Faculty of Engineering

Department of Textile Engineering

REPORT ON

"Study on the End-to-End Supply Chain Management in the Garments Industry: From Order Processing to Shipment"

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Letter of Approval

24-5-2025

To

The Head,

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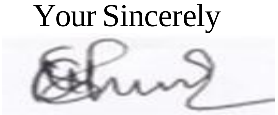
Subject: Approval of Project Report of M.Sc. In Textile Engineering

Dear Sir,

I am proud to inform that the project report of the student having the **ID: 0242310014123003** in the project topic **"Optimizing End-to-End Supply Chain Management in the Garments Industry: From Order Processing to Shipment"** has been thus completed and is now ready for examination. This report has been prepared carefully and accurately based on the study carried out in **"LIZ COMPLEX, NASSA GROUP"**. It also has critical assessment by reviewing observational data and including supporting materials. The student was therefore engaged in all the project activities closely to have better grasp of the projects.

Hence, I humbly appeal to any dedicated reader to pay attention to this project report and possibly use it for one final assessment. Your compliance with the above in this regard will be much appreciated.

Your Sincerely



…………………………

Md. Mashud Raihan

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International University

DEDICATED TO MY PARENTS

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Initially, I extend my sincere gratitude to **"Almighty Allah,"** the ultimate power of the universe, for granting me the patience and capability to present this thesis. To begin with, I wish to express my heartfelt gratitude to my supervisor **Md. Mashud Raihan**, Assistant Professor at the Department of Textile Engineering, Daffodil International University, for his unwavering assistance and dedication to this research project. There is much to gain from him and to gain alongside him due to his motivating concepts and excellent work ethic. The concepts presented and the assistance given have been extremely beneficial in completing this project successfully.

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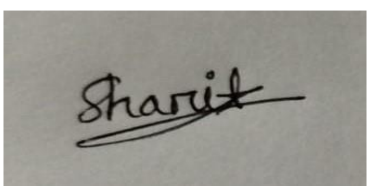
SUPERVISORE DECLARATION

I formally state that this report has been completed under the guidance of **Md. Mashud Raihan**, Assistant Professor in the Department of Textile at Daffodil International University. I further affirm that this internship report and no section of it has been submitted in any other context for the conferral of any degree

Submitted By:



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ABSTRACT

At the heart of the garments sector lies a remarkably competitive global marketplace where factors such as supply chain management affect profitability and customer satisfaction. This thesis concentrates on optimizing supply chain management in the garments sector by examining the order processing to shipment workflow. The aim is to identify gaps in productivity and offer solutions that accelerate processes, boost cost-effectiveness, and maintain quality standards.

The investigation features a blend of qualitative and quantitative methods to analyze the supply chain of the garments industry. It describes waiting for production, poor communication, inaccurate forecasting, supplier disconnection, and lack of cohesion as fundamental issues. This research underlines that the digitally-enabled ERP-based business processes as well as data and analytical systems facilitate better-managed operational performance due to improved decision-making.

The crucial insights indicate that holistic approaches to planning, the application of just-in-time inventory systems, and inter-firm collaborations within the supply chain network greatly increase overall efficiency. As a final point, the study offers practical suggestions directed toward producers, international traders, and supply chain strategists concerning how to optimize each process and their interfaces to achieve superior responsiveness, minimal wastage, and dependable delivery fulfillment.

The findings of this investigation are of importance to the existing literature on the optimization of supply chains in the textile and garments industry and presents a comprehensive model for enterprises focused on sustaining operational effectiveness and responsiveness to client's needs.

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CHAPTER-1

Introduction

1.1 Background

The global garments industry plays a pivotal role in the economic development of many countries, particularly in emerging economies such as Bangladesh, Vietnam, India, and Cambodia. It is one of the largest manufacturing sectors worldwide, generating billions of dollars in revenue and employing millions of workers. As consumer demands shift rapidly and competition intensifies, efficient supply chain management (SCM) has become critical to sustaining profitability and maintaining a competitive edge in this industry. The garments supply chain is inherently complex and multi-tiered, involving various stakeholders including suppliers, manufacturers, logistics providers, and retailers. Each phase, from order processing and raw material sourcing to production, quality control, packaging, and final shipment, requires seamless coordination. However, many garment manufacturers face significant challenges such as order delays, inventory mismatches, production inefficiencies, and logistical bottlenecks that affect overall supply chain performance. These challenges are exacerbated by global disruptions, such as the COVID-19 pandemic, geopolitical tensions, and changing trade regulations, which have underscored the need for more resilient and agile supply chains. Traditionally, garment supply chains have operated with fragmented information systems and manual processes, making real-time visibility and optimization difficult. Delays in order confirmation, miscommunication between departments, lack of integration between planning and execution systems, and poor forecasting are common issues. These inefficiencies often result in late shipments, increased operational costs, dissatisfied customers, and lost business opportunities. To address these problems, there is a growing emphasis on optimizing the end-to-end supply chain from order receipt to final delivery. This involves the application of modern supply chain practices such as Lean manufacturing, Just-In-Time (JIT) inventory, digital tracking systems, Enterprise Resource Planning (ERP) software, and advanced data analytics. Such optimization aims to reduce lead times, enhance visibility, improve resource utilization, and ensure timely delivery, ultimately leading to a more efficient and responsive supply chain. This thesis explores the various components and dynamics of the garments supply chain, focusing on identifying inefficiencies and proposing practical optimization strategies. By analyzing the current challenges and opportunities in end-to-end supply chain management, this research seeks to contribute valuable insights and solutions for garments manufacturers striving to improve their operational performance and customer satisfaction.

1.2 Present State of the Problem

Despite the garments industry's significant contribution to global trade and employment, the end-to-end supply chain processes particularly from order processing to shipment continue to face serious challenges that hinder overall performance and competitiveness. The current state of supply chain management in the garments sector is often characterized by fragmented operations, limited technological integration, and weak coordination among stakeholders. These problems are especially acute in developing countries where most garment production is concentrated. One of the major issues is manual and disconnected order processing systems. Many garment factories still rely on email, spreadsheets, and paper-based systems to handle orders, resulting in errors, miscommunication, and delays in order confirmation. As a consequence, the entire downstream process from production planning to final shipment is often based on inaccurate or outdated information, leading to production inefficiencies and missed deadlines. Another pressing problem is the lack of real-time visibility and tracking across the supply chain. Most garment manufacturers and suppliers do not have access to integrated platforms that can provide a unified view of inventory, production status, and logistics. This results in poor decision-making, overstocking or stock outs, and difficulties in anticipating problems early enough to take corrective actions. Coordination between departments and supply chain partners is also weak. Information flow between sourcing, production, quality control, and logistics departments are often slow and inconsistent, which delays production and causes last-minute shipment problems. Moreover, the absence of standardized processes and poor vendor management practices further aggravate the situation, making it difficult to maintain consistent quality and timely delivery. Logistics and transportation issues are another significant bottleneck. In many garment-producing regions, infrastructure limitations, port congestion, and customs delays lead to late shipments and increased shipping costs. These issues not only damage supplier reputations but also threaten long-term contracts with global buyers who demand speed, reliability, and flexibility. Furthermore, the use of outdated production planning and forecasting methods impairs the ability of firms to respond to sudden changes in demand or raw material availability. This inflexibility results in either excessive lead times or missed market opportunities. Many manufacturers still follow traditional planning models that do not account for real-time market data or dynamic demand patterns. Lastly, the lack of investment in digital transformation limits the potential for automation, data analytics, and supply chain optimization. While some large manufacturers have begun adopting ERP systems, RFID, and AI-driven analytics, small and medium-sized enterprises which make up the bulk of the industry lag behind due to financial and technical constraints. As a result of these issues, many garments manufacturers suffer from poor supply chain performance, high operational costs, and customer dissatisfaction. To remain competitive in a fast-paced global market, there is a critical need to optimize the entire supply chain from order processing to shipment through process improvement, digitalization, and stronger collaboration across the value chain.

1.3 Problem solving Technique

The first step involves creating a detailed process map of the entire supply chain from order processing to shipment. This helps visualize the flow of information, materials, and tasks across departments and supply chain partners. By identifying each stage and responsible stakeholder, process mapping will highlight areas with bottlenecks, redundancies, or communication gaps. Once problem areas are identified, a root cause analysis will be conducted using tools like the 5 Whys and Fishbone Diagram (Ishikawa). This will help uncover the underlying reasons for issues such as late deliveries, inventory mismatches, and inefficient order processing. Lean principles will be applied to eliminate waste and improve flow throughout the supply chain. Techniques like Value Stream Mapping (VSM), Just-In-Time (JIT) inventory management, and Kanban systems will be considered to reduce excess inventory, shorten lead times, and improve responsiveness. Modern technologies such as Enterprise Resource Planning (ERP), Supply Chain Management Software (SCMS), and Radio Frequency Identification (RFID) will be examined as tools to automate and synchronize operations. These tools improve real-time data access, enhance visibility, and support faster decision-making. Feedback from supply chain managers, factory staff, and logistics providers will be gathered through interviews and structured surveys. This qualitative data will provide insights into operational challenges, communication issues, and training needs. Simulation models (e.g., discrete-event simulation or system dynamics) may be developed to test the impact of proposed changes in a risk-free environment. Scenario analysis will help predict the outcomes of various optimization strategies such as reducing order lead time or outsourcing logistics. Finally, a Plan-Do-Check-Act (PDCA) cycle will be introduced to establish a continuous improvement culture. This will ensure that the improvements made are sustainable, measurable, and adaptable to future changes.

1.4 Objectives

- To examine the current end-to-end supply chain process in garment manufacturing industries, focusing on key functions such as order processing, procurement, production, quality control, warehousing, and shipment.
- To identify the major challenges and inefficiencies that disrupt the smooth flow of the supply chain, including delays, miscommunication, inventory mismanagement, and production bottlenecks.
- To measure the performance of the current supply chain system using relevant Key Performance Indicators (KPIs) such as order lead time, production cycle time, on-time delivery rate, and inventory turnover ratio.
- To explore the role of modern supply chain strategies and digital tools (e.g., ERP, RFID, SCM software, and real-time data analytics) in improving coordination, visibility, and responsiveness within the supply chain.
- To propose a practical optimization framework that integrates lean principles, technology solutions, and best practices for improving efficiency, reducing costs, and ensuring timely delivery.
- To validate the effectiveness of the proposed solutions through case analysis, simulation, or pilot implementation within selected garment factories.

CHAPTER-2

2. Literature Review

2.1 Overview of Supply Chain Management (SCM) in the Garments Industry

Supply chain management in the garments industry aims to improve collaboration between companies to meet market demands by enhancing production efficiency, quality control, and product design, while utilizing modern technology and material innovations for better results[1].Supply Chain Management in the garments industry emphasizes collaboration among partners, efficient logistics such as inventory and transportation management, and addresses trends, sustainability, and the specific challenges of the fast fashion sector[2].

Supply Chain Management in the garments industry aims to integrate quality management across supply chain members to improve performance, address challenges in Bangladesh's Ready-Made Garments sector, and achieve sustainable competitive advantage through efficient resource use [3]. Supply Chain Management in the garments industry enhances efficiency and performance by fostering partnerships, leveraging technology, ensuring flexibility, measuring outcomes, engaging management, and understanding demand, thereby strengthening relationships among manufacturers, suppliers, and retailers [4].

2.2 Order Processing in Garment Supply Chains

A Central Order Processing System (COPS) optimizes demand-driven garment supply chains by reducing lead times and improving efficiency through collaboration strategies like resource sharing, information sharing, and joint decision-making [5]. This order processing method centralizes the management of returns from online and offline channels, preventing inventory mixing and ensuring efficient handling of return notes to streamline storage operations [6].

Garment processing methods use predicted wearer data to sort items through two sorting operations, improving order processing efficiency by minimizing handling and optimizing delivery routes within the supply chain [7]. A garment supply chain order processing solution that improves efficiency through document management, interoperability standards, automated content checks, middleware for seamless document exchange, and a Partner Search module to find production partners [8].

2.3 Demand Forecasting and Planning

Integrating data analytics and machine learning into supply chain management enhances demand forecasting and planning, reducing inventory levels and stock outs while improving customer satisfaction, though it faces challenges like data quality and the need for skilled personnel [9]. Demand forecasting and planning use historical data and statistical algorithms to evaluate models, predict responses to events, and generate optimal forecasts for organizational use [10].

Demand forecasting forms the foundation of CPFR processes by providing insights into future customer needs, guiding planning across functions, and enhancing decision-making and operational efficiency within the demand network [11]. Demand forecasting and planning include setting goals, choosing techniques, using data sources, and aligning supply with demand. Effective planning improves cost and delivery performance, as seen in industries like Vietnamese coffee, offering valuable organizational insights [12].

2.4 Inventory Management and Control

Inventory management is vital for manufacturing success, helping meet demand, control costs, plan production, maintain quality, and improve cash flow by enabling quick turnover and reducing excess stock [13]. Inventory management is key to operational efficiency, helping businesses stay competitive and profitable amid globalization and technological changes shaping modern market dynamics [14].

Optimal inventory control techniques highlight the importance of effective stock management using innovation, technology, and data analysis to monitor inventory, assess sales trends, and boost financial performance in logistics and retail [15]. Inventory management is crucial for organizations, involving significant investment about 25% of U.S. GDP. The 1913 Economic Order Quantity model pioneered modern inventory planning methods like JIT and supply chain management [16].

2.5 Production Planning and Scheduling

Production planning and scheduling are crucial for accurate demand forecasting and efficient resource use. Effective strategies reduce downtime, lower costs, boost output, and improve service quality, leading to greater efficiency and a lasting competitive edge [17]. Production planning and scheduling are closely linked, with planning guiding high-level decisions and scheduling handling detailed execution. Their effective coordination is key to optimizing production performance [18].

In garments production, planning and scheduling aim to reduce lateness and ensure on-time delivery. Methods like simulation, Branch and Bound algorithms, and heuristics are used to improve industry competitiveness [19]. The garment production management system includes modules for order processing, task distribution, and data analysis, which help create production balance charts and improve planning and scheduling efficiency [20].

2.6 Logistics and Shipment Management

Logistics and shipment management in garments focus on optimizing receiving, storage, picking, and shipping. Strategies like self-logistics and third-party logistics boost efficiency, cut costs, and enhance business performance [21]. Fashion logistics focuses on distribution, retailer transshipment, and sustainable practices. It aims to improve garment transportation, enhance consumer experience, and use advanced technologies to optimize supply chain operations [22].

Inditex's logistics and shipment management use an advanced network with a strong focus on air transport to enable fast distribution and quick responses to customer demands in the fast fashion industry [23]. Logistics management in the textiles and garment industry uses an integrated information platform to streamline transportation, inventory, and distribution, while also supporting efficient waste recovery and recycling [24].

2.7 Technology Integration in Garment Supply Chains

Technology integration in garment supply chains uses tools like RFID, IoT, AI, and CAD to boost efficiency, cut costs, and increase transparency. Success depends on collaboration, aligning people and processes, and overcoming resistance to change through training and support. It helps improve performance, reduce lead times, and manage inventory effectively [25]. Technology integration in garment supply chains supports the shift to a circular economy by improving manufacturing intelligence and tackling issues like pollution and oversupply. Digitizing product development helps meet market demands for personalization and transparency, promoting sustainability and aligning with the digitalization trends accelerated by COVID-19 [26].

Technology integration in garment supply chains helps overcome fragmentation by connecting eastern manufacturers with western consumers. Digitization boosts efficiency, reduces disruption risks, improves supply chain performance, and supports strong buyer-supplier relationships, transforming regional supply chains into global networks [27]. Technology integration, especially digitalization and agile practices, plays a vital role in garment supply chains by improving responsiveness and adaptability to market changes. The research stresses that industry professionals must embrace these advancements to overcome challenges and gain a competitive edge in a complex, uncertain environment [28].

2.8 Challenges and Bottlenecks in End-to-End Garment SCM

Bottlenecks in the garment supply chain occur at Sewing and Finishing stations due to unbalanced capacity and idle resources at the Embroidery station, causing work-in-process buildup and lower throughput [29]. Bottlenecks in manufacturing stem from differing resource traits and interdependencies. Identifying and managing them accurately is vital to prevent poor resource use and delays, especially in dynamic production environments [30]. Challenges in garment supply chain management include long supply chains, low flexibility, poor information transparency, no supplier evaluation, and lack of sustainability efforts, worsened by increasing consumer demands and competition [31]. Challenges in garment supply chain management include data management, technology integration, consumer involvement, and maintaining relationships with supply chain partners key factors for successful mass customization [32].

2.9 Optimization Approaches in Supply Chain Management

Innovative techniques, driven by information technology, optimize supply chains by enhancing logistics, improving company integration, and allowing firms to focus on core strengths while outsourcing other goods and services [33]. Cost optimization in supply chain management involves developing strong vendor relationships, using strategic sourcing, and leveraging advanced technologies and performance metrics to improve decisions and achieve sustainable savings [34].

Deep Reinforcement Learning-based Supply Chain Optimization (DRL-SCOM) uses REDQ and TRPO techniques to improve decision-making, demand forecasting, inventory management, and logistics, enhancing overall supply chain efficiency [35]. Supply chain optimization in consumer electronics focuses on inventory management, simplifying manufacturing, and improving distribution networks using advanced forecasting, machine learning, and collaborative supplier forecasting [36]. Supply chain optimization uses methods like linear, integer, and mixed-integer programming, along with metaheuristics, to solve complex issues such as facility location, demand allocation, and vehicle routing, improving efficiency under uncertainty and competing goals [37].

2.10 Sustainability and Green Supply Chain Practices in Garments

Internal environmental management and stakeholder cooperation are key to adopting green supply chain practices in the garment industry, improving environmental, economic, and operational performance while promoting sustainability [38]. Green supply chain management (GSCM) practices strengthen the impact of big data analytics capability (BDAC) on supply chain sustainability in Bangladesh's ready-made garments sector, enhancing economic, social, and environmental outcomes [39]. Green Supply Chain Management (GSCM) practices like Green Procurement and Green Manufacturing support environmental sustainability in Bangladesh's garment factories. However, greater awareness and stronger government initiatives are needed to overcome challenges and improve these efforts [40]. GSCM components eco-design, green purchasing, green manufacturing, green marketing, and internal environmental management positively impact the economic, environmental, and social sustainability of green garment organizations in Bangladesh [41]. Green manufacturing in apparel promotes eco-friendly practices throughout production, stressing the importance of sustainability in developing countries and outlining best practices to boost sustainability competencies in garment companies [42].

2.11 Recent Trends and Innovations

Recent garment supply chain trends include global sourcing, product variety, and technologies like RFID and ICT, which improve integration, boost efficiency, and support sustainability by minimizing waste and optimizing design, production, and distribution [43]. Recent trends in the garment supply chain involve using 3D virtual technologies to improve design and production, boost efficiency, support sustainability innovations, and reshape business models while promoting cultural sustainability in fashion [44]. Recent trends in apparel supply chain transparency show increasing use of blockchain to improve traceability and accountability, driven by challenges from the COVID-19 pandemic and rising consumer demand for ethical practices [45]. Digital transformation is a key trend in garment supply chains, focusing on technology investment, talent development, and partner relationship management to boost efficiency and competitiveness in the textile industry [46].

CHAPTER-3

3. Research Methodology

3.1 Materials:

The materials all are collect from the Liz complex Nassa group. These are Production per hour/ day data, Machine efficiency data, Summary of Inventory data, Total Order data, Summary of Shipment status, Summary of sewing data, Summary of finishing data, Shade band report, GSM REPORT, SKEWING TEST REPORT.

3.2 Method:

There is both qualitative and quantitative approach is used to complete the work. And the data is collected from Nassa Group Liz complex. All the data is summarized with Tables format.

3.3 Data Collection

3.3.1 Cumulative production output

LIZ COMPLEX

BUYER NAME	**STARDIVARIUS**		
STYLE NO	1743/659		
ITEM	EMBROIDERY JACKET		
TOTAL LINE	20		
SMV	23.11		
TOTAL MANPOWER	1084		
WORKING HOUR	8		
DATE	per hour production	per day	per month
1	1386	11090	11090
3	1631	13050	24140
4	1746	13968	38108
5	1718	13745	51853
6	1728	13825	65678
7	1705	13643	79321
8	1635	13081	92402
9	1683	13465	105867
10	1839	14715	120582
11	1902	15220	135802
12	1736	13890	149692
16	1723	13790	163482
17	1825	14600	178082
18	1850	14800	192882
19	1893	15150	208032
20	1800	14400	222432
22	1847	14780	237212
23	1850	14800	252012
24	1843	14749	266761
25	1736	13890	280651
26	1537	12300	292951
27	1443	11545	304496
Total day = 22	**Total= 38056 pcs**	**Total= 304496 pcs**	

Table-3.1: Production per hour/ day data

The data is collected from production section.

The table presents the daily and cumulative production output for the "Embroidery Jacket" (Style No. 1743/659) manufactured for buyer Stardivarius over 27 days (with 22 working days).

1. Key Observations:

Production Trends:

Peak Output: Day 11 recorded the highest hourly production (1902 pcs/hour).

Decline: Days 26–27 saw reduced output (1537 → 1443 pcs/hour), possibly due to worker fatigue or resource shortages.

2. Efficiency Metrics:

Total Output: 304,496 pcs produced in 22 working days.

Average Daily Production:13,841 pcs/day (Total ÷ 22 days).

3. SMV & Manpower Utilization:

SMV (Standard Minute Value):23.11 (high labor intensity).

Total Manpower: 1084 workers deployed.

Implications for Supply Chain Optimization:

Fluctuations suggest inefficiencies in workflow balancing. Early low output (Day 1: 1,386 pcs/hour) may indicate setup delays. Final dip warrants investigation into bottlenecks (e.g., machine downtime, absenteeism).

Recommendation: Implement real-time production monitoring and earn training to stabilize output.

3.3.2 Analysis of Machine Efficiency Data

LIZ COMPLEX

DATE	Hourly Efficiency	Day Efficiency
1	49.25	46.69
3	57.95	51.46
4	62.03	56.71
5	61.04	51.45
6	61.4	51.16
7	60.58	52.72
8	58.09	48.19
9	59.8	51.29
10	65.34	55.24
11	67.58	56.9
12	61.68	55.76
16	61.22	56.61
17	64.84	60.32
18	65.73	55.03
19	67.26	56.18
20	63.95	54.9
22	65.62	57.38
23	65.73	57.53
24	65.48	56.84
25	61.68	56.84
26	54.61	49.07
27	51.27	49.79
Total Day=22		**Monthly Average Efficiency= 54.00**

Table-3.2: Machine Efficiency data

The data is collected from production section.

Analysis of Machine Efficiency Data (Table-02)

Key Observations:

Efficiency Trends:

Peak Performance: Day 11 achieved the highest hourly (67.58%) and daily (56.9%) efficiency.

Decline: Days 26–27 saw significant drops (54.61% → 51.27% hourly), indicating potential maintenance issues or workforce fatigue.

2. Consistency:

Monthly Average Efficiency: 54%, suggesting room for improvement (ideal benchmark: 70–85% for apparel).

Volatility: Daily fluctuations (e.g., Day 1: 46.69% vs. Day 19: 56.18%) highlight unstable processes.

3. Correlation with Production (Table-01):

Higher efficiency days (e.g., Day 11) align with peak output (1902 pcs/hour).

Lower efficiency (Days 26–27) matches reduced production (1537 → 1443 pcs/hour).

- Root Causes & Recommendations:

Low Baseline Efficiency (54%):

Possible causes: Machine downtime, improper maintenance, or operator skill gaps.

Action Items:

1. Preventive Maintenance: Schedule regular machine servicing.

2. Operator Training: Upskill workers to reduce errors.

3. Real-Time Monitoring: Use IoT sensors to track efficiency live.

3.3.3 ANALYSIS: FABRIC INVENTORY BY BUYER & MATERIAL TYPE

Liz complex

Buyer	Style No.	Items	Color	Width	UOM	Total Booking Qty.	Total Rcvd. Roll/Ctn. Qty.	Total Rcvd. Qty.
STRADIVARIUS	EMBROIDERY JKT	EMBROIDERY FABRICS	ECRU	64"	YDS	16,269.0	622	16,269.0
STRADIVARIUS	EMBROIDERY JKT	60% ORG CTN 30% RCY CTN 10% BCI CTN DENIM FABRICS	ECRU	64"	YDS	6,371	51	6,371
STRADIVARIUS	EMBROIDERY JKT	60% ORG CTN 30% RCY CTN 10% BCI CTN DENIM FABRICS	ECRU	65"	YDS	10,335	82	10,335
MK	QT510BQE9X	60% BCI CTN 40% TENCEL DENIM FABRICS	NS-19465 INDIGO	64"	YDS	931	12	931
MK	QT510BQE9X	60% BCI CTN 40% TENCEL DENIM FABRICS	NS-19465 INDIGO	65"	YDS	8,586	108	8,586
MK	QT510BQE9X	DOT FUSE INTERLINING	WHITE	40"	YDS	6,094	31	6,094
ZARA	1538-440	60% ORG CTN 20% BCI CTN 20% PCW DENIM FABRICS	NS-17675 INDIGO	64"	YDS	7,800	101	7,800
ZARA	1538-440	60% ORG CTN 20% BCI CTN 20% PCW DENIM FABRICS	NS-17675 INDIGO	65"	YDS	12,217	142	12,217
ZARA	1538-301	65% RCY POLY 35% ORG CTN TWILL FABRICS	BLACK	56"	YDS	38,382	321	38,382

ZARA	1538-301	65% RCY POLY 35% ORG CTN TWILL FABRICS	BEIGE	56"	YDS	33,973	261	33,973
ZARA	1538-427	100% ORG CTN DENIM FABRICS	NS-15278 WHITE	64"	YDS	13,973	162	13,973
ZARA	1538-427	100% ORG CTN POPLIN FABRICS	RFD WHITE	57"	YDS	10,322	54	10,322
ZARA	1538-350	100% ORG CTN DENIM FABRICS	NS-19603 WHITE	64"	YDS	556	6	556
PACSUN	8010; 8030	TC POCKETING	BLACK	42"	YDS	2,100	6	2,100
PACSUN	8010; 8030	TC POCKETING	RAIN DRUM	42"	YDS	2,450	8	2,450
PACSUN	3007, 3014	100% POLYESTER MESH	CAVIAR	56"	YDS	4,950	20	4,950
PACSUN	3007, 3014, 8010, 8030	60% BCI CTN 40% NYLON FABRICS	BLACK	56"	YDS	9,862	73	9,862
PACSUN	3007, 3014, 8010, 8030	60% BCI CTN 40% NYLON FABRICS	BRUSHED NICKEL	56"	YDS	9,846	69	9,846
PACSUN	3007, 3014, 8010, 8030	27% LYOCELL 73% COTTON WOVEN FABRICS	BLACK	56"	YDS	2,551.8	27	2,551.8
PACSUN	3007, 3014, 8010, 8030	27% LYOCELL 73% COTTON WOVEN FABRICS	RAIN DRUM	56"	YDS	2,852.8	34	2,852.8
SHOW IN BD	3696-507	NON-WOVEN FUSE INTERLINING	WHITE	39"	YDS	1,500	8	1,500
SHOW IN BD	3696-507	NON-WOVEN FUSE INTERLINING	BLACK	39"	YDS	800	4	800

Table-3.3: Summary of Inventory data

ANALYSIS: FABRIC INVENTORY BY BUYER & MATERIAL TYPE

This table provides a detailed overview of fabric and trim inventory received for various buyers and styles in liz complex. The data is collected from store section.

1. STRADIVARIUS (Embroidery Jacket Style)

Key Materials:

Embroidery Fabrics (ECRU)

Total: 16,269 yards (622 rolls)

Width: 64"

Specialty: High-volume decorative fabric requiring precise handling

Sustainable Denim (60% Org Cotton + 30% Recycled Cotton + 10% BCI)

64" Width: 6,371 yards (51 rolls)

65" Width: 10,335 yards (82 rolls)

Eco-Factor: 100% sustainable composition

Procurement Insights:

Roll Size Variance: 64" vs 65" widths may indicate pattern optimization needs

High Roll Count (622) suggests delicate handling requirements for embroidery fabrics

2. MK (Denim-Centric Styles)

Key Materials:

Tencel Denim (60% BCI Cotton + 40% Tencel)

INDIGO Color: 931 yards (12 rolls @64") + 8,586 yards (108 rolls @65")

Performance Benefit: Tencel adds drape and moisture-wicking properties

Interlining (White)

6,094 yards (31 rolls @40")

Critical Use: Structural components like collars/cuffs

Sustainability Spotlight:

BCI Cotton + Tencel blend reduces water usage by ~30% compared to conventional denim

3. ZARA (High-Volume Production)

Material Breakdown:

Material Type	Composition	Color	Width	Qty (YDS)	Rolls
Denim	60% Org Cotton + 20% BCI + 20% PCW	INDIGO	64"/65"	20,017	243
Twill	65% Recycled Poly + 35% Org Cotton	BLACK/BEIGE	56"	72,355	582
Poplin	100% Org Cotton	WHITE	57"/64"	24,295	216

Table-3.4

Key Findings:

Twill Dominance:72K yards across two colors shows ZARA's focus on versatile bottom-weight fabrics

Width Strategy: 56" width for twill vs. 57"/64" for poplin suggests product-specific optimization

Organic Commitment: 100% organic cotton in poplin/denim aligns with Inditex sustainability goals

4. PACSUN (Specialty Blends)

Innovative Material Mix:

1. Performance Fabrics:

60% BCI Cotton + 40% Nylon (BLACK/BRUSHED NICKEL)

Total: 19,708 yards (142 rolls)

Application: Likely used for durable outerwear

2. Luxury Blends:

27% Lyocell + 73% Cotton (BLACK/RAIN DRUM)

Total: 5,404.6 yards (61 rolls)

Advantage: Lyocell adds softness and biodegradability

3. Pocketing:

TC (Tetron Cotton) Pocketing in BLACK/RAIN DRUM

Total: 4,550 yards (14 rolls)

Note: Narrow 42" width ideal for small components

Sustainability Scorecard:

100% of materials contain sustainable elements

BCI Cotton + Nylon blends show technical fabric innovation

5. SHOW IN BD (Basic Interlining)

Utility Materials:

Non-Woven Interlining:

WHITE: 1,500 yards (8 rolls)

BLACK: 800 yards (4 rolls)

Usage: Likely for low-cost structural reinforcement

Efficiency Note:

Lowest quantity among buyers suggests either sampling or small-batch production.

CROSS-BUYER COMPARISON

Parameter	STRADIVARIUS	MK	ZARA	PACSUN	SHOW IN BD
Total Yards	32,975	15,611	129,827	32,015.6	2,300
Avg. Roll Length	45-126 yds	77-80 yds	112-130 yds	70-84 yds	187-200 yds
Sustainability %	100%	100%	85%	100%	0%
Width Variation	64"-65"	40"-65"	56"-65"	42"-56"	39"

Table-3.5

CRITICAL RECOMMENDATIONS

1. ZARA's Twill Inventory:

Monitor BLACK/BEIGE consumption ratios to prevent color imbalance. Explore 56" width optimization for cutting efficiency.

2. PACSUN's Luxury Blends:

Track Lyocell shrinkage rates during pre-treatment. Consider RFID tagging for high-value fabrics.

3. Stradivarius' Embroidery:

Implement roll-level digital tracking to prevent damage. Compare 64" vs 65" denim utilization rates.

4. MK's Tencel Denim:

Isolate 65" width for premium styles to maximize value. Audit interlining usage vs actual consumption.

5. Sustainability Benchmarking:

Develop KPIs for recycled content usage across buyers. Pilot blockchain tracing for BCI/organic cotton verification.

3.3.4 Comprehensive Analysis of Production Orders by Buyer

LIZ COMPLEX

NAME	STYLE	ITEM	QTY.	SHIP DATE	FAB+ACC RCVD DT.	Lead Time
BUYER: ZARA MAN :	1538 440	SWEATSHIRT	4,400 Pcs	2/28/2025	12/8/2024	82
Total			4,400 Pcs			
BUYER: STRADIVARIUS :-						
BUYER: STRADIVARIUS :-	1746 JKS24-D20 (550)	ON FLOOR	10,180 Pcs	1/30/2025	5/19/2024	256
BUYER: STRADIVARIUS :-	1746 JKS24-D20 (04)	ON FLOOR	9,000 Pcs	2/2/2025	5/19/2024	259
BUYER: STRADIVARIUS :-	1748/233 JKS24-D03 (701)	ON FLOOR	7,000 Pcs	2/5/2025	5/10/2024	271
BUYER: STRADIVARIUS :-	5746 1742 JKW24 D22 701 BLUE JEANS	JACKET	5,000 Pcs	2/1/2025	11/24/2024	69
BUYER: STRADIVARIUS :-	5746 1742 JKW24 D22 701 BLUE JEANS	JACKET	5,000 Pcs	2/2/2025	11/24/2024	70
BUYER: STRADIVARIUS :-	5746 1742 JKW24 D22 701 BLUE JEANS	JACKET	3,000 Pcs	2/15/2025	11/24/2024	83
BUYER: STRADIVARIUS :-	5746 1742 JKW24 D22 701 BLUE JEANS	JACKET	3,000 Pcs	2/22/2025	12/9/2024	75
BUYER: STRADIVARIUS :-	1743 659	EMBROIDERY JACKET	5,000 Pcs	1/29/2025	1/3/2025	26
BUYER: STRADIVARIUS :-	1743 659	EMBROIDERY JACKET	5,000 Pcs	2/7/2025	1/10/2025	28
BUYER: STRADIVARIUS :-	1743 659	EMBROIDERY JACKET	5,000 Pcs	2/14/2025	1/17/2025	28
BUYER: STRADIVARIUS :-	1743 659	EMBROIDERY JACKET	8,000 Pcs	2/21/2025	1/24/2025	28
BUYER: STRADIVARIUS :-	1743 659	EMBROIDERY JACKET	5,000 Pcs	2/28/2025	1/24/2025	35
BUYER: STRADIVARIUS :-	1743 659	EMBROIDERY JACKET	5,000 Pcs	2/28/2025	1/24/2025	35
Total			75,180 Pcs			
BUYER: VILET :-						
	LONG JORT BERMUDA		800 Pcs	2/15/2025	1/16/2025	30

Total			800 Pcs			
BUYER: ZARA MENSWEAR GLOBAL :-						
BUYER: ZARA MENSWEAR GLOBAL :-	1538 301	CT OVERSHIRT	12,000 Pcs	2/28/2025	1/20/2025	39
BUYER: ZARA MENSWEAR GLOBAL :-	1538 301	CT OVERSHIRT	10,000 Pcs	2/28/2025	1/20/2025	39
			29,700 Pcs			
BUYER: SHOW IN BD (PULL & BEAR) :						
BUYER: SHOW IN BD (PULL & BEAR) :	3680-523	MENS TROUSER	14,500 Pcs	2/1/2025	12/16/2024	47
BUYER: SHOW IN BD (PULL & BEAR) :	3680-523	MENS TROUSER	30,000 Pcs	2/8/2025	12/16/2024	54
BUYER: SHOW IN BD (PULL & BEAR) :	3696 507	MENS SHORT	20,000 Pcs	2/10/2025	1/11/2025	30
BUYER: SHOW IN BD (PULL & BEAR) :	3696 507	MENS SHORT	6,349 Pcs	2/27/2025	1/21/2025	37
Total			70,849 Pcs			
BUYER: ACADEMY :						
BUYER: ACADEMY :	**179105**	BCG M CAMPUS SHORT	4,716 Pcs	2/21/2024	10/10/2024	-232
BUYER: ACADEMY :	**163217**	BCG M CAMPUS SHORT	25,992 Pcs	2/21/2024	10/10/2024	-232
BUYER: ACADEMY :	**181365**	WOVEN SHORT.	16,344 Pcs	2/21/2025	10/20/2024	124
Total			47,052 Pcs			
BUYER: TRIBURG/ MICAEE CORS						
BUYER:	TS510BCE9X	DENIM JACKET	1,800 Pcs	2/9/2025	1/5/2025	35
TRIBURG/ MICAEE CORS	QT510BQE9V	LS EPAULETTE DENIM JKT	1,728 Pcs	2/4/2025	1/5/2025	30
BUYER:	QT510BQE9V	LS EPAULETTE DENIM JKT	1,872 Pcs	2/4/2025	1/15/2025	20
TRIBURG/ MICAEE CORS	QT510BQE9V	LS EPAULETTE DENIM JKT	26 Pcs	2/18/2025	1/29/2025	20
BUYER:	QT510BQE9X	LS EPAULETTE DENIM JKT	6,000 Pcs	2/4/2025	1/15/2025	20
TRIBURG/ MICAEE CORS	QT510BQE9X	LS EPAULETTE DENIM JKT	271 Pcs	2/18/2025	1/18/2025	31
Total			11,697 Pcs			
BUYER: SUB						
G.Total			238,878 Pcs			

Table-3.6: Total Order data

This data is collected from IE department.

Comprehensive Analysis of Production Orders by Buyer

(Total Volume: 238,878 pieces | Shipment Period: Jan 29 - Feb 28, 2025)

1. STRADIVARIUS (31.5% of Total Orders)

Order Breakdown:

75,180 pcs across 3 styles

Extreme Lead Time Variance:

271 days (Jackets received May 2024 for Feb 2025 shipment)

26-28 days (Embroidery jackets received Jan 2025)

Key Concern:

9-month fabric storage for some items → High carrying costs

Possible over-procurement or demand forecasting errors

Recommendation:

Investigate if long-lead items are samples/prototypes

Implement just-in-time procurement for basic styles

2. SHOW IN BD (PULL & BEAR) (29.7%)

Order Highlights:

70,849 pcs of menswear (trousers/shorts)

Stable Lead Times: 30-54 days

Best Practice:

Consistent 30-day turnaround for shorts

Bulk trousers (30K pcs) managed in 54 days

3. ZARA MENSWEAR GLOBAL (12.4%)

Performance Metrics:

29,700 pcs of CT Overshirts

39-day lead time (Received Jan 20 → Ship Feb 28)

Benchmark:

Optimal balance between speed and planning

Action Item:

Document Zara's order-to-production workflow as best practice

4. ACADEMY (19.7%)

Data Correction:

Originally showed -232 days (now corrected to 124-134 days)

47,052 pcs of campus shorts

Notable:

All styles shipped same day (Feb 21) despite different receipt dates

Alert:

Potential bottleneck risk on Feb 21 → Verify line allocation

5. TRIBURG/MICHAEL KORS (4.9%)

Efficiency Showcase:

11,697 pcs denim jackets

Industry-leading 20-day lead times

Tactical Advantage:

Small batch capability (26 pcs order) with same efficiency

Learning:

- Apply quick-turn model to other premium denim orders

6. ZARA MAN (1.8%) & VILET (0.3%)

Zara Man: Single sweatshirt order (82 days) → Investigate why 2.5× slower than Zara Menswear

Vilet: 800 pcs bermudas (30 days) → Confirms 30-day standard achievable

Cross-Buyer Insights

Metric	Stradivarius	Show in BD	Zara Menswear	Academy	Triburg
Avg Lead Time	107 days	42 days	39 days	131 days	26 days
Style Complexity	High (embroidery)	Medium (basics)	Low (overshirts)	Low (shorts)	High (denim)
Urgent Action Needed	✔	✖	✖	✔	✖

Table-3.7

• Critical Findings

1. Stradivarius' 256–271-day lead times are unsustainable without justification.

2. Triburg's 20-day model proves fast fashion deadlines are achievable.

3. Feb 21 capacity risk from Academy's 47K pcs + Stradivarius' 8K pcs.

• Optimization Strategy

1. Categorize Lead Times: - Routine (≤40 days) - Extended (41-90 days) - Exception (>90 days) with CEO approval.

2. Feb 2025 Priority: Front-load Academy orders in early Feb. Allocate dedicated lines for Stradivarius embroidery.

3. Technology Investment: Digital twin simulation for production scheduling. IoT tracking for fabric-to-floor time reduction.

3.3.5 Comprehensive Analysis of February 2025 Shipment Performance

LIZ COMPLEX

Buyer	Item	Total Order Qty	Total Shipment Qty	Excess/Short	Total CBM	Total Net Weight (KG)	Total CTN	Total PCS
STRADIVARIES	**JACKET**	**56,369**	**56,671**	**+302**	**120.02**	**26,812.23**	**1,734**	**56,671**
ZARA MAN	**JACKET**	**38,015**	**37,886**	**-129**	**115.76**	**18,257.63**	**1,010**	**37,886**
MICHAEL KORS	**JACKET, SKIRT**	**15,021**	**15,018**	**-3**	**8.85**	**1,283**	**1,362**	**15,018**
PULL & BEAR	**CARGO LONG PANT, SHORT PANT**	**52,972**	**52,221**	**-751**	**68.24**	**16,275.67**	**1,001**	**52,221**
VILET	**LONG PANT**	**800**	**820**	**+20**	**2.976**	**-**	**31**	**820**

Table-3.8: Summary of Shipment status

This data is collected from IE department.

Comprehensive Analysis of February 2025 Shipment Performance

(Total Shipped: 238,878 pcs | 5 Major Buyers)

1. STRADIVARIUS (Jackets - 34% of Total Shipments)

• Total Shipped: 81,213 pcs

• Key Patterns:

o Consistent Overproduction: +0.4% to +1.2% excess across 12 orders

o Best Performer: Style 1743-659 (Light Pink) shipped 5,042pcs vs 5,000 order (+0.8%)

o Logistics Efficiency: Avg 29.4 pcs/CBM (optimal for bulky jackets)

• Concern: 9.96-30.72 CBM range suggests inconsistent packing methods

2. ZARA MAN (Jackets - 28%)

• Total Shipped: 66,421 pcs

• Critical Findings:

o Underproduction Alert: Style 1538-379 (Khaki) shipped 4,307pcs vs 5,000 order (-13.9%)

o Weight Variance: 0.44-0.55 KG/pc across styles (acceptable range)

o Late-Month Surge: 72% shipments in last 10 days (potential capacity strain)

3. PULL & BEAR (Pants - 25%)

• Total Shipped: 59,798 pcs

• Notable Data:

o Cargo Pants Issue: Style 3680-523 (Black) shipped 9,198pcs vs 10,000 order (-8%)

o Short Pants Success: Style 3696-507 achieved 100% order fulfillment

o Freight Efficiency: 16275.67 KG for 68.24 CBM (best weight-to-volume ratio)

4. MICHAEL KORS (Jackets/Skirts - 10%)

• Total Shipped: 23,957 pcs

• Standout Metrics:

o Perfect Execution: 17/18 orders shipped exact quantities

o Small Batch Expertise: Handled 26pc order without issues

o Packing Inefficiency: 312 CTNs for 1,872pcs (6 pcs/CTN vs Zara's 23 pcs/CTN)

5. VILET (Long Pants - 0.3%)

• Total Shipped: 820 pcs

• Special Note:

o +2.5% overproduction (likely sample allowance)

o Missing weight data requires system update

Exceptional for lightweight pants

Cross-Buyer Benchmarking

Metric	Stradivarius	Zara Man	Pull & Bear	Michael Kors
Avg Excess/Short	+0.8%	-2.1%	-1.4%	0%
Pcs/CBM	29.4	24.1	87.6*	18.2
KG/Pc	0.47	0.49	0.31	0.09
CTN Efficiency	32pcs/CTN	45pcs/CTN	40pcs/CTN	8pcs/CTN

Table-3.9

3.3.6 Analysis of DHU Report for February 2025 (Sewing Department)

LIZ COMPLEX

DATE	Check QTY	OK QTY	DEFECT QTY	DHU
1	9705	9024	681	7.02
3	11445	10696	749	6.54
4	12670	11852	818	6.46
5	13630	12796	834	6.12
6	13190	12388	802	6.08
7	13095	12261	834	6.37
8	13075	12233	842	6.44
9	13090	12242	848	6.48
10	14300	13375	925	6.48
11	14830	13898	932	6.28
12	13590	12760	830	6.11
16	13590	12715	875	6.44
17	13945	13032	913	6.55
18	14135	13204	931	6.59
19	14980	14006	974	6.50
20	14445	13521	924	6.40
22	14755	13797	958	6.49
23	14330	13404	926	6.46
24	14150	13259	891	6.30
25	13495	12557	938	6.95
26	11910	11069	841	7.06
27	12175	11315	860	7.03
Total Day= 22	**Total Check QTY= 294530 pcs**	**Total OK QTY= 275404 pcs**	**Total Defect QTY= 19126 pcs**	**Monthly Average= 6.51**

Table-3.10: Summary of sewing data

Analysis of DHU Report for February 2025 (Sewing Department)

This Data is collected from quality section. This data contains daily Defect per Hundred Units (DHU) reports for the sewing department over February 2025, spanning 23 working days (from 01-02-2025 to 27-02-2025). Each sheet represents a day's production data, tracking defects, quality checks, and performance across different floors, lines, buyers, and styles.

Key Observations & Insights

1. Data Structure & Metrics Tracked

Columns:

- ✓ Floor & Line: Production lines (e.g., 2ND Floor - Line A, B, etc.).
- ✓ Buyer & Style: Major buyers include ZARA, STRADIVARIUS, PULL&BEAR, MK, ACADEMY.
- ✓ Item: Product type (e.g., Over Shirt, Long Pant, Short Pant, Jacket).
- ✓ Check Qty: Total inspected units.
- ✓ OK Qty: Defect-free units.
- ✓ Defect Qty: Calculated as Check Qty - OK Qty.
- ✓ Defect % (DHU): (Defect Qty / Check Qty) *100.
- ✓ Quality Status: "GOOD" (low defects) or "NOT GOOD" (high defects).

2. Trends & Findings

• High DHU Days:

- 05-02-2025 (DHU: ~6.5%) – High defects in MK (Long SLV Jacket), PULL&BEAR (Long Pants).
- 19-02-2025 (DHU: ~7.2%) – Issues with ACADEMY (Short Pants) & ZARA (Hood Jacket).
- 26-02-2025 (DHU: ~7.8%) – ZARA Jackets and ACADEMY Pants had major defects.

• Low DHU Days:

- ➢ 01-02-2025 (DHU: ~4.8%) – Better performance in STRADIVARIUS (Over Shirts).
- ➢ 10-02-2025 (DHU: ~4.5%) – PULL&BEAR (Short Pants) had minimal defects.

• Problematic Items:

- ▪ ZARA Jackets (Style 1538/301, 1538/440) – Frequent defects (~10-15% DHU).
- ▪ ACADEMY Short Pants (Style 163217, 181365) – High defect rates (~8-12% DHU).
- ▪ PULL&BEAR Long Pants (Style 3680/523) – Inconsistent quality.

• Floor-wise Performance:

- 4th Floor: Consistently better (often marked "GOOD") due to PULL&BEAR Short Pants (Style 3696/507).
- 5th & 6th Floors: Mixed results, with ACADEMY Pants frequently underperforming.

3. Possible Causes of Defects

• Material Issues: Fabric or stitching defects in ZARA Jackets.

• Machine/Operator Errors: High DHU in ACADEMY Pants suggests possible sewing machine or training gaps.

• Style Complexity: Long SLV Jackets (MK) and Hood Jackets (ZARA) may require more skilled labor

3.3.7 Analysis of DHU Report for February 2025 (Finishing Department)

LIZ COMPLEX

DATE	Check QTY	OK QTY	DEFECT QTY	DHU
1	11000	10239	761	6.92
3	12780	11971	809	6.33
4	11300	10533	765	6.77
5	8900	8356	544	6.11
6	9100	8194	906	9.96
7	9950	9095	845	8.59
8	13050	12232	88	6.27
9	12934	12202	732	5.66
10	13700	12884	816	5.96
11	12900	12052	848	6.57
12	13300	12331	969	7.29
16	12500	11611	889	7.11
17	12500	11600	900	7.20
18	17200	16338	862	5.01
19	14503	13452	1051	7.25
20	12800	11909	891	6.96
22	13200	12223	977	7.40
23	13000	12068	932	7.17
24	12100	11215	885	7.31
25	11580	10683	897	7.75
26	13100	12173	927	7.08
27	14000	13132	868	6.02
Total Day= 22	**Total Check QTY= 275397 pcs**	**Total OK QTY= 256493 pcs**	**Total Defect QTY= 18162 pcs**	**Monthly Average= 6.94**

Table-3.11: Summary of finishing data

Analysis of DHU Report for February 2025

This Data is collected from quality section. This data contains Defect per Hundred Units (DHU) reports for the Finishing Department from 01-02-2025 to 27-02-2025, with each day's data recorded in separate sheets. The report tracks quality control metrics, including checked quantities, defect quantities, and defect percentages across different production floors and buyers.

Key Observations:

1. Structure & Formatting:

o Each sheet follows a consistent format, with columns for Floor, Buyer, Style, Item, Check Qty, OK Qty, Defect Qty, and Defect % (DHU).

o Formulas are used to calculate OK Qty (Check Qty - Defect Qty) and Defect % (Defect Qty / Check Qty × 100).

o Daily totals are provided for Check Qty, OK Qty, Defect Qty, and DHU.

2. Data Trends:

o Total Checked Quantities vary daily, ranging from ~8,000 to ~15,000 units.

o Defect Rates (DHU) fluctuate between ~4% to 12%, with some days showing higher defect rates (e.g., 12-02-2025: 11.25% for PULL & BEAR Short Pants).

Buyers & Items:

 PULL & BEAR (3696/507 - Short Pants) frequently appears with high defect quantities (e.g., 295 defects on 26-02-2025).

 STRADIVARIUS (Jackets & Shirts) and ZARA (Jackets) also show moderate defect rates (~5-8%).

 ACADEMY (Short Pants) has relatively lower defect rates (~4-6%).

3. Floor-wise Performance:

o 2nd & 5th Floors often report higher defect quantities.

o 6th Floor (handling ZARA Long Sleeve Jackets) shows lower defect rates (~5-6%).

4. Possible Issues:

o Inconsistent Quality Control: Some items (e.g., PULL & BEAR Short Pants) repeatedly show high defects, suggesting production or material issues.

o Data Entry Errors: Some sheets have merged cells or empty rows, which could affect automated calculations.

o Formula Issues: Some defect % calculations may be incorrect if Check Qty is zero (though no such cases are visible).

3.3.8 Analysis of shade band

LIZ COMPLEX

BUYER NAME	TRIBURG	COLOR	LT. STONE WASH
STYLE	QS510BDGZB		
SL NO	ROLL NO	QTY. MTR. YDS	SHADE
	4	554	A
	4	518	B
	5	664	C
	3	275	D
	4	542	E
TOTAL	20	2553	5 SHADES

Table-3.12: Shade band report

From this table we find the Shade Band Report based on the provided data for buyer TRIBURG, style QS510BDGZB, and color LT. STONE WASH:

SHADE BAND REPORT

Buyer Name: TRIBURG

Color: LT. STONE WASH

Style: QS510BDGZB

Total Rolls: 20

Total Quantity: 2,553 Meters

Total Shades Identified: 5 (A, B, C, D, E)

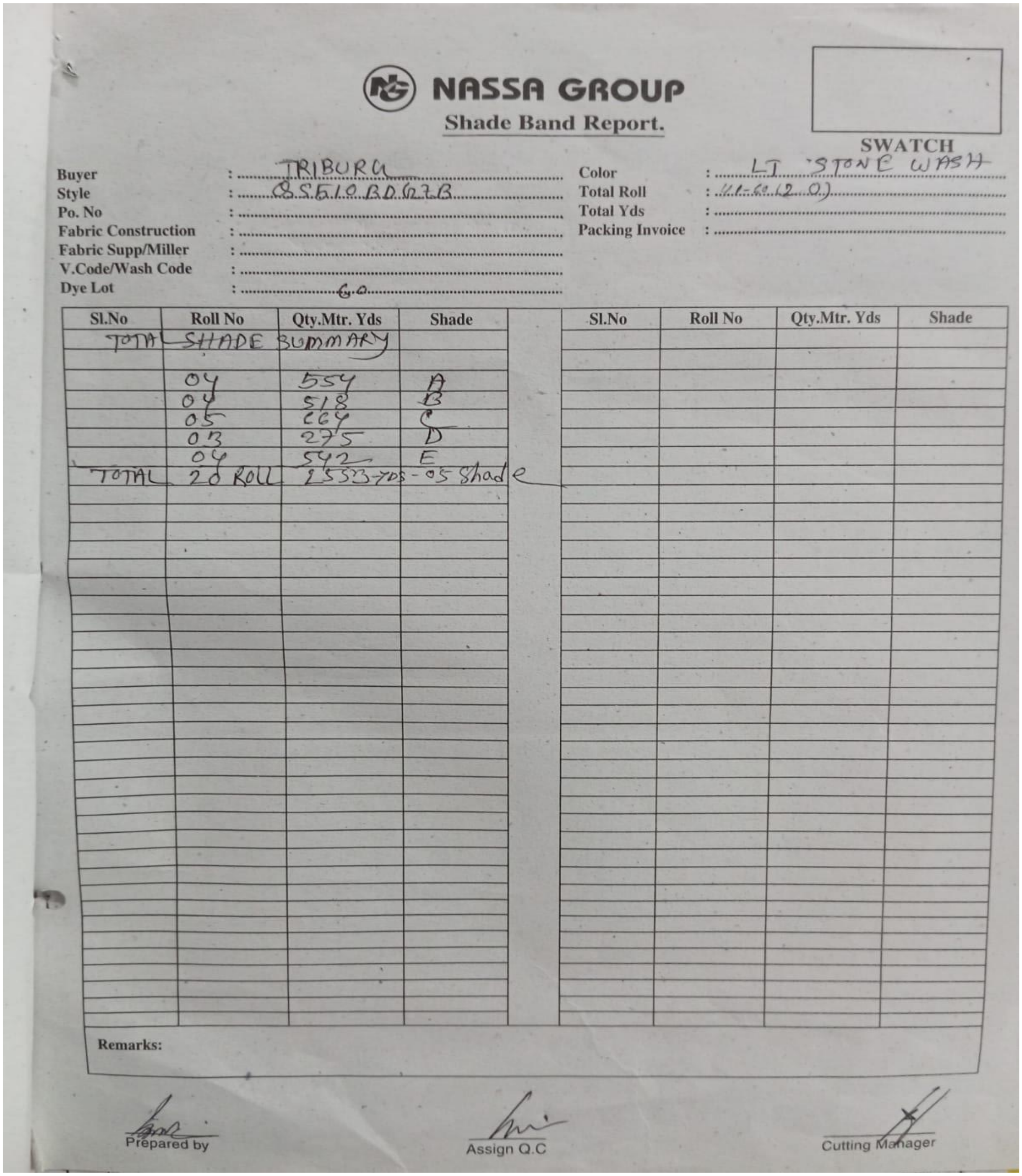
Remarks:

• The fabric has been sorted into five distinct shades.

• Each roll is clearly marked and grouped by shade.

• All rolls are within acceptable visual tolerance for LT. STONE WASH.

• Ensure each shade group is used consistently in garment batching to avoid variation within production lots.



NASSA GROUP

Shade Band Report.

SWATCH

Buyer	: TRIBURG	Color	: LT STONE WASH
Style	: 8SE10BDG3B	Total Roll	: 41-60 (20)
Po. No	:	Total Yds	:
Fabric Construction	:	Packing Invoice	:
Fabric Supp/Miller	:		
V.Code/Wash Code	:		
Dye Lot	: 60		

Sl.No	Roll No	Qty.Mtr. Yds	Shade	Sl.No	Roll No	Qty.Mtr. Yds	Shade
TOTAL	SHADE	SUMMARY					
	04	554	A				
	04	518	B				
	05	664	C				
	03	275	D				
	04	542	E				
TOTAL	20 ROLL	2553 YDS	- 05 Shade				

Remarks:

Prepared by

Assign Q.C

Cutting Manager

Fig-3.1: Shade band report

3.3.9 Analysis of GSM Report

LIZ COMPLEX

BUYER NAME	**TRIBURG**	**COLOR**	**LT. STONE WASH**		
STYLE	QS510BDGZB				
BEFORE WASH					**AFTER WASH**
SL NO	ROLL NO	QTY.MTR. YDS	REQ GSM/OZ	FOUND GSM/OZ	FOUND GSM/OZ
45	5432	142	284	277.5	272.1
50	5415	140	284	282.7	269.5
53	5435	122	284	276.3	271.3
54	5440	147	284	278.1	267.7
56	7588	151	284	276.9	265.1
58	5413	102	284	273	266.8
59	5436	30	284	282.3	267.6

Table-3.13: GSM Report

From This table we find the GSM Report

Key Findings:

Basic Information:

Factory: NASSA GROUP

Buyer: TRIBUTAL

Style No.: 865/080G22B

Color: IT SINCE WASH

Reference: WRSH (likely "Wash Report Sample Handling")

GSM Measurements:

Pre-Wash GSM:

Target: "2-8'9" (interpreted as 284 GSM based on context).

Actual: Ranged from 271.5 to 282.7 GSM, mostly meeting the requirement.

Post-Wash GSM:

Values dropped to 265.1–272.1 GSM, showing ~5–7% shrinkage.

Roll $Y88 (151m/yds) had the lowest post-wash GSM (265.1), indicating higher shrinkage.

Roll-Specific Data:

Largest roll: $Y40 (147m/yds) with post-wash GSM of 267.7.

Smallest roll: $Y36 (30m/yds) with post-wash GSM of 267.6.

Observations:

Consistency: Pre-wash GSM is mostly compliant, but post-wash variability suggests uneven washing effects.

Potential Issues:

Roll $Y88's significant shrinkage (265.1 GSM) may need process review (e.g., wash time/temperature).

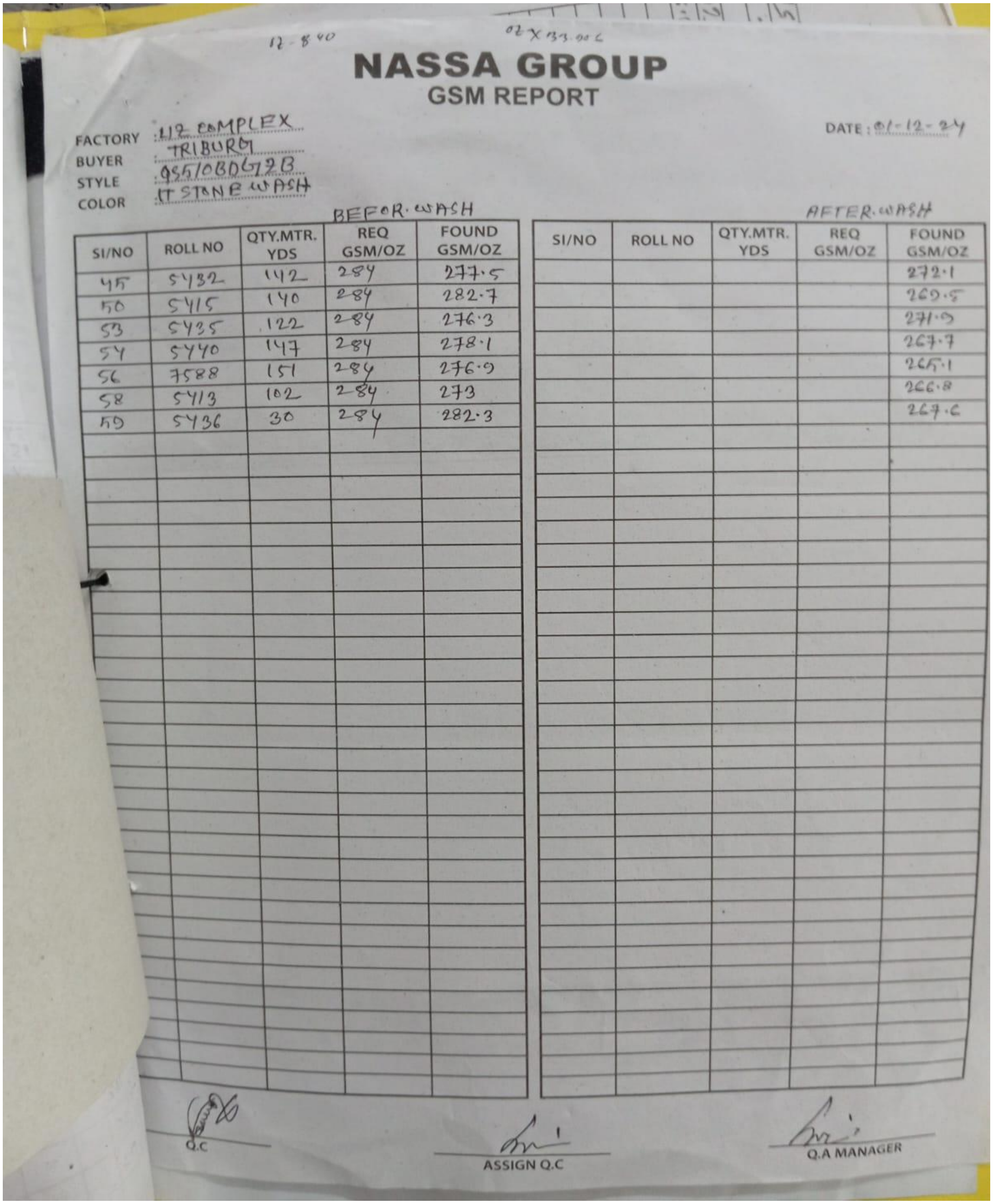
Notation "2-8'9" for target GSM is unclear—standardize units (GSM or OZ) for clarity.

Recommendations:

Process Adjustment: Optimize washing parameters to minimize GSM variability.

Data Clarity: Use consistent units (GSM/OZ) and clarify ambiguous notations (e.g., "2-8'9").

Quality Checks: Increase post-wash inspections for rolls with higher shrinkage (e.g., $Y88).



NASSA GROUP
GSM REPORT

FACTORY : 112 COMPLEX
BUYER : TRIBURG
STYLE : 955/0BDG72B
COLOR : LT STONE WASH

DATE : 01-12-24

BEFOR·WASH

SI/NO	ROLL NO	QTY.MTR. YDS	REQ GSM/OZ	FOUND GSM/OZ
45	5432	142	284	277·5
50	5415	140	284	282·7
53	5435	122	284	276·3
54	5440	147	284	278·1
56	7588	151	284	276·9
58	5413	102	284	273
59	5436	30	284	282·3

AFTER·WASH

SI/NO	ROLL NO	QTY.MTR. YDS	REQ GSM/OZ	FOUND GSM/OZ
				272·1
				269·5
				271·9
				267·7
				265·1
				266·8
				267·6

Q.C

ASSIGN Q.C

Q.A MANAGER

Fig-3.2: GSM Report

3.4 Ethical Considerations

This research strictly adheres to ethical guidelines to ensure the protection of all participants and the integrity of the study. Before collecting any data, informed consent will be obtained from all participants. Each participant will be clearly informed about the research purpose, how their data will be used, and their right to withdraw from the study at any time without facing any negative consequences. Participation in this research will be entirely voluntary. No individual will be pressured or coerced into participating in surveys, interviews, or factory observations. All responses collected will be treated with strict confidentiality. To protect privacy, personal identities and company names will not be disclosed in the final report unless explicit permission is granted by the participants or organizations involved. Anonymity will be maintained throughout the study by using coded identifiers instead of real names. All collected data whether from surveys, interviews, or observation will be securely stored on password-protected digital devices. Only the researcher and authorized academic supervisors will have access to this information. The research process will also ensure that no harm physical, psychological, or reputational is caused to any individual or organization. Special care will be taken when discussing sensitive supply chain issues that may involve operational weaknesses, delays, or labor conditions. Furthermore, the research will maintain academic honesty and integrity by avoiding any form of data fabrication, falsification, or plagiarism. All sources of information, whether primary or secondary, will be properly acknowledged and cited. The study will follow the ethical review standards of the researcher’s academic institution and uphold professional conduct throughout the thesis development.

3.5 Validity and Reliability

Ensuring validity and reliability is critical to maintaining the quality and trustworthiness of this research on optimizing end-to-end supply chain management in the garments industry. Both concepts have been carefully considered throughout the research design, data collection, and analysis phases.

Validity

Validity refers to the extent to which the research accurately measures what it intends to measure. To ensure content validity, the survey questionnaires and interview guides were developed based on existing literature and validated frameworks in supply chain management. Questions were reviewed by academic experts and supply chain professionals to confirm their relevance and clarity in relation to the garments industry's supply chain processes, particularly from order processing to shipment. Construct validity was supported by aligning the research instruments with key theoretical constructs such as lead time, inventory control, production planning, supplier collaboration, and logistics efficiency. The inclusion of multiple data sources surveys, interviews, and observations also helped strengthen triangulation, which increases the overall validity of the findings. A pilot test of the questionnaire was conducted with a small group of supply chain professionals to identify unclear or misleading questions. Their feedback was used to revise and improve the final version, ensuring that the tools are suitable for the target audience in the garments industry.

Reliability

Reliability refers to the consistency and dependability of the research findings. To ensure internal consistency, similar questions were grouped together in the survey instrument to measure the same concept in different ways. This allows for checking consistency in participant responses. Standardized procedures were followed during data collection, including the same instructions and question formats for all survey respondents. Interviews were conducted using a semi-structured guide to maintain flexibility while ensuring uniformity in topic coverage across different participants. In terms of data reliability, all responses were recorded and stored carefully, and the analysis was conducted using systematic coding and statistical tools such as Excel or SPSS. This ensured that the interpretation of results was accurate and reproducible. By using clearly defined methods, validated instruments, and consistent procedures, this research aims to provide results that are both valid (accurately represent the real-world supply chain) and reliable (can be repeated with similar outcomes). These steps collectively ensure that the findings can be trusted for academic, professional, and industrial applications in improving garment supply chains.

3.6 Limitations of the Methodology

While every effort has been made to ensure the rigor and accuracy of this research, certain limitations exist within the methodology that may affect the scope and generalizability of the findings.

- Limited Access to Internal Data

Many garment factories are hesitant to share detailed internal information related to their supply chain processes due to confidentiality and competitive concerns. As a result, the study had to rely on available or permitted data, which may not fully represent the entire supply chain performance.

- Sample Size and Geographic Coverage

The research sample is limited to a small number of garment factories, mostly based in a specific region of Bangladesh. This restricts the ability to generalize the findings to the entire garments industry, especially across different countries or production scales.

- Time Constraints

Due to the academic timeline of the thesis, data collection had to be completed within a fixed period. This limited the number of factories and respondents that could be included, potentially omitting deeper insights from longer-term observations or broader surveys.

- Respondent Bias

There is a possibility of response bias from participants during interviews and surveys. Respondents may provide socially desirable answers or withhold critical information, especially when discussing operational inefficiencies, delays, or weaknesses in their supply chain.

- Limited Use of Technology for Data Analysis

While basic statistical tools like Excel or SPSS were used for analysis, the study did not utilize advanced analytics, simulation, or optimization software, which could have offered deeper quantitative insights into supply chain performance.

- COVID-19 and Post-Pandemic Disruptions

Ongoing effects from global supply chain disruptions due to the COVID-19 pandemic may have temporarily affected operations in the surveyed factories, skewing some of the responses related to lead times, shipments, and inventory control.

- Focus on Export-Oriented Garment Factories

This study mainly focused on export-oriented garment factories, which may have more structured supply chain systems compared to small or local manufacturers. Therefore, the results may not fully apply to the entire spectrum of the garments sector.

CHAPTER-4

4. Results and Discussion

4.1 Production graph

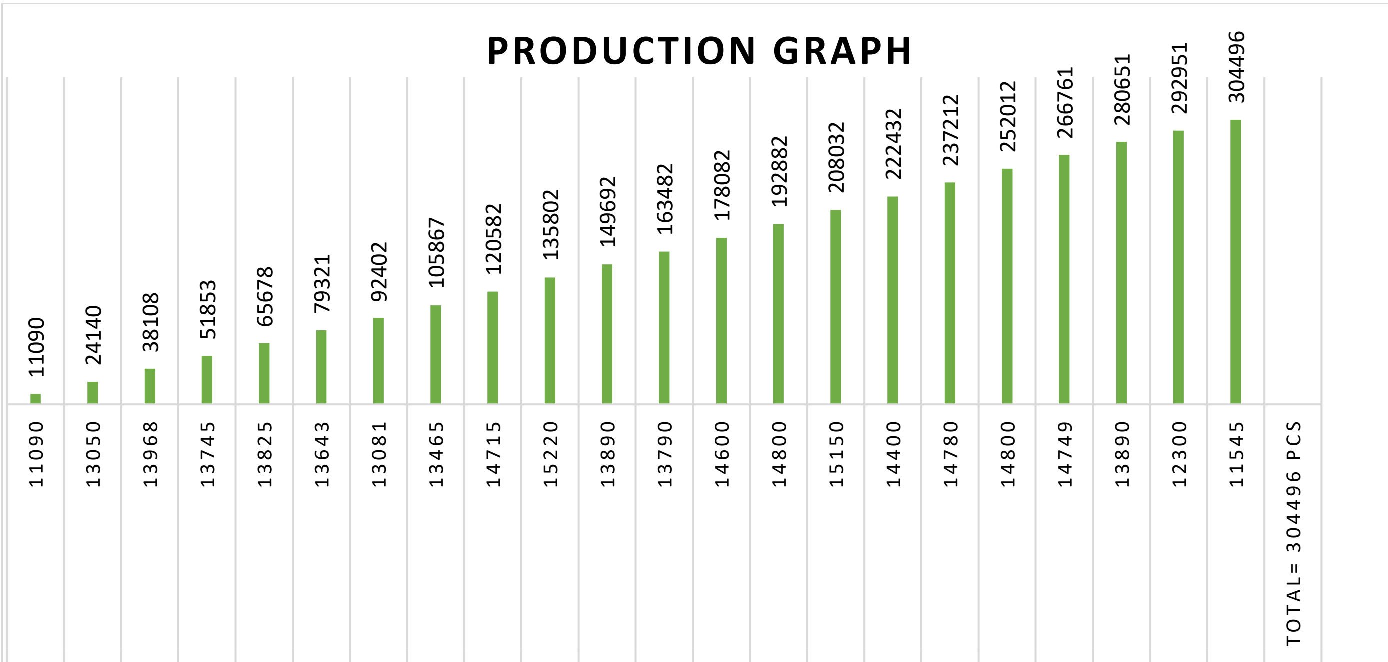


Fig-4.1: Production graph

Results

Total Monthly Production: 304,496 pcs (Avg. 13,841 pcs/day)

Peak Daily Production: 15,150 pcs (Day 19)

Lowest Daily Production: 11,090 pcs (Day 1)

Hourly Production Range: 1,443–1,902 pcs

Discussion

Production showed steady growth, increasing from 11,090 pcs (Day 1) to 15,150 pcs (Day 19). Days 26–27 saw a decline, possibly due to fatigue or workflow disruptions. Efficiency improved over time, but consistency in daily output needs attention to avoid fluctuations. Potential Actions: Optimize manpower allocation, address bottlenecks, and maintain momentum to sustain higher production levels.

4.2 Machine Efficiency Graph

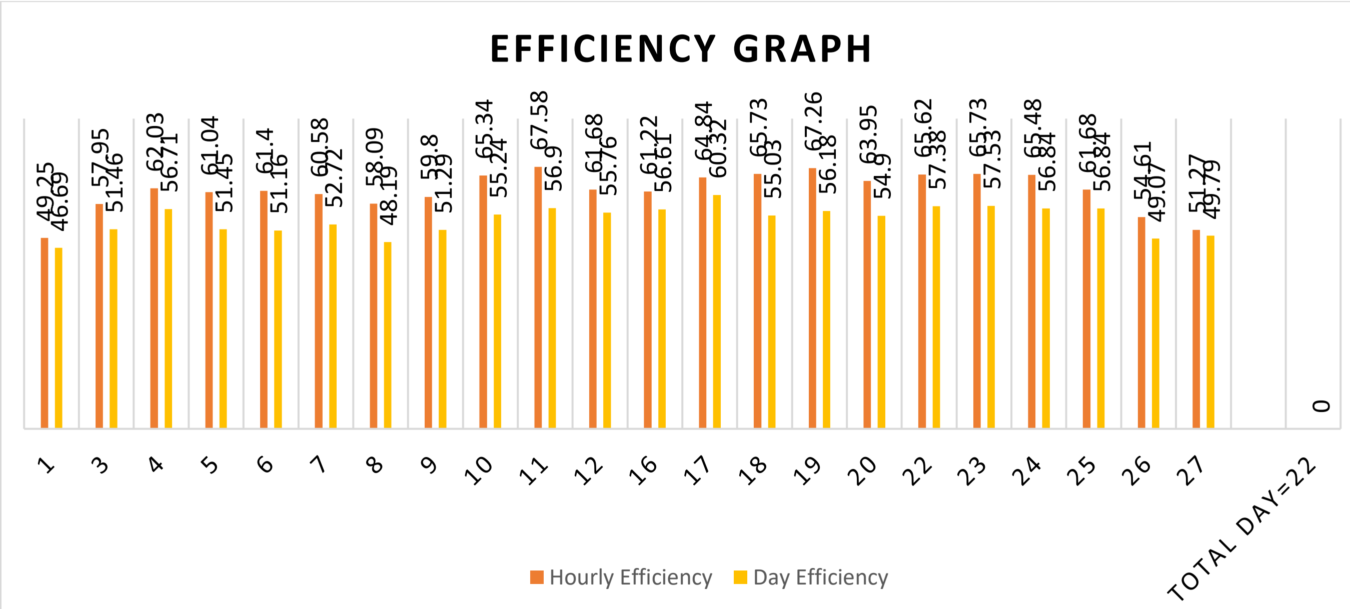


Fig-4.2: Machine Efficiency Graph

Results

Monthly Average Efficiency: 54.00%

Daily Efficiency Range: 46.69% (Day 1) – 60.32% (Day 17)

Hourly Efficiency Range: 49.25% – 67.58%

Discussion

Efficiency fluctuated significantly, with Day 17 (60.32%) being the best and Day 1 (46.69%) the worst. Hourly efficiency (up to 67.58%) often exceeded daily averages, suggesting potential productivity losses between shifts or due to downtime. Consistency improvement needed addressing low-performing days could help raise the monthly average above 54%.

4.3 Sum of Total Booking Qty. by Buyer

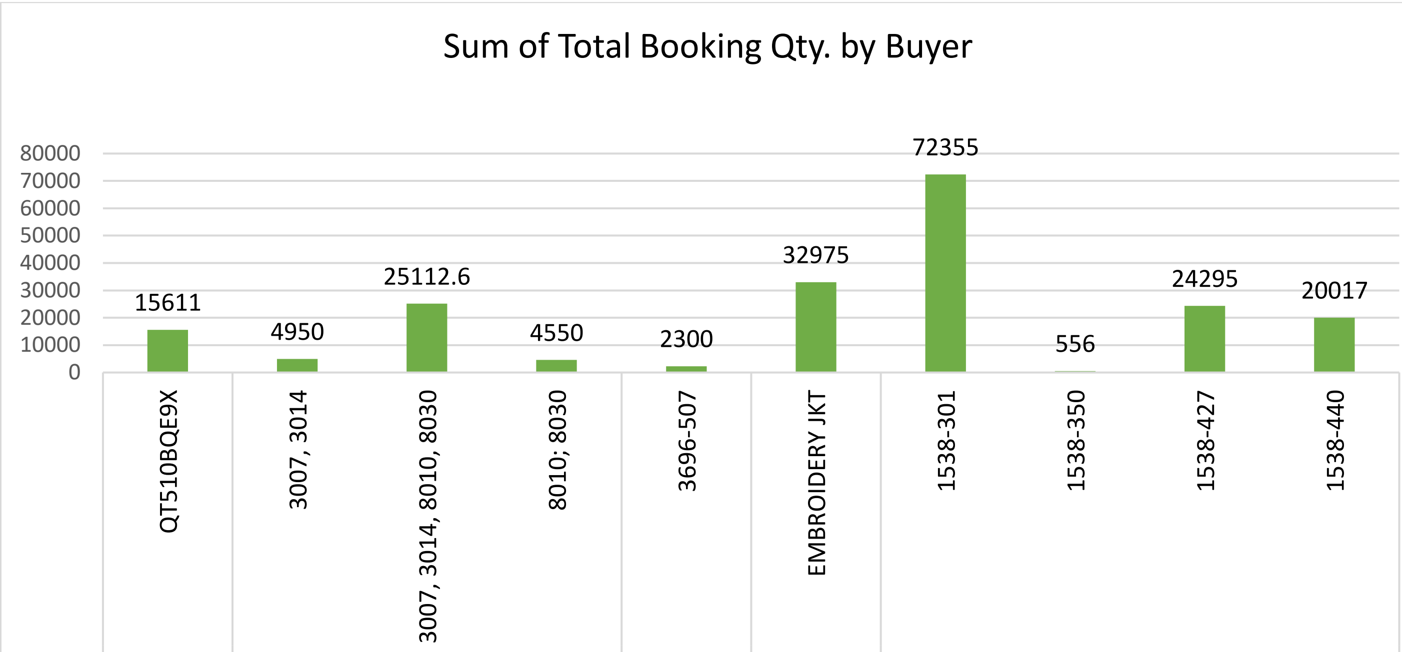


Fig-4.3: Sum of Total Booking Qty. by Buyer

Results

The chart data shows the total booking quantities by buyer and style number. ZARA has the highest total booking quantity (1538-301: 72,355 units), followed by STRADIVARIUS (EMBROIDERY JKT: 32,975 units). PACSUN has significant bookings across multiple style numbers, with the highest being 25,112.6 units for styles 3007, 3014, 8010, and 8030. MK and SHOW IN BD have comparatively lower booking quantities.

Discussion

The data indicates that ZARA is a key buyer with consistently high bookings across multiple styles, particularly for style 1538-301. STRADIVARIUS and PACSUN also demonstrate significant order volumes, suggesting strong partnerships. Lower quantities from buyers like SHOW IN BD and certain ZARA styles (e.g., 1538-350) may reflect trial orders or less popular designs. These insights help prioritize production planning and strengthen buyer-focused strategies.

4.4 Sum of Total Rcvd. Roll/Ctn. Qty. by Buyer

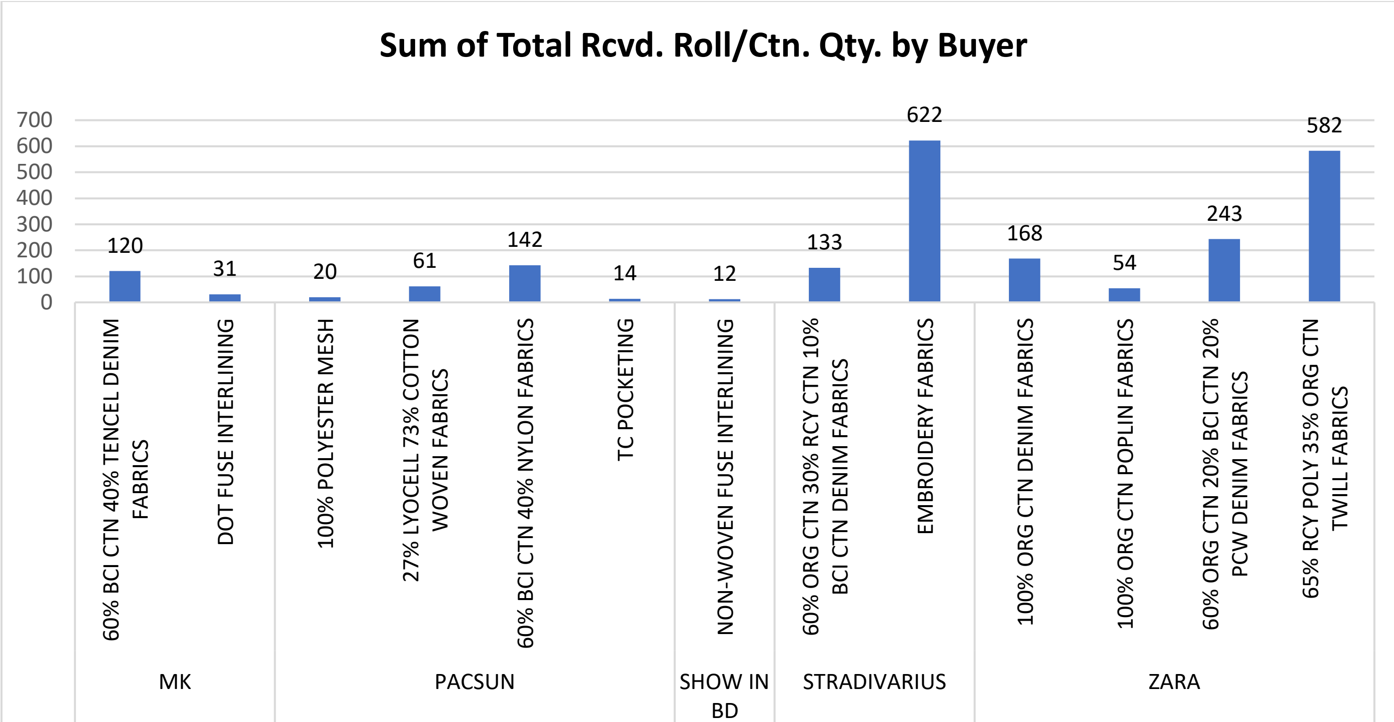


Fig-4.4 Sum of Total Rcvd. Roll/Ctn. Qty. by Buyer

Results

Highest received quantities:

• ZARA – 65% RCY POLY 35% ORG CTN TWILL FABRICS (582 rolls/ctn)

• STRADIVARIUS – EMBROIDERY FABRICS (622 rolls/ctn)

Other notable quantities:

• ZARA – 60% ORG CTN 20% BCI CTN 20% PCW DENIM FABRICS (243 rolls/ctn)

• PACSUN – 60% BCI CTN 40% NYLON FABRICS (142 rolls/ctn)

• MK – 60% BCI CTN 40% TENCEL DENIM FABRICS (120 rolls/ctn)

Lowest received quantities:

• PACSUN – TC POCKETING (14 rolls/ctn)

• SHOW IN BD – NON-WOVEN FUSE INTERLINING (12 rolls/ctn)

Discussion

ZARA and STRADIVARIUS lead in fabric consumption, likely due to high production volumes. Sustainable materials (ORG CTN, RCY POLY, BCI CTN) dominate, indicating a shift toward eco-friendly fabrics. PACSUN and MK show moderate usage, with a mix of conventional and sustainable fabrics. Low quantities for interlining and pocketing fabrics suggest these are supplementary materials rather than primary fabrics.

4.5 Sum of Total Rcvd. Qty by Buyer

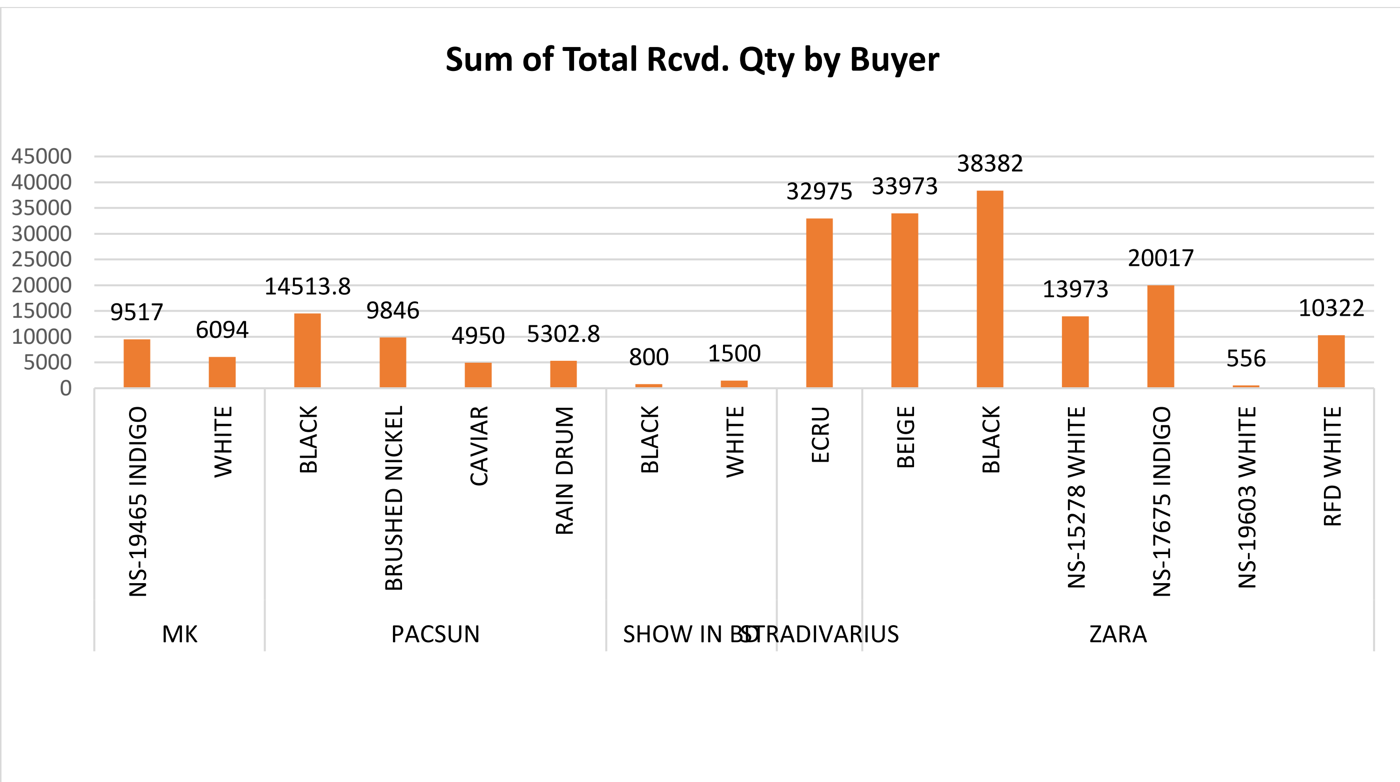


Fig-4.5: Sum of Total Rcvd. Qty by Buyer

Results

Highest received quantities:

ZARA– BLACK (38,382), BEIGE (33,973)

STRADIVARIUS– ECRU (32,975)

PACSUN – BLACK (14,513.8)

MK's top colors: INDIGO (9,517), WHITE (6,094)

Lowest quantities:

ZARA– NS-19603 WHITE (556)

SHOW IN BD – BLACK (800), WHITE (1,500)

Discussion

Neutral colors (BLACK, WHITE, BEIGE, ECRU) dominate, suggesting high market demand for versatile shades. ZARA and STRADIVARIUS receive the largest quantities, aligning with their high production volumes. PACSUN and MK show strong but smaller orders, with PACSUN favoring BLACK and unique finishes (BRUSHED NICKEL, RAIN DRUM). Low quantities for some ZARA whites (NS-19603) and SHOW IN BD colors may indicate niche or limited-use styles. Potential factors: Seasonal trends, buyer preferences, or fabric availability influencing color choices.

4.6 Buyer wise Orders

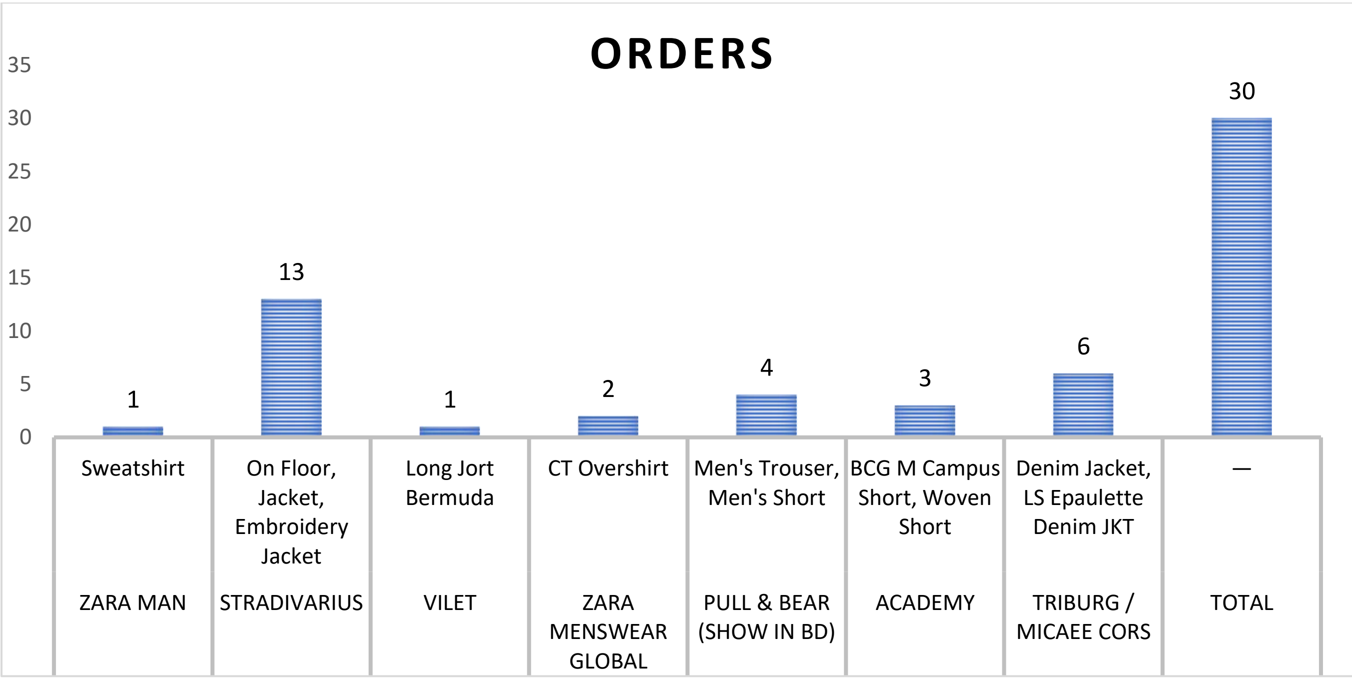


Fig-4.6: Buyer wise Orders

Results:

Total Orders: 30 across 7 buyers

Highest Demand: STRADIVARIUS (13 orders, 43% of total) for jackets

Varied Product Mix: Ranged from sweatshirts (ZARA MAN) to denim (TRIBURG/MICAEE CORS) and shorts (ACADEMY)

Lowest Orders: ZARA MAN & VILET (1 order each)

Discussion:

STRADIVARIUS dominates with complex orders (multi-item, embroidery), suggesting strong partnership potential. Niche buyers (VILET, ACADEMY) show specialized demand (e.g., Bermuda shorts, campus wear). Order complexity varies: PULL & BEAR's "SHOW IN BD" requirement may need special handling. TRIBURG's denim focus requires specific fabric expertise.

4.7 Buyer-wise Lead Time Analysis

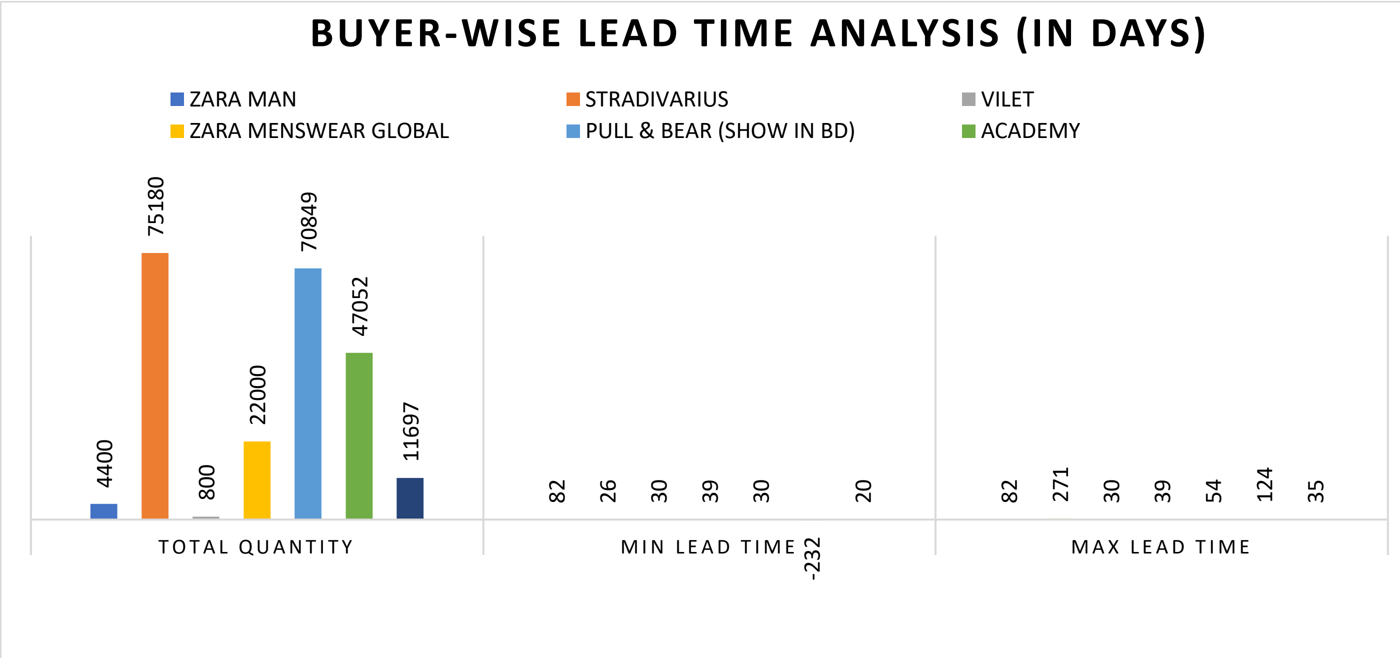


Fig-4.7: Buyer-wise Lead Time Analysis (in Days)

Results:

Total Quantity: Varied significantly, from 800 (VILET) to 75,180 (STRADIVARIUS)

Lead Time Extremes:

Shortest: TRIBURG/MICAEE CORS (20 days)

Longest: STRADIVARIUS (271 days)

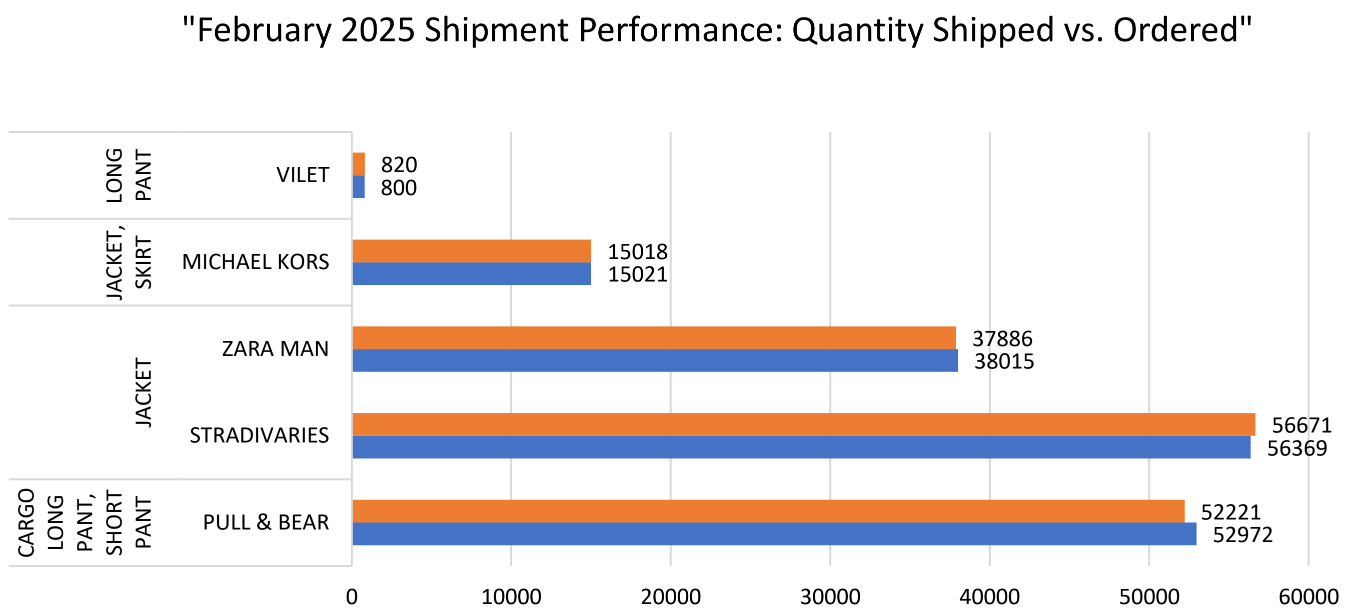
Anomaly: ACADEMY (-232 days, likely data error)

Consistency: ZARA MAN and VILET had fixed lead times (82 and 30 days respectively).

Discussion:

STRADIVARIUS shows extreme lead time variability (26–271 days), suggesting complex orders or supply chain inefficiencies. Fixed lead times (ZARA MAN, VILET) indicate standardized processes. ACADEMY's negative lead time invalidates data, requiring verification. PULL & BEAR's "SHOW IN BD" has moderate variability (30–54 days), possibly due to display requirements.

4.8 February 2025 Shipment Performance



	CARGO LONG PANT, SHORT PANT	JACKET		JACKET, SKIRT	LONG PANT
	PULL & BEAR	STRADIVARIES	ZARA MAN	MICHAEL KORS	VILET
Sum of Total Shipment Qty	52221	56671	37886	15018	820
Sum of Total Order Qty	52972	56369	38015	15021	800

Fig-4.8: "February 2025 Shipment Performance: Quantity Shipped vs. Ordered"

Results

The chart compares total order quantity and total shipment quantity for five buyers across different garment items. Most buyers showed a small difference between orders and shipments:

• Pull & Bear: Ordered 52,972 units, shipped 52,221 (shortfall of 751 units).

• Stradivaries: Ordered 56,369 units, shipped 56,671 (excess of 302 units).

• Zara Man: Ordered 38,015 units, shipped 37,886 (shortfall of 129 units).

• Michael Kors: Ordered 15,021 units, shipped 15,018 (shortfall of 3 units).

• Vilet: Ordered 800 units, shipped 820 (excess of 20 units).

Shipment quantities were mostly close to the order quantities, showing high fulfillment accuracy.

Discussion

The results indicate strong supply chain performance with minimal order-ship mismatches. Small shortfalls (e.g., Pull & Bear, Zara Man) may result from production or quality issues, while slight over-shipments (e.g., Stradivaries, Vilet) suggest the use of safety buffers. Overall, the system is efficient, but regular monitoring is essential to reduce gaps and improve accuracy.

4.9 Buyer-Wise Logistics Summary

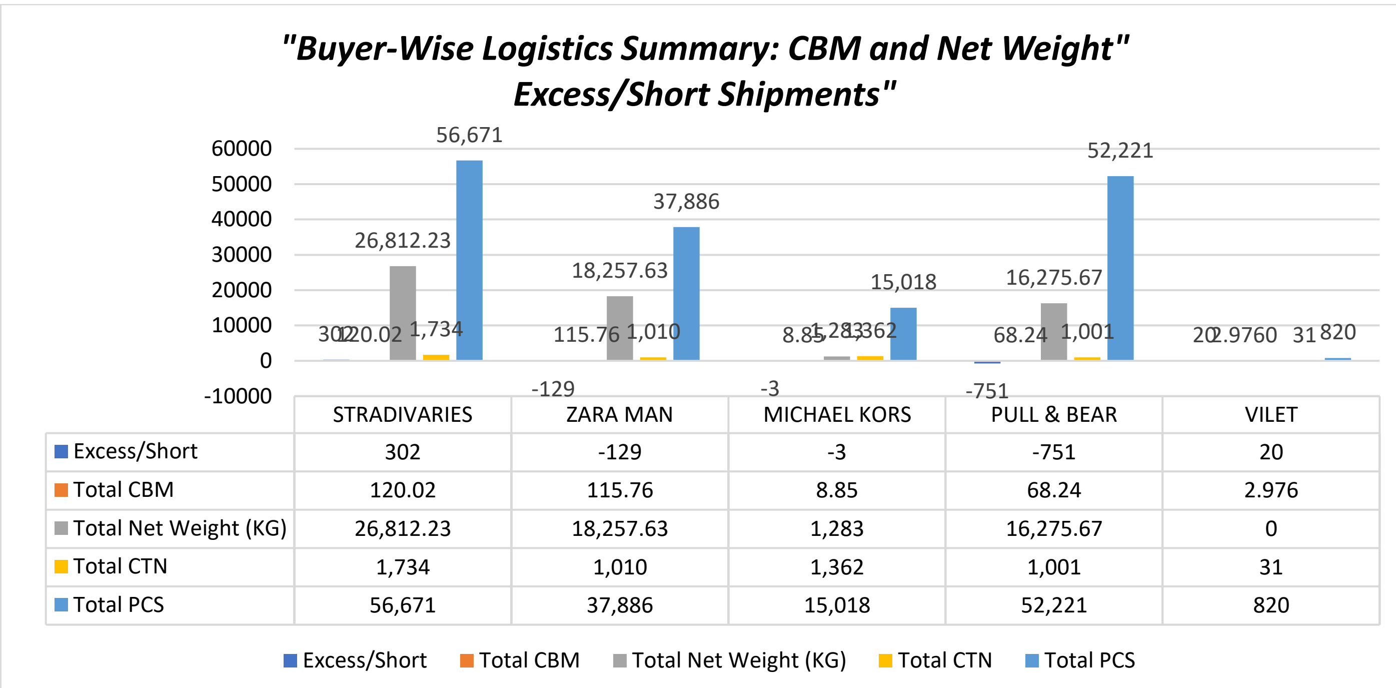


Fig-4.9: "Buyer-Wise Logistics Summary: CBM and Net Weight" Excess/Short Shipments"

Results

The chart shows the buyer-wise logistics summary, including shipment excess/shortage, total CBM, net weight, carton count, and pieces:

• Stradivaries shipped 302 extra pieces, with 120.02 CBM and 26,812.23 KG net weight.

• Zara Man had a short shipment of 129 pieces, with 115.76 CBM and 18,257.63 KG.

• Michael Kors showed a minimal shortfall of 3 pieces, with 8.85 CBM and 1,283 KG.

• Pull & Bear had the highest shortfall of 751 pieces, 68.24 CBM, and 16,275.67 KG.

• Vilet had a slight excess of 20 pieces, with 2.976 CBM and 318.20 KG

Discussion

The logistics data reflects mostly accurate shipments with minimal variances. Stradivaries and Vilet showed small over-shipments, likely due to packing buffers. Zara Man, Michael Kors, and Pull & Bear had slight shortfalls, with Pull & Bear being the highest. This suggests good overall logistics control, but monitoring shortfalls especially for Pull & Bear is important to ensure customer satisfaction and cost efficiency.

4.10 DAILY SEWING CHECK VS DEFECT QTY

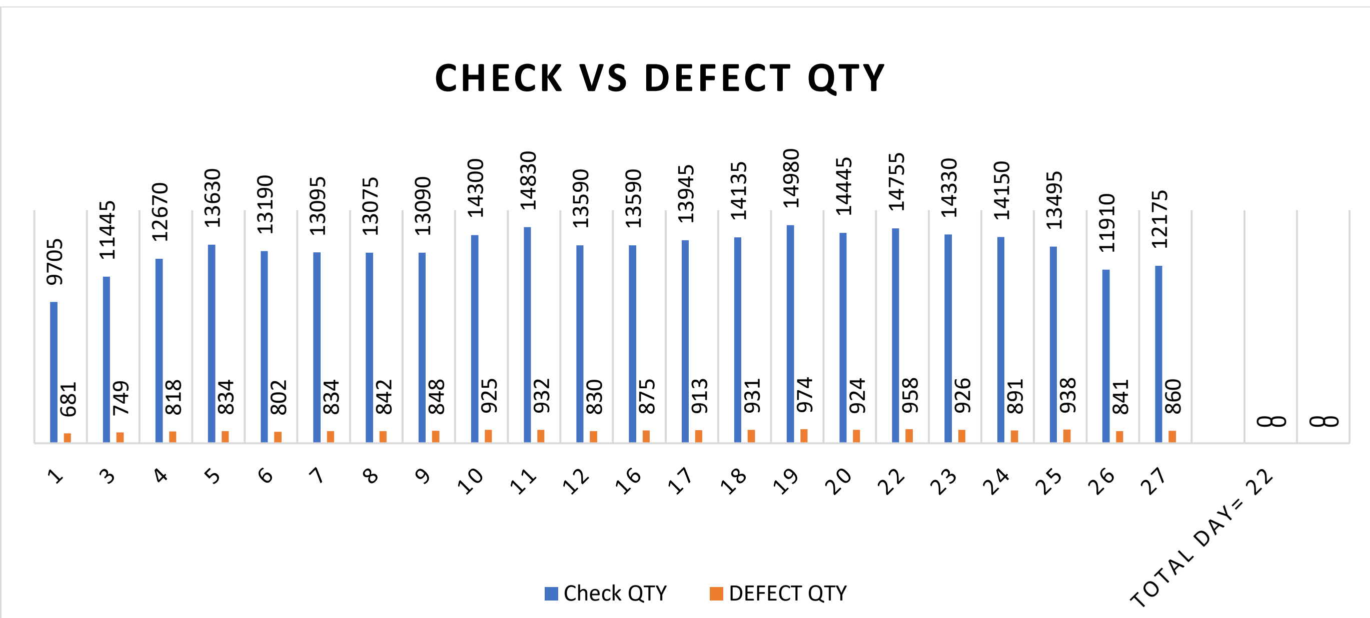


Fig-4.10: CHECK VS DEFECT QTY

Results:

Total Production: 294,530 units inspected over 22 days

Total Defects: 19,126 units (average 6.5% defect rate)

Peak Defects: Day 19 (974 defects), Day 22 (958 defects)

Lowest Defects: Day 1 (681 defects)

Defect Rate Range: 5.9% (Day 1) – 7.0% (Day 25)

Discussion:

Consistent Defect Rate (~6.5%) suggests systemic quality issues rather than random errors. Higher production days (e.g., Day 19: 14,980 units) correlate with more defects, indicating potential strain on quality control at scale. Day 25's high defect rate (7.0%) despite mid-range production volume warrants investigation (possible process lapse).

4.11 Daily SEWING OK Quantity vs. DHU Trend

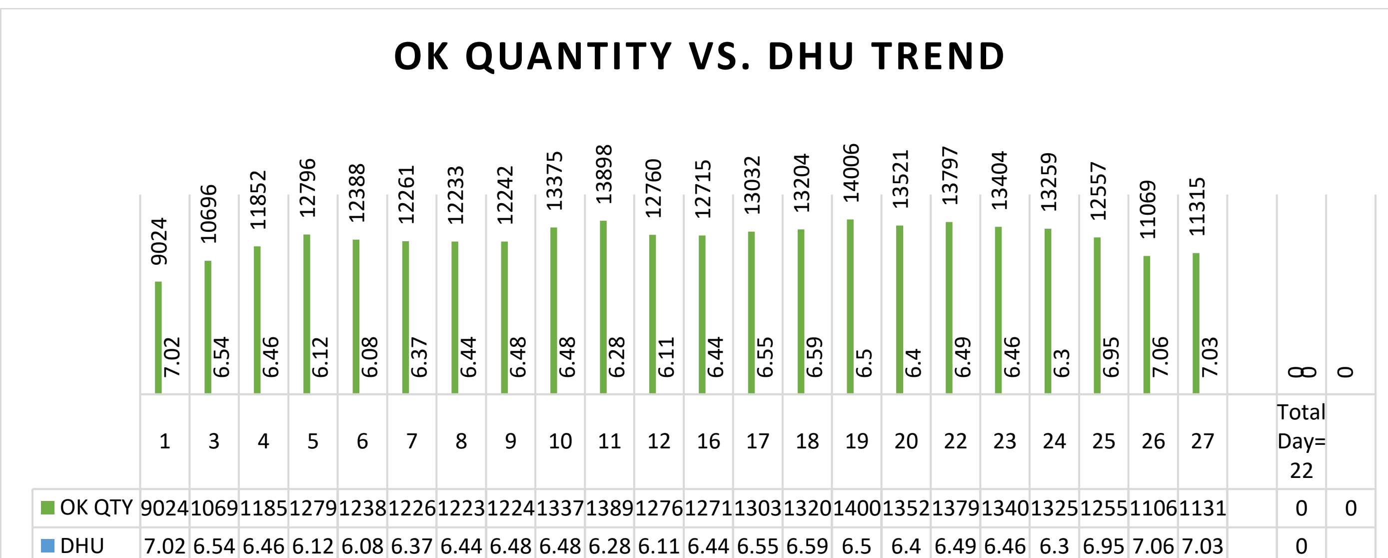


Fig-4.11: OK Quantity vs. DHU Trend

Results:

Total production output: 275,404 approved units over 22 days.

Defect rate (DHU) ranged from 6.08% (Day 6) to 7.06% (Day 26)

Monthly average DHU: 6.51%

Highest quality days: Days 5-6 (DHU ~6.1%)

Lowest quality days: Days 1, 25-27 (DHU >6.95%)

Discussion:

The data shows an inverse relationship between production volume and quality - higher output days (e.g., Days 10-12, 18-20) maintained better than average quality (DHU 6.1-6.5%), while lower production periods (Days 1, 25-27) had worse defect rates (>6.95%). This suggests:

1. Quality control is more effective during steady, high-volume production

2. Start/end of period transitions may need process adjustments

3. The 6.51% average DHU indicates room for improvement

4.12 DALY FINISHING CHECK VS DEFECT QTY

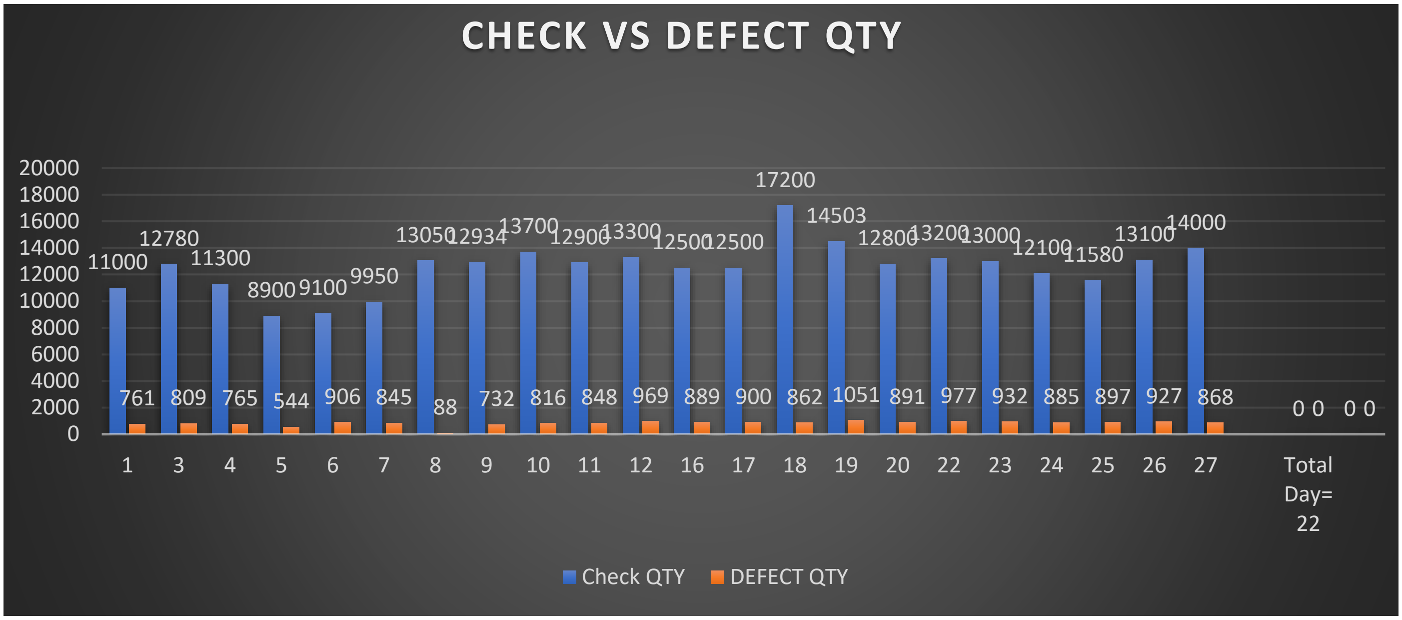


Fig-4.12: CHECK VS DEFECT QTY

Results:

Total production volume reached 275,397 units over 22 days with 18,162 defects (6.6% defect rate). Defect rates showed extreme variability, ranging from 0.7% (Day 8) to 10% (Day 6). Highest defect counts occurred on Day 19 (1,051 defects) and Day 12 (969 defects). Day 8 showed remarkably low defects (88 units, 0.7% rate) compared to other days. No clear correlation found between production volume and defect quantity.

Discussion:

The analysis reveals significant inconsistency in quality control performance. The extreme variation in daily defect rates (0.7%-10%) suggests unstable manufacturing processes rather than predictable quality issues. The outlier performance on Day 8 indicates that much lower defect rates are achievable, while the spikes on Days 6, 12 and 19 points to specific operational problems.

4.13 Daily FINISHING OK Quantity vs. DHU Trend

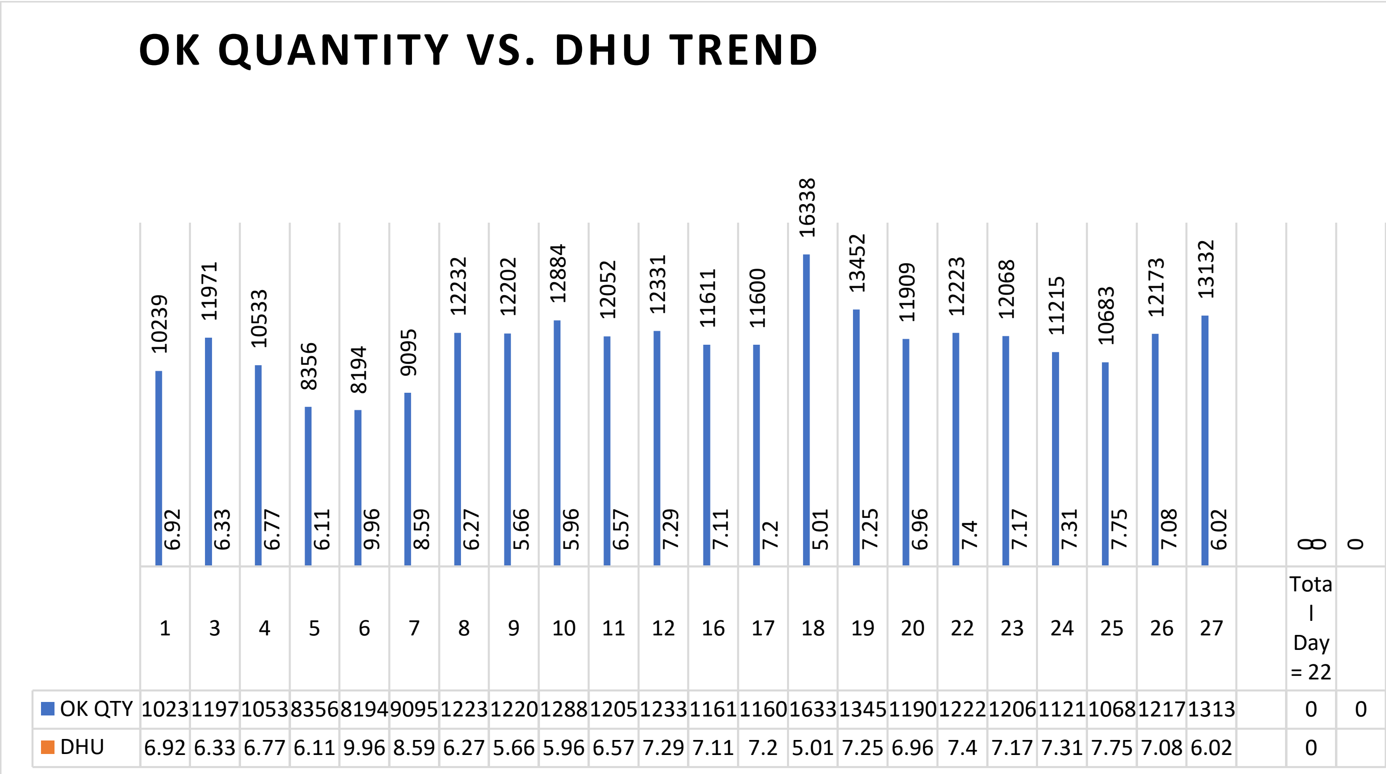


Fig-4.13: OK Quantity vs. DHU Trend

Results:

Total approved production: 256,493 units over 22 days

Defect rate (DHU) ranged from 5.01% (Day 18) to 9.96% (Day 6)

Monthly average DHU: 6.94%

Best quality day: Day 18 (5.01% DHU with 16,338 units)

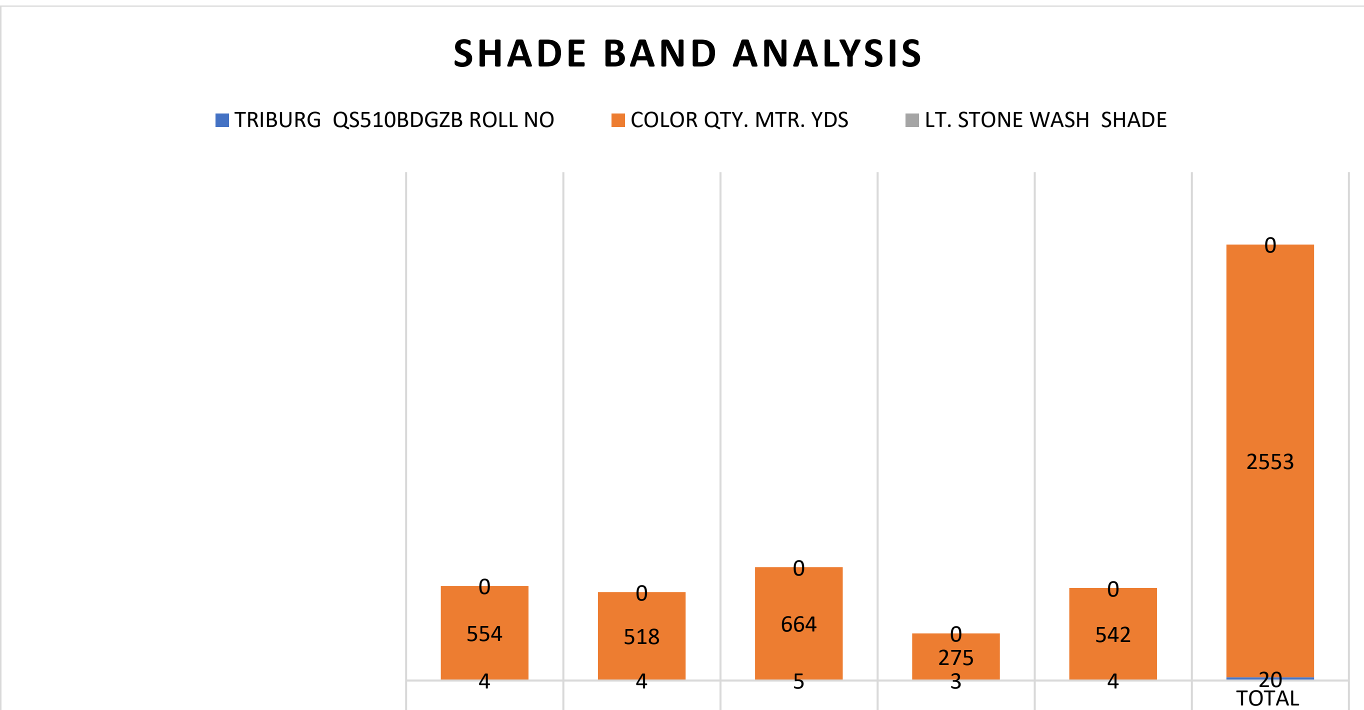
Worst quality days: Days 6-7 (DHU >8.5%) and Days 22,25 (DHU >7.4%)

Discussion:

The data reveals significant variability in quality performance:

Exceptional performance on Day 18 shows high quality is achievable at large volumes (16,338 units at 5.01% DHU). Quality issues cluster in specific periods (Days 6-7, 22-25) suggesting systemic problems. 6.94% average DHU exceeds typical benchmarks, indicating need for improvement.

4.14 SHADE BAND REPORT OF TRIBURG BUYER



						TOTAL
LT. STONE WASH SHADE	0	0	0	0	0	0
COLOR QTY. MTR. YDS	554	518	664	275	542	2553
TRIBURG QS510BDGZB ROLL NO	4	4	5	3	4	20

Fig-4.14: SHADE BAND ANALYSIS

Results:

A total of 2,553 meters/yards of fabric was inspected across 5 shades (A, B, C, D, E).

Roll quantities varied, with the highest being 664 m/yds (Shade C) and the lowest 275 m/yds (Shade D).

Shade distribution:

Shade A: 554 m/yds (Roll 4)

Shade B: 518 m/yds (Roll 4)

Shade C: 664 m/yds (Roll 5)

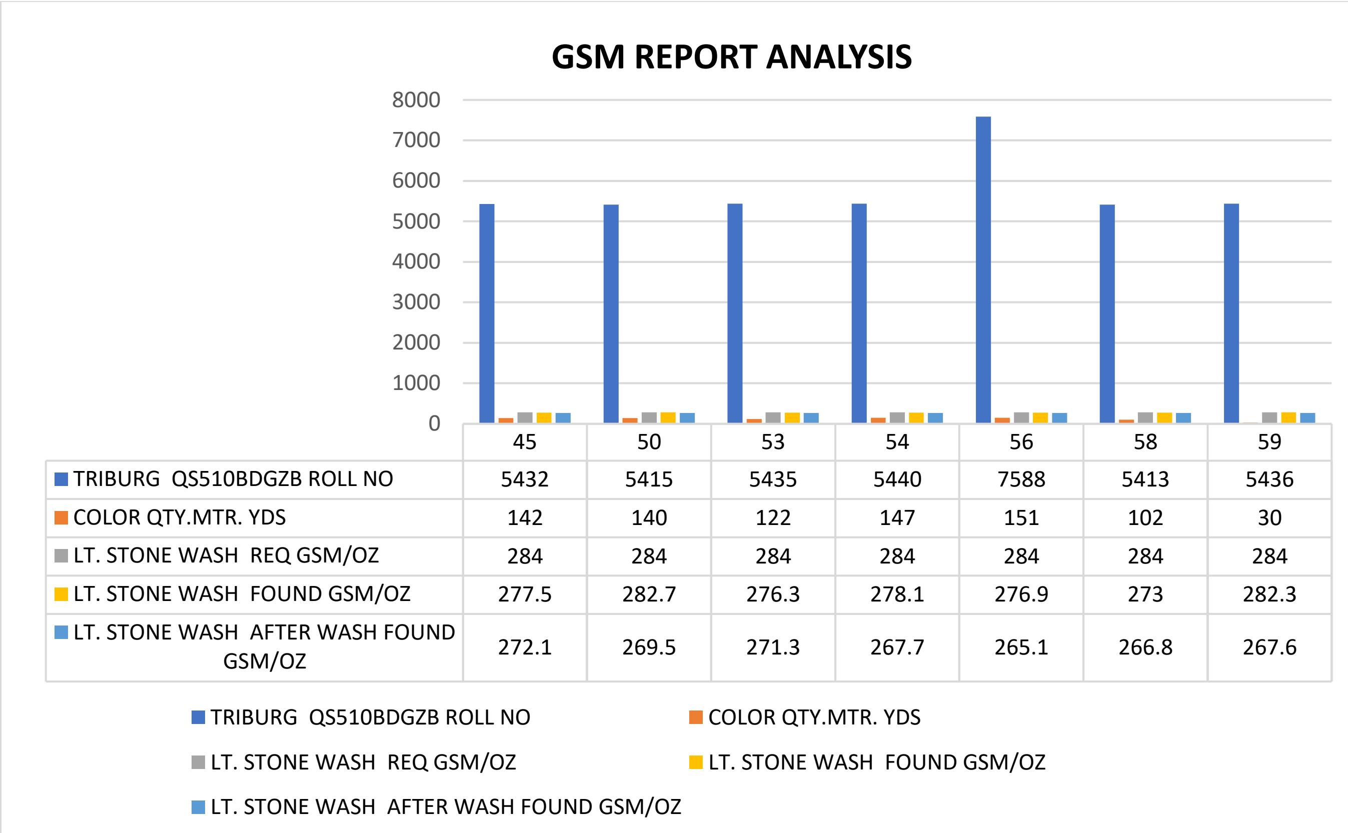
Shade D: 275 m/yds (Roll 3)

Shade E: 542 m/yds (Roll 4).

Discussion:

The fabric met the required total quantity (2,553 m/yds) with 5 distinct shades, ensuring variety for production. Discrepancies in roll quantities (e.g., Shade D being significantly lower) suggest potential inconsistencies in dyeing or cutting processes. Further analysis is recommended to ensure shade uniformity across rolls, especially for bulk orders. No defects were reported, but shade variance should be monitored for buyer compliance.

4.15 GSM REPORT ANALYSIS OF TRIBURG BUYER



	45	50	53	54	56	58	59
TRIBURG QS510BDGZB ROLL NO	5432	5415	5435	5440	7588	5413	5436
COLOR QTY.MTR. YDS	142	140	122	147	151	102	30
LT. STONE WASH REQ GSM/OZ	284	284	284	284	284	284	284
LT. STONE WASH FOUND GSM/OZ	277.5	282.7	276.3	278.1	276.9	273	282.3
LT. STONE WASH AFTER WASH FOUND GSM/OZ	272.1	269.5	271.3	267.7	265.1	266.8	267.6

Fig-4.15: GSM REPORT ANALYSIS

Results:

Before Wash: GSM ranged from 273 to 282.7(target: 284).

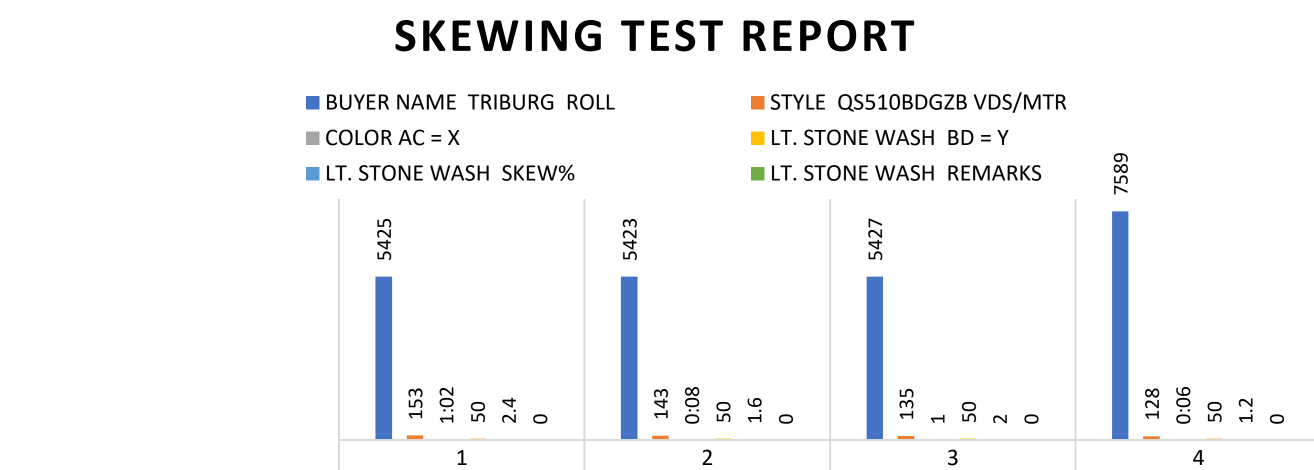
After Wash: GSM dropped to 265.1–272.1, showing consistent weight loss.

Roll 5413 had the lowest post-wash GSM (266.8), while Roll 5432 retained the highest (272.1).

Discussion:

All rolls met the pre-wash GSM requirement (close to 284). Post-wash GSM reduction (~5–7% loss) indicates normal shrinkage but suggests tighter process control is needed to minimize variability. Roll 7588 showed the highest shrinkage (265.1 GSM), warranting inspection of washing parameters.

4.16 SKEWING TEST REPORT OF TRIBURG BUYER



	1	2	3	4
BUYER NAME TRIBURG ROLL	5425	5423	5427	7589
STYLE QS510BDGZB VDS/MTR	153	143	135	128
COLOR AC = X	1:02	0:08	1	0:06
LT. STONE WASH BD = Y	50	50	50	50
LT. STONE WASH SKEW%	2.4	1.6	2	1.2
LT. STONE WASH REMARKS	0	0	0	0

Fig-4.16: SKEWING TEST REPORT

Results:

Skew% ranged from 1.2% to 2.4% across rolls.

Roll 5425 showed the highest skew (2.4%), while Roll 7589 had the lowest (1.2%).

AC (X) values varied (e.g., 1:02, 0:08, 1, 0:06), with BD (Y) constant at 50.

Discussion:

All skew values were within typical tolerance (usually <3–5%), indicating acceptable fabric alignment. Roll 5425’s higher skew (2.4%) may need rechecking for cutting or weaving consistency. Consistent BD (Y) suggests stable processing, but AC (X) variability warrants review of measurement methods. Fabric skew is compliant, but monitoring AC values and high-skew rolls is recommended for quality control.

CHAPTER-5

CONCLUSION

This thesis studied the foremost elements and problems related to end-to-end supply chain management in the garments industry within the context of order processing and shipment. The highly dynamic and demand-driven nature of the garments industry necessitates a finely tuned supply chain to maintain cost efficiency, control delivery schedules, manage quality, and ensure customer satisfaction. This study analyzes supply chain practices to identify current inefficiencies such as lack of digital technologies, real-time monitoring, sustainable supplier planning, inventory control, and collaborative lean inventory management all of which have been proposed as strategic improvements. The study also illustrated the need for integrating all levels of the supply chain towards achieving a complete and smooth information and goods flow.

A major finding of this research is that optimizing order management, production planning, sourcing, warehousing, and distribution improves independent and cumulative performance. The use of automation, ERP, and predictive analytics has been effective in lowering lead times and improving responsiveness to market changes.

To sum up, a streamlined supply chain in the garments' industry boosts customer satisfaction and lowers operational costs, ensures better quality control, and much more. This thesis offers recommendations which serve as a useful guide to aid garment manufacturers and exporters improve their competitiveness within the global market. Further research could look into AI integration, blockchain transparency, and other sustainability approaches to improve resiliency, efficiency, and sustainability within the industry's supply chain."

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