
4	FACTORY -4	Mr. Mostofa	28	37
5	ALL FACTORY	TOTAL LOSS	99	117

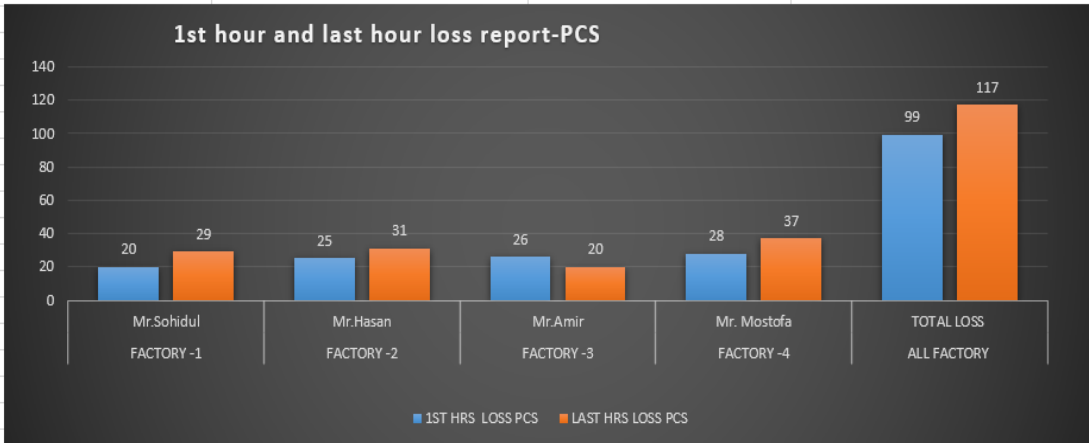


Table 11 :First hour and last hour loss report

Day 3 :09/01/2023

S/L	FACTORY NAME	RESPONSIBLE	1ST HRS LOSS PCS	LAST HRS LOSS PCS
1	FACTORY -1	Mr.Sohidul	28	36
2	FACTORY -2	Mr.Hasan	30	33
3	FACTORY -3	Mr.Amir	26	28
4	FACTORY -4	Mr. Mostofa	19	23
5	ALL FACTORY	TOTAL LOSS	103	120

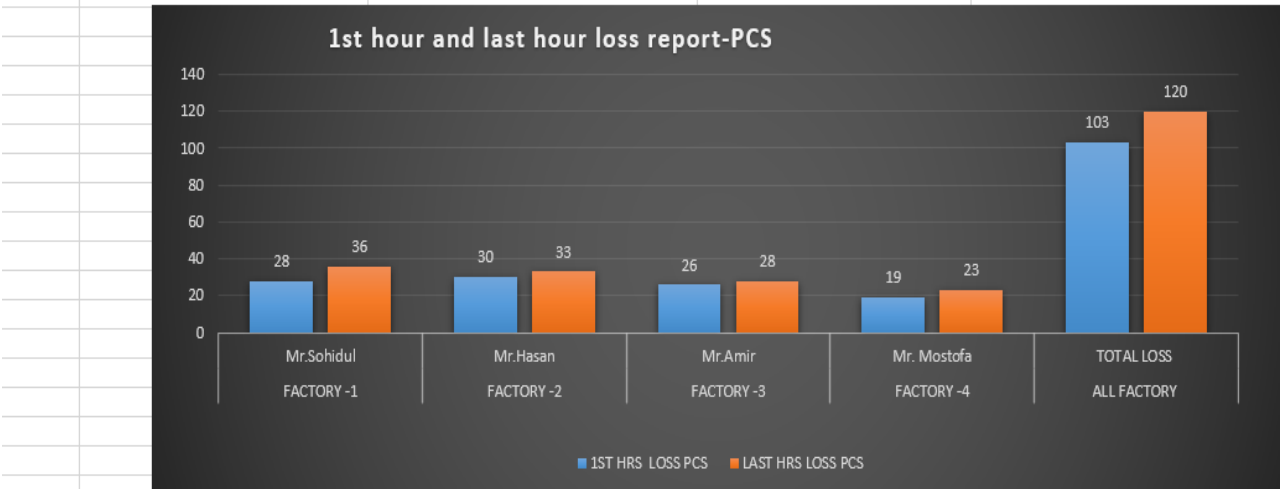
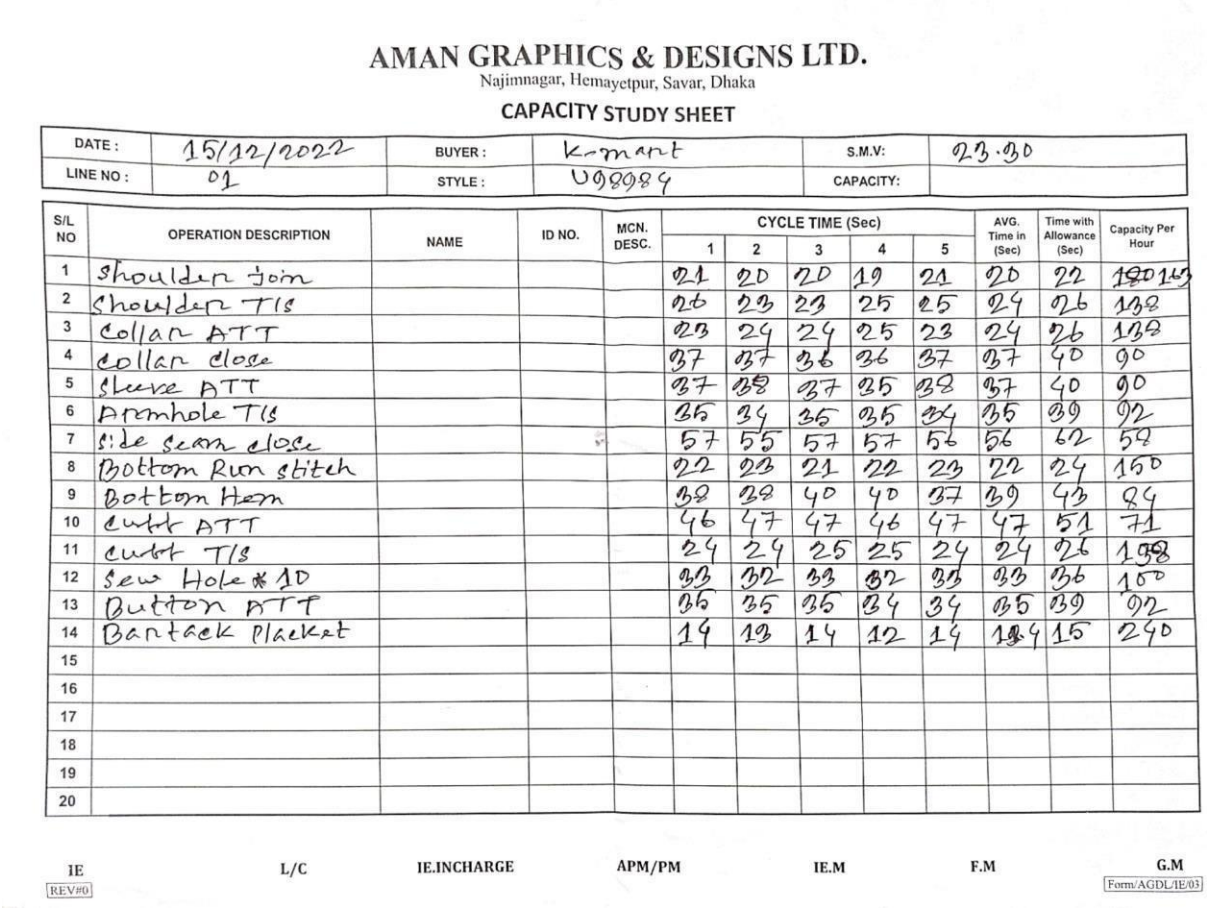


Table 12 :First hour and last hour loss report

3.3 Progressive Bundle System and Unit Production System capacity

After the kaizen project was implemented, the factory increased the UPS line more than the PBS line. The UPS line reduces lower productivity on the sewing floor more than the PBS line.

3.3.1 Progressive Bundle System capacity



AMAN GRAPHICS & DESIGNS LTD.
Najimnagar, Hemayetpur, Savar, Dhaka
CAPACITY STUDY SHEET

DATE :	15/12/2022	BUYER :	K-mart	S.M.V:	23.30
LINE NO :	01	STYLE :	U98984	CAPACITY:	

S/L NO	OPERATION DESCRIPTION	NAME	ID NO.	MCN. DESC.	CYCLE TIME (Sec) 1	2	3	4	5	AVG. Time in (Sec)	Time with Allowance (Sec)	Capacity Per Hour
1	Shoulder join				21	20	20	19	21	20	22	120 145
2	Shoulder TIS				26	23	23	25	25	24	26	138
3	Collar ATT				23	24	24	25	23	24	26	138
4	collar close				37	37	36	36	37	37	40	90
5	Sleeve ATT				37	38	37	35	38	37	40	90
6	Armhole TIS				35	34	35	35	34	35	39	92
7	Side seam close				57	55	57	57	56	56	62	58
8	Bottom Run stitch				22	23	21	22	23	22	24	150
9	Bottom Hem				38	38	40	40	37	39	43	84
10	cuff ATT				46	47	47	46	47	47	51	71
11	cuff TIS				24	24	25	25	24	24	26	138
12	Sew Hole * 10				33	32	33	32	33	33	36	100
13	Button ATT				35	35	35	34	34	35	39	92
14	Bartack Placket				14	13	14	12	14	13	15	240
15												
16												
17												
18												
19												
20												

IE L/C IE.INCHARGE APM/PM IE.M F.M G.M

REV#0 Form/AGDL/IE/03

Figure 1: Capacity study of PBS Line

3.3.2 Unit Production System capacity

AMAN GRAPHICS & DESIGNS LTD.
Najimnagar, Hemayetpur, Savar, Dhaka

CAPACITY STUDY SHEET

DATE :	15/12/2022	BUYER :	K-mart	S.M.V:	23.30
LINE NO :	04	STYLE :	U98984	CAPACITY:	

S/L NO	OPERATION DESCRIPTION	NAME	ID NO.	MCN. DESC.	CYCLE TIME (Sec)					AVG. Time in (Sec)	Time with Allowance (Sec)	Capacity Per Hour
					1	2	3	4	5			
1	Shoulder join				19	18	19	18	18	18	20	180
2	Shoulder TIS				25	24	24	25	25	24	25	144
3	Collar ATT				21	21	20	21	21	21	23	157
4	Collar close				34	34	34	33	31	33	36	100
5	Sleeve ATT				34	32	32	31	33	32	35	103
6	Armhole T/S				32	31	32	31	31	31	34	106
7	Side Seam close				55	54	53	54	54	54	59	61
8	Bottom Run stitch				20	19	20	21	20	20	22	164
9	Bottom Hem				35	36	35	36	35	35	38	95
10	cuff ATT				44	43	43	43	44	43	47	77
11	cuff ~~Hem~~ T/S				22	22	23	21	22	22	24	150
12	Sew Hole				30	31	30	29	30	30	33	109
13	Button ATT				32	31	31	32	30	31	34	106
14	Bartack Placket				13	12	13	12	12	12	13	277
15												
16												
17												
18												
19												
20												

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Figure 2: Capacity study of UPS Line

Chapter- IV

DISCUSSION & RESULTS

4.1 Report Analysis:

4.1.2 Kaizen Implement Example 1

Aman Graphics & Designs Ltd.							
Date	18-Dec	Kaizen No.		Implemented Area	Sewing Line-28B	Once ●	Repeated ○
Status		Department	Sewing		Kaizen Lead	Md.Mahfuj	Standardized ○

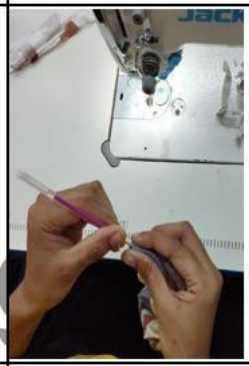
Before	After
	

Impact	Before	After	Improvement	$$ Saving
Safety/ Productivity/ Quality/ Delivery/ Cost/ Moral	Previously, We used to mark the center of back neck binding for attach the label.	Now, We are using a magnet guide & give size-wise measurement to the TM. So, she can join the label at the mid point without a mark.	**Cycle time improved of binding tack & cut process & 0.16SMV from total SMV.**	**0.16*0.08*6050 Pcs= 78 $**

4 1.2 Kaizen Implement Example 2

Aman Graphics & Designs Ltd.

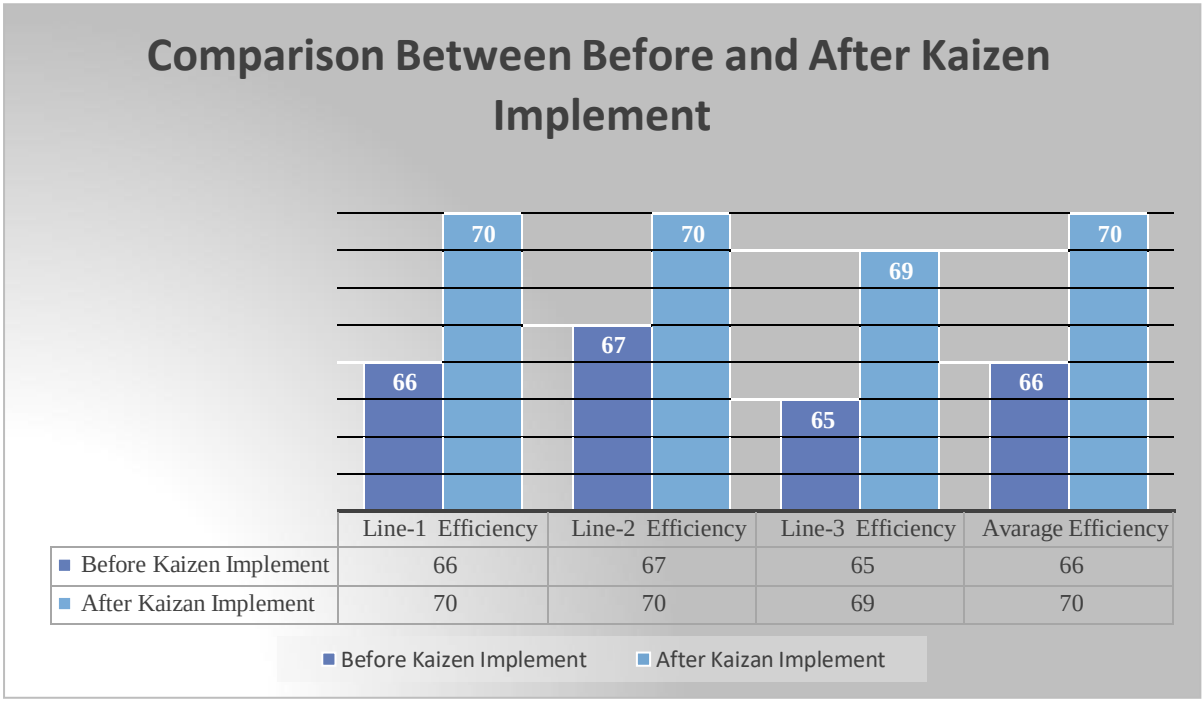
Date	17-Jan	Kaizen No.		Implemented Area	Sewing Line- Knit-3	Once ○	Repeated ○
Status		Department	Sewing		Kaizen Lead	Md.Fazle Farhad	Standardized ●

Before	After	
		

Impact	Before	After	Improvement	$$ Saving
Safety/ Productivity/ Quality/ Delivery/ Cost/ Moral	Previously, We used to attach Main Label at back part engaging a separate team-member.	Now, during Neck TS, Team-members attachig main label by marking individually.	**One team-member reduced from the line & a s/n machine from layout.**	**SMV Saving = 0.16, Manpower saved =1**

Description: Here we show 2 examples of Kaizen implemented on the sewing floor. The first one was before Kaizen implement used to mark the center of the back neck binding for attaching the label. Then kaizen uses a magnet guide and gives size-wise measurements to the TM. Now operator joins the label at the midpoint without a mark. Hereafter kaizen used cycle time improved from total cycle time which saved 78 $. Moreover, 2nd Kaizen before used kaizen operator used to attach Main Label at the back part engaging a separate team member now after the kaizen implementation operator can easily attach the main label during neck TS by marketing individually which saves one manpower and also reduces SMV making the garment.

4.1.3 Efficiency Comparison of 3 production lines.



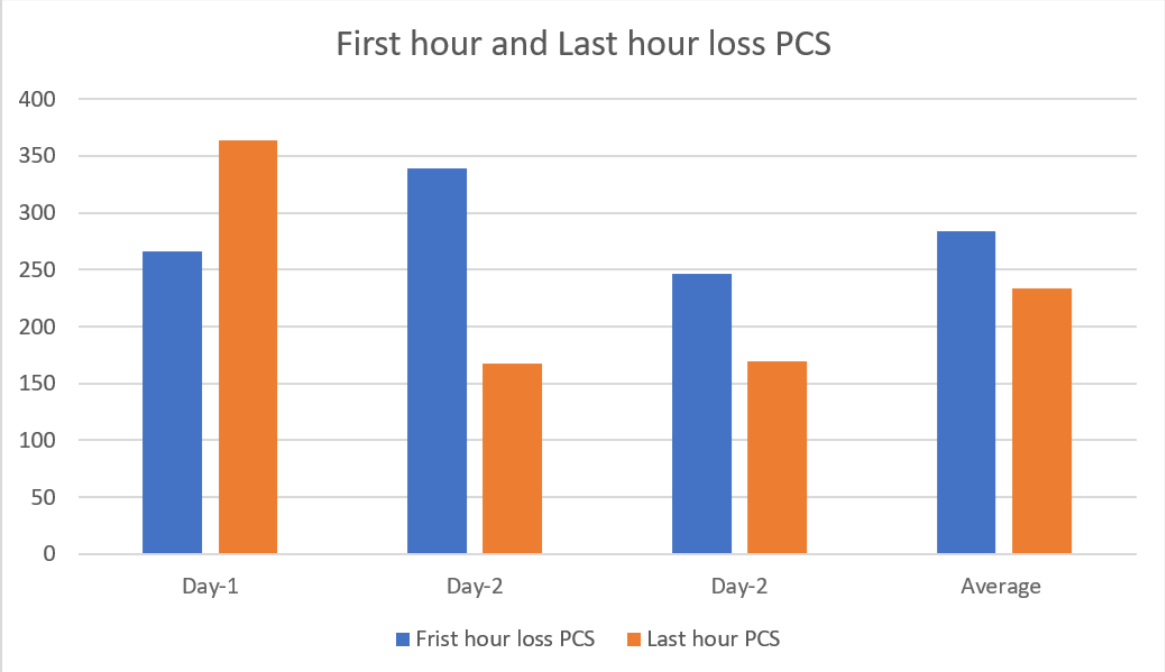
Description: After kaizen implementation at Aman Aman Graphics &Designs Ltd applied kaizen in every line. Here we show the 3-line efficiency comparison before and after the kaizen implementation. Line 1 we can see efficiency was 66% and it is 70%. Also, average line efficiency increases from 66% to 70% which is a great achievement for the factory.

Cause

- After kaizen implementation which reduces SMV and saves manpower for every line.
- Save the factory costing and time after kaizen implement
- After kaizen implementation total efficiency increases from the past.

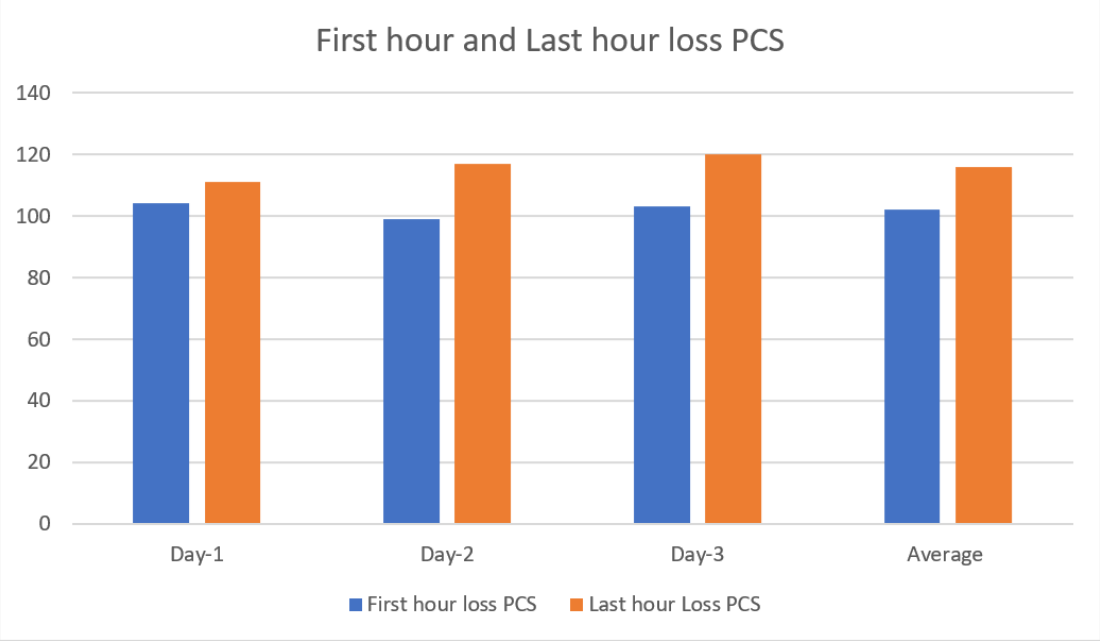
- Reduce lower productivity on the sewing floor.

4.2.1 Before the Kaizen project implement



Days	First-hour loss PCS		Lass hour loss PCS
Day-1	266		364
Day-2	339		167
Day-3	246		169
Average	284		233

4.2.2 After the Kaizen project implement



Days	First-hour loss PCS	Lass hour loss PCS
Day-1	104	111
Day-2	99	117
Day-3	103	120
Average	102	116

Description: Before the kaizen project implements in the factory work starts at 8 am and work ends at 5 pm. So workers and all the employees come from 8.05 am to 8.30 am. If an employee comes to the factory at 8 am. But he will start the work at 8.20 am or 8.30 am because he will need first start the machine and see the day target for him. As a result, he will not fully work in his first hour. Moreover, in the first hour, he will full fill his target.

On the other hand end of the working hour, an operator can not work properly because he or she getting through tired last hour of work. Also, an operator does not focus his or her work on getting home as soon as possible

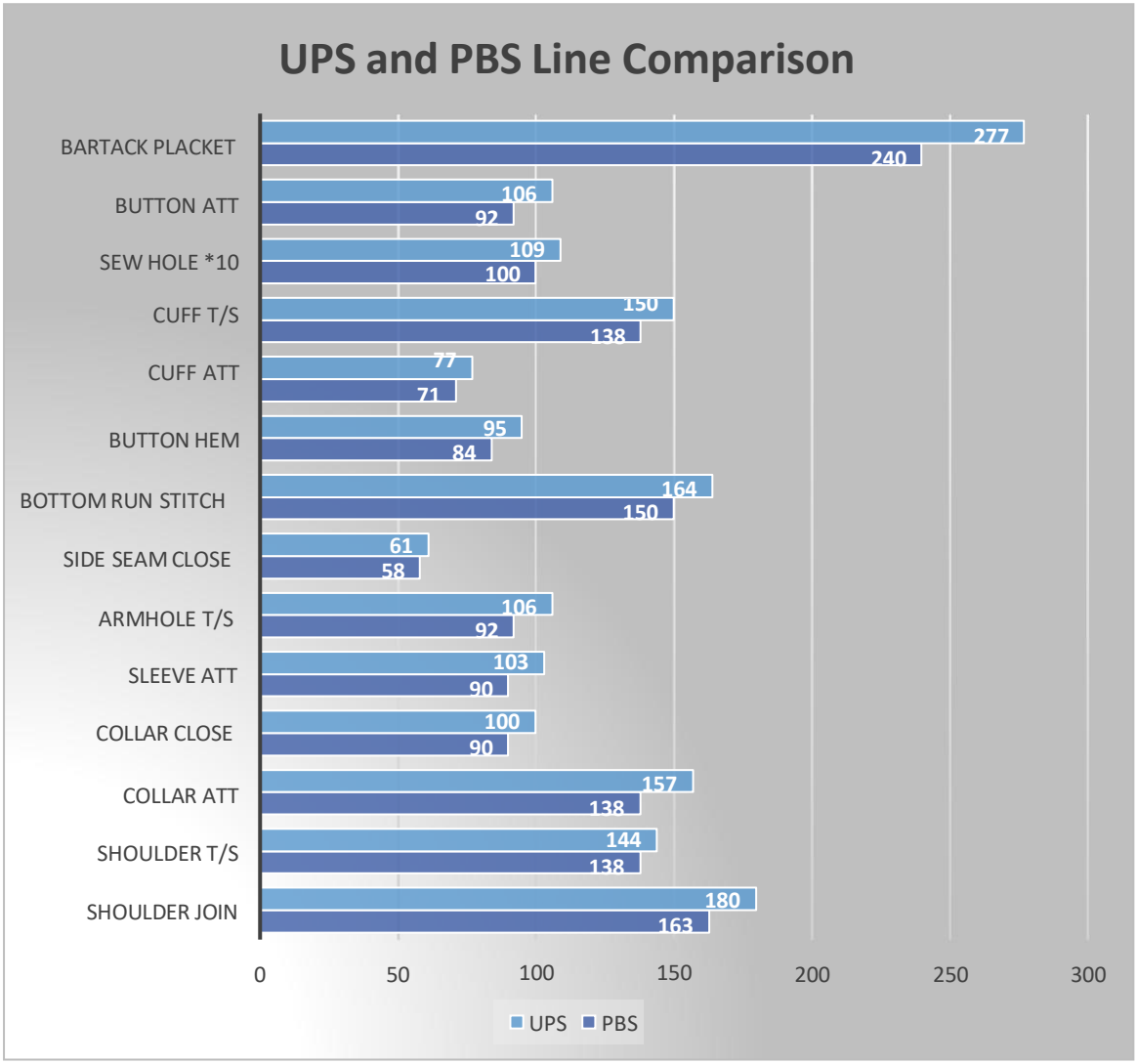
Factory finds the solutions through the Kaizen implements. To save, the first hour and last hour production loss. Factory authority starts the working time from 7.45 am. As a result, if an operator comes to the factory at 7.40 am he or she will work from 7.55 am. So first hour production loss decrease smoothly.

Other side factories decrease the last hour time by around 20 minutes. So an operator can try to finish his or her work right time. Moreover, the factory gives the operator an early coming bonus end of the month and also gives a bonus for the last of our work done properly.

Now we can see the data before Kaizen implements the 1-day first-hour loss PCS was 266 and the last-hour loss PCS was 364. Also, the Average 3 days production loss first hour was 284, PCS, and in the last hour production loss was 233 PCS.

On the other hand, After kaizen implements, the 1-day first-hour loss PCS was 104 and the last-hour loss PCS was 111. Also, the Average 3 days production loss first hour was 102, PCS, and in the last hour production loss was 116 PCS. So here we can see a lot of decreased loss production first hour andlast hour production loss. This method decreases lower productivity on the sewing floor.

4.3.1 Comparison of capacity study between UPS and PBS Line



Description: From the data, we can see UPS capacity is more than the PBS line. Now a day factory have increased UPS lines more than PBS lines on the sewing floor.

Cause:

- ✓ System for sewing quickly.
- ✓ Eliminated all handling of bundles.
- ✓ The time it takes to pick up and get rid of the trash is cut to a minimum.
- ✓ Layout for sewing quickly.
- ✓ No chance of getting things out of order.
- ✓ Better way to handle clothes without touching the floor.
- ✓ Better monitoring environment.
- ✓ During each step of the process, the amount of each part is checked, and the quality is good.
- ✓ Nothing is wrong with WIP. Because steady production helps keep WIP under control.
- ✓ It is possible to have a smooth production.

In every operation, the Unit Production System has a higher output capacity than the Progressive Bundle System Line

- ✓ Bundle handling removed.
- ✓ UPS boosts productivity by 15-30%.
- ✓ The solution reduces WIP, improves space use, and boosts productivity.
- ✓ Accelerate production.
- ✓ Increase needle movement time, machine utilization, and handling reduction.
- ✓ Real-time performance report.
- ✓ Clean your workplace.
- ✓ Staff assignment with little resources.
- ✓ Improved lead timeless process.
- ✓ Space optimization.
- ✓ Better garment handling without floor contact.
- ✓ No serial/sequence errors.
- ✓ Automatic output recording avoids operator work registration.
- ✓ Easy rework.
- ✓ Automatic product counting and reduced rejection.

So, Unit Production System has a higher output capacity than the Progressive Bundle System Line. Progressive Bundle System Line increase lower productivity from Unit Production System Line.

Chapter- V

Conclusion

Conclusion:

The method of continuous improvement began with a small region and worked its way out to increase output, effectiveness, and quality. Throughout the industrial shop floor, effective teamwork and collaboration with team members surpass the standard. The outcomes both before and after the implementation of Kaizen are extremely fruitful. Here, the factory raised production line efficiency from 66% to 70% by using the Kaizen approach. It is quite costeffective for a factory. analysis of the causes of poor productivity is very important. We discussed the study that contrasted productivity prior to and following the application of the Kaizen method. This is still true today, as corporations waste millions of dollars every day because they don't realize how important it is to consistently improve productivity. We examine how the sector might more successfully reduce lower sewing floor productivity. The kaizen method was put into use, and the sewing floor's efficiency rose from 66% to 70%. Also, we talk about first- and last-hour output loss. Also, we demonstrate how the Progressive Bundle System and Unit Production System compare. In addition, we demonstrate that Unit Production System outperforms both Unit Production System and Progressive Bundle System in terms of output capacity

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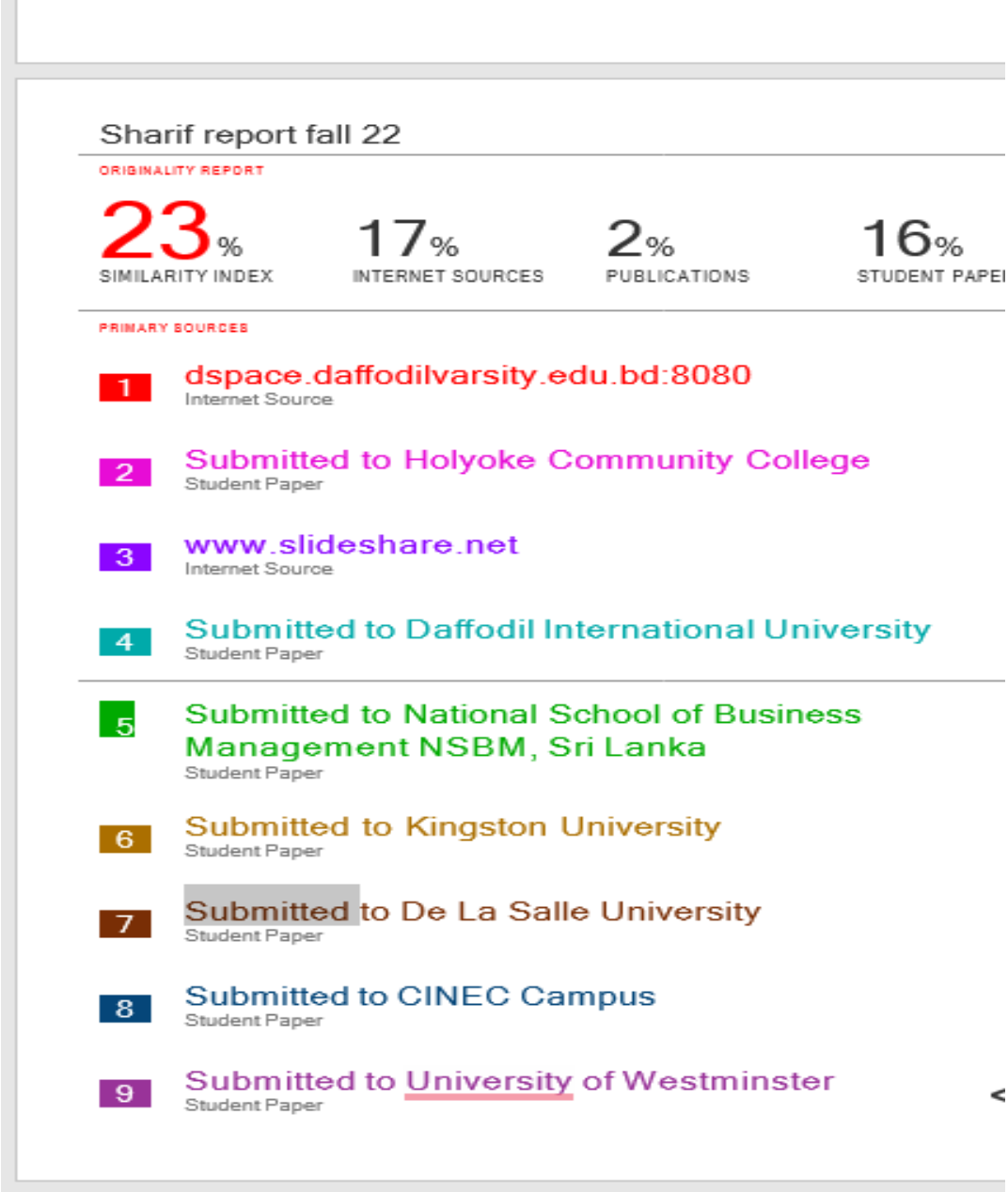

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