The Implementation Of A Green Supply Chain And The Enhancement Of Production Line Efficiency In Unnoyon Textile Limited Using The Scor Racetrack Model.

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CHAPTER I INTRODUCTION

I.1 Background

Unnoyon Textile Limited, a prominent RMG Garments company, boasts a diverse product range, including T-shirts, shirts, and pants. With a deep understanding of the textile industry's production capabilities, Unnoyon Textile Limited is facing significant challenges within its production section. In pursuit of operational excellence and environmental responsibility, the company is actively seeking a sustainable solution that aligns with the principles of the green supply chain. The demand for their products necessitates a robust and efficient production system, but Unnoyon Textile Limited has encountered obstacles that hinder their production processes. These challenges may include production delays, resource constraints, and inefficiencies impacting the overall manufacturing capacity. The company acknowledges the need for a transformational approach to address these issues and enhance their production capabilities sustainably.

Sustainable supply chain management has emerged as a critical focus for companies seeking to balance their economic objectives with environmental responsibility. (Sekhari, Ratan, Rahman, Bouras, & Ouzrout, 2010). In the case of Unnoyon Textile Limited, a prominent RMG garments company, their diverse product range, including T-shirts, shirts, and pants, has led to a growing demand for efficient production processes. The waste generated during the cutting, sewing, and finishing processes at Unnoyon Textile Limited is not only detrimental to the environment but also significantly impacts the company's production efficiency and ability to meet customer deadlines. The excessive waste leads to delays on the production line, affecting the overall productivity of the company. As a result, Unnoyon Textile Limited struggles to fulfill customer orders on time and achieve its target production goals.

Table I.2 Q2 Waste Table (April, May, June)

Process	Input Quantity (kgs)	Wastages	Output Quantity (kgs)
Cutting	2480.27	6%	2331.4538
Sewing	2331.4538	8%	2144.937496
Finishing	2144.937496	3%	2080.58

Table I.3 Q2 Waste Table (July, August, September)

Process	Input Quantity (kgs)	Wastages	Output Quantity (kgs)
Cutting	2760.8	7%	2677.976
Sewing	2677.976	5%	2544.0772
Finishing	2544.0772	7%	2365.99

Table I.4 Q4 Waste Table (October, November, December)

Process	Input Quantity (kgs)	Wastages	Output Quantity (kgs)
Cutting	2670.8	6%	2537.26
Sewing	2537.26	12%	2359.6518
Finishing	2359.6518	6%	2218.07

An important concern in the context of Unnoyon Textile Limited is on the large waste that occurs during the production operations. The information in the waste tables shows that this wastage is seen in many quarters. The information emphasizes the input amounts, wastage rates, and final output amounts for different production phases, including cutting, sewing, and finishing. The standard wastage percentages of 3% to 8% in cutting, 3% to 8% in sewing, and 2% to 5% in finishing indicate that the company is facing challenges in effectively managing their sewing and finishing processes. Sewing wastages may arise due to various reasons, such

as human errors, lack of skilled labor, and inadequate training, leading to mistakes in stitching and assembly. Additionally, inefficient operations and poor workflow management can contribute to increased sewing wastages. In the finishing stage, wastages may occur due to suboptimal ironing and pressing practices, inadequate quality inspection procedures, and improper packaging, resulting in damaged garments and rework.

To address these issues, the company can consider adopting green supply chain practices, which focus on reducing waste, improving resource efficiency, and promoting sustainability. By implementing Lean Manufacturing principles, the company can optimize its processes, minimize inefficiencies, and reduce sewing and finishing wastages. Furthermore, embracing sustainable packaging materials and eco-friendly finishing techniques can contribute to a more environmentally responsible approach to garment manufacturing. (Chakrabortty & Paul, 2011)

The consequences of wastage in cutting and sewing processes can have significant impacts on both the company and the environment. Higher sewing wastages lead to increased material costs and resource consumption, affecting the company's profitability and competitiveness. The accumulation of fabric scraps and discarded garments can also contribute to environmental pollution and waste generation, putting strain on limited natural resources. Additionally, excessive wastage can disrupt the supply chain, causing delays in production schedules and affecting delivery timelines, leading to customer dissatisfaction and potential order cancellations. From a sustainability standpoint, the company's reputation and brand image may suffer if it is perceived as being wasteful and environmentally irresponsible. Embracing more efficient cutting and sewing practices can not only improve the company's bottom line but also contribute to a greener and more socially responsible approach to garment manufacturing. (Ali & Habib, 2012)

In the first quarter (Q1), the waste percentages for cutting, sewing, and finishing are 4%, 9%, and 8% respectively. In the second quarter (Q2), the waste percentages increased slightly for cutting (6%), sewing (8%), and finishing (10%). The third quarter (Q3) sees a 7% waste in cutting, 5% waste in sewing, and 11% waste in finishing. Finally, in the fourth quarter (Q4), the waste percentages are 6% for cutting, 12% for sewing, and 8% for finishing.

The delays in production and supply to customers have a cascading effect on the company's reputation and customer satisfaction. Customers may experience dissatisfaction due to delayed deliveries, leading to potential order cancellations or a loss of repeat business. Meeting production deadlines is crucial for the company to maintain a competitive edge in the RMG Garments industry and retain its customer base. To enhance their production efficiency and meet target goals, Unnoyon Textile Limited is eager to implement a sustainable system, particularly a green supply chain approach. By addressing the waste issues and optimizing production processes, the company can streamline its operations, reduce lead times, and improve overall productivity. A sustainable system will not only benefit the environment but also enhance the company's ability to meet customer demands, leading to increased customer satisfaction and loyalty.

Moreover, adopting a green supply chain can attract environmentally conscious customers who value sustainable practices and eco-friendly products. By aligning their production processes with green principles, Unnoyon Textile Limited can position itself as an environmentally responsible and socially conscious company, further enhancing its brand image and market competitiveness.

In conclusion, Unnoyon Textile Limited's drive to enhance their production processes and reach target production goals is motivated by the need to reduce waste, improve efficiency, and meet customer deadlines. By implementing a sustainable system, the company can address these challenges, achieve operational excellence, and contribute positively to the environment and the textile industry.

The Fishbone diagram, also known as the Ishikawa diagram, is a visual tool used to identify and understand the potential causes of a specific problem or effect. It helps teams to brainstorm and categorize various factors that could be contributing to the problem, making it easier to analyze and prioritize them. (How to use the fishbone diagram to determine data quality root causes, n.d.) By visually representing the cause-and-effect relationships, the Fishbone diagram provides a clear and organized way to explore the complexity of the problem and guide problem-solving efforts. It encourages collaboration among team members and ensures that all possible factors are considered, leading to more effective problem resolution.

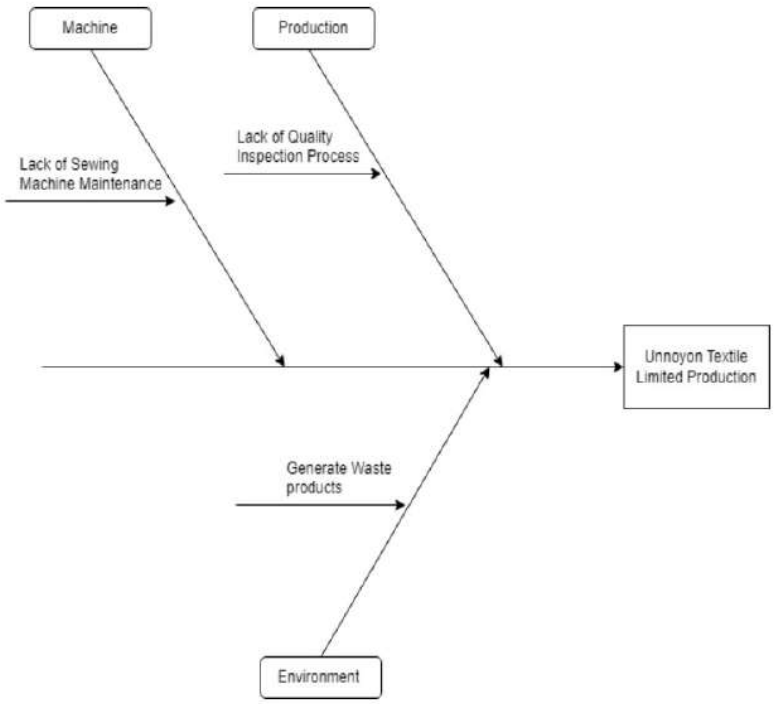


Figure I.1 Fishbone Diagram

The Fishbone diagram analysis reveals three main problem areas causing late production in Unnoyon Textile Limited's production line: lack of sustainable raw materials and production line delays in the material section, waste production in the environment section, and machine maintenance issues in the machine section. Addressing these problems can improve production efficiency and align with the company's sustainability goals.

By adopting SCOR Racetrack, Unnoyon Textile Limited can streamline its supply chain management and address the identified problems effectively. SCOR's structured approach allows the company to assess and optimize every stage of the supply chain, from sourcing sustainable raw materials to efficient production and timely delivery to customers. (Akkucuk, 2016) SWOT analysis within the pre-SCOR stage enables Unnoyon Textile Limited to gain valuable insights into its strengths, weaknesses, opportunities, and threats. This assessment will help the company prioritize areas for improvement and devise strategies that align with its business objectives.

Furthermore, incorporating lean management methods and 5S Kaizen strategy will lead to a more organized and efficient workplace. Lean principles focus on minimizing waste, improving productivity, and enhancing overall quality. By implementing 5S Kaizen, the company will promote workplace cleanliness, organization, and employee engagement, resulting in a smoother production process. (Myerson, 2012)

Overall, the combination of SCOR Racetrack 12.0, SWOT analysis, lean management, and 5S Kaizen will empower Unnoyon Textile Limited to optimize its production line, increase operational efficiency, meet customer demands promptly, and achieve its target production goals. Embracing a sustainable and environmentally responsible approach will position the company as a leader in the RMG Garments industry and strengthen its competitive edge in the market.

I.2 Alternative solutions

Table I.4 Alternative solutions

No	Root Causes	Alternative solutions
1	Lack of Production Standard Schedule Activities	Implementing standard schedule activities for production processes
2	Hard to Find Sustainable Raw Material	Implementing a material planning system to ensure availability
3	Lack of Maintenance Planning	Implementing maintenance planning for machinery and equipment
4	Lack of Consistent Layout	Implementing a consistent and organized layout for production

I.3 Problem Formulation

1. Based on the SCOR 12.0 Racetrack assessment, which aspect of supply chain management performance requires improvement at Unnoyon Textile Limited?
2. What suggestions can be proposed to enhance the performance of green supply chain management at Unnoyon Textile Limited?

I.4 Purpose

1.This research is intended to advance knowledge of the SCOR Racetrack model for evaluating the implementation of green supply chains in Unnoyon Textile Limited.
2.Determine the priority based on company performance results. Ensuring workable solutions with the results.

I.5 Benefits of Final Project

1.Reduced environmental impact: Through rigorous analysis and data-driven insights, this research will reveal which materials are the most detrimental to our environment and provide recommendations on how to reduce their usage. By identifying these materials,

we can shift our focus to more sustainable alternatives and take a step towards an eco-friendlier future.

2. Cost savings: Implementing sustainable practices throughout the supply chain can lead to cost savings for Unnoyon Textile Limited, such as reducing waste and energy consumption, and improving operational efficiency.
3. Reduced time in production: After the implementation of machine maintenance, the production time will be reduced.

I.6 Writing Systematics

CHAPTER I INTRODUCTION

Chapter I Introduction introduces Unnoyon Textile Limited's challenges, explores remedies, outlines project's purpose and benefits, and provides writing structure overview.

CHAPTER II THEORETICAL BASIS

Covers essential theories: Supply Chain Management, Green Supply Chain, Textile Industry's Supply Chain, Advantages, SCOR framework, and SCOR Racetrack. Also discusses the choice of a standard design framework.

CHAPTER III METHODOLOGY OF RESEARCH

This chapter outlines the research methodology. **Problem Solving Systematics** is detailed, emphasizing structured analysis. It further covers Limitation and Assumption, ensuring transparency. Identification of Integrated Components highlights key elements. Lastly, Final Project Completion Time sets the timeline for project execution, ensuring comprehensive exploration.

CHAPTER IV DATA COLLECTION AND PROCESSING

Covers Pre-SCOR Steps, including company profile, product, production system, and price list. Establishing the Scope encompasses global aspects, SWOT analysis, supply chain documentation, and scope definition. Setting up the Supply Chain involves data collection, benchmarking, and threat analysis. Lastly, Enhancing Project Effectiveness addresses issue grouping.

CHAPTER V PREPARE FOR AN EXECUTION

Covers Improvement Project Charter, Readiness Check, Prioritization Matrix, and Result Prediction. Also discusses Improvement Suggestions including machine maintenance and lean management.

CHAPTER VI CONCLUSION AND SUGGESTION

Final step, identify identification of a reliable answer. Or providing ways to solve these issues in the future. After measuring the performance, provide solutions based on the analyzed results.

CHAPTER II THEORETICAL BASIS

II.1 BASIC THEORY

II.1.1 Supply Chain Management

The process of coordinating actions connected to the production and delivery of goods and services to customers is known as supply chain management (SCM). SCM's main goal is to make the flow of products, services, information, and money more efficient throughout the entire supply chain, from raw materials to finished items. According to (Chopra & Meindl, 2016), the three major kinds of flows in SCM are the flow of products, the flow of information, and the flow of money. Product flow refers to the actual movement of materials and products through the supply chain, whereas information flow refers to the communication of information among supply chain participants for effective coordination and collaboration. Finally, the term "financial flow" describes the exchange of money among supply chain associates to ease transactions. Companies can benefit from several benefits, including expense savings, enhanced customer service, increased productivity, and increased competitiveness, by implementing effective SCM practices. Additionally, it enables businesses to control risks and rapidly adjust to changes in supply and demand on the market.

II.1.2 Green Supply Chain Management

The term "green supply chain management" (GSCM) refers to supply chain managementthat incorporates an environmentally friendly or green component into every part of thesupply chain. It encompasses every stage of a product's life cycle, including sourcing, design, product development, production, packing, storage, and transportation, as well as disposal, recovery, and post-sale services including end-of-product life management.(Sarkis, 2014)

II.1.3 Sustainable Supply Chain Management

Sustainable supply chain management (SSCM), in contrast to traditional supply chain management (SCM), is concerned with addressing the social, economic, and environmental needs of supply chain stakeholders (Svensson, 2007). The integration of financially and environmentally sound methods into routine supply chain operations is known as a sustainable supply chain (Ahi & Searcy, An analysis of metrics used to measure performance in green and sustainable supply chains, 2015). Sustainability was described as the avoidance of present

activities of a business that may harm the future, such as emphasizing primarily profit rather than socio-environmental wellbeing and excessive use of inorganic raw resources. A different definition of SSCM provided by (Ahi & Searcy, A comparative literature analysis of definitions for green and sustainable supplychain management, 2013) is coordinated chains that combine elements of the environment and society, effective management of information, goods, and capital flows for both production and product distribution, and increased organizational resilience.

II.1.4 Supply Chain in Textile Industry

The global distribution of the textile industry's supply chain increases its susceptibility to disruption. It is also more difficult to maintain sustainability in their supply chains because these businesses are interconnected with a big number of suppliers who are distributed around the globe. How sensitive the textile industry is to the triple bottom line of sustainability in developing nations has been the subject of several studies ((Seuring S, 2008). Unsustainable practices in the textile sector are a result of several factors. First, a significant amount of chemicals used in this sector are endangering human health and harming environmental ecosystems. Second, a lot of top-tier purchasers in the world outsource their purchases to vendors with competitive prices. Consequently, to get a pricing competitive edge, suppliers are disregarding social and environmental laws (Yu, 2012).

II.1.5 Advantages of Supply Chain

According to (Fawcett, Magnan, & McCarter, 2008), there are several advantages of supply chain management, including:

- Lower costs: By streamlining processes, reducing waste, and improving efficiency, companies can lower their costs and increase profitability.
- Improved customer service: Effective supply chain management ensures that products are delivered to customers on time and in good condition, which can lead to higher levels of customer satisfaction and loyalty.
- Increased efficiency: By optimizing processes and reducing waste, supply chain management can help companies operate more efficiently and effectively.
- Enhanced competitiveness: Companies with well-managed supply chains are better able to compete in the marketplace, as they can offer high-quality products at lower costs.
- Risk management: Supply chain management can help companies identify and manage risks in their supply chain, such as supply disruptions or quality issues.

Overall, effective supply chain management can help companies achieve a range of strategic and operational benefits, from lower costs and improved customer service to increased efficiency and enhanced competitiveness.

II.1.4 Supply Chain Operation Reference (SCOR)

The Supply Chain Operations Reference (SCOR) model, created by the Supply Chain Council, aims to establish a structure for comprehending and refining supply chain procedures (Chorozidis, 2009). The framework is centered on five fundamental processes, which are Plan, Source, Make, Deliver, and Return, classified into three levels. The initial level outlines the complete range and organization of the supply chain, while the subsequent level specifies the processes implicated in the supply chain, and the last level defines the tasks and actions within each process. These are the characteristics based on:

1. Reliability: Reliability refers to the capability to carry out a task as anticipated. Its emphasis is on the consistency and predictability of a process's outcomes. The matrix for measuring reliability typically includes on-time delivery, the correct quantity, and the appropriate quality.
2. Responsiveness: This refers to the rate at which tasks are completed, particularly in terms of how quickly a supply chain can deliver products to customers. Examples of matrix used to measure this attribute may include cycle-time.
3. Agility: Agility refers to the capability to react to external factors and market changes in order to gain or maintain a competitive edge. The SCOR Agility matrix consists of Adaptability and Overall Value at Risk.
4. Cost: The expenses associated with running supply chain processes, such as labor, materials, and transportation costs. The cost of goods sold is a common metric used to evaluate these expenses.
5. Asset Management Efficiency: Efficient utilization of assets is an important attribute in supply chain management. To achieve this, inventory reduction and decisions regarding insourcing or outsourcing are important strategies. To measure this attribute, matrix such as inventory days of supply and capacity utilization are used.

By employing the SCOR model, companies can develop a common language and structure to enhance collaboration and enhance their supply chain performance. The model is beneficial in identifying areas of ineffectiveness and inefficiency, as well as providing opportunities for improvement and creativity. Adopting the SCOR model allows businesses to optimize their supply chain processes, decrease expenses, improve customer satisfaction, and obtain a competitive edge in the market.

II.1.5 SCOR Racetrack

SCOR Improvement Program Racetrack is a program for improving supply chain efficiency that has been developed using SCOR 12.0 as its foundation. The acronym SCOR, which stands

for Supply Chain Operational Reference, also stands for the program stages of Scope Setting, Supply Chain Configuration, Project Optimization, and Implementation Preparation in Racetrack.

Figure II.1 SCOR Racetrack Model

The SCOR Racetrack model outlines a methodology for implementing a SCOR improvement program, which involves incorporating the SCOR process and supporting methods. The methodology is divided into five distinct stages (APICS, 2017).

a. Pre-SCOR Program Step: In the initial stage, the background of the problem, an overview, and the organizational structure of the company are identified.
b. Set the Scope: During this stage, the SCOR improvement program team gains an understanding of the company's business environment and determines the scope of the supply chain to be addressed.
c. Configure the Supply Chain: In SCOR, "Configure the Supply Chain" is the phase where the SCOR improvement program team creates a design and plan for the supply chain processes, using the requirements and scope established in the earlier stages as a basis.
d. Optimize Projects: The SCOR improvement program team creates a project portfolio that outlines the process scope, priority, and expected benefits of each project. This portfolio is a comprehensive document that provides a clear overview of the improvement projects, their objectives, and their expected outcomes. It helps the team to manage and prioritize the projects effectively and ensures that resources are allocated appropriately.
e. Ready for Implementation: "Ready for Implementation" in SCOR refers to the final stage in which the SCOR improvement program team prepares for the implementation of the improvement projects.

II.2 Selection of Standard Design Framework

Table II. 1 Selection of Standard Design Framework

	Supply Chain Operational Reference (SCOR) Racetrack Model	Green Supply Chain Operational Reference (G-SCOR)	Analytic Hierarchy Process
Defining the stages in the process	The SCOR Racetrack Model, based on the SCOR framework, enhances supply chain efficiency in 5 stages: Set the Scope, Configure the Supply Chain, Optimize Project, Ready for Implementation, and Sustain and Improve. The model is structured and systematic, focusing improvement efforts on critical areas, and follows a circular path.	Determining environmental performance attributes using the G-SCOR model. The G-SCOR model uses five performance matrices to assess a supply chain's performance: reliability, responsiveness, flexibility, costs, and asset management effectiveness. These matrices do not, however, directly address environmental	AHP (Analytic Hierarchy Process) is a decision-making framework that is used to prioritize and make decisions based on a set of criteria and alternatives. The AHP hierarchy framework is a way to organize the decision problem into a structured hierarchy of criteria, sub-criteria, and alternatives.
Advantages	The SCOR Racetrack Model provides a structured, comprehensive, and standardized approach to supply chain management, leading to improved performance and continuous improvement. It also helps organizations enhance sustainability by reducing	The G-SCOR model expands on the standard SCOR model by adding sustainability-specific processes like Design, Procure, Produce, Deliver, Return, and Enable, each with sub-processes related to environmental impact.	The AHP model evaluates sustainability initiatives, using consistent criteria to identify strategies that best achieve sustainability goals.

	environmental impact.		
Framework Selection	The SCOR Racetrack Model framework emphasizes the importance of continuous improvement and ongoing monitoring of environmental performance. This can help Unnoyon Textile Limited to identify new opportunities for improving their green supply chain management practices and ensuring that they are continuously reducing their environmental impact.		

CHAPTER III METHODOLOGY OF RESEARCH

III.1 Problem Solving Systematics

This research uses a systematic approach to problem-solving, which is described below.

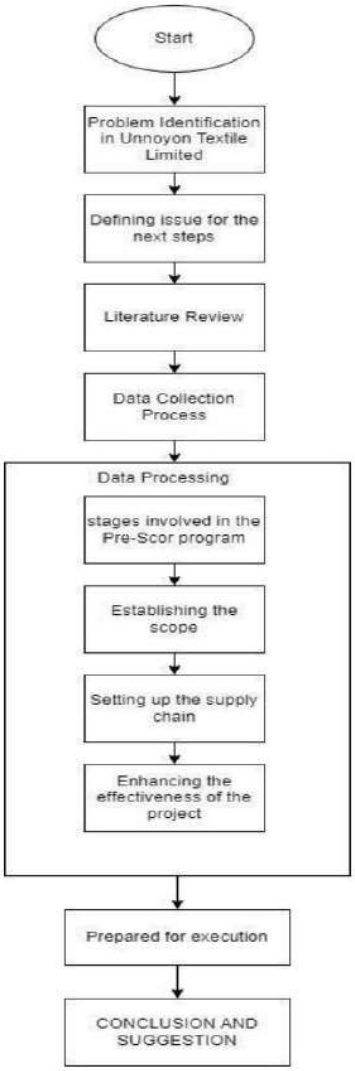


Figure III.1 Problem solving systematics.

1. Problem Identification

To begin this research, it is necessary to assess the current state of the industry. This involves identifying the problems that exist within it, and the focus of this research is on the output of the supply chain at Unnoyon Textile Limited.

2. Defining problem issue

After identifying the issues present in the supply chain at Unnoyon Textile Limited, the next step is to specify the problems that are relevant and consistent with what occurred. This problem formulation will then serve as the basis for determining the research objectives and potential benefits.

3. Literature Review

In order to conduct thorough and comprehensive research, it is important to first review the relevant literature on the topic at hand. This involves identifying and analyzing existing research studies, articles, and publications related to the subject of the research.

4. Data Collection and Processing

To gather the necessary information for this research project, multiple methods of data collection will be utilized. These methods will include conducting interviews, reviewing company data sheets, and distributing questionnaires to targeted individuals or groups.

Pre SCOR-Program Steps

1. At this stage, the focus is on identifying performance-related issues in Unnoyon Textile Limited. This step is crucial in determining areas that require improvement and developing the most effective strategies for doing so. To accomplish this, the SCOR Racetrack method will be utilized to provide an overview of the project to Unnoyon Textile Limited. This approach will aid in identifying and addressing performance gaps and enhancing the overall efficiency of the supply chain.

Establishing the Scope

2. During this stage, an evaluation is conducted on the market environment and the supply chain scope is defined for the SCOR improvement program. The purpose of prioritizing the supply chain is to ensure that the SCOR team recognizes that not all supply chains are equally valuable or beneficial to a company. Some supply chain networks may generate significant revenue, while others may not. Therefore, it is essential to determine which supply chains require the most attention and focus on improving them accordingly. This prioritization can be achieved by utilizing various quantitative supply chain matrices, such as size, sales, volume, and margin. Additionally, factors such as complexity, strategic significance, cash consumption, risk, and volume variability should be considered when assessing the ranking of each supply chain network.

Setting up the Supply Chain

3. The goal is to secure the support and commitment of both internal and external teams. The SCOR performance attributes are used to evaluate supply chain performance, and a performance gap is selected after the kickoff. The selection can be made based on either consensus or predetermined criteria. The aim is to determine the matrix that will be used

to measure progress. The team is trained on the SCOR model to understand the matrix used and to match it with the company's supply chain matrix. If the matrix is not suitable, they can be modified. When assessing results, comparisons are made with competitors using benchmarks or established criteria. It is recommended that no more than three times the strength of the selected matrix is used in level 1 return on supply chain fixed assets. The most crucial gap to close is then determined after evaluating level 2 data, and level 1 is selected for assessment.

Enhancing the effectiveness of the project

4. In this phase, a compilation of all the enhancement initiatives carried out in the previous phase is compiled, and their cost-benefit analysis is evaluated. SCOR level 3 processes are recognized, and the differences in success attributed to the projects are linked. The probable benefits or opportunities associated with each project are also documented. The focus is now on prioritizing the projects that require enhancement.

Prepared for execution

5. The team uses a combination of level 3 and level 4 methods to conduct the straightforward production of selected matrix, which is considered a best practice. The team then solves any issues related to the selected concept type that will be used as a test material, pilot, and rollout solution. After the project team selects a proposal that has significant advantages and a high impact, with a set timeline and goals, the team enters the execution preparation phase.

Conclusion and suggestion

6. The conclusion of this study presents the findings obtained from the rigorous collection, processing, and analysis of data, which were conducted to address the research objectives. The conclusion is supported by a set of practical recommendations and considerations that can be implemented to enhance future research in the field.

III.2 Limitation and Assumption

Data from this company has restrictions. Money is a limited resource for the author. Missing data includes things like carbon emissions and the company's supply region. To draw a conclusion, the author will make certain assumptions to account for the missing data.

III.3 Identification of Integrated Components

Table III.2 Identification of integrated components

	Man	Machine	Information
Object (system)	Operating company's data	Operating company's data	Analysis SCOR model
Design Solution	Perform all analysis based on the data	Calculation of production line data	Analyzed based on SCOR Racetrack

III.4 Final Project Completion Time

Table III.3 Final project completion time

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Stage																
Introduction	v	v														
Theoretical Basis		v	v	v												
Methodology					v	v										
Data Collection and Processing						v	v	v								
Prepare for an execution								v	v	v	v					
Conclusion and suggestion											v	v	v			
Finalizing and documentation project													v	v	v	v

CHAPTER IV DATA COLLECTION AND PROCESSING

IV.1 Pre SCOR-Program Steps

IV.1.1 Company profile

Unnoyon Textile Limited is a leading readymade garments company based in Keraniganj, Dhaka, Bangladesh. Established in 2011, the company has built a strong reputation for producing high-quality garments for the domestic and international markets.

At Unnoyon Textile Limited, they are committed to providing their clients with the best possible service and quality products. They work closely with our clients to understand their specific needs and requirements, and their team of designers and production experts ensures that every garment we produce meets the highest standards.

As a socially responsible company, Unnoyon Textile Limited takes pride in its commitment to ethical and sustainable practices. They believe in fair labor practices and take steps to ensure that their workers are treated with respect and dignity. Additionally, we use environmentally friendly production methods and materials wherever possible.

With a strong focus on innovation and customer satisfaction, Unnoyon Textile Limited has become a trusted name in the readymade garments industry. They are constantly looking for new ways to improve our products and services, and we are dedicated to building lasting relationships with our clients.

IV.1.2 Product

Unnoyon Textile Limited produces a diverse range of high-quality readymade garments to cater to the varying needs of our clients. Our product line includes:

1. T-Shirts: Unnoyon Textile Limited has a collection of t-shirts available in different styles and designs, including round neck, V-neck, polo neck, and more. They use high-quality cotton and other materials to ensure maximum comfort and durability.
2. Shirts: Unnoyon Textile Limited manufactures both formal and casual shirts, which are available in different sizes, colors, and patterns. Their shirts are made from high-quality cotton, linen, and other fabrics, and are designed to provide maximum comfort and style.
3. Pants: Unnoyon Textile Limited has a pants collection that includes formal trousers, chinos, jeans, and more. They are premium quality fabrics and pay attention to details such as stitching, buttons, and zippers to ensure that our pants are comfortable, durable, and stylish.

IV.1.3 Production System

As a researcher, I have analyzed and observed the production system process at Unnoyon Textile Limited and can provide an overview of it. The company has a structured production system that

focuses on efficiency, quality, and sustainability. It involves multiple departments and staff members to ensure the timely production of readymade garments.

Design and Sample Development: The initial step in the process is the design and sample development phase. The design team works closely with clients to finalize the design and create a sample garment for approval. This step guarantees that the final product meets the client's needs and specifications.

Sourcing and Procurement: Next, the company sources high-quality fabrics and accessories from reliable suppliers in the sourcing and procurement phase. It maintains strong relationships with its suppliers to ensure prompt delivery and consistent material quality.

Cutting and Sewing: The cutting and sewing phase are the most critical stage in the production process. Unnoyon Textile Limited utilizes modern machinery to achieve precision and efficiency in cutting and stitching fabrics. Its skilled workforce and use of premium threads and accessories result in high-quality final products.

Quality Control: The quality control phase is essential in ensuring that each garment meets the company's high standards. The company's quality control team conducts thorough inspections throughout the production process to identify and rectify any defects.

Finishing and Packaging: The finishing and packaging phase involves adding final touches such as ironing and folding to the garments. This stage guarantees that the final product is presentable and ready for shipment.

Shipment: Finally, the finished products are shipped domestically and internationally through a well-managed shipment process.

In conclusion, Unnoyon Textile Limited has an efficient and well-organized production system that prioritizes quality, sustainability, and timely delivery. Its commitment to ethical and sustainable practices, along with its use of modern machinery and skilled workforce, ensures that it produces high-quality readymade garments that meet the specific requirements of its clients.

IV.1.4 Product Price List

Unnoyon Textile Limited is a ready-made garments company based in Bangladesh that offers a variety of products including shirts, jeans pants, T-shirts, and trousers. These products are designed and manufactured to meet the needs and preferences of customers who demand. high-quality, comfortable, and stylish clothing. They sell their products wholesale; the price range is given below.

Table IV.1 Product Price List

No	Product	Price
1	T-shirt	৳220.00

2	Jeans Pant	৳510.00
3	Shirts	৳400.00
4	Trouser	৳450.00

IV.1.5 Working Hours

Unnoyon Textile Limited adheres to a regular working schedule within their company, which spans from Saturday to Thursday. The designated operational hours encompass an 8-hour period, commencing at 9:00 AM and concluding at 5:00 PM.

Table IV.2 Working Hours

No	Days	Working hours
1	Saturday - Thursday	9 am - 5 pm

IV.2 Establishing the scope

IV.2.1 Global Organization

Unnoyon Textile Limited follows a standardized organization chart that enables efficient and prompt execution of tasks. At the top of the hierarchy is the Head Department, responsible for overseeing all sectors within the company. The Head Department directly controls two main divisions: the Production Division and the Supply Chain Division.

The Production Division plays a crucial role in the manufacturing process, beginning with product development. This division collaborates on product design, engages in material sourcing and procurement, and handles cutting, sewing, and quality control to ensure the production of high-quality garments.

On the other hand, the Supply Chain Division focuses on packaging and shipment. This division ensures that the finished products are packaged appropriately, meeting presentation standards and ensuring their readiness for shipment.

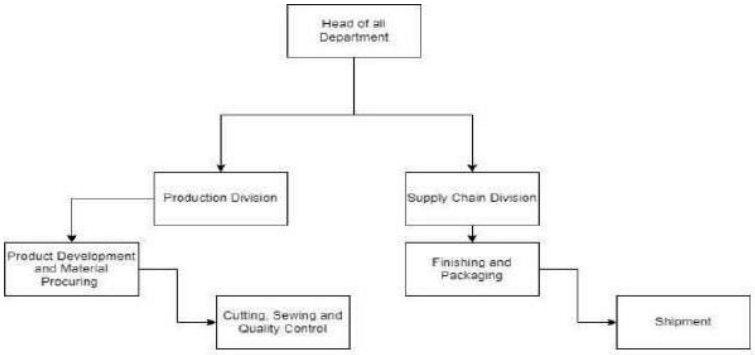


Figure IV.1 Organization Chart

By implementing this structured organization chart, Unnoyon Textile Limited ensures effective coordination and division of responsibilities across different departments. This enables smoother workflow, timely production, and efficient delivery of garments to customers.

IV.2.2 Global Network

Unnoyon Textile Limited, a prominent textile company, has its headquarters located in Dhaka, the capital city of Bangladesh. While operating from Dhaka, the company has expanded its presence and established four main hubs across the country. These hubs are strategic.

Figure IV.2 Bangladesh Supply Chain Map

located in Dhaka, Sylhet, Rangpur, Chittagong, and Khulna regions of Bangladesh. These regional hubs serve as essential centers for the company's operations, allowing Unnoyon Textile Limited to effectively cater to customers in different parts of the country. By having a strong presence in multiple locations, the company can streamline its production, distribution, and

sales processes, ensuring efficient supply chain management and providing convenient access to its products for customers across various regions of Bangladesh.

Customers from Dhaka:

Dhaka serves as the primary market for Unnoyon Textile Limited. As the capital city of Bangladesh, Dhaka holds significant economic and commercial importance, attracting a large consumer base for the company's products. Unnoyon Textile Limited strategically targets and focuses its marketing efforts on Dhaka, recognizing the city's bustling population, diverse demographics, and thriving business environment.

Customers from Chittagong:

The second largest market for Unnoyon Textile Limited is in Chittagong, a major port city in Bangladesh. Chittagong holds significant importance as a commercial and industrial center, making it a prime market for the company's garments.

Customers from Sylhet:

The third largest market for Unnoyon Textile Limited is in Sylhet. Sylhet stands as the company's third-largest market, reflecting the significant demand for their products in the region. With a diverse product range, including T-shirts, shirts, and pants, Unnoyon Textile Limited has catered effectively to the preferences of customers in Sylhet.

Customers from Khulna:

The fourth largest market for Unnoyon Textile Limited is in Khulna. Unnoyon Textile Limited's presence in Khulna showcases their ability to capture the attention of customers in this region, offering them high-quality garments that align with their preferences and fashion choices.

Customers from Rangpur:

The fifth largest market for Unnoyon Textile Limited is in Rangpur. This indicates the company's expansion into multiple regions and the effective distribution of their products to cater to the demands of customers in Rangpur.

IV.2.3 SWOT Analysis

An organization's strengths, weaknesses, opportunities, and threats are assessed using the SWOT analysis, a strategic planning technique. With the help of this extensive framework, firms can examine their internal and external environments and create.

plans that take advantage of their advantages and opportunities while minimizing their disadvantages and risks.

IFAS and EFAS Mechanism:

The IFAS (Internal Factor Analysis Summary) and EFAS (External Factor Analysis Summary) data has been duly verified by the owner of Unnoyon Textile Limited.

a. Internal Factor Analysis Strategy (IFAS)

A strategic management tool called the Internal Factor Analysis Strategy (IFAS) is used to assess a company's internal strengths and shortcomings. In order to create effective strategies

that will enable them to accomplish their goals, businesses can identify and evaluate their internal resources, capabilities, and processes with the aid of IFAS analysis.

No	Strength	Initial
1	They have very large market	A
2	Manufacturer of best quality products in RMG sector	B
3	They have good brand value	C
4	Trusted by customers	D

Table IV.3 IFAS Strength Table

No	Weakness	Initial
1	There are product defects to manage quality.	E
2	Not having sustainability parameters.	F
3	Poor waste management	G
4	Lack of eco-friendly raw materials	H

Table IV.4 IFAS Weakness Table

b. External Factor Analysis Strategy (EFAS)

The External Factor Analysis Strategy (EFAS) is a strategic management technique that assists firms in analyzing external factors that influence their business operations. It entails locating and assessing the external environment's opportunities and dangers that could affect an organization's success.

Table IV.4 EFAS Opportunity Table

No	Opportunity	Initial

1	Increasing demand for sustainable and eco-friendly clothing	I
2	Emerging markets	J
3	Collaboration with suppliers and partners	K
4	Technological advancements	L

Table IV.5 EFAS Threat Table

No	Threat	Initial
1	Increasing competition	M
	Fluctuating raw material costs	N
3	Changes in consumer preferences	O
4	Increasing environmental regulations	P

1.IFAS Calculation

The description of the technical weighting in IFAS calculation is as follows.

Table IV.5 IFAS Technical Weighting

Factor	A	B	C	D	E	F	G	H	TR	Scale
A	x	1	1	0	1	0	1	0	4	0.14
B	0	x	0	1	0	1	1	1	4	0.14
C	0	1	x	1	0	1	1	1	5	0.17
D	1	0	0	x	1	1	1	0	4	0.14
E	0	1	1	0	x	1	0	1	4	0.14
F	1	0	0	0	0	x	1	1	3	0.1
G	0	0	0	0	1	0	x	1	2	0.07
H	1	0	1	1	0	0	0	x	3	0.1

Total	28	1

Table IV.6 Calculation of weight, rating, and score in the IFAS

Initial	Weight	Rating	Score
A	0.14	4	0.56
B	0.14	4	0.56
C	0.17	5	0.85
D	0.14	4	0.56
Total S			2.53
Initial	Weight	Rating	Score
E	0.14	4	0.56
F	0.1	3	0.3
G	0.06	2	0.12
H	0.1	3	0.3
Total W			1.28
S-W			1.25

2.EFAS Calculation

The description of the technical weighting in IFAS calculation is as follows.

Table IV.7 EFAS Technical Weighting

Factor	I	J	K	L	M	N	O	P	TR	Scale
I	x	1	1	0	0	1	1	0	4	0.14
J	0	x	1	1	1	1	1	0	5	0.17

K	0	0	x	1	1	0	0	1	3	0.1
L	1	1	0	x	0	0	0	1	3	0.1
M	1	0	0	1	x	1	1	0	4	0.14
N	0	0	1	1	0	x	1	1	4	0.14
O	0	0	1	1	0	0	x	0	2	0.07
P	0	1	0	1	0	0	1	x	3	0.1
Total									28	1

Table IV.8 Calculation of weight, rating, and score in the IFAS

Initial	Weight	Rating	Score
I	0.14	4	0.56
J	0.17	5	0.85
K	0.1	3	0.3
L	0.1	3	0.3
Total O			2.01
Initial	Weight	Rating	Score
M	0.14	4	0.56
N	0.1	4	0.4
O	0.06	2	0.12
P	0.1	3	0.3
Total T			1.38
O-T			0.63

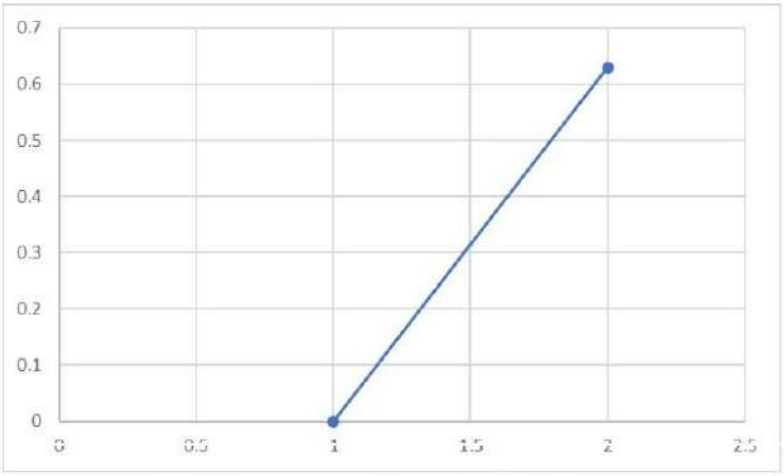


Figure IV.3 IFAS and EFAS Graph

Upon analyzing the graph and conducting IFAS and EFAS calculations, it is determined that the IFAS score is 1.25, while the EFAS score is 0.63. These scores provide valuable insights into the internal and external factors affecting the organization or situation being evaluated.

The IFAS (Internal Factor Analysis Summary) score of 1.25 suggests that the internal factors, such as strengths and weaknesses, have a relatively positive impact on the overall performance or condition being assessed. This indicates that the organization has several internal factors working in its favor, contributing to its competitive advantage and success.

On the other hand, the EFAS (External Factor Analysis Summary) score of 0.63 indicates that the external factors, such as opportunities and threats, have a moderate impact on the evaluated entity. This suggests that the organization faces both favorable external conditions and challenges that need to be addressed or mitigated.

By considering both the IFAS and EFAS scores, decision-makers can gain a comprehensive understanding of the internal and external factors influencing the organization's performance. This information serves as a valuable foundation for strategic planning, identifying areas for improvement, and capitalizing on opportunities while effectively managing potential risks or threats.

IV.2.4 Document Supply Chain

Supply Chain Document: Unnoyon Textile Limited

1. Introduction:

Unnoyon Textile Limited is a leading ready-made garments company committed to delivering high-quality apparel to its customers. This document outlines the company's supply chain network, including its relationships with suppliers, channel partners, and customers. By effectively managing these relationships, Unnoyon Textile Limited aims to ensure the timely delivery of products, maintain high standards of quality, and achieve customer satisfaction.

2. Suppliers:

Unnoyon Textile Limited maintains strong partnerships with reliable suppliers who provide high-quality materials, fabrics, and accessories for garment production. The company collaborates closely with its suppliers to ensure consistent material supply, timely deliveries, and adherence to ethical and sustainable sourcing practices. Key suppliers include:

- Fabric Suppliers: Unnoyon Textile Limited sources premium fabrics from trusted suppliers who meet the company's quality standards and specifications.
- Accessory Suppliers: The company partners with reputable accessory suppliers to obtain buttons, zippers, threads, and other necessary components for garment manufacturing.

3. Channel Partners:

Unnoyon Textile Limited works closely with channel partners to efficiently distribute its products to customers. Channel partners play a vital role in ensuring that the garments reach the right markets at the right time. Key channel partners include:

- Distributors: Unnoyon Textile Limited collaborates with distributors who have an established network and expertise in reaching specific customer segments or geographical areas.
- Retailers: The company partners with retail outlets, both offline and online, to make its products easily accessible to customers. These retailers showcase and sell Unnoyon Textile Limited's garments through their platforms.

4. Customers:

Unnoyon Textile Limited values its customers and strives to meet their expectations through excellent service and quality products. The company serves a diverse customer base, including retail consumers, bulk buyers, and corporate clients. By understanding customer needs and preferences, Unnoyon Textile Limited aims to develop long-term relationships and deliver garments that exceed customer expectations.

5. Supply Chain Management:

Unnoyon Textile Limited maintains a robust supply chain management system to ensure seamless operations and optimize efficiency. Key components of the supply chain management process include:

- Demand Planning: Accurate forecasting and demand planning help Unnoyon Textile Limited align production capacities with customer requirements, minimizing stock-outs or excess inventory.
- Inventory Management: The company employs efficient inventory management techniques to monitor stock levels, track product movement, and prevent supply chain disruptions.
- Logistics and Distribution: Unnoyon Textile Limited partners with reliable logistics providers to ensure timely and cost-effective transportation of finished products from manufacturing facilities to distribution centers and customers.
- Order Fulfillment: The company emphasizes timely order processing and fulfillment to meet customer expectations and maintain a high level of customer satisfaction.

- Continuous Improvement: Unnoyon Textile Limited regularly reviews and enhances its supply chain processes, seeking opportunities for improvement, cost reduction, and sustainability initiatives.

By maintaining strong relationships with suppliers, channel partners, and customers, and implementing effective supply chain management practices, Unnoyon Textile Limited aims to deliver high-quality garments efficiently, strengthen its competitive advantage, and contribute to the success of its stakeholders.

Overall, by regularly reviewing and updating its supply chain, Unnoyon Textile Limited can ensure that it remains resilient, efficient, and effective in meeting the needs of its customers and stakeholders.

After the documentation of Unnoyon Textile Limited's supply chain, it is important to closely monitor the company's revenue monthly. By doing so, the company can identify any fluctuations or trends in its revenue and take appropriate actions to address them. This can include adjusting production levels, optimizing inventory management, and improving customer satisfaction. Additionally, tracking revenue can help Unnoyon Textile Limited make more informed decisions about investing in new technologies, expanding operations, or entering new markets. By regularly reviewing its revenue data, Unnoyon Textile Limited can stay competitive in the rapidly evolving global textile industry and continue to meet the needs of its customers and stakeholders.

Table IV.9 Q1 Revenue Table

Product Name	January	February	March
T-shirt	৳49,000.00	৳67,000.00	৳35,000.00
Jeans Pant	৳66,000.00	৳36,000.00	৳60,000.00
Shirt	৳75,000.00	৳22,000.00	৳28,000.00
Trousers	৳29,000.00	৳15,000.00	৳21,000.00
Total Revenue			৳503,000.00

Table IV.10 Q2 Revenue Table

Product Name	April	May	June
T-shirt	৳39,546.00	৳36,015.00	৳36,344.00

Jeans Pant	৳58,648.00	৳46,744.00	৳48,327.00
Shirt	৳54,248.00	৳60,241.00	৳57,503.00
Trousers	৳35,732.00	৳41,257.00	৳44,143.00
Total Revenue			৳558,748.00

Table IV.11 Q3 Revenue Table

Product Name	July	August	September
T-shirt	৳36,691.00	৳39,909.00	৳39,159.00
Jeans Pant	৳53,398.00	৳45,154.00	৳48,731.00
Shirt	৳50,923.00	৳60,256.00	৳50,744.00
Trousers	৳38,678.00	৳36,270.00	৳38,070.00
Total Revenue			৳537,983.00

Table IV.12 Q4 Revenue Table

Product Name	October	November	December
T-shirt	৳37,214.00	৳38,302.00	৳37,856.00
Jeans Pant	৳39,200.00	৳40,992.00	৳43,082.00
Shirt	৳53,606.00	৳62,633.00	৳59,277.00
Trousers	৳48,293.00	৳40,741.00	৳46,388.00
Total Revenue			৳547,584.00

Upon reviewing the revenue data of Unnoyon Textile Limited for Q1, Q2, Q3, and Q4, it becomes apparent that there are instances where the revenue figures are significantly high. However, it is also noteworthy that during these periods, there is a corresponding increase in waste generation. This indicates a potential correlation between revenue and waste, suggesting that certain operations or processes within the company may be leading to higher waste production. Addressing this issue becomes crucial to ensure sustainable growth, optimize

resource utilization, and align revenue generation with responsible waste management practices.

IV.2.5 Define the Scope

The scope of Unnoyon Textile Limited's green supply chain initiative, based on the analysis of monthly revenue data and waste calculation data, is defined by the need to prioritize waste reduction, and ensure timely delivery. This encompasses implementing strategies and practices that effectively minimize waste generation throughout the supply chain, including raw material procurement, production processes, and post-production stages. Additionally, the focus on timely delivery entails optimizing logistics, streamlining transportation routes, and enhancing supply chain efficiency to ensure products are delivered promptly to customers. By addressing these aspects, Unnoyon Textile Limited aims to enhance sustainability, minimize environmental. impact, improve production line efficiency, and meet customer expectations for eco-friendly practices and timely delivery.

IV.3 Setting up the Supply Chain

Level 1 Strategic Matrices Mechanism:

Based on the existing problems faced by Unnoyon Textile Limited, the appropriate attribute in SCOR Level 1 would be "Responsiveness." This matrix system helps research to find out exact matrix that suitable for the company existing problems.

Responsiveness, in the context of SCOR, refers to the ability of the supply chain to respond to changes quickly and effectively in customer demand, market trends, and other external factors. In the case of Unnoyon Textile Limited, their focus on waste reduction and timely delivery indicates a need for improved responsiveness in their supply chain operations.

By enhancing their responsiveness, Unnoyon Textile Limited can better adapt to changing customer expectations, optimize production and delivery schedules to minimize waste, and effectively address any disruptions or issues that may arise. This attribute emphasizes the importance of agility and flexibility in meeting customer demands while maintaining sustainable and efficient supply chain operations.

	Attribute	**Level 1 Strategic matrices**
Customer	Supply Chain Delivery Reliability	Reliability 1.1 Delivery Performance
		Reliability 1.2 Perfect Order Fulfillment

	Supply Chain Responsiveness	Responsiveness 1.1 Order Fulfillment Lead Times
	Supply Chain Agility	Agility 1.1 Supply Chain Responses Time
Internal	Supply Chain Costs	Cost 1.1 Total Supply Chain Management Costs
		Cost 1.2 Warranty / Returns Processing Costs
	Supply Chain Asset Management Efficiency	Asset Management 1.1 Cash-to-Cash Cycle Time
		Asset Management 1.2 Asset Turns

Table IV.13 SCOR Level 1 matrices of Unnoyon Textile Limited

Upon reviewing the SCOR Level 1 matrices of Unnoyon Textile Limited, the logical progression is to develop the Level 2 matrices, which provide a more detailed breakdown of the Level 1 matrices. The Level 2 matrices offer a comprehensive view of specific areas within each process category and enable a deeper understanding of performance within the supply chain. By defining the Level 2 matrices, Unnoyon Textile Limited can gain insights into the nuances of their operations, identify areas for improvement, and establish measurable targets to enhance overall supply chain performance. These Level 2 matrices will serve as a valuable tool in monitoring and optimizing the various elements of the supply chain, ultimately leading to more efficient and effective operations.

The table provided highlights Order Fulfillment Lead Time as one of the selected variables. This variable, in turn, influences the Level 2 Matrix for Order Fulfillment Lead Time. Within this matrix, four key variables play a significant role: Sustainable Raw Material Cycle Time, Production Cycle Time, Delivery Cycle Time, and Delivery Retail Cycle Time. These variables collectively contribute to the overall Order Fulfillment Lead Time and are essential factors to consider in optimizing and managing the efficiency of the fulfillment process. By analyzing and addressing each of these variables, businesses can streamline their operations, minimize delays, and enhance customer satisfaction by ensuring timely order fulfillment.

Table IV.14 Table of Metrics works level.

Level 1	Level 2	Actual Time (days) Average	Target (days) Average	Gaps
Supply Chain Responsiveness	RS 2.1 Sustainable Raw Material Cycle Time	1	1	0
	RS 2.2 Production Cycle Time	3	2	1
	RS 2.3 Delivery Cycle Time	2	2	0
	RS 2.4 Delivery Retail Cycle Time	2	1	1
Total		8	6	2

Upon analyzing the Level 2 matrices, It becomes evident that there is a significant gap of two days between the actual average and the target set. It is crucial for us to focus on improving the efficiency of our production cycle times. Currently, the delay primarily occurs in the sewing, cutting, and finishing, which leads to the production cycle time exceeding the targeted duration. When focusing on Level 3 matrices related to the green supply chain and production, Unnoyon Textile Limited can track and analyze various performance indicators to drive improvements and optimize production efficiency.

Table IV.15 Table of Metrics works level

Level 1	Level 2	Level 3	Activity
Supply Chain Responsiveness	RS. 2.2 Production Cycle Time	RS. 3.1 Production Scheduling activities	Measure the efficiency of production lines in terms of minimizing waste
		RS. 3.2 Sustainable raw material procurement activities	The average duration required to obtain sustainable raw materials.

		RS. 3.3 Production and test cycle time	The duration required for the production and testing of a product, starting from the acquisition of raw materials to successfully passing the required tests.
		RS. 3.4 Eco-friendly Packaging Cycle Time	The average duration required to package the finished product using eco-friendly materials and practices.
		RS. 3.5 Quality Control Cycle Time	The average duration required to perform a double-check or verification process on the finished product.
		RS. 3.6 Delivery Cycle Time	The average duration required to deliver the finished product to the customer.

After analyzing the Level 3 matrices of Unnoyon Textile Limited, the next step is to establish work formulas or formulas that capture the relationship between key variables and performance indicators. These formulas can help in quantifying and understanding the factors that influence the matrices and guide decision-making for process improvement.

Table IV.16 Works metrics Formula

No	Matrix	Formula	Characteristic
1	Supply Chain Responsiveness	On Time Delivery = (Number of On-time Deliveries / Total Number of Deliveries) * 100	Lesser better
2	RS. 2.1 Production Cycle Time	Production Cycle Time = Total Production Time / Total Quantity Produced	Lesser better

3	RS. 3.1 Production Scheduling activities	Average production time	Lesser better
4	RS. 3.2 Sustainable raw material procurement activities	Average time for collecting raw material	Lesser better
5	RS. 3.3 Production and test cycle time	Average Production and test cycle time	Lesser better
6	RS. 3.4 Eco-friendly Packaging Cycle Time	Average packaging time	Lesser better
7	RS. 3.5 Quality Control Cycle Time	Average Quality Control Cycle Time	Lesser better
8	RS. 3.6 Delivery Cycle Time	Average Delivery Cycle Time	Lesser better

The next stage is to configure the supply chain after it has been characterized and mapped. In this stage, researcher will create a data matrix in accordance with the benchmarking priorities.

IV.3.1 Data Collection

I have successfully collected valuable data from the owner through a comprehensive interview. This personal interaction allowed me to delve into their insights, experiences, and expertise, providing a deeper understanding of their unique perspective. The interview served as a rich source of information, shedding light on the intricacies of the business, its operations, and the challenges it faces. By meticulously documenting the obtained data, I am equipped with a robust foundation for analysis and informed decision-making.

Table IV.17 Collection Detail Data

Matrix	Process	Owner	Collection date	Status
Level 1-3	Rs 1-3	Owner of the Unnoyon Textile Ltd	13/05/2023	Collected

Once the data owner has been identified, the subsequent task involves the computation of the matrix data collection, which encompasses the performance matrix at levels 1 and 2. Specifically, the focus is on evaluating the Supply Chain Responsiveness, denoted as Matrix RS1.1, at Unnoyon Textile Limited. This assessment will be conducted based on the SCOR

version 12.0 guidelines for Matrix Supply Chain Responsiveness at levels 1 and 2, as presented in the table below.

Table IV.18 Metrics RS level 1 and 2

Supply Chain Responsiveness Order Fulfillment Lead Times					
Matrix level	**Calculation**	**Days**	**Days**	**Level 2 Matrix**	**Calculation**
RS.1.1 Supply Chain Responsiveness	The total actual time needed to send all the products / Total order	8	5	Production Cycle Time	Production cycle time – Production scheduling + Sustainable Raw material Procurement / Production Cycle Time + Production time and test + Delivery Time Cycle

Based on the provided table, the specific time intervals can be discerned. To fulfill RS 1.1 Order Fulfillment Lead Times for a batch of 350 products, it takes 8 days in total. Out of this duration, 5 days are allocated to the Production Cycle Time, while the remaining 3 days are dedicated to processing RS 2.1 Raw Material Cycle Time, RS 2.3 Delivery Cycle Time, and RS 2.4 Delivery Retail Cycle Time.

Subsequently, the researcher proceeds to develop a Comprehensive Analysis that will outline the methodology for assessing performance at level 3. Data is collected from four specific time periods, namely January 2023, February 2023, March 2023, and April 2023. Within this research, six matrices pertaining to responsiveness are employed. The subsequent calculations provide an overview of each variable's evaluation.

Table IV.19 Metrics value RS level 1 and 2

Matrix		**Average (Days needed)**
RS.3.1	Production Scheduling activities	0.3

RS.3.2	Sustainable Raw material procurement activities	0.8
RS.3.3	Production and test cycle time	2.7
RS.3.4	Eco-friendly Packaging Cycle Time	0.1
RS.3.5	Quality Control Cycle Time	0.1
RS.3.6	Delivery Cycle Time	0.8
Total		4.8

Based on the provided table, information regarding the production time requirements between November and December 2022 is available. The average duration was utilized for the production of 180 products within a certain timeframe. As a result, the average time required to produce 180 products is determined to be 4.8 days. This calculation is based on the standard working hours at Unnoyon Textile Limited, which amount to 8 hours per day. A notable difference is observed between the internal target production time of 3 days and the actual production time of 4.8 days, resulting in a gap of 1.8 days.

Table IV.20 Production Days

Production Days		
Target time	**Actual time**	**Gap**
3 Days	4.8 Days	1.8 Days

IV.3.2 Benchmarking

When referring to green supply, benchmarking refers to the process of evaluating and comparing the environmental performance of supply chain processes and operations. By contrasting them with accepted industry standards or best practices, this evaluation is carried out. Finding areas for improvement can help to build a supply chain that is more environmentally friendly and sustainable.

Table IV.21 Benchmarking Table

Matrix	**Average actual time (days)**	**Internal Target (days)**	**Gap**

RS.3.1	0.3	0.05	0.25
RS.3.2	0.8	0.10	0.70
RS.3.3	2.7	1.85	0.85
RS.3.4	0.1	0.1	0
RS.3.5	0.1	0.1	0
RS.3.6	0.8	0.8	0
Total	4.8	3	

Benchmarking these KPIs enhances the green supply chain by streamlining logistics, slashing manufacturing, and delivery times, fostering sustainable raw material procurement, waste reduction, energy efficiency, and employee training. It promotes resource efficiency, environmental responsibility, and a more dependable and effective supply chain.

IV.3.3 Supply Chain Threat Diagram

The thread diagram illustrates the representation of each process within Unnoyon Textile Limited through mapping.

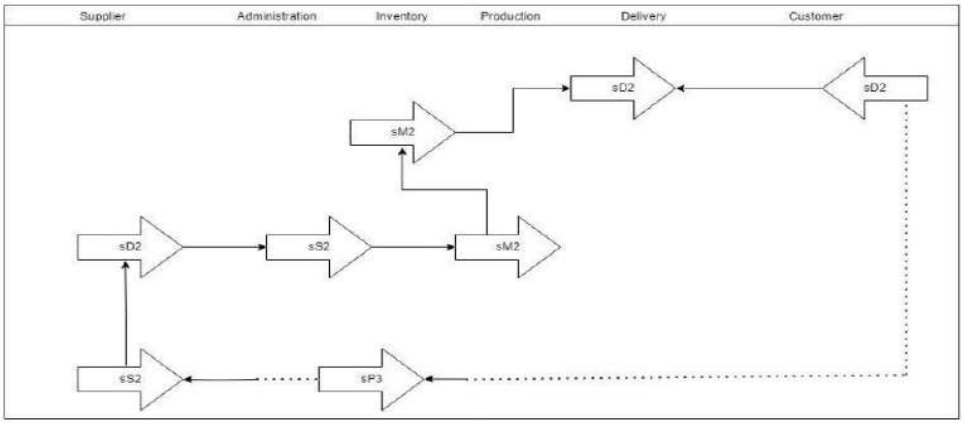


Figure IV.4 Supply Chain Threat Diagram

Plan represent as (sP)

Source represent as (sS)
Make represent as (sM)
Deliver represent as (sD)

This is the thread diagram of Unnoyon Textile Limited, which outlines the entire business processes from the supplier of sustainable raw materials to the delivery of finished products to the customers. The diagram consists of a black line representing the sustainable raw material chain, indicating that sustainable raw materials are delivered and stored in the inventory before processing. After production, the finished products are again stored in inventory before being delivered to customers. On the other hand, the dotted line in the diagram represents the chain of information, starting with customer orders. The processes are planned based on customer needs, and the required number of raw materials is calculated accordingly to produce the products. The thread diagram presents a visual representation of this entire process flow in Unnoyon Textile Limited.
Additionally, the thread diagram also shows the Cycle Time of production for 180 products in the company. The diagram serves as a tool to analyze and optimize production time, with the potential for future improvements to decrease production time further.

IV.3.4 Fishbone Diagram

The purpose of utilizing a Fishbone diagram in Unnoyon Textile Limited was to analyze the factors contributing to the gap that occurred in several aspects. The Fishbone diagrams were created through observations and interviews, following the 5W (why, when, who, where) + 1H (how) principle. Specifically, a Fishbone diagram was necessary to identify the reasons behind the delays in production processes, particularly in Factor RS. 3.1, RS. 3.2, and RS. 3.3. The gathered Fishbone diagram presents the root causes of the lateness issue, obtained through the application of the 5W+1H approach.

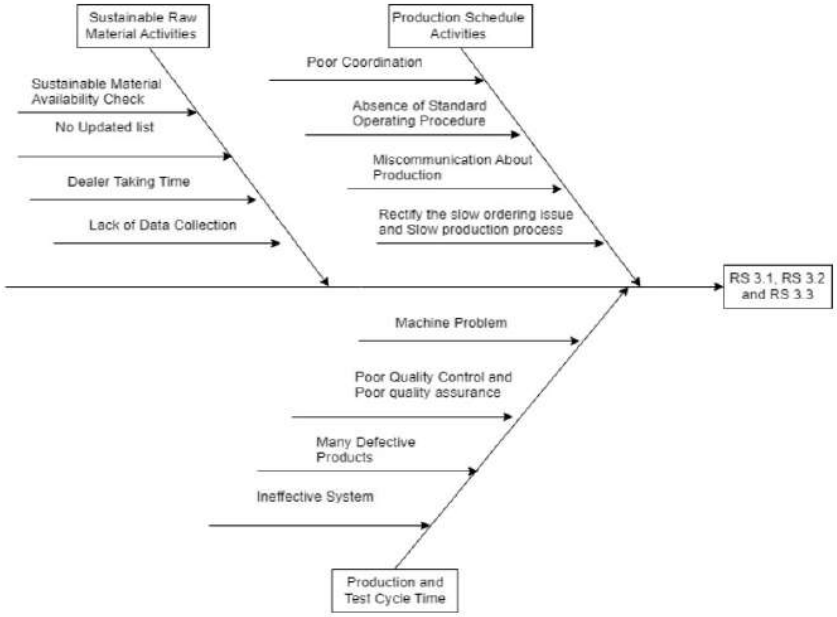


Figure IV.5 Fishbone Diagram

From the Fishbone diagram, we can identify the reasons behind the delays in production processes. Here are the causes of the lateness in the three metrics that exhibit gaps.

1. RS. 3.1 Production Scheduling activities

Production scheduling delays occur due to inadequate coordination among different workstations, lack of standard operating procedures, miscommunication regarding production, and the need to address ordering issues and slow production processes.

2. RS. 3.2 Sustainable Raw Material Procurement Activities

Delays in Sustainable Raw Material Procurement Activities are caused by the following factors: limited availability, updating material lists, slow dealer response, and time-consuming data collection.

3. RS. 3.3 Production and test cycle time

The delay in Production and Test Cycle Time is due to machine problems, poor quality control and assurance, numerous defective products, and an ineffective system.

Based on the fishbone diagram provided earlier, it is evident that the identified factors are the root cause of the delays leading to lateness.

Table IV.22 Causes of Gaps

Matrix		Causes of Gaps
RS.3.1	Production Scheduling activities	Lack of standard schedule activities
RS.3.2	Sustainable Raw material procurement activities	Sometimes it hard to find a dealer as sustainable raw material is rare
RS.3.3	Production and test cycle time	No quality maintenance Lack of consistent layout Lack of standard procedures

IV.4 Enhancing the effectiveness of the project.

During this phase, the researcher will examine the benchmarking results to prioritize performance areas that require resolution and the potential benefits that could be achieved through project implementation. The following represents the procedure involved in the Optimize project.

Table IV.23 Project Improvement

Level 1	Level 2	Level 3		Project improvement	
RS. 1.1 Supply chain responsiveness	RS. 2.1 Production Cycle Time	RS.3.1	Production Scheduling Activities	1	Implement standard schedule activities
		RS.3.2	Sustainable raw material procurement activities	2	Implement material planning system
				3	Find a fixed dealer for reorder

		RS.3.3	Production and test cycle time	4	Implement standard quality procedures
				5	Implement maintenance planning
				6	Implement consistent layout

To address the issue, six project improvements need to be implemented.

IV.4.1 Grouping issues

During this phase, matrices will be categorized based on their process and problem similarities. The causes of the issues in Unnoyon Textile Limited were grouped into categories such as Production and inventory, processes plan, source, make, deliver, return, and enable. The table below illustrates the grouping of matrices.

Table IV.24 Grouping Issues

Group	**Plan**	**Source**	**Make**	**Deliver**	**Return**	**Enable**
Production	1,4		5,6			
Inventory	2	3				

Based on the mentioned identification, projects 1, 4, 5, and 6 fall under the production group, while projects 2 and 3 belong to the inventory group. Additionally, projects 1, 2, and 4 are part of the process planning category, project 3 pertains to sourcing processes, and projects 5 and 6 are associated with manufacturing processes.

CHAPTER V PREPARE FOR EXECUTION

Execution is the last step of The SCOR Racetrack 12.0 process that comes to an end at this phase.

V.1 Improvement Project Charter

The first stage in getting ready to carry out a project is the project charter. The project's objectives, scope, deliverables, timing, and necessary resources are all outlined in this vital document. The project charter serves as a road map, giving the project team and any stakeholders engaged a defined direction and goal.

Table V.1 Improvement Project Charter

Matrix	Case	Plan Improvements	Benefits
RS. 3.1	Production scheduling delays occur due to inadequate coordination among different workstations, lack of standard operating procedures, miscommunication regarding production, and the need to address ordering issues and slow production processes.	Implement standard schedule activities	Implementing standard schedule activities leads to streamlined production schedules and reduced delays.
RS. 3.2	Delays in Sustainable Raw Material Procurement Activities are caused by the following factors: limited availability, updating material lists, slow dealer response, and time-consuming data collection.	Implement material planning system	Sustainable sourcing of raw materials, reducing environmental impact. Enhanced inventory management, optimizing stock levels and minimizing waste.
		Find a fixed dealer for reorder	Delay for material will be reduced

RS. 3.3	The delay in Production and Test Cycle Time is due to machine problems, poor quality control and assurance, numerous defective products, and an ineffective system. Reliance on non-sustainable sources due to ineffective raw material gathering. Ineffective recycling programs, too much waste is produced, and ineffective waste management techniques.	Implement standard quality procedures	Improved product quality, meeting customer expectations. Reduced defects and rework, leading to cost savings.
		Implement maintenance planning	Regular maintenance keeps equipment in optimal condition, leading to improved operational efficiency and reduced energy consumption.
		Implement consistent layout	A consistent layout provides a solid foundation for continuous improvement initiatives and lean manufacturing practices.

V.2 Readiness Check

A program called Readiness Check determines whether proposals are ready to be put into action. The five components—vision, incentives, resources, skill, and action plan—are used to assess readiness prior to execution.

Table V.2 Readiness Check

Project	Vision	Incentives	Resource	Skill	Action Plan	Result
1	✓	✓	✓	✓	✓	Ready to be implemented
2	✓	✓	✓	✓	✓	Ready to be implemented
3	✓	✓	✓	✓	✓	Ready to be implemented

4	✓	✓	✓	✓	✓	Ready to be implemented
5	✓	✓	✓	✓	✓	Ready to be implemented
6	✓	✓	✓	✓	✓	Ready to be implemented
7	✓	✓	✓	✓	✓	Ready to be implemented

V.3 Prioritization Matrix

The Prioritization Matrix is a method used to rank several options or projects according to their prospective significance and relative value. By considering several variables and allocating weights to them, it aids in making educated decisions.

Table V.3 Prioritization Matrix

Effort						
Unnoyon Textile Ltd.		1 (low)	2	3	4	5 (high)
Risk	1 (low)	4,5	1,6		2,3	
	2					
	3					
	4					
	5 (high)					

Projects #4 and #5 are the most prioritized due to their relatively low effort and risk levels. Project #4 aims to establish a standard for quality control, while project #5 focuses on implementing a well-managed layout. Following closely, projects #1 and #6 rank second with the second-lowest risk and effort, while projects #2 and #3 are last with the highest effort.

V.4 Result Prediction

Table V.4 Result Prediction

Priority	**Metrics**

	RS 3.1	**RS 3.2**	**RS 3.3**	**Total**
1			4,5	2
2	1		6	2
3		2,3		2
Total	1	2	3	6
Gap (days)	0.25	0.70	0.85	1.8

Now we do some prediction to find out about project feasibility.
The priority values for each project are as follows:
Priority 1: Weight = 3
Priority 2: Weight = 2
Priority 3: Weight = 1

Let's analysis for these priorities:
Step 1: Calculate the sum of the weights (Total Weight):
Total Weight = 3 (Priority 1) + 2 (Priority 2) + 1 (Priority 3) = 6

Step 2: Calculate the percentage weight for each priority:
Priority 1: Percentage Weight = (Weight of Priority 1 / Total Weight) * 100
= (3 / 6) * 100
= 50%
Priority 2: Percentage Weight = (Weight of Priority 2 / Total Weight) * 100
= (2 / 6) * 100
= 33.33% (approximately 33.33%)
Priority 3: Percentage Weight = (Weight of Priority 3 / Total Weight) * 100
= (1 / 6) * 100
= 16.66.% (approximately 16.67%)

Therefore, based on the unique way analysis, the priorities are given the following percentage weights:
- Priority 1: 50%

- Priority 2: 33.33%
- Priority 3: 16.67%

The analysis reveals priority 1's 50% impact, priority 2's 33.33% impact, and priority 3's 16.67% impact towards achieving the internal target. Implementing all priorities results in a total improvement of 100%, meeting the company's goal of producing 180 products in 3 days.

V.5 Improvement suggestion

Based on the top priority in the provided table, the necessary improvement involves developing maintenance planning and creating a production layout.

V.5.1 Machine Maintenance

To ensure effective maintenance, a set of activities is required. Consequently, planning is executed to compare actual maintenance outcomes with the plans and make necessary adjustments. This focused approach to maintenance allows the company to reach its objectives and address extended production schedules efficiently.

Table V.5 Machine Maintenance Project Table

No.	Work Breakdown	Activity	Product	Deadline
1	**Planning**			
	Project Planning	Creating all projects associated with eco-friendly maintenance.	Compile an inventory of items requiring maintenance.	≤10 weeks before the project launch
		Getting ready for the maintenance prerequisites.	Proposal checklist	≤10 weeks before the project launch
	Meeting	Activities discussion		
		Task handle to a	The responsible person	≤9 weeks before the

		responsible person		project launch
	Administration	SOP Design	SOP	≤8 weeks before the project launch
2.	**Requirement for the Maintenance project**			
	Making draft	A draft maintenance project	Excel Sheet	≤7 weeks before the project launch
	The training programs' material.	Developing and creating instructional materials for maintenance purposes.	A guidebook.	≤6 weeks before the project launch
3.	**Maintenance**			
	Perform maintenance	Maintenance machine	Maintenance checklist	Beginning week of the project
4.	**Production**			
	Monitoring	Monitoring the production	Make report	Check how machines are performing during production. If something error happens, report immediately.
	Improving	Check how machines can be improved	Improvement	Immediately
5.	**Pre-Event**			

	Reporting	Maintenances report and highlight solutions	Report	End of the week

Below is the machine maintenances table sheet in Unnoyon Textile Limited

Table V.6 Machine Maintenance Activity

Activity No.	Maintenance Activity	Frequency	Green Supply Chain Focus
1.	Energy Settings of Industrial Sewing Machines	Once a week	Reduce energy consumption and promote sustainable practices.
2.	Inspection of Sewing Machine	Once a week	Enhance machine reliability, minimize downtime, and waste.
3.	Sustainable Lubrication	Once a week	Use eco-friendly, biodegradable lubricants for reduced impact
4.	Recycling and Reusing Cutting Blades and Parts	Once a week	Reduced waste, cost savings, sustainable resource management through recycling and reusing

			cutting blades and parts.
5.	Lean Maintenance Practices	Once a week	Optimize processes to reduce cycle time and resource usage.

The implementation of these maintenance activities plays a crucial role in helping Unnoyon Textile Limited achieve its goals, particularly in improving their green supply chain. Each maintenance activity targets specific areas of the production process, contributing to enhanced sustainability and operational efficiency. Below are several provisions devised for the execution of maintenance activities.

- Maintenance will be conducted on a weekly basis, preferably at the start of the week.
- Any damage or non-compliance with the SOP should be promptly reported to the company management, specifically the owner, for further action.
- Mention 1,2,3 in the SOP. 1 means excellent, 2 means good and 3 means need to be repaired.
- Additionally, regular maintenance reports will be submitted on a weekly basis.

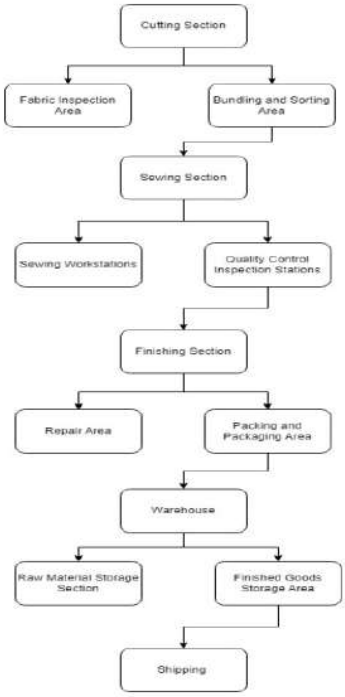
V.5.2 Lean Management

A systematic technique called lean management, commonly referred to as lean manufacturing or lean production, aims to maximize value while decreasing waste in the production process. (Womack, J. P., Jones, D. T., & Roos, D., 1990)

Lean management benefits for supply chain: Reduced lead times, lower costs, improved efficiency, minimized waste, enhanced customer satisfaction, and increased agility in responding to market changes.

Layout Redesign: The subsequent improvement involves devising an efficient and productive working layout for Unnoyon Textile Limited's production line. This entails implementing changes in each section to establish a new production flow. Multiple areas require enhancement due to outdated practices that have caused increased production line time. Below is the layout of Unnoyon Textile Limited's production line.

Figure V.1 Old Production Layout



As depicted in the above picture, the production line at Unnoyon Textile Limited appears to rely on outdated methods. By implementing lean management systems, the company can address these inefficiencies and streamline their production processes. Lean management principles can help them eliminate waste, improve productivity, and enhance overall performance, leading to a more efficient and successful production line. Embracing these practices would enable Unnoyon Textile Limited to meet their production goals more effectively and stay competitive in the market.

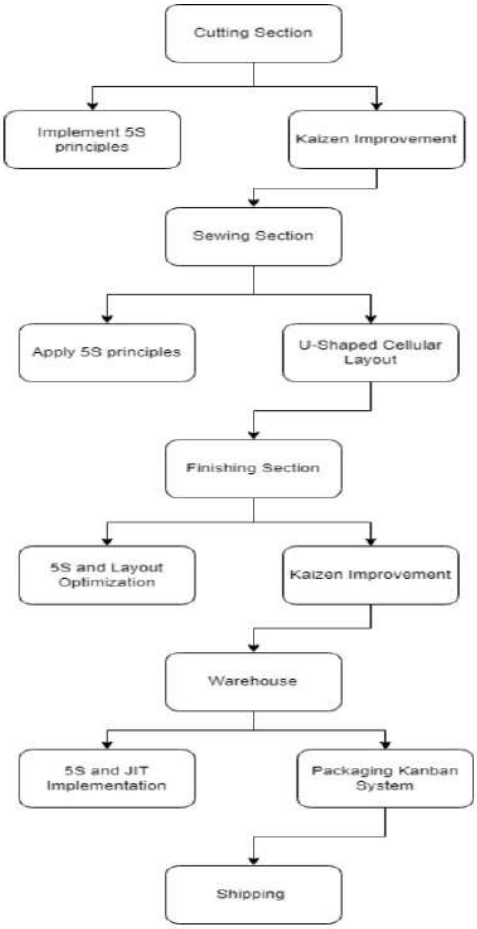


Figure V.2 New Production Layout

The updated layout showcases various methods that will enable Unnoyon Textile Limited to enhance sustainability in their production line. These methods likely emphasize lean management, waste reduction, and resource optimization, leading to reduced environmental impact, lower costs, and improved overall efficiency. By adopting a more sustainable approach, the company is positioning itself for long-term success in the industry.

V.6 Some Improvements Suggestion

Creating a workable layout for Unnoyon Textile Limited production line using 5S Kaizen Design Improvement and lean management principles entails organizing the workspace efficiently, maximizing material flow, and decreasing waste.

Table V.7 Cost Calculation for Improvement Suggestion

Project No	Cost	Project Plan	Timeframe
1	Bdt 7000	Organize cutting tables and tools	Two weeks
2	Bdt 14500	Train employees for Kaizen improvement and conduct kaizen improvement	Two weeks
3	Bdt 5500	Apply 5S and layout optimization	Two weeks
4	Bdt 15,000	Implement 5S and JIT inventory management	Four weeks
5	Bdt 6000	Establish Kanban for packaging	Four weeks
	Bdt 48,000		

V.6.1 Organize cutting tables and tools:

Implementing the organization of cutting tables and tools in the sewing section of Unnoyon Textile Limited's can be achieved through the following suggestions:

1. Conduct a Lean Assessment: Conduct a thorough assessment of the current cutting section to identify inefficiencies and opportunities for improvement.
2. Create a U-Shaped Layout: Reorganize cutting tables in a U-shaped layout to optimize the flow of materials and garments, reducing material movement and enhancing productivity.
3. Use Color Coding: Use color-coded labels and markings to identify different cutting tools, aiding quick identification and reducing search time.
4. Standardize Tool Placement: Standardize the placement of cutting tools to ensure consistency and reduce the risk of misplacement.
5. Allocate Material Storage Areas: Designate specific areas for storing fabrics and materials, ensuring they are easily accessible to cutters.

By implementing these suggestions, Unnoyon Textile Limited can create a well-organized cutting section that promotes efficiency, reduces waste, and improves overall production performance in their RMG garment company.

V.6.2 Train employees for Kaizen improvement and Conduct Kaizen Improvement

To train employees for Kaizen improvement, Unnoyon Textile Limited can follow these steps:

1. Awareness Sessions: Conduct awareness sessions to introduce employees to the concept of Kaizen, its benefits, and its relevance to their work.
2. Kaizen Principles: Educate employees about the core principles of Kaizen, such as continuous improvement, employee empowerment, and waste reduction.
3. Training Workshops: Organize interactive workshops to teach employees problem-solving skills, root cause analysis, and effective team collaboration.
4. Kaizen Tools: Familiarize employees with various Kaizen tools like PDCA (Plan-Do-Check-Act), 5 Whys, Gemba walks, and visual management.
5. Hands-on Projects: Encourage employees to participate in small-scale Kaizen projects within their work areas to practice Kaizen principles.
6. Support and Coaching: Provide ongoing support and coaching to employees during their Kaizen initiatives to guide them toward successful improvements.

By training employees in Kaizen principles and empowering them to identify and implement improvements, Unnoyon Textile Limited can cultivate a culture of continuous improvement, leading to enhanced efficiency, quality, and employee engagement in their RMG garment company.

V.6.3 Apply 5S and layout optimization

To apply 5S and layout optimization in the sewing section of Unnoyon Textile Limited's RMG garment company, follow these steps:

1. Sort (Seiri):

- Remove unnecessary items and tools from the sewing section, keeping only essential ones.
- Organize sewing machines and equipment based on their usage frequency and relevance.

2. Set in Order (Seiton):

- Arrange sewing machines in a logical sequence to create a smooth flow of garments.
- Use color-coded markings to indicate different sewing machine functions and their designated positions.

3. Shine (Seiso):

- Regularly clean and maintain sewing machines, workstations, and the surrounding area.
- Conduct daily cleaning routines to keep the sewing section tidy and organized.

4. Standardize (Seiketsu):

- Develop standard operating procedures (SOPs) for sewing processes to ensure consistency and efficiency.
- Implement visual aids, such as work instructions and process flow charts, to guide operators.

5. Sustain (Shitsuke):

- Foster a culture of continuous improvement by regularly training employees in 5S principles.
- Conduct periodic audits to monitor adherence to 5S practices and address any deviations.

Layout Optimization:
Analyze the current sewing section layout to identify bottlenecks and inefficiencies.
Redesign the layout to create a U-shaped cellular layout, promoting a one-piece flow of garments.

Benefits:

1. Improved sewing section efficiency and productivity.
2. Reduced material handling time and increased throughput.
3. Enhanced quality control and consistent product output.
4. Streamlined workflow and minimized operator movement.
5. Increased employee engagement and satisfaction.

By applying 5S and layout optimization in the sewing section, Unnoyon Textile Limited can create a well-organized and efficient workspace that supports lean manufacturing principles, leading to improved productivity and product quality in their RMG garment production line.

V.6.4 JIT inventory management

To implement JIT inventory management in the warehouse, follow these steps:

1. Demand Forecasting: Analyze demand patterns and collaborate with sales teams to accurately forecast future requirements.
2. Supplier Collaboration: Establish strong relationships with suppliers, share production schedules, and communicate real-time demand information.
3. Reduced Lead Times: Optimize warehouse processes, transportation, and order processing to minimize lead times.
4. Kanban System: Implement a Kanban system to manage inventory levels effectively and use visual signals to signal material replenishment needs.
5. Small Batch Production: Adopt a production strategy that focuses on producing smaller batches based on actual customer demand.

Benefits:

1. Cost Savings: JIT inventory management minimizes carrying costs and excess inventory, leading to cost savings.
2. Faster Order Fulfillment: JIT ensures quicker order processing and delivery, enhancing customer satisfaction.

By JIT inventory management in the warehouse, Unnoyon Textile Limited can achieve a lean and efficient supply chain, leading to cost savings and improved customer service in their RMG garment production.

Overall, by implementing these methods effectively, Unnoyon Textile Limited can potentially fix some of their problems and achieve better operational efficiency, cost savings, and improved product quality, production delays.

V.6.5 Establish Kanban for packaging

To establish a Kanban system for packaging materials in the warehouse of Unnoyon Textile Limited's RMG garment company, follow these steps:

1. Identify Packaging Materials: Determine the types of packaging materials needed for garment products.
2. Create Kanban Cards: Design cards indicating optimal inventory levels for each material.
3. Implement Replenishment Process: Restock materials when Kanban cards signal the need for replenishment.

Benefits from implementing the three steps of the Kanban system for packaging materials in the warehouse:

1. Improved Inventory Management: The Kanban system helps maintain optimal inventory levels, reducing excess stock and minimizing storage costs.
2. Efficient Replenishment: With Kanban cards signaling the need for restocking, the warehouse team can quickly replenish packaging materials, ensuring a continuous supply for garment packing.
3. Reduced Waste: By always having the right quantity of packaging materials, the Kanban system minimizes waste and prevents stockouts, improving overall warehouse efficiency.

By implementing a Kanban system for packaging materials in the warehouse, Unnoyon Textile Limited can enhance packaging efficiency, reduce costs, and improve overall warehouse management in their RMG garment production.

Chapter VI CONCLUSION AND SUGGESTION

VI.1 Suggestion

There are various methods available through SCOR Racetrack 12.0 that can be employed to enhance the effectiveness and efficiency of production at Unnoyon Textile Limited. Some of these methods include the following:

1. During the pre-SCOR stage, the researcher conducted observations of different aspects of the company, such as the company profile, products offered, production system, product price list, and working hours. All these observations were carried out through interviewing and face-to-face meetings with relevant personnel.
2. The second stage involves establishing the scope, wherein researchers gather testimonials to identify potential solutions for the problem. During this process, they assess the company's strengths, weaknesses, opportunities, and threats, which subsequently helps in defining the scope of the research.
3. The third stage is setting up the supply chain, it involves data collection, benchmarking, and supply chain threats diagram. In this stage researchers observed that in order to improve their existing problem it is needed to solve its responsiveness. Level 3 metrics are needed to solve, these metrics are RS. 3.1, RS 3.2 and RS. 3.3.
4. The fourth stage aims to enhance the effectiveness of the project. During this stage, the researcher examines six project improvement plans to facilitate project execution.
5. The final stage is the preparation for execution. During this stage, the researcher carries out the implementation process, which includes developing the project plan, making predictions, creating a prioritize matrix, and planning improvements to ensure a successful execution of the project.

The top two improvement priorities at Unnoyon Textile Limited are maintenance planning and production layout redesign. To address maintenance issues, a comprehensive plan is devised, including activities like project planning, SOP design, and regular inspections. Weekly maintenance activities, reporting, and assessment based on a scoring system are implemented to ensure efficient machine upkeep.

In terms of production layout, lean management principles are adopted to maximize value and minimize waste. The outdated production line is redesigned to establish a more efficient flow, reducing lead times, costs, and increasing customer satisfaction. The company's commitment to sustainability is reflected in practices like using eco-friendly lubricants, recycling, and lean manufacturing principles, leading to reduced environmental impact and improved overall efficiency. By implementing these improvement measures, Unnoyon Textile Limited is positioning itself for long-term success and competitiveness in the market.

VI.2 Final Suggestion

By closely monitoring their production scheduling activities, sustainable raw material procurement activities, and production and test cycle time, Unnoyon Textile Limited can achieve their objectives of timely production, on-time deliveries, waste reduction in production, and establishing a green and sustainable system. Successfully implementing these improvement measures will not only boost their production efficiency but also move the company towards establishing a green supply chain. A green supply chain focuses on environmentally responsible practices and sustainable resource management. Embracing these changes will position Unnoyon Textile Limited as a responsible and forward-thinking industry leader, resonating positively with environmentally conscious customers and stakeholders while contributing to the company's long-term viability and competitiveness in an increasingly eco-aware market. This approach will foster growth and success for the company for years to come.

REFERENCES

Muhammad Rizqy Abdurrahman Assyifa (2021) Improving Responsiveness of Micro, Small,and Medium Enterprise (MSME)Business Process by Using SCOR Racetrack Method (Case Study: Sahara Aluminium)

Ahi, P., & Searcy, C. (2013). A comparative literature analysis of definitions for green and sustainable supply chain management. *Journal of Cleaner Production, 52*, 329-341. Retrieved 7 28, 2023 from https://sciencedirect.com/science/article/pii/s095965261300067x

Ahi, P., & Searcy, C. (2015). An analysis of metrics used to measure performance in green and sustainable supply chains. *Journal of Cleaner Production, 86*, 360-377. Retrieved 7 28, 2023 from https://sciencedirect.com/science/article/pii/s0959652614008270

Akkucuk, U. (2016). *SCOR Model and the Green Supply Chain*. Retrieved 7 28, 2023 fromhttps://igi-global.com/chapter/scor-model-and-the-green-supply-chain/141892

Ali, M., & Habib, M. (2012). Supply Chain Management of Textile Industry: A Case Studyon Bangladesh. *International Journal of Supply Chain Management, 1*(2). Retrieved 7 28, 2023 from http://ojs.excelingtech.co.uk/index.php/ijscm/article/view/587

Apics. (2017). *Supply Chain Operations Reference Model SCOR VERSION 12.0*. Retrieved 728, 2023 from https://www.apics.org/docs/default-source/scor-training/scor-v12-0- framework-introduction.pdf?sfvrsn=2

Chakrabortty, R. K., & Paul, S. K. (2011). Study and Implementation of Lean Manufacturing in a Garment Manufacturing Company: Bangladesh Perspective. *Journal of Optimization in Industrial Engineering, 4*(17), 11-22. Retrieved 7 28, 2023 from http://qjie.ir/article_62_3fefdadeee2c4c05b10c4a94e0d915be.pdf

Chopra, S., & Meindl, P. (2016). *Supply chain management : strategy, planning, andoperation.* Retrieved 7 28, 2023

Chorozidis, A. (2009). *Enriching SCOR Model: Recapturing the notions of Business Strategyand Business Sustainability*. Retrieved 7 28, 2023 from https://repository.tudelft.nl/islandora/object/uuid:382bf64c-4704-4f4a-8258-0c90c004b4ec/datastream/obj/download

Fawcett, S. E., Magnan, G. M., & McCarter, M. W. (2008). Benefits, barriers, and bridges to effective supply chain management. *Supply Chain Management, 13*(1), 35-48

Retrieved 7 28, 2023 from

https://emerald.com/insight/content/doi/10.1108/13598540810850300/full/html

Fishbone Diagram – How to Make and Use a Fishbone Diagram. (n.d.). Retrieved 7 28,2023 from LBSPartners: http://lbspartners.ie/fishbone-diagram/

How to use the fishbone diagram to determine data quality root causes. (n.d.). Retrieved 7 28, 2023 from http://www.lightsondata.com/how-to-fishbone-diagram-data-quality-root-causes/

Myerson, P. (2012). *Lean Supply Chain and Logistics Management.* Retrieved 7 28, 2023from https://amazon.com/lean-supply-chain-logistics-management/dp/007176626x

Roehrich, J. K. (2008). Supply chain management: Strategy, planning & operations, by Chopra, S. and Meindl, P. *Journal of Purchasing and Supply Management, 14*(4), 273-274. Retrieved 7 28, 2023 from https://researchportal.bath.ac.uk/en/publications/supply-chain-management-strategy-planning-amp-operations-by-chopr

Sarkis, J. (2014). *Overview of the GSCM research and theory.* Retrieved 7 28, 2023 from http://proceedings.asmedigitalcollection.asme.org/content.aspx?bookid=859&sectioni d=50958853

Sekhari, A., Ratan, S. R., Rahman, M., Bouras, A., & Ouzrout, Y. (2010). *Sustainable SupplyChain Management: State- of- the- Art.* Retrieved 7 28, 2023 from https://hal.archives-ouvertes.fr/hal-00527386/document

Seuring S, M. M. (2008). Conceptual Framework for Sustainable Supply Chain Management. Journal of Cleaner Production. *Journal of Cleaner Production, 2012*(02). Retrieved 7 28, 2023 from https://omicsonline.org/open-access/supply-chain-management-in-textiles-and-apparel-2165-8064.1000e104.pdf

Svensson, G. (2007). Aspects of sustainable supply chain management (SSCM): conceptual framework and empirical example. *Supply Chain Management, 12*(4), 262-266. Retrieved 7 28, 2023 from

https://emerald.com/insight/content/doi/10.1108/13598540710759781/full/html

Yu, A. N. (2012). Sustainable fashion supply chain management under oligopolistic competition and brand differentiation. *nternational Journal of Production Economics*. Retrieved 7 28, 2023 from https://hbr.org/2002/02/the-reverse-supply-chain

Order Qty	Cutting Qty	Sewing Qty	Finishing Qty	Shipping Qty
January	840	787	700	654
February	802	781	749	654
March	826	776	719	682
April	845	760	744	663
May	815	792	727	677
June	832	780	723	663
July	846	785	708	663
August	848	774	722	660
September	817	756	707	699
October	815	750	733	679
November	800	776	720	699
December	838	772	715	682

Quality Control Department Data

Month	Jeans Pant	T-shirt	Shirt	Trousers	Total
January	৳66,000.00	৳49,000.00	৳75,000.00	৳29,000.00	৳2,19,000.00
February	৳36,000.00	৳67,000.00	৳22,000.00	৳15,000.00	৳1,44,000.00
March	৳60,000.00	৳35,000.00	৳28,000.00	৳21,000.00	৳1,44,000.00
April	৳58,648.00	৳39,546.00	৳54,248.00	৳35,732.00	৳1,88,174.00
May	৳46,744.00	৳36,015.00	৳60,241.00	৳41,257.00	৳1,84,257.00
June	৳48,327.00	৳36,344.00	৳57,503.00	৳44,143.00	৳1,86,317.00
July	৳53,398.00	৳36,691.00	৳50,923.00	৳38,678.00	৳1,79,690.00
August	৳45,154.00	৳39,909.00	৳60,256.00	৳36,270.00	৳1,81,589.00
September	৳48,731.00	৳39,159.00	৳50,744.00	৳38,070.00	৳1,76,704.00
October	৳39,200.00	৳37,214.00	৳53,606.00	৳48,293.00	৳1,78,313.00
November	৳40,992.00	৳38,302.00	৳62,633.00	৳40,741.00	৳1,82,688.00
December	৳43,082.00	৳37,856.00	৳59,277.00	৳46,388.00	৳1,86,603.00

Montly Revenue of Unnoyon Textile Limited