

**A STUDY ON SUPPLY CHAIN MANAGEMENT PRACTICES
AND SUPPLY CHAIN PERFORMANCE EFFECTIVENESS
UNDER POWER TRANSMISSION AND DISTRIBUTION
DEPARTMENT IN L&T CONSTRUCTION**

Submitted in partial fulfillment of the requirements for the award of

MASTER OF BUSINESS ADMINISTRATION

by

BLESSY ROOBAVATHY J

REGISTER NO: 42410083



**DEPARTMENT OF BUSINESS ADMINISTRATION
SCHOOL OF MANAGEMENT STUDIES**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade "A" by NAAC | 12B Status by UGC | Approved by AICTE
JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119**

NOVEMBER 2023



SATHYABAMA

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SCHOOL OF MANAGEMENT STUDIES

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the Bonafide work of **BLESSY ROOBAVATHY.J 42410083** who carried out the Project Training "**A STUDY ON SUPPLY CHAIN MANAGEMANT PRACTICES AND SUPPLY CHAIN PERFORMANCES EFFECTIVENESS**" under my supervision from September 2023 to November 2023.

Dr. M. RAJA

Internal guide

External Guide

Dr. BHUVANESWARI. G, MBA., Ph.D.
Dean – School of Management Studies

Submitted for Viva Voce Examination held on_____

Internal Examiner External Examiner

DECLARATION

I **BLESSY ROOBAVATHY.J (42410083)** hereby declare that the Project Report entitled **“A STUDY ON SUPPLY CHAIN MANAGEMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE EFFECTIVENESS UNDER POWER TRANSMISSION AND DISTRIBUTION DEPARTMENT IN L&T CONSTRUCTION”** done by me under the guidance of **DR.M.RAJA** is submitted in partial fulfillment of the requirements for the award of Master of Business Administration degree.

DATE:

PLACE:

BLESSY ROOBAVATHY J

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to the Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my sincere thanks to **Dr. G. Bhuvaneswari, MBA., Ph.D., Dean -School of Management Studies** and **Dr. A. Palani, M.Com. M.Phil., M.B.A., Ph.D., - Head - School of Management Studies** for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **DR.M. RAJA** for her valuable guidance, suggestions and constant encouragement which paved the way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **School of Management Studies** who were helpful in many ways for the completion of the Training.

BLESSY ROOBAVATHY.J

COMPLETION CERTIFICATE



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Fax : +91-44-2270 5482
www.Lntec.com

19th October 2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Blessy Roobavathy pursuing MBA (Finance & Ops) from Sathyabhama Institute of Science and Technology, Chennai has completed her Internship Training on the project "Supply Chain Practices and Supply chain Performance effectiveness", under the guidance of Mr. Ravi Chandra Reddy (JGM - SCM), during the period from 20.09.2023 to 19.10.2023.

Her conduct and performance during the above-mentioned period were found to be good.

We wish her all the best.

Yours faithfully,
For LARSEN & TOUBRO LIMITED

A handwritten signature in blue ink that reads 'Probhakaran Sanyal'.

Probhakaran Sanyal
Executive HR
Power Transmission & Distribution IC

Registered Office: L&T House, N. M. Marg, Ballard Estate, Mumbai - 400 001. INDIA
CIN - L99999MH1946PLC004768

L&T Construction - Power Transmission & Distribution is a brand of Larsen & Toubro Limited

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ABSTRACT

Supply chain management (SCM) practices play a critical role in the success of any organization, especially in the construction industry where timely project completion and cost control are paramount. This study investigates the impact of SCM practices on supply chain performance effectiveness in the Power Transmission and Distribution (T&D) department of Larsen & Toubro (L&T) Construction, a leading Indian multinational engineering and construction company. The study aims to identify the key SCM practices that contribute to improved supply chain performance and to assess the current level of implementation of these practices in L&T Construction's T&D department.

A comprehensive literature review was conducted to identify the critical SCM practices that have been shown to have a positive impact on supply chain performance. A structured questionnaire was developed to collect data from T&D project managers and supply chain professionals at L&T Construction. The questionnaire was designed to assess the level of implementation of each SCM practice and to measure the perceived impact of each practice on supply chain performance.

The data collected from the questionnaire was analyzed using statistical methods to identify the SCM practices that have the strongest impact on supply chain performance. The findings of the study suggest that the SCM practices are particularly important for improving supply chain performance in the T&D department of L&T Construction. The study also identified several areas where L&T Construction's T&D department can improve its SCM practices. The findings of this study provide valuable insights into the importance of SCM practices for improving supply chain performance in the construction industry. The study also provides practical recommendations for L&T Construction's T&D department to enhance its SCM practices and achieve a more efficient and effective supply chain.

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CHAPTER 1

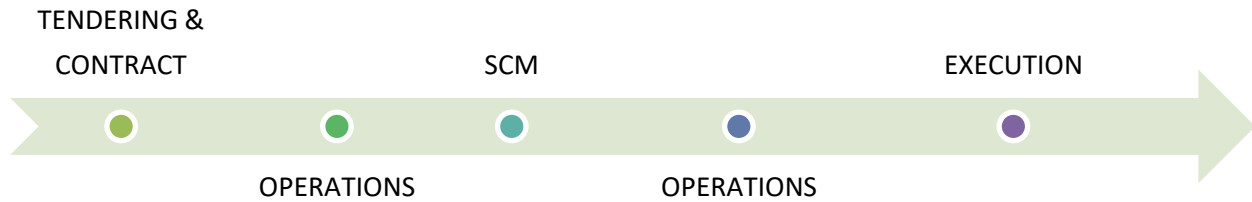
INTRODUCTION

1.1. INTRODUCTION:

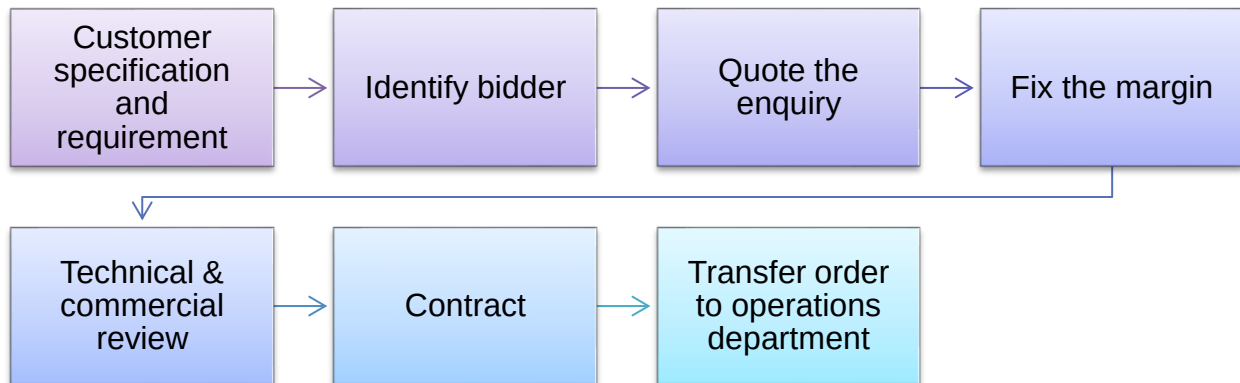
Any firm must implement supply chain management (SCM), but complicated sectors like power transmission and distribution (PT&D) require it even more. To guarantee that power is supplied consistently and effectively, PT&D firms have to handle a variety of suppliers, consumers, and internal procedures. PT&D enterprises have encountered several problems in the recent past, like pandemics, natural disasters, and geopolitical crises. These difficulties have brought to light the significance of SCM resilience and the requirement that T&D businesses implement cutting-edge SCM techniques.

The Power Transmission and Distribution Department at L&T Constructions' SCM procedures and efficacy are examined in this study. Leading Indian engineering and construction firm L&T is well-known throughout the world. Worldwide power transmission and distribution project design, construction, and commissioning are handled by the Power Transmission and Distribution Department. The study's objectives are to understand the importance of supply chain management and how it can be used to improve an organization's performance and the different functionalities of supply chain management, the key performance indicators (KPIs) that can be used to measure performance, the pivotal role of digital tools and technologies in SCM, and how to involve in a real-time supply chain activity to develop recommendations for continuous process improvement. Finally, to explore the real-time causes of supply chain performance disruptions. The study will help other PT&D organizations enhance their own SCM performance by offering insights into the SCM approaches that work well in the industry. The study's conclusions will assist PT&D businesses in creating SCM procedures that are more successful and in raising their general level of performance.

PT&D PROCESS



1. TENDERING & CONTRACTS



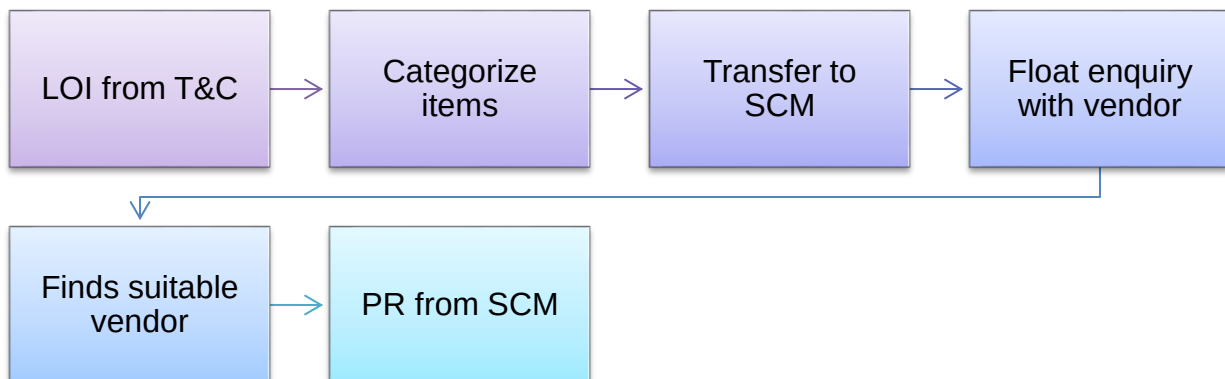
Tendering and contracts is the initial step in the entire process. It is the main way for companies to get orders and is therefore the main reason for order inflow. The tendering and contracts department (T&C) has the maximum number of government clients. The initial work of the T&C department is to understand the customers' requirements and provide them with the final product. Based on the customer's requirements and specifications, the T&C department will identify a source and act as a bidder. L&T is one of the contractors that bids for almost all government clients in India.

The T&C department will quote the enquiry as per the customer requirement, which includes manpower requirements, workmanship, materials, and rates. The department will then works on the quote, fix the margin, and bid it to the customer. All contracts have agreements between two or more parties with certain rules and conditions. The T&C department takes responsibility in case of failure to fulfill the customer's order.

General Terms and Conditions (GTC) of about 23 pages, as per the Indian Contract Act, always exist in contracts. In the event of any deviations in these contracts, the changes can be either inferior or superior. Superior changes are called Special Terms and Conditions (STC). STCs are always higher than GTC's. The main work of the T&C department is to quote the enquiry by identifying opportunities in the market and choosing the most comfortable opportunities. Opportunities are also known as prospects. In some cases, there will be less comfort but higher gain, and in other cases, there will be more comfort but lower gain but more volume of business.

After identifying the opportunity, the T&C department chooses the desired number, which can also be a tentative number. Then, they bid for the job by analyzing the previous budget and conducting a technical review (customer capabilities) and a commercial review (financial capabilities). They also reduce the price to market price. After bidding, they will get the order and hand it over to the operations team to execute the job. Then, the operations team takes over.

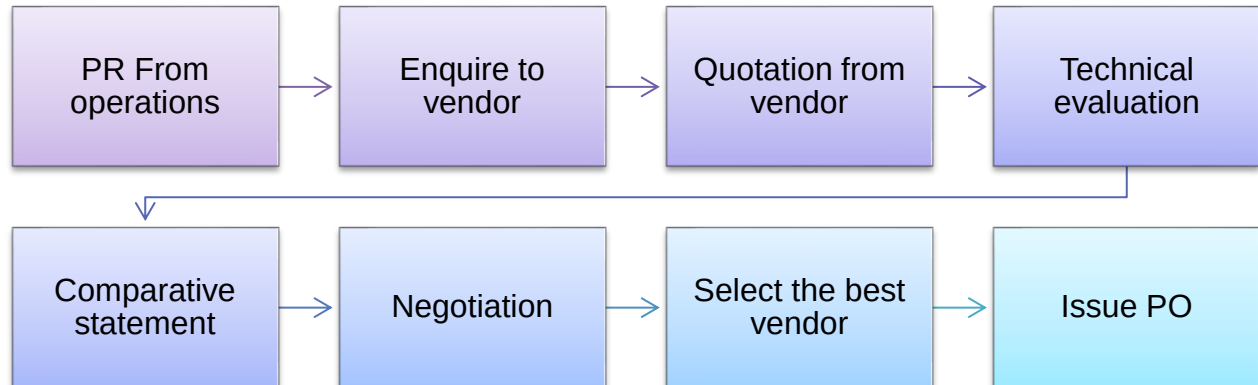
2. OPERATIONS



The T&C Department will now transfer the order to the Operations Department along with the client's letter of intent (LOI), the tender's terms and conditions, and the estimations. The Operations Department will then categorize the ordered items and send them to the SCM Department along with the quantity, estimations, and a list of categorized vendors. The SCM Department will float an enquiry with all the categorized vendors and identify the best vendor, known as the L1 vendor. The SCM Department will then provide the L1 vendor with a purchase order (PO)

3. SUPPLY CHAIN MANAGEMENT

SCM is the intermediate process in PT&D that involves the procurement and management of materials from suppliers to end users. It begins with the receipt of a purchase request (PR) from the Operations department and ends with sending the purchase offer (PO) to the vendor.



SCM process for PT&D

1. The operations department sends all the details about the PR, including annexure (terms and condition given by client), ace value, sales value, special vendor list, material diagram, design, commercial and technical document to initiate an enquiry.

The screenshot shows the 'Create - RFQ' interface. At the top, there are six steps: 1. Add Material, 2. Add RFQ Values, 3. Choose Vendors, 4. Payment Terms, 5. Other Terms, and 6. Attachment. Below these steps, there is a 'Rate Discovery' toggle. The main section is titled 'Details' and contains a table with columns: Allocation No., Allocation Date, Allocator, Start Date, and End Date. Below this table, there is a list of PRs with columns: PR No., Code/Description, P. Category, Qty., WH, St. Date, End Date, and Drawing Link. The first PR is LE/LE150079/CA/23/000040. Below the list, there is a 'Next' button.

- References For Enquiry (RFQ) is prepared before sending purchase enquiry to vendors.

Following is the format of RFQ of PT&D

ENQUIRY FOR VIBRATORS REQUIREMENT				
Project			Date	
Job code				
Location				
S.NO	Material Description	UOM	qty	RATE /UOM
1				
2				
Terms & Conditions		L&T REQUIREMENT		Vendor Confirmation
Delivery by				
Delivery location				
Payment Term				
Warranty				
LD Clause				
Inspection				
Offer Validity				
Quantity Variation				
Price Basis / Validity				

RFQ includes the name of the project, job code location of the project, on date on which the RFQ is sent, detailed description about the material required, that includes Unit Of Measure (UOM)quantity and Rate per quantity. The vendor must fill the requirement of the L&T Requirement that includes the delivery time, location, payment terms, Liabilities Clause (LD), Inspections information, offer validity period, quantity verification and price basis.

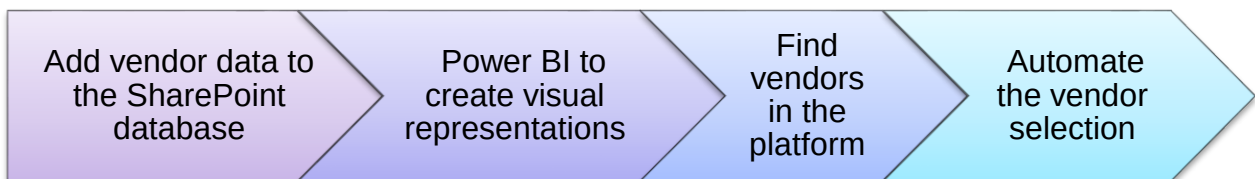
VENDOR DATABASE PLATFORM



Partner Data Bank

Online Vendor Database by PTD - SCM

A vendor database platform is an online platform for collecting and managing vendor data. It allows businesses to create a virtual database of all their vendors, which can be accessed and used by anyone in the organization. Vendor database platforms typically use Microsoft SharePoint and Power BI. SharePoint is used to store and organize the vendor data, while Power BI is used to create visual representations of the data, such as charts and graphs. Vendor database platforms make it easier for businesses to find and manage their vendors. They can also help businesses to reduce costs and save time by automating the vendor selection and procurement process.



The objective of vendor data base is to “Identify, Review, Record, retrieve with various filters, Track performance & Build relation “Online Vendor Data Base makes decisions based on the category, product range, location (region wise), capacity, performance and client approval status. They use Artificial Intelligence & Robotic Process Automation to extract data from IEEMA Vendor database & Used RPA to automatically load data from Excel & PDF into SharePoint.

The roles and responsibilities of partner databases are as follows.

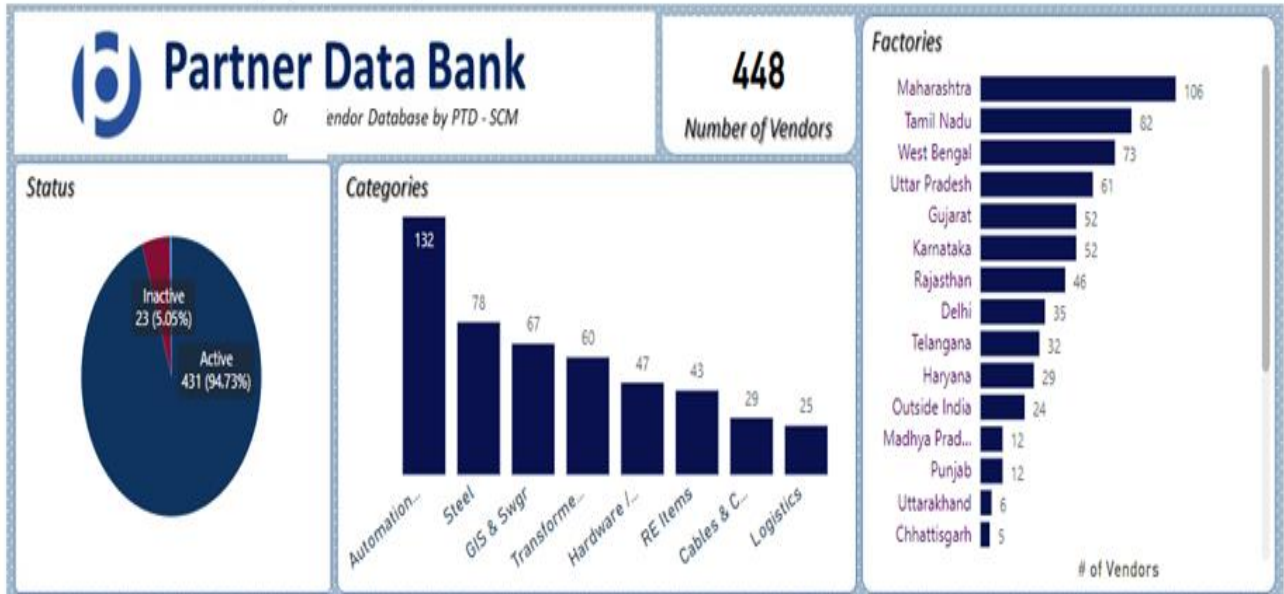
- Administration of data records related to respective categories.
- Rating of the existing vendor based on the performance in PPE.
- Management Connect, Visits, Assessments & Dispute Records.
- Data sanitization & updating.
- Periodically addition of new vendors to the list.

Following are the considerations for selecting the vendors.

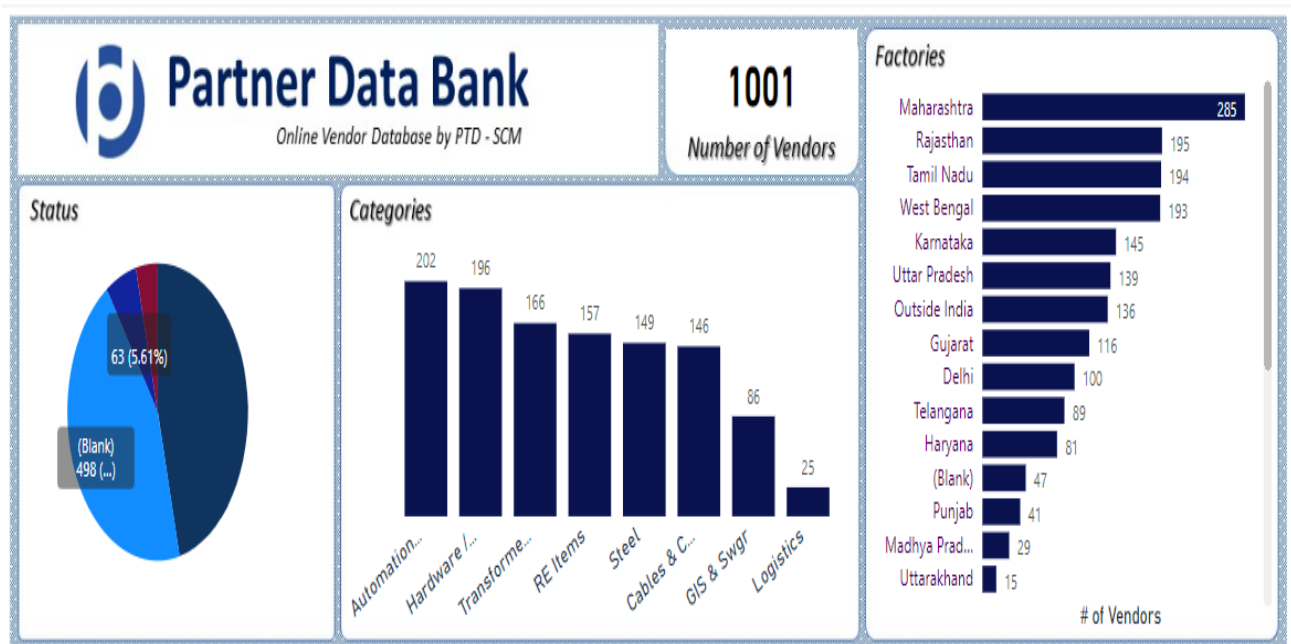
- Data base based on 7 Major Categories
- Accountability with Category Team Leads
- Focus on Major Value Contributors
- Factory or Location Based Segregation with Capacity & Capability to help in decision making.
- Vendor Class - Client Approved, Proposed for Client Approval / Moderate Capacity & Capability and Alternative / Newly added / Hold Suppliers
- Performance Monitoring Strategy- Quarterly Meeting shall be conducted along with BU operations /Quality team.

 Collaboration Collaborative platform in SharePoint. User level access for data edit & update.	 Interactive Dashboard Interactive Dashboard in PowerBI for visualization
 Attachments Provision to add attachments (vendor approval, inspection docs., etc.	 Data filter Provision of filters to slice & dice records
 Standardized Master List Standardized Master List to avoid data anomaly	 Live Comments Live comments for event logs & records

PAST DATA



CURRENT DATA



So, the RFQ is sent to the vendors in the partner database platform.

ENQUIRY FOR EATHING REQUIREMENT

Project			Date	26-09-23
Job code				
Location				

S.NO	Material Description	UOM	qty	RATE /UOM
1	PVC TANK ; CAPACITY:- 10000 L	Litres	3	

Terms & Conditions	L&T REQUIREMENT	Vendor Confirmation
Delivery by	Within 7 Days	
Delivery location		
Payment Term	100% with 45 days credit from date of MRN	
Warranty	18 months from date of supply	
LD Clause	0.5% to 5% of the order value	
Inspection	Applicable by L&T & client	
Offer Validity	27.09.2023	
Quantity Variation	+/- 10% of the ordered qty	
Price Basis / Validity	Firm / Till completion of order.	

The process of sending RFQ to vendors is known as purchase enquiry. Purchase enquiry must include the diagrams, technical and commercial documents. It must be sent to the vendor including the special vendor list from the client through e-mail. While sending e-mail, heads should be mentioned in CC and vendors should be mentioned in BCC.

Above is the RFQ sent by L&T to 10 vendors on 26th September 2023 for KUDANKALUM NUCLEAR PROJECT in Tirunelveli and it is valid up to 27th November 2023. the requirement is PVC TANK of 10000 liters of 3 numbers. It's mentioned that the delivery should be made within 7 days; the payment is made 100% with 45 days credit from date of Material Receipt Note (MRN). The warranty for the material is about

18 months from the date of supply. in case of any damage during transportation, the loss of about 0.5% to 5% should be met by the vendor and the inspection of the PVC is to be inspected by the client and L&T.

- Vendors send the quotations to the SCM department. Below is the sample response of the quotations sent by one of the vendors to whom the RFQ was sent.



QUOTATION							
M/S:L&T CONSTRUCTION LTD						QUOTATION NO	Dated
						STC/991 A1	26-Sep-23
S.NO	DESCRIPTION	QTY	UNIT	RATE	DIS	AMOUNT	TOTAL AMOUNT
1	PVC WATER TANK 10000LTR SINTEX WHITE	3	NOS				
TOTAL							
ADD GST 5%						0%	0.00
ADD GST 12%						0%	0.00
ADD GST 18%						18%	
ADD GST 28%						0%	0.00
TOTAL AMOUNT							

4. The SCM department verifies the technical specifications of the quotations and prepares a comparative statement of the quotations received.

L&T CONSTRUCTION POWER TRANSMISSION AND DISTRIBUTION (DOMESTIC) BU : TL Title: COMPARATIVE STATEMENT SCM															Quality Management System Doc. No.: LT/PTD/SSPD/SP/007/F/005 REV NO: 0								
PROJECT NAME:															Date : 2-Sep-23								
PROJECT LOCATION:																							
ITEM DESCRIPTION:																							
S.NO	DESCRIPTION	UOM	TOTAL QTY	Quoted Prices		Negotiated Prices		Quoted Prices		Negotiated Prices		Quoted Prices		Negotiated Prices		Quoted Prices		Negotiated Prices		ACE			
				Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)	Unit Rate (INR)	Amount (INR)
	Factory Location																						
	Vendor Approval			Approved		Approved		Approved		Approved		Approved		Approved		Approved		Approved					
	Price Basis: Firm / PVC (Base Date)			Firm		Firm		Firm		Firm		Firm		Firm		Firm		Firm					
	Supply Portion																						
1		Litres	3																				
	Total Ex Works Value (Rs)																						
	Discount offered by Vendor																						
	Total Exworks price after Discount																						
	Packing & Forwarding																						
	Freight																						
	Insurance																						
A	Total Value																						
	GST			18%	-	18%	-	18%	-	18%	-	18%	-	18%	-	18%	-	18%	-	18%	-		
C	Total PO Value																						
B	Total Service Value																						
	GST			18%	-	18%	-	18%	-	18%	-	18%	-	18%	-	18%	-	18%	-	18%	-		
D	Total Work Order Value																						

A+B	F.O.R (Final Cost to L&T without GST)																				
	Savings Wrt ACE (W/O GST)																				
	% Savings Wrt ACE (W/O GST)																				
E=C+D	Total for Supply + Service Portion (Ind Taxes)																				
F	Cost of finance@8.5% p.a to equate payment terms			0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-
E+F	Total for Supply + Service Portion after interest loading																				
	Delivery schedule																				
	Payment terms - Supply																				
	Offer validity																				
	Warranty																				
	LD Clause																				
	Other terms																				
	Status					L4				L3					L2					L1	

- The SCM department negotiates with the vendors based on the comparative statement and selects the vendor with the best offer and issues a PO.

PURCHASE ORDER



**Larsen & Toubro Limited,
Construction**

PB No 979, Mount-Poonamallee Road,
Manapakkam, Chennai - 600089,
Tamil Nadu, India
CIN - L99999MH1946PLC004768
Tel No. : 044-22526000
Fax No. : 044-22526059
Website : <https://eip4.Intecc.com>
Email :

ORDER NO. :
PO DATE :
LATEST AMENDMENT NO :
AMENDMENT DATE :
VALUE :
STATUS :



AUTHORIZED

Order Essentials

Job :
Payment Centre :
Type :
Purchase Group :
Delivery Period :
RFQ No. :
BQ No. :

Vendor Details

Name :
Address :
State :
Country :
Mobile :
Phone :
Email :
PO Accepted :

Statutory Details - Job

GST :
GST State :
Vertical :

Statutory Details - Vendor

GST :
GST State :
Vertical :

Statutory Details - Job

GST :
GST State :
Vertical :

Statutory Details - Vendor

GST :
GST State :
Vertical :

Billing To

Shipping To

Nature of Scope

Refer Annexure Details

Report Generated at 11:00:00 AM on 11/01/2023

Page 1 of 4

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***Save Paper ! Save Trees !! - View Purchase Order digitally...!!!**

Material Abstract

Code - Description	Amend. No	Quantity	Basic Rate	Net Rate	Total Value
HSN :	UOM : Rectangular Strip				

In Words

Grand Total :

Payment Terms**Liquidity Damages**

LD applicable Date	LD Value applied On	LD Value (%)	Duration	Maximum % on PO Value

Defect Liability Period

DLP Period	Duration	Events

Essentials Details

Attribute Details	Attribute Value
Direct Supply to Client	
Liquidity Damages	
Price Variation	
Defect Liability Period	
Transport - Work Order	
Order Expiry Date	
Delivery Terms	
ASN	

BG Details

BG Type	Valid From	Valid To

Quotation Details

RFQ Number	BQ Number	PR Number

Report Generated at

Page 2 of 4

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***Save Paper ! Save Trees !! - View Purchase Order digitally..!!!**

ANNEXURE : Delivery Schedule

Code - Description		Quantity	UOM	Deliver Between
Schedule Number	Quantity	Deliver Between	Remarks	

ANNEXURE : Materialwise Tax Details

Code - Description	Source	Destination	Tax Component	Tax Value

Total Tax Value: Rectangular Snip

Note : The Purchase Order Shall be governed by the “ [General Conditions of Contract for Procurement of Materials / Equipment](#) ” until unless specified. it is important that seller confirms acceptance of this Purchase Order within 7 days of receipt. Failure to return the acceptance does not diminish the responsibilities as set forth herein, but may result in a delay to any payments that may be due and may be a cause of termination of this Purchase Order.
In case of any clarification required, please contact the Purchase Order Issuing Authority.

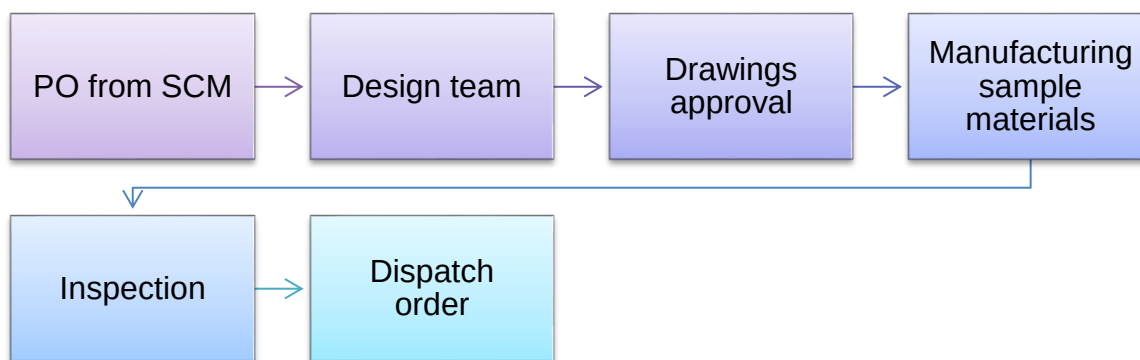
For any issue, payment or otherwise, relating to this PO/WO, please raise a grievance request by logging into the Partner Grievance Redressal Portal available in the Partner Portal mentioning the PO/WO number, the reason for the grievance, a brief description of the same along with the necessary attachments. E-mails to individuals will not be responded to.

Link for the portal: <https://partners.intecc.com/PartnerMgmtApp/home>

The vendor should only provide the quantity of the goods to the client, not the Ace value and sales value. The SCM department should negotiate with the vendors to get the best possible price, payment terms, and delivery schedule. The SCM department should ensure that the goods meet the technical specifications before releasing payment to the vendor.

The SCM department may also be responsible for other tasks, such as inventory management, warehousing, and transportation. The SCM process may vary depending on the size and complexity of the organization. Effective SCM is essential for PT&D companies to ensure reliable and cost-effective delivery of electricity to customers.

4. OPERATIONS DEPARTMENT.



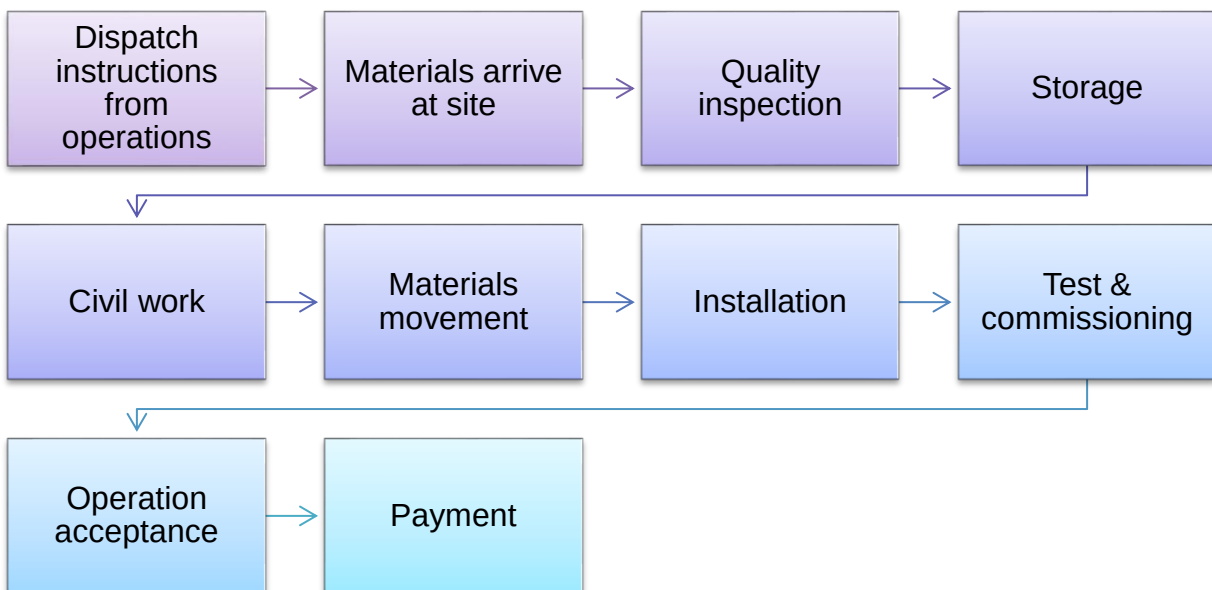
The Operations Department will send the PO to the Design Team. The Design Team will attach the PO to a supplier request, asking the supplier to submit the drawings.

The supplier will provide the drawings as per the PO. The Design Team will review the drawings and make changes if required. Once the drawings have been reviewed by the Design Team, they are sent to the client to check whether they meet their requirements. The client can then make changes if required. Once the client has approved the drawings, the Operations Department will communicate with the supplier and ask them to start the manufacturing process.

The supplier will agree on a manufacturing lead time within which they must complete production and call the Operations Team for inspections. As per the contract document,

the inspections are done by the client or the EPC (engineering, procurement, and construction) company. The process will proceed if the conditions are approved and meet all specifications. If any rectifications are required, they will be made. After the inspection, the Operations Department will communicate with the vendor. The vendor will then dispatch the items to the client.

5.EXECUTION DEPARTMENT



After receiving the dispatch instruction (DI) from the operations department, the materials will arrive at the site. The project quality team will then conduct a visual inspection of the materials to ensure that they are correct and undamaged. After inspection, the materials will be stored properly based on their nature, as some items need to be stored in air conditioning and others in a dust-free area.

Once the civil work, such as laying the foundations, is completed, the materials will be moved to their respective locations as per the drawings and site layout drawings. The materials will then be installed and tested and commissioned internally to ensure that they meet the requirements.

Once all the equipment has been received and commissioned, the client will provide final acceptance (OA). The client will make payment in different stages based on the terms and conditions in the tender synopsis. For example, the client might pay 10% advance, 70% after receiving the materials, and 20% after T&C.

➤ PROJECT SITE STRUCTURE



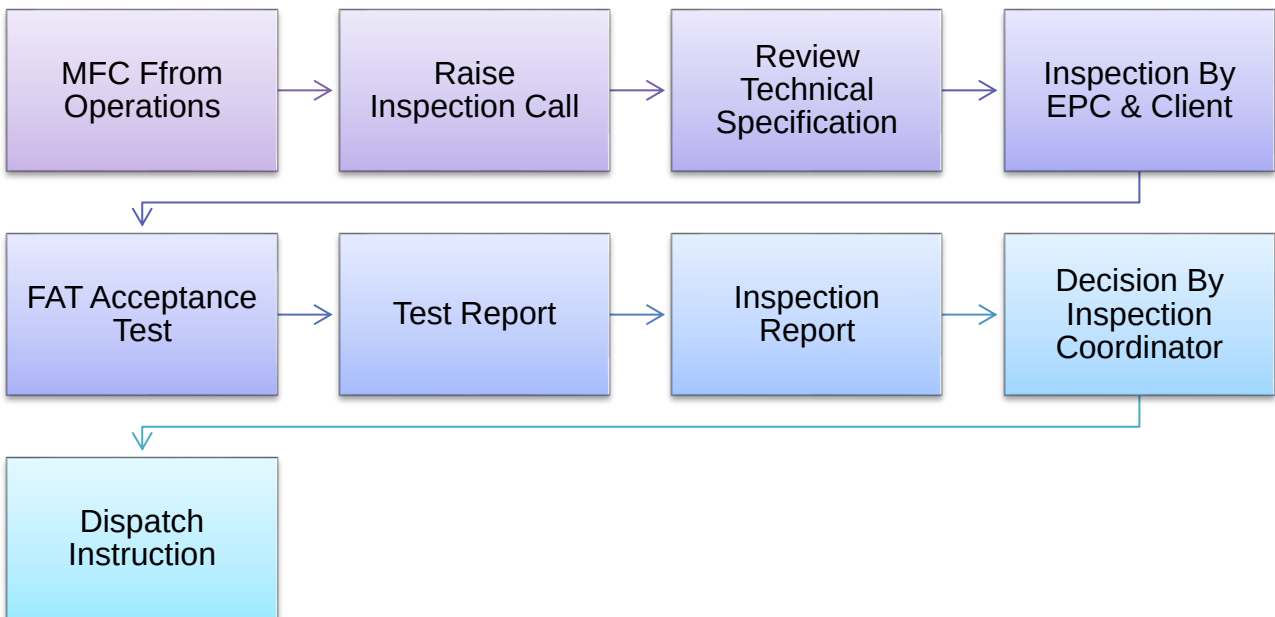
A construction project is being carried out at a project site. The project's actual work is completed at the project site. Depending on the kind of project, different things happen at different physical project sites. However, a few typical pursuits are as follows:

- Preparing the site may entail grading the area, clearing the land, and installing utilities.
- Construction: This phase involves the actual erection of the building or structure.
- Demolition: This is the process of tearing down an existing building or structure.
- Testing and inspection: After construction is finished, the project needs to be examined and tested to make sure it complies with all building and safety regulations.
- Clean-up: The site needs to be cleared after the project is finished and put back in its original state.

Every project will have a planning department, a quality department, an execution department, etc., all working under the project manager's direction. There are multiple project managers in each state that will answer the cluster manager. The segments in India are separated into northern, eastern, southern, and western regions to have efficient operations. As a result, one segment head oversees all of the projects in the northern and western regions, while a separate segment oversees the southern and

eastern regions. The operations head will report to the segment head, who will report to the business head.

➤ **QUALITY**



After obtaining approval from vendors, the Supply Chain Management (SCM) department will issue a Manufacturing Clearance (MFC). Once the vendor has prepared all materials, they will inspect request with the Engineering, Procurement, and Construction (EPC) contractor for inspection. Sometimes, the materials are also inspected by the client. The EPC contractor will coordinate with the client based on the inspection request conditions, including the dates and time duration.

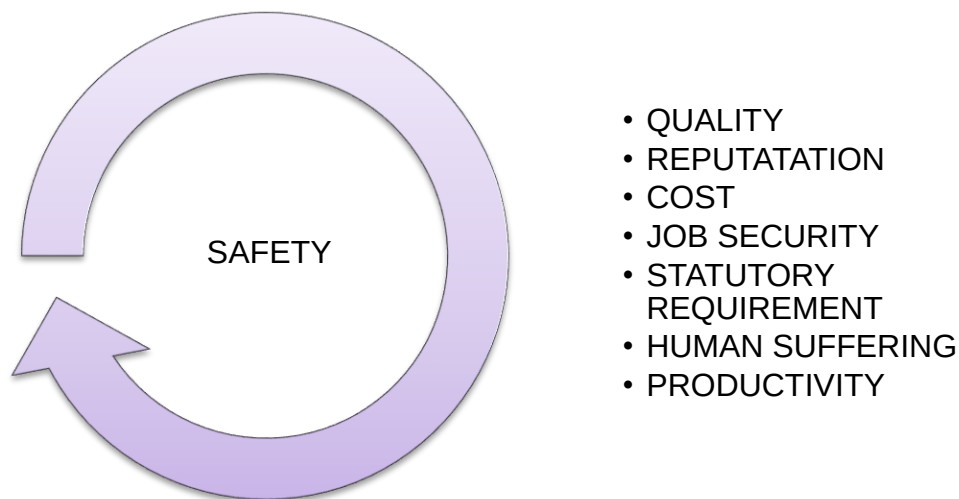
The vendor must provide a Manufacturing Quality Plan (MQP) that has been approved by the manufacturer, contractor, and client. Fat Acceptance Test (FAT) is conducted by checking a specific number of items from a large quantity based on sampling. Before inspections, the inspector must review the approved drawings, technical specifications of the project, and MQP. The inspection is conducted based on these documents.

Some inspections must be witnessed physically, and a report must be prepared. Other inspections can be verified without being witnessed. A Routine Test Report is prepared

for all materials that can only be witnessed and cannot be verified. Acceptance or Witness tests are conducted on a sampling basis.

After conducting the inspection, a report is prepared and forwarded to the inspection coordinator. The inspection coordinator then issues a Dispatch Instruction (DI). If there are any corrections or remarks, the EPC contractor will send comments to the vendor. The vendor will make the changes, inspect the materials again, and provide an inspection report. If the vendor fails to meet the requirements, the entire material will be rejected. However, the inspection coordinator makes the final decision.

➤ **SAFETY**



Environment, Health & Safety (EHS) Management System

The Environment, Health & Safety (EHS) Management System focuses on protecting the environment and the health and safety of workers. It is a systematic approach to managing hazards and risks and ensuring that all activities are carried out in a safe and sustainable manner. Being safe means being free from injury, damage, and incidents in work-related events. An incident is an event that could have resulted in injury, illness, or damage, but did not. The main causes of accidents are unsafe acts, unsafe conditions, and natural calamities. Safety is important for several reasons; it is a statutory requirement for companies to provide a safe and healthy workplace for their employees. It creates job security for workers. It reduces the cost of quality, productivity, and reputation losses. It increases the cost of human losses.

Behavior Based Safety (BBS)

Behavior Based Safety (BBS) is a safety management approach that focuses on understanding and changing the behaviors that lead to accidents. It is based on the principle that most accidents are caused by unsafe behaviors, rather than unsafe conditions.

PT&D's EHS Management System policy covers both environmental safety and worker safety. For example, the policy requires that PT&D plant 10 trees for every 5 trees that are cut down for construction purposes. The policy also requires that welders be given frequent breaks to reduce the risk of lung cancer.

L&T's Three Crucial Safety Rules

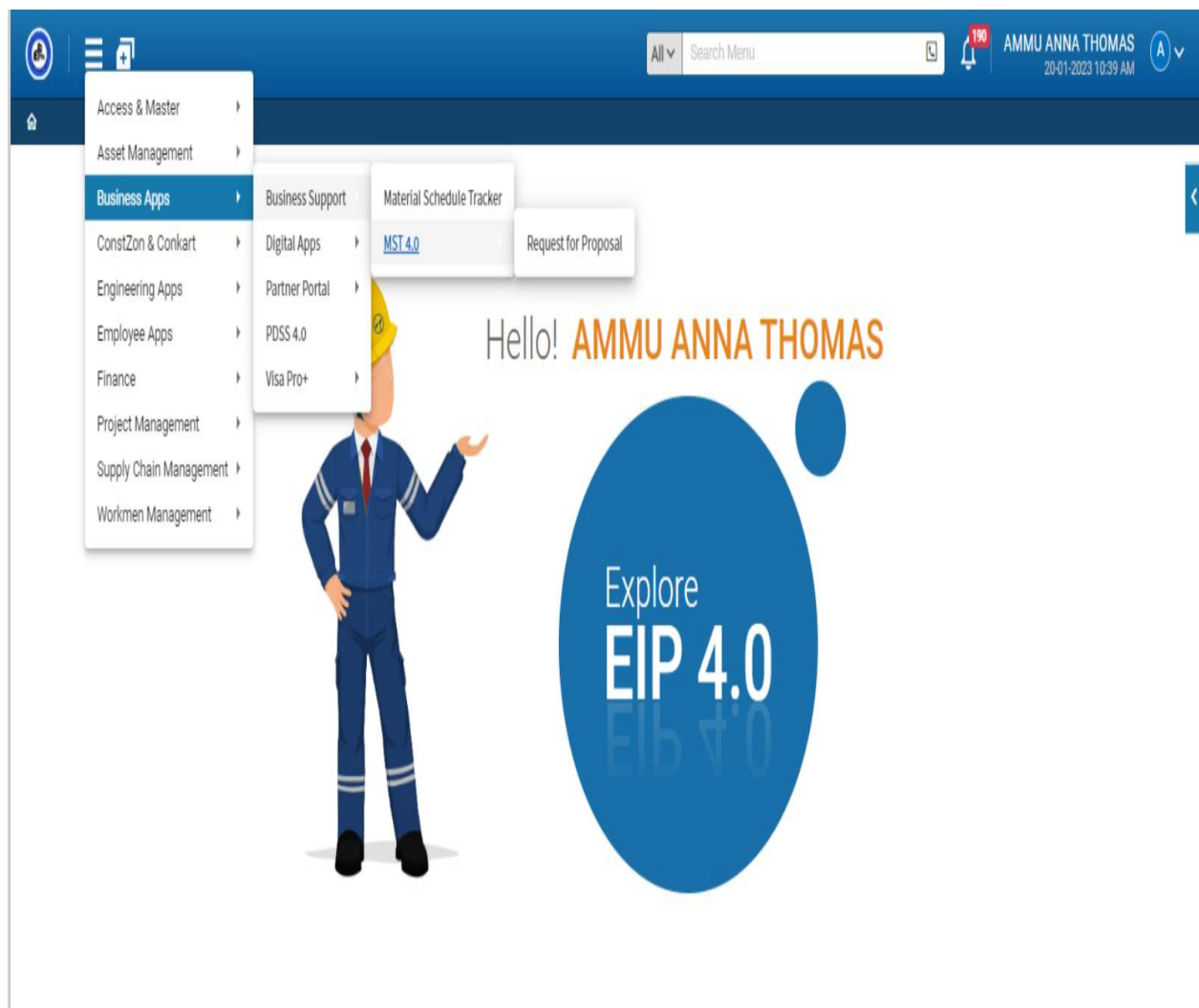
- Hook the harness: This means that workers must always wear a safety harness when working at heights.
- Lock Out-Tag Out (LOTO): This is a procedure for isolating and de-energizing equipment before maintenance or repairs are performed.
- Suspend outdoor work immediately: If there is any danger from lightning, storms, or other hazardous weather conditions, all outdoor work must be suspended immediately.

BOCW Act 1996, The Factories Act-1948, The Indian Electricity Rules 1956, The Gas Cylinders Rules 2004, The Petroleum Rules 2002, Motor Vehicle Act 1988, and Hazardous Waste Rules 2008 L&T follows all applicable Indian laws and regulations related to safety, including the BOCW Act 1996, The Factories Act-1948, The Indian Electricity Rules 1956, The Gas Cylinders Rules 2004, The Petroleum Rules 2002, Motor Vehicle Act 1988, and Hazardous Waste Rules 2008.

All new workers at L&T are required to complete a general safety induction. This induction covers the company's safety policies and procedures, as well as the specific

hazards and risks associated with their job. Personal Protective Equipment (PPE)L&T provides all workers with the necessary Personal Protective Equipment (PPE) to reduce the severity and impact of injuries. PPE includes safety helmets, shoes, and full body harnesses. L&T celebrates Safety Month every January. During Safety Month, the company organizes safety campaigns and competitions at all its sites. L&T Safety Day is celebrated on July 4th every year. This is a day to celebrate the company's commitment to safety and to recognize the contributions of workers who have made significant contributions to safety.

➤ **MATERIAL SCHEDULE TRACKING 4.0 (MST 4.0) PLATFORM**



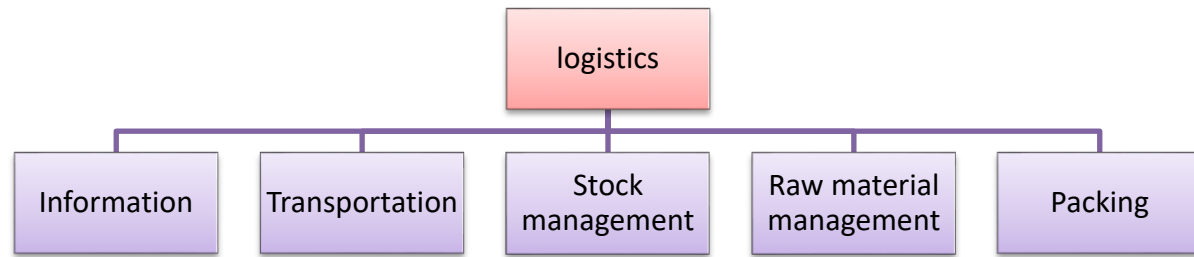
The Material Schedule Tracker (MST) is a tool that is used to track the progress status of items while passing through various stages (Drawing, drawing approval, MR, PO, Inspection, Clearance, etc.,) of the targeted items by integrating with SCM / EDMS. It is used to track key/crucial materials which are involved in the critical path of a project's timeline.

The MST has several benefits, including:

- **Tracking progress:** The MST can be used to track the progress of items as they move through the various stages of the supply chain. This helps to identify any potential delays and to take corrective action as needed.
- **Identifying critical items:** The MST can be used to identify the key/crucial materials which are involved in the critical path of a project's timeline. This helps to ensure that these items are given priority and that they are not delayed.
- **Recording communication:** The MST can be used to record all the communication between vendors and coordinators. This information can be used for future reference and to help resolve any disputes.
- **Generating reports:** The MST can be used to generate detailed reports that provide insight on the exact status of each item. This information can be used to do delay analysis and to identify areas for improvement.
- **Ensuring process transparency:** The MST provides a single platform for monitoring and tracking the items. This helps to ensure that the process is transparent and that everyone involved has the same information.

Overall, the MST is a valuable tool for managing the supply chain of critical items. It helps to improve communication, transparency, and efficiency.

Supply Chain Challenges in Logistics and the Economic Market



A logistics system is one that moves resources, information, and items from an origin location to a destination based on the requirements of the client. Information, transportation, stock management, raw material management, and packing are all part of logistics. Logistics can be defined as the process of moving products, services, or information from their point of origin to a place where a demand exists and then storing and distributing it. This is accomplished through a comprehensive process that emphasizes effectiveness and efficiency with the goals of lowering costs, ensuring on-time delivery, raising customer happiness, and adding value to goods and services. A component of the supply chain called logistics uses time and location to enhance the value of commodities.

One of the main responsibilities of the supply chain is logistics, which operates through statutory authorities, external agencies, and internal stakeholders while encountering several difficulties. Effective and efficient delivery of the items can be achieved through joint responsibility and accountability among all parties involved in logistics management.

Usually, during the execution of an EPC project, from design to production, tasks are transferred to the subsequent stage when there is enough lead time. Logistics is regarded as the last task and is given little consideration. Because of the shorter lead time, logistics receives the greatest attention when the products are ready, and the project is about to proceed. When all project stakeholders are involved in the planning process from the beginning of the supply chain management process, logistics can be managed considerably more effectively.

There is enormous pressure towards the end when the products are complete, and the project is about to begin. If thorough preparation is done at the outset of the project with all parties involved, this can be managed more effectively.

Key Challenges

I. Country regulation

Each nation has its own customs procedure for authorizing the import or export of commodities. Here are a few instances:

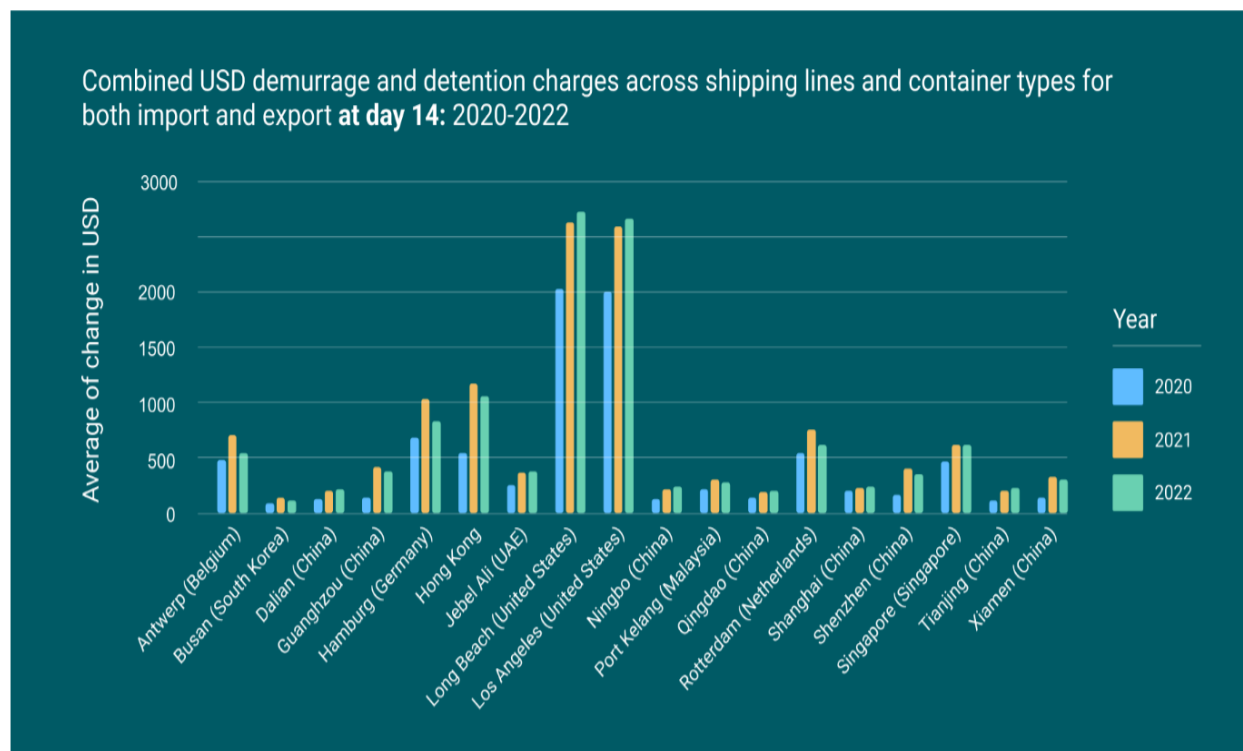
- Nepal: To clear the goods, Customs requires a form of acceptance from the bank. The exporter must detain the cargo at the border warehouse until the necessary paperwork is handled by the Nepali government and bank, as clearing the shipment under concessional duty payment requires the completion of a mandatory bank form. At the time of the tender, this will be an additional expense to consider.
- Saudi Arabia: If all original bank-endorsed documentation is on hand, customs clearance and duty can be paid in advance of the vessel's arrival. The procedure is the same in Saudi Arabia and Bangladesh.
- Australia: Upon import, a phytosanitary certificate meeting Australian standards must be presented if the commodities are packaged in wooden boxes. If not, there will be a 14-day quarantine on the containers.

II. Demurrage & Detention Charges

Demurrage and detention charges are hidden costs in logistics. Demurrage charges are storage charges for goods that are not picked up from the port within a certain number of days after the ship arrives. Detention charges are storage charges for empty containers that are not returned to the shipping line within a certain number of days after the goods are picked up from the port. These charges can be very expensive and can sometimes be more than the cost of the product itself. That's why it's important to

understand these charges and negotiate with your logistics service provider (LSP) before you finalize your logistics contract.

Before you finalize your LSP contract, you should discuss your logistics requirements in detail with your project team, operations team, and the destination port. You should also find out how long the LSP needs to clear customs. Once you have this information, you can negotiate the demurrage and detention charges with your LSP. The normal container free period for demurrage at ports is 3-4 days from the date of arrival of cargo. The normal container free period for detention is 5-7 days from the date of arrival of the vessel.



The average combined Demurrage and detention charges is more than \$2000 per container in the US than any other country in world. These charges are additional charges which will have a severe impact on the project.

III. Contract related issue

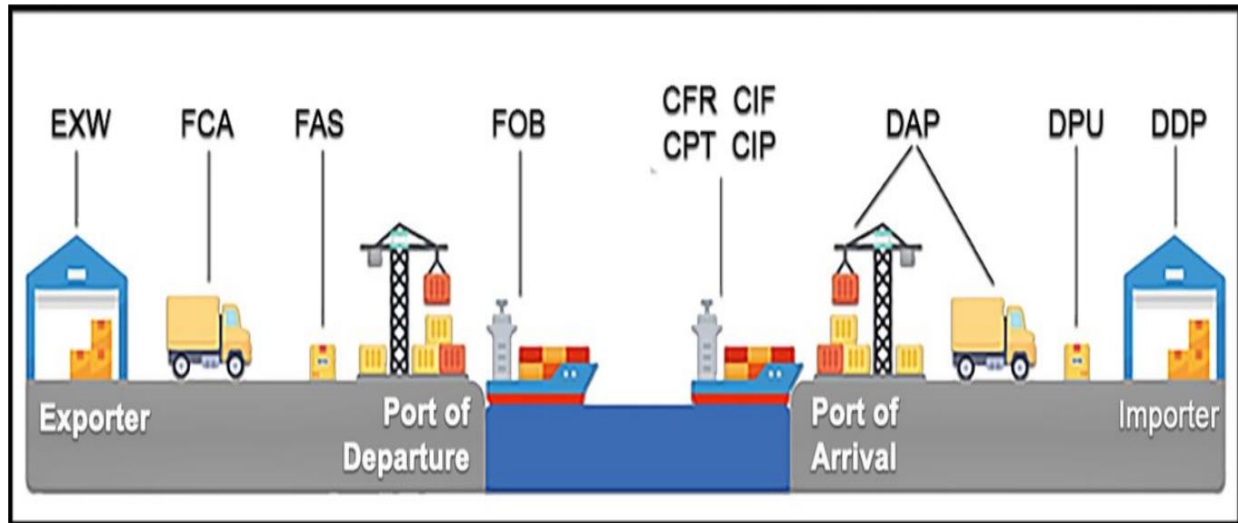
Issues pertaining to contracts for example, we have a contract with a client in Bangladesh for Transmission Line Business that states that billing will be based on the number of towers rather than weight, which adds to the project's cost because it takes a long time to complete supplies and requires the vehicles to wait at the Indo-Bangla border.

IV. Land Border issues

Security forces thoroughly inspect cars before allowing them to cross the border, and customs procedures are strict in land ports. Due to capacity limitations by Customs, there are political concerns in the Indo-Bangla border. Warehouses to manage volume and longer security force processing times for export automobiles must wait at the border for a duration of 15 to 45 days. These are presently less because of steps implemented by the government, but the price of stopping is significant and capricious. Exporters in the border region of India and Nepal, however, might choose to hire a private warehouse to hold the goods until the export-ready paperwork is ready. The price is little associated with this storage.

V. Understanding INCO Terms properly

Before finalization of contract with LSP (Logistics Service Provider) international commercial terms to be selected appropriately as per project requirements. The incoterms support the basis for material sourcing, local and international. Therefore, they are vital drivers in defining risk and liability.



EXW – Ex Works

FCA – Free Carrier

FAS – Free Alongside

FOB – Free Onboard

CFR – Cost and Freight

CIF – Cost insurance and Freight

CPT – Carriage Paid to

CIP – Carriage and Insurance paid to

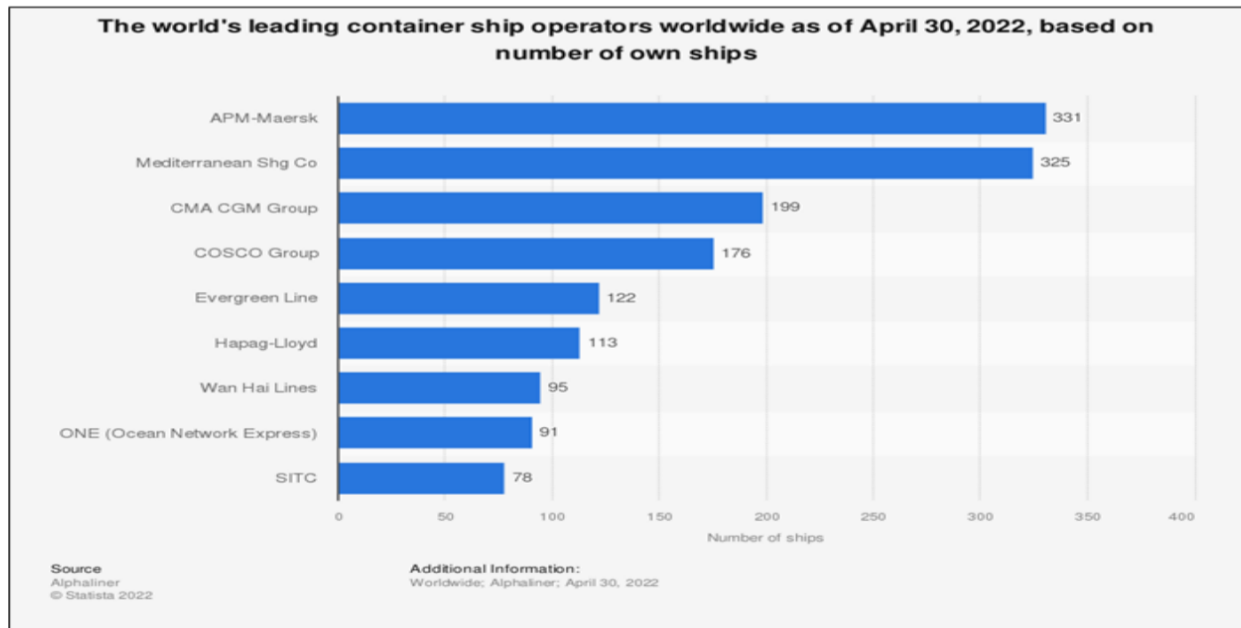
DAP – Delivered at Place

DPU – Delivered At place Unloaded.

DDP – Delivered Duty Paid

VI. Limited Competition

There are only 3 major shipping lines which control about 50-65% of the freight based on the vessels they own and containers they handle. If the volume drops liners cancel vessel or rationalize their vessel putting pressure on freight and containers availability and create demand-supply gap.



VII. Dynamic Sea Freight

Sea freight rates are constantly changing, and there are a number of factors that influence them. These factors include:

- Export/import cargo demand: When there is high demand for shipping goods, freight rates tend to go up.
- Voyage route: The distance and difficulty of the voyage route can also affect freight rates. For example, shipping goods to a remote location will typically cost more than shipping goods to a major port.

- Availability of containers: If there is a shortage of containers, freight rates will tend to go up. This is because shipping companies will be able to charge more for the limited number of containers that are available.
- Bunker/port costs: The cost of fuel and port charges can also affect freight rates.
- Blank sailing/vessel cancellation: When shipping companies cancel sailings or blank sailings, this can reduce the supply of shipping capacity and drive-up freight rates.

VIII. Over Dimensional Cargo

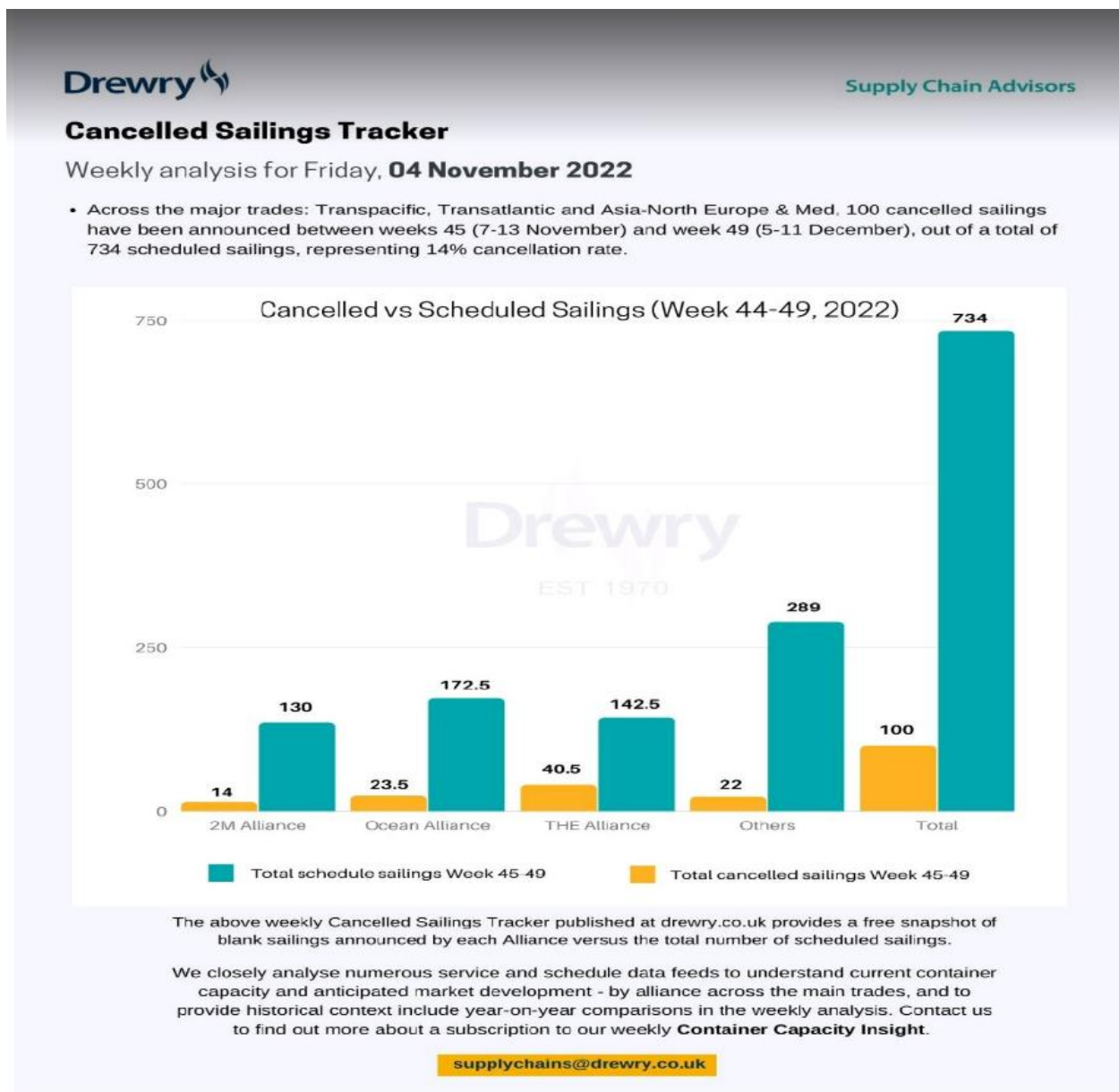
Transporting ODC is usually difficult. To pick the method of transportation and route, a thorough route reconnaissance from the origin to the destination is necessary. Heavy weight transformer transportation is extremely difficult in steep terrain because special vehicles and turning tables must be employed to navigate hairpin curves without a turning radius. Not every transporter is experienced in handling over-dimensional freight, so choosing the right one is essential to getting the cargo to the destination safely and affordably.

Transformers were transported over a multimodal route that included road, sea, river, and road modes from Vadodara, Bangladesh to Dhaka, Bangladesh.



IX. Covid related issues

Following the Covid pandemic, there was a significant global shortage of containers because of an increase in demand and container strikes in other countries. Demand and supply were out of balance, and this persisted until March 22. Every nation has its own regulations governing the handling of COVID-19 and logistics constraints that may affect port and factory activities and result in vessel cancellations.



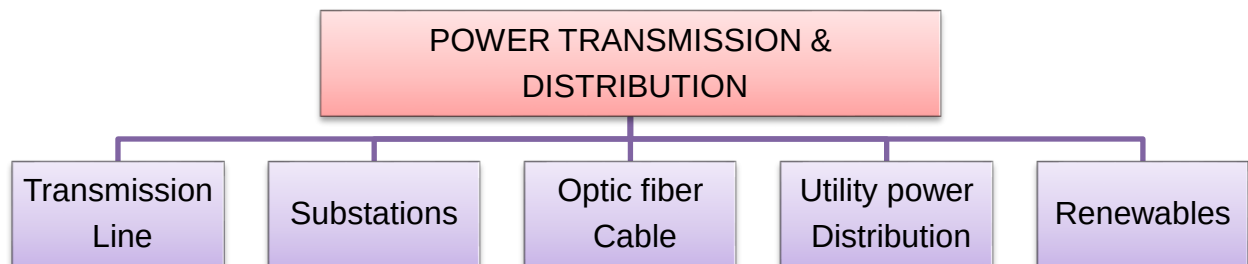
1.2 INDUSTRY PROFILE

POWER TRANSMISSION & DISTRIBUTION IC

1.2.1. INTRODUCTION

L&T Power Transmission & Distribution (PT&D) is a leading global EPC company specializing in complex and innovative power transmission and distribution projects. With a strong reputation for delivering high-quality work on time and within budget, PT&D is a major player in the global energy industry. The company's team of experienced and qualified professionals is committed to innovation and developing new and better ways to deliver its services. PT&D is well-positioned to capitalize on the growing demand for power transmission and distribution infrastructure around the world.

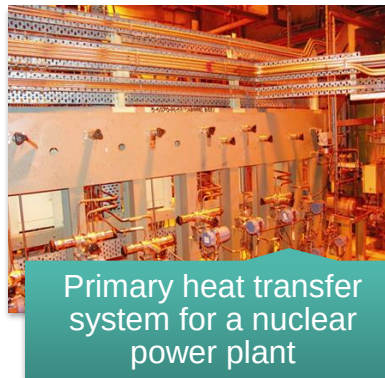
1.2.2. WHAT PT&D DOES?



- Transmission lines are high-voltage power lines that carry power from generation sources to substations. They can be overhead or underground, and they are typically made of aluminum or copper. Transmission lines are essential for the efficient delivery of electricity over long distances.
- Substations are electrical facilities that step down the voltage of electricity from transmission lines to distribution lines. They also distribute electricity to different parts of the power grid. Substations contain a variety of equipment, including transformers, circuit breakers, and switchgear.

- Optic fiber cables are used to transmit data and telecommunications signals over long distances. They are also increasingly being used to monitor and control the power grid. Optic fiber cables are made of thin strands of glass or plastic that can transmit light signals over long distances.
- Utility power distribution is the delivery of electricity from substations to homes and businesses. Distribution lines are lower-voltage power lines than transmission lines, and they are typically made of aluminum or copper. Distribution lines can be overhead or underground.
- Renewable are energy sources that can be replenished, such as solar, wind, and hydropower. Renewable energy sources are becoming increasingly important for power generation, as they can help reduce greenhouse gas emissions and air pollution.

1.2.3. PROJECTS OF PT&D



1.3. COMPANY PROFILE

L&T CONSTRUCTION

1.3.1. INTRODUCTION



L&T Construction is a division of Larsen & Toubro (L&T), a major Indian technology, engineering, construction, manufacturing, and financial services with global operations. L&T addresses critical needs in key sectors, including hydrocarbon, infrastructure, power, process industries, and defense, for customers in over 30 countries around the world. L&T Construction is engaged in core high-impact sectors of the economy and its integrated capabilities span the entire spectrum of "design to deliver." With over 8 decades of a strong, customer-focused approach and a continuous quest for world-class quality, L&T Construction has unmatched expertise across technology, engineering, construction, infrastructure projects, and manufacturing. L&T Construction is a large Indian company that builds things, such as roads, bridges, buildings, and power plants. It also provides other services, such as engineering and manufacturing. L&T Construction has operations all over the world and is known for its high-quality work.

1.3.2. L&T BUSINESSES



BUILDINGS



**TRANSPORTATION
INFRASTRUCTURE**



**WATER EFFLUENT
TREATMENT**



**HEAVY CIVIL
INFRASTRUCTURE**



**POWER TRANSMISSION
& DEPARTMENT**



GEO STRUCTURE



L&T SMART WORK

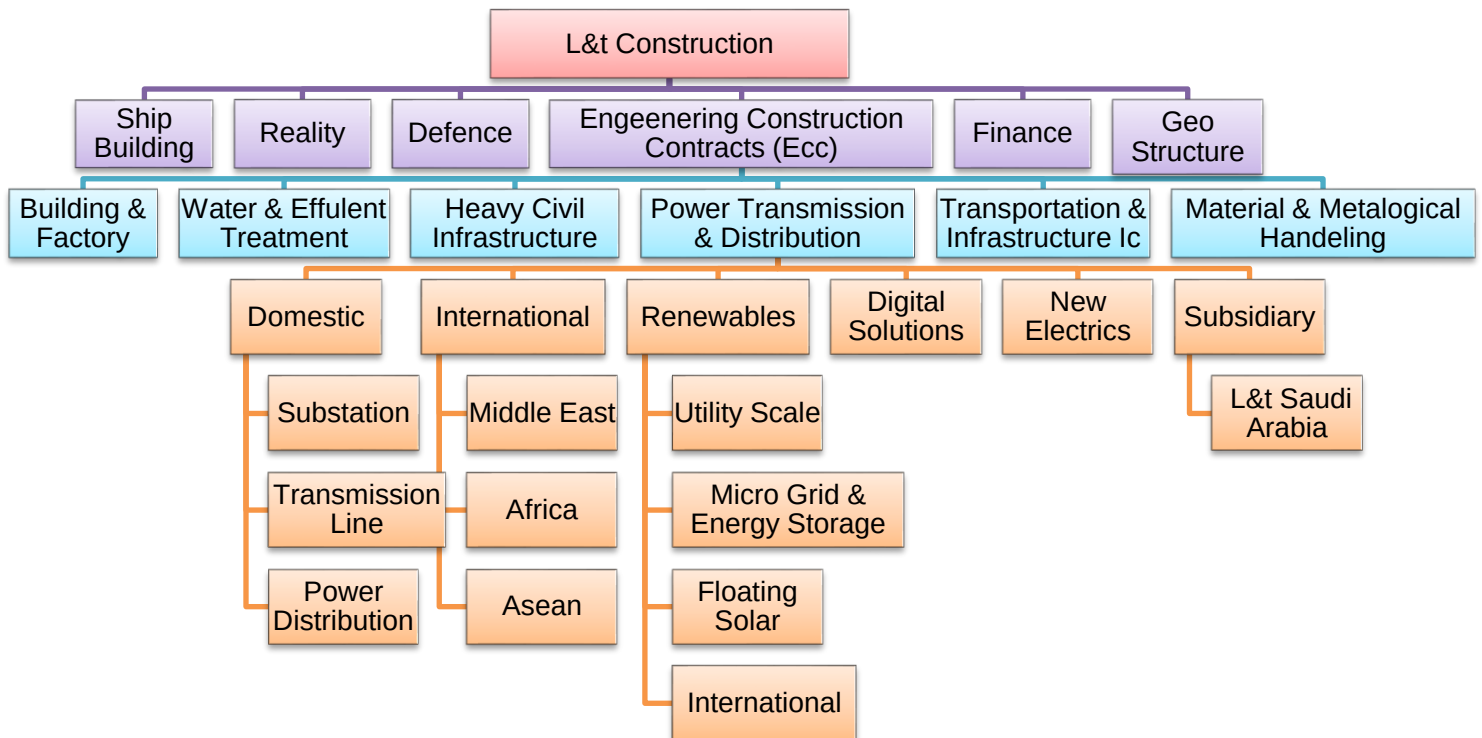


MINERALS & METALS



RAILWAYS

1.3.3. ORGANISATIONAL STRUCTURE



1.3.4. LANDMARKS IN THE MAKING

 INDIA'S FIRST AND FASTEST L&T is constructing the longest section of India's first high-speed rail corridor, covering 237.1 km from Zaroli Village to Vadodara Station	 INDIA'S LONGEST SEA BRIDGE L&T is building Packages 01 & 03 of the 21.1 km Mumbai Trans Harbour Link, a 6-lane bridge connecting Mumbai to Navi Mumbai and the Nhava Sheva Port.	 SEAMLESSLY CONNECT SOUTH AND NORTH MUMBAI L&T is constructing a 7.75 km coastal road in Mumbai, including an underground tunnel
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1.4 PROBLEM STATEMENT

Supply chains are important for businesses because they help them to deliver the right product, at the right time, at the right quality, and at the right price. On a macro level, it is important to understand the practices that make up supply chains so that businesses can identify and mitigate risks and disruptions. On a micro level, it is also important to understand the day-to-day operations of supply chains so that businesses can improve the effectiveness of their practices.

1.5 SCOPE OF THE STUDY

- Identifying and evaluating the main supply chain management techniques used by L&T Constructions' power transmission and distribution division.
- Analyzing these methods' efficacy in relation to supply chain performance measures.
- Determining where supply chain procedures might be strengthened in order to boost performance even more.

1.6 OBJECTIVES OF THE STUDY

- To understand the significance of supply chain management practices across various functionalities of an organization.
- To determine the key performance indicators relevant to supply chain to determine the performance & impact across functionalities.
- To understand the pivotal role of digital tools & technologies in SCM and their contribution on performance.
- To involve in a real time supply chain activity of a requirement, to develop recommendations for improvement.
- To explore & identify the real time causes of supply chain performance disruptions in area of logistics & economic market conditions.

1.7 NEEDS OF THE STUDY

- Identify and implement best practices to improve efficiency and reduce costs across the supply chain.
- Keep track of how the supply chain works and how much it helps the business.
- Use technology to make the supply chain more visible, efficient, and able to bounce back from problems.

1.8 LIMITATION OF THE STUDY

- The study is limited to only 110 employees of L&T CONSTRUCTIONS. This means that the results may not be representative of the entire company or the industry as a whole.
- The respondents chosen were busy, which may have limited the number of responses and the diversity of perspectives.
- Self-reported surveys were used to gather data for the research. This means that the results may be biased by the respondents' own perceptions and memories.
- The report is being created for a specific project, and the study may not be specific enough to be applied to other projects or contexts.
- The study may not be relevant to the intended audience for the report

CHAPTER 2

REVIEW OF LITERATURE

2.1 REVIEW OF LITERATURE

A literature review of SCM practices and supply chain performance in PT&D in L&T Construction can provide valuable insights into how the company can improve its SCM practices and achieve its business goals. The review can identify the key SCM practices that are most important for success in the power T&D industry, as well as the challenges and opportunities that L&T Construction faces in managing its supply chain. The review can also provide recommendations for how L&T Construction can improve its SCM practices and achieve its business goals. The literature review will draw on a variety of sources, including academic papers, industry reports, journals, and articles. The sources will be evaluated for their quality, relevance, and credibility. All sources will be cited properly in the review. The literature review is expected to make a significant contribution to the field of SCM in the PT&D industry. The review will provide a comprehensive overview of the key SCM practices, challenges, and opportunities in the industry. The review will also provide specific recommendations for how L&T Construction can improve its SCM practices and achieve its business goals.

Green supply chain management practices: impact on performance by Kenneth W. Green Jr, Pamela J. Zelbst, Jeremy Meacham, Vikram S. Bhadauria (2012)

Green supply chain management (GSCM) practices can have a significant positive impact on organizational performance. This abstract summarizes the findings of a study that found that GSCM practices lead to improved environmental performance, economic performance, and operational performance. Operational performance, in turn, enhances overall organizational performance. GSCM practices improve environmental, economic, and operational performance, which leads to better organizational performance. Implications: Organizations can improve their performance by adopting GSCM practices.

Effects of supply chain management practices, integration and competition capability on performance by Soo Wook Kim (2006)

This study examines the impact of supply chain integration (SCI) on sustainable performance improvement in small and large manufacturing firms. The results show that SCI plays a more critical role in sustainable performance improvement for small firms, while the close interrelationship between the level of supply chain management (SCM) practices and competition capability has a more significant effect on performance improvement for large firms.

The impact of supply chain management practices on performance of SMEs by S.C. Lenny Koh, Mehmet Demirbag, Erkan Bayraktar, Ekrem Tatoglu, Selim Zaim (2007).

This study examines the impact of supply chain management (SCM) practices on operational performance (OPER) and SCM-related organizational performance (ORG). The results show that two factors of SCM practices, outsourcing and multi-suppliers (OMS) and strategic collaboration and lean practices (SCLP), have a direct positive and significant impact on OPER, but not on ORG. However, both SCLP and OMS have an indirect and significant positive effect on ORG through OPER.

Measuring supply chain management practices by Ana Beatriz Lopes de Sousa Jabbour, Alceu Gomes Alves Filho, Adriana Backx Noronha Viana, Charbel José Chiappetta Jabbour (2011)

This study proposes a new framework for measuring supply chain management (SCM) practices, with four constructs Supply chain (SC) integration for production planning and control (PPC) support, Information sharing about products and targeting strategies, Strategic relationship with customer and supplier. Support customer order. This framework is more concise and easier to use than previous frameworks, and it has been validated to have adequate levels of validity and reliability.

A framework for sustainable performance assessment of supply chain management practices by Emilie Hardine-Baumann, Valérie Botta-Genoulaz (2014)

Sustainable development is becoming increasingly important for supply chain management (SCM). To evaluate the impact of SCM practices on sustainable performance, we propose a framework and an analytical model. The framework characterizes a company's sustainable performance in three fields: economic, environmental, and social. The analytical model assesses the sustainable performance of an SCM practice based on its relationships with the three fields.

Benchmarking supply chain management practice in New Zealand by Chuda Basnet, Jim Corner, Joel Wisner, Keah-Choon Tan (2003)

New Zealand manufacturing firms are aware of SCM, but adoption of newer SCM concepts is lagging. A postal survey was conducted to assess SCM adoption and identify significant issues. The findings suggest that New Zealand manufacturers need to focus on adopting newer SCM concepts to improve their supply chains. New Zealand manufacturing firms should invest in adopting newer SCM concepts to improve their competitiveness.

The effect of supply chain management practices on supply chain and manufacturing firms' performance by Moh'd Anwer Radwan Al-Shboul, Kevin D. Barber, Jose Arturo Garza-Reyes, Vikas Kumar, M. Reza Abdi (2017)

This study is among the first to examine SCM practices in the Jordanian manufacturing sector. Jordanian manufacturing firms need to adopt specific SCM practices to improve their competitiveness. These practices include supply chain integration, information sharing, strategic relationships, and customer order support. The results have broader implications for manufacturing companies in developing economies. Manufacturing companies in developing economies should focus on adopting the SCM practices identified in this study to improve their competitiveness.

An Empirical Taxonomy of Supply Chain Management Practices by Antony Paulraj, Injazz J. Chen, Augustine A. Lado (2012)

An empirical taxonomy of SCM practices identified three groups: transactional, translational, and relational SCM. Transactional SCM focuses on efficiency and cost reduction. Translational SCM focuses on information sharing and coordination. Relational SCM focuses on building strong relationships. Translational and relational SCM practices lead to improvements in supplier and buyer performance. Firms should focus on adopting translational and relational SCM practices to improve their supply chain performance.

Influence of National Cultures on Operations Management and Supply Chain Management Practices by Manjul Gupta, Sushil Gupta (2019)

The study examines the impact of national culture on operational decisions, supply chain management, and interdisciplinary topics. Methodological considerations for future research are also suggested. Researchers should focus on cross-cultural research to better understand the impact of national culture on operations management and supply chain management. Managers should be aware of the cultural differences that may exist between their own organization and their suppliers and customers and take steps to bridge these differences.

Mediating effect of industry 4.0 technologies on the supply chain management practices and supply chain performance by Vikash Sharma, Rakesh D. Raut a, Mostafa Hajiaghaei-Keshteli b, Balkrishna E. Narkhede (2022)

This study examines the mediating effect of Industry 4.0 technologies on the relationship between supply chain management practices and supply chain performance measures. The results show that supply chain management practices influence Industry 4.0 technologies adoption, and Industry 4.0 technologies significantly positively affect supply chain performance measures. The findings offer important insights into understanding the underlying mechanisms in successfully adopting and effectively using Industry 4.0 technologies.

Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance by Jiangtao Hong, YibinZhang, Minqiu Ding (2018)

Supply chain dynamic capabilities partially mediate the relationship between SSCM practices and enterprise performance. The findings suggest that firms, especially in developing countries, should reinforce their supply chain dynamic capabilities and implement effective SSCM practices to improve their performance. Organizations should focus on adopting SSCM practices to improve their supply chain performance and sustainability. They should also invest in developing their supply chain dynamic capabilities to better adapt to changes and challenges.

A proposal of LARG Supply Chain Management Practices and a Performance Measurement System by Susana G. Azevedo, Helena Carvalho, and V. Cruz-Machado (2011)

This paper proposes a conceptual model for a lean, agile, resilient, and green (LARG) supply chain (SC) to improve operational, economic, and environmental performance. The model is based on a literature review of the four SC management paradigms and SC performance measurement. Organizations should focus on adopting LARG practices to improve their supply chain performance and sustainability. They should also invest in measuring their performance using the suggested measures to track their progress and identify areas for improvement.

Factors influencing blockchain adoption in supply chain management practices: A study based on the oil industry by Javed Aslam, Aqeela Saleem,Nokhaiz Tariq Khan, Yun Bae Kim (2021)

This study proposes a framework for deciding whether to implement Blockchain in complex supply chain networks. The framework is based on two key considerations: The impact of supply chain management (SCM) practices on operational performance and the influence of Blockchain features on different supply chain practices. The results show that SCM practices positively impact operational performance, and that different

Blockchain features can help to improve supply chain practices and ultimately operational performance.

The Implementation of Green Supply Chain Management Practices in Electronics Industry by Ninlawan C., Seksan P., Tossapol K., and Pilada W (2010)

This study surveys current green activities in computer parts' manufacturers in Thailand and evaluates green supply chain management (GSCM). The study also provides suggestions for developing GSCM in the Thai electronics industry. Thai computer parts' manufacturers should focus on improving their GSCM practices to reduce their environmental impact and improve their sustainability. The Thai government and industry associations should also play a role in promoting GSCM practices by providing financial incentives and technical assistance to manufacturers. Overall, this study provides valuable insights into the state of GSCM in the Thai electronics industry and offers recommendations for improvement.

An investigation of the relationship between supply chain management practices (SCMP) on supply chain performance measurement (SCPM) of Indian retail chain using SEM by Shradha Ashok Gawankar, Sachin Kamble, Rakesh Raut (2017)

This study examines the relationship between supply chain management practices (SCMP) and supply chain performance measures (SCPM). This suggests that the implementation of SCMP is associated with improvements in SCPM and overall supply chain performance. The findings can help decision-makers in the supply chain/procurement field to understand the importance of SCMP and implement effective practices to improve their organization's performance. Organizations should focus on implementing effective SCMP to improve their supply chain performance. This study provides empirical evidence to support the business case for investing in SCMP.

Exploring reverse supply chain management practices in Turkey by İsmail Erol, Meltem Nurtaniş Velioğlu, Funda SivrikayaŞerifoğlu, GülçinBüyüközkan, Necati Aras, Nigar Demircan Çakar, Aybek Korugan (2010)

Reverse supply chain management (RSCM) initiatives are still in a very early stage in the considered industries. Companies' involvement in product returns is mostly due to legislative liabilities. System inadequacies are the most important reason for not being able to implement an efficient RSCM. This research is a pioneering study and will provide a benchmark for future research on RSCM. Companies should focus on developing and implementing effective RSCM initiatives to reduce waste and improve sustainability.

Examining the effects of green supply chain management practices and their mediations on performance improvements by QinghuaZhuJoseph Sarkis &Kee-hung Lai (2011)

Green supply chain management (GSCM) is an important corporate environmental strategy for manufacturing enterprises. This study examines three models to evaluate the mediation relationships between the external and internal practices of GSCM with respect to environmental, economic, and operational performance. Manufacturing enterprises should focus on coordinating internal and external GSCM practices to reap the performance benefits. This study provides valuable insights for manufacturers on how to implement GSCM practices effectively to improve their overall performance and sustainability.

Supply chain management practices as a mediator of the relationship between operations capability and firm performance by C. Hsu, K. C. Tan, V. R. Kannan &G. Keong Leong (2008)

Supply chain management practices mediate the relationship between operations capability and firm performance. Operations capability is defined in terms of new product design and development, total quality management, and just-in-time capabilities. A direct relationship between operations capability and performance also exists. Firms should focus on developing and implementing effective supply chain

management practices to improve their operations capability and firm performance. This study provides evidence that supply chain management practices are a key driver of firm performance.

Sustainable supply chain management practices and dynamic capabilities in the food industry by Anna Land, Stefan Seuring (2014)

Sustainable Supply Chain Management (SSCM) and Dynamic Capabilities (DCs) are two emerging research fields that are relevant to the dynamic food industry. SSCM practices can help companies to maintain control over their supply chain and achieve a competitive advantage by implementing DCs. Sustainability practices and DCs in the supply chain are used to enhance traceability and tracking and to fulfill customer demands. Food companies should focus on adopting SSCM practices and developing DCs to improve their supply chain performance and sustainability.

Influence of Green and Lean Upstream Supply Chain Management Practices on Business Sustainability by Susana G. Azevedo; Helena Carvalho; Susana Duarte; V. Cruz-Machado (2012)

Green and lean supply chain management practices are often adopted separately, with little understanding of their combined impact on company performance. The framework includes performance measures covering economic, environmental, and social perspectives. The findings suggest that green and lean upstream supply chain practices can have a positive impact on sustainable business development. Companies should focus on adopting both green and lean supply chain management practices to improve their sustainability and performance.

Application of Supply Chain Management Practices in Banks by Dewi Anggraini ,AzreenHamiza , CaturidaMeiwantoDoktoralina , Sri Anah (2018)

This study examines supply chain management (SCM) in financial institutions in Indonesia. A model for SCM in banks is developed, considering both physical and financial implications. A causal association between SCM and banking performance is studied using data from 5 multinational banks. The findings show that SCM is a

significant tool for improving banking performance. Departmental heads are aware of the importance of SCM practices for better banking performance. The findings have important practical implications for banks, as they show that SCM can help to improve performance.

Investigating green supply chain management practices and performance: The moderating roles of supply chain ecocentricity and traceability by Paul D. Cousins, Benn Lawson, Kenneth J. Petersen, Brian Fugate (2019)

Green supply chain management (GSCM) practices are associated with improvements in both environmental and cost-based performance. Firms should focus on adopting GSCM practices to improve their environmental and financial performance. Managers should be aware of the impact of ecocentricity and supply chain traceability on the relationship between GSCM practices and performance. Researchers should focus on understanding the complex relationships between GSCM practices, ecocentricity, supply chain traceability, and performance. Overall, this paper provides valuable insights into the role of GSCM practices and supply chain sustainability in improving firm performance.

Cost management practices for supply chain management: an exploratory analysis by Stephan M. Wagner (2008)

Cost management in supply chain management (SCM) is a growing area of interest, but the literature is dominated by conceptual and anecdotal work. The results show that only supplier evaluation and purchasing performance benchmarking are regularly used, and cost management practices linked to integrated logistics are rarely used. Seven of the cost management practices were associated with higher supply chain performance. Firms should carefully consider implementing these cost management practices improving their performance.

A Meta-Analysis of Environmentally Sustainable Supply Chain Management Practices and Firm Performance by Susan L. Golicic, Carlo D. Smith (2013)

This meta-analysis of 20 years of research finds that environmental supply chain practices have a positive and significant impact on market-based, operational-based, and accounting-based forms of firm performance. Organizations should focus on adopting environmental supply chain practices to improve their performance. They should also consider the different types of supply chain practices, industry, sample region, firm size, and time when implementing these practices. Overall, this study provides evidence that environmental supply chain management is a viable way for organizations to improve their performance.

An integrated model for supply chain management practice, performance and competitive advantage by LiSuhong. (2002)

This research is one of the first large-scale empirical studies to explore the causal relationships within the entire supply chain. An integrated supply chain management (SCM) model is developed and tested using structural equation modeling. The model includes measures of SCM practice, performance, strategy process, and partner relationship. The findings show that higher levels of SCM practice lead to improved performance and competitive advantage, and that effective SCM strategy process and good partner relationship facilitate SCM practice.

An Examination of Collaborative Planning Effectiveness and Supply Chain Performance by Kenneth J. Petersen, Gary L. Ragatz, Robert M. Monczka (2005)

Many organizations are integrating suppliers more thoroughly into key supply chain processes to gain a competitive advantage. This requires greater strategic and operational cooperation between buyer and supplier firms, often involving collaborative planning. Advances in information technology are making it easier for firms to share planning information. This study surveyed purchasing executives to examine factors that support effective collaborative planning and its impact on performance. The results show that effective collaborative planning is dependent on trust and the quality of information shared.

Assessing Effectiveness of Supply Chain Collaboration: An Empirical Study by Amarpreet S. Kohli & John B. Jensen (2015)

This study validates and uses an instrument to measure the extent of collaboration and its perceived effectiveness. The instrument includes measures of information sharing, joint planning, goal congruence, personal interaction, and trust. Firm-specific variables such as number of employees, sales revenue, percent of partners involved in collaboration, years in collaboration, and length of current agreement are also measured.

Measures for evaluating supply chain performance in transport logistics by hung Lai, E.W.T Ngai, T.C.E Cheng (2002)

The study is well-motivated and timely, as there is a need for empirically validated measurement instruments for supply chain performance. The study is also well-designed and rigorous, and the findings have important implications for both practitioners and researchers. The study provides a valuable contribution to SCM research by extending it to the transport logistics context. Transport logistics is a critical component of supply chains, and understanding its performance is essential for effective SCM. Overall, this study is a well-written and informative review of the literature on supply chain performance measurement. It provides a valuable contribution to SCM research and practice.

The Perceived Impact of Supply Chain Management on Organizational Effectiveness by Dean Elmuti (2006)

Supply chain management (SCM) aims to improve competitive performance by integrating internal and external operations. This study examines the impact of SCM on organizational effectiveness and identifies challenges to SCM success. Results show that organizations generally consider themselves successful at SCM but have not achieved the full potential benefits. SCM can have a significant impact on organizational performance, but it is important to implement it effectively and address challenges such as aligning internal and external goals and measuring and managing performance.

The nature and effectiveness of collaboration between firms, their customers, and suppliers: a supply chain perspective by Prakash J. Singh, Damien Power (2009)

This paper investigates a model of collaboration based on firms having strong working relationships with suppliers and customers. Two key constructs, customer relationship and supplier involvement, are developed and tested using data from 418 Australian manufacturing plants. Results show that there is some support for the model, with both collaboration-based constructs influencing performance. The findings provide insights into how firms can develop a level of collaboration capability.

Effectiveness of information systems in supply chain performance: a system dynamics study by Ashish Agarwal, Ravi Shankar, and Purnendu Mandal (2006)

IT can help organizations streamline supply chains and improve their ability to respond to market changes. Previous system dynamics modelling works on supply chain have not focused directly on IT implementation. This study uses system dynamics simulation to capture the impacts of IT on a supply chain for the auto industry. Simulation results show that IT has a significant impact on supply chain performance. This is a well-designed and rigorous study that provides valuable insights into the impact of IT on supply chain performance.

The Effectiveness of Supply Chain Risk Information Processing Capability by T. C. E. Cheng; Gang Li; Peter K. C. Lee (2016)

Current supply chain risk management (SCRM) research focuses on activities such as risk identification, assessment, mitigation, and response. The authors argue that a firm's supply chain risk information processing capability (SCRI PC) is also critical to effective SCRM. SCRI PC comprises supply chain risk information sharing and supply chain risk information analysis. The authors propose a model showing how SCRI PC affects operational performance, contingent on product-specific and environment-related uncertainty characteristics.

An assessment of supply chain effectiveness at the point of purchase by Johan C. Taylor, Stanley E. Fawcett (2011)

The study's findings are particularly relevant in today's omnichannel retail environment, where customers expect to be able to purchase products seamlessly online or in stores. If a product is not available on the shelf, customers are more likely to abandon their purchase or shop elsewhere. Retailers can use a variety of strategies to improve on-shelf stock performance, such as: Using accurate demand forecasting to ensure that the right products are in the right place at the right time. Implementing efficient supply chain processes to ensure that products are delivered to stores on time and in full. Training store employees on proper merchandising and inventory management techniques.

Predicting supply chain effectiveness through supply chain finance: Evidence from small and medium enterprises by Zulqurnain Ali, Bi Gongbing, Aqsa Mehreen (2019)

Supply chain finance (SCF) is a risk-free financing solution that can help textile SMEs improve their supply chain effectiveness (SCE). This study uses a transaction cost (TC) approach to investigate the effect of SCF on SCE. The results show that SCF has a significant positive effect on SCE. This study provides practical implications for SMEs executives and owners on how to adopt SCF to improve their SCE.

The effectiveness of using e-collaboration tools in the supply chain: an assessment study with system dynamics by Oscar Rubiano Ovalle a, Adolfo Crespo Marquez (2003)

E-commerce is growing rapidly, and B2B e-commerce is the next generation of business automation-collaboration tools are essential for businesses to take advantage of new technologies and stay competitive. E-collaboration tools can play a role of "value creation enabler," but they also generate new business and market complexities. This paper presents a classification of "managerial spaces" where trading partners share critical information using e-collaboration tools.

Effectiveness framework for supply chain management by Christine Jones a b, Jeff Clark (1990)

The Effectiveness Framework is a valuable tool for businesses that are looking to improve their supply chain performance. It can help businesses to identify and address the root causes of supply chain problems, and to design and implement IT solutions to solve these problems. The paper's findings are particularly relevant in today's globalized economy, where businesses increasingly rely on complex supply chains to deliver products and services to their customers. By using the Effectiveness Framework, businesses can improve their supply chain performance and achieve their end-customer service objectives.

Enhancing Supply Chain Efficiency and Effectiveness with Lean Six Sigma Approach by Pankaj M. Madhani (2020)

LSS is a powerful methodology, but it is important to implement it correctly in order to achieve the desired results. Organizations should carefully consider their specific needs and goals when developing an LSS implementation plan. It is also important to get buy-in from all stakeholders before implementing LSS. LSS is a cultural change, and it is important for everyone in the organization to be committed to the process. Organizations that are successful in implementing LSS can achieve significant improvements in their supply chain performance.

Determining supply chain effectiveness for Indian MSMEs: A structural equation modelling approach by Kalyani Mulchandani, Sahil Singh Jasrotia, Ketan Mulchandani (2023)

Industry 4.0 offers numerous benefits to supply chains, especially for MSMEs with liquidity issues. This study investigates the adoption factors for supply chain finance in MSMEs and its impact on supply chain effectiveness. The study finds that internal factors such as negotiation, collaboration, and digitizing trade play an essential role in

adopting supply chain finance. Implementing supply chain finance leads to improved supply chain effectiveness.

Supply chain effectiveness: strategy and integration by Brian Leavy (2006)

Supply chain effectiveness is crucial for commercial success. Technology alone is not the answer; strategy and management considerations are also essential. Effective supply chain management requires the ability to meet two main challenges: strategic and integration. The article offers insights and guidance on how to address these challenges. The article provides a valuable contribution to business strategists.

Factors Influencing the Effectiveness of Operational Information Sharing within Supply Chain by SuhaizaZailani R. Premkumar Yudi Fernando (2008)

Information sharing is essential for supply chain effectiveness. This study identifies five factors that influence the effectiveness of operational information sharing: information quality, IT commitment, SCM commitment, organizational size, and trust. The study's findings provide valuable guidance for managers who want to improve their information sharing with suppliers and customers. The study's findings are particularly relevant for Malaysian firms that are competing in the global marketplace.

Supply chain management practices and supply chain performance in the manufacturing industry by sonjapetrovic-lazarevic, amriksohal& imam baihaqi (2007)

Supply chain management is a strategic tool for firms to improve performance and competitiveness. This study identifies five aspects of SCM practice: supplier and customer relations, internal operations, information sharing, information technology (IT), and training. IT and information sharing have a significant contribution to firms' operational performance. Training also significantly contributes to most performance measures.

Carbon Reporting and Supply Chain Performance Effectiveness of Oil and Gas Companies in Rivers State by Ikegwuru, Mac-Kingsley (2022)

The study's findings suggest that firms should focus on implementing all aspects of SCM practice to achieve high performance. However, the study also highlights the importance of IT and information sharing, as well as training. Firms should invest in IT infrastructure and capabilities, and they should focus on building trust with their trading partners and sharing information effectively. Firms should also provide training to their employees on SCM best practices.

Effectiveness of performance measurement framework on manufacturers supply chain by Wael Hassan El-Garaihy (2021)

The study's proposed collaborative supply chain system has the potential to be a valuable tool for businesses of all sizes. The system's ability to support decision-making at all levels of the supply chain and to improve communication between regional parties is particularly noteworthy. Overall, this study is a valuable contribution to the literature on supply chain management. I would recommend it to any business that is interested in improving its supply chain performance.

Supply Chain Transformation with Blockchain Deployment: Enhancing Efficiency and Effectiveness by Pankaj M Madhani (2021)

Blockchain is a promising technology that can significantly impact businesses by streamlining inter- and intra-organizational processes. Blockchain has the potential to revolutionize supply chain and operations management, reducing costs and risks, and improving quality, flexibility, speed, and sustainability. This study explores the deployment of blockchain technology in supply chain operations and develops frameworks to highlight the likely improved performance. Blockchain can enhance the efficiency and effectiveness of the supply chain, leading to competitive advantages for businesses.

Assessing the effectiveness of supply chain partnering with scalable partnering as a moderator by Premkumar Rajagopal, SuhaizaZailani, Mohamed Sulaiman (2009)

This study examines the determinants of supply chain partnering (SCP) and the impact of scalable partnering on SCP effectiveness. The study finds that resource sharing has a positive impact on SCP and that scalable partnering leads to increased SCP effectiveness. The study recommends that managers pay more attention to the need of channel members to generate confidence in scalable partnering. This study is original in its contribution of the variable "scalable partnering" to the literature on SCP. The study's findings are practical and can help managers to improve their SCP efforts.

The effect of supply chain collaboration on supply chain performance by Ahmet DOGANAY Sinem ERGUN (2017)

This study examines the relationship between supply chain collaboration (SCC) and supply chain performance (SCP). The study uses a causal model tested with regression analyses. The study finds that SCC has a significant and positive relationship with SCP. The study concludes that organizations can increase SCP by collaborating with their supply chain partners. The study's findings are consistent with other research on SCC and SCP, and they have practical implications for managers.

Feasibility of performance measurement system for supply chain: a process-based approach and measures by Felix T.S. Chan, H.J. Qi (2007)

Supply chain management has gained significant attention due to increasing business competition and economic globalization. There exist challenges in structure mapping and analysis, and performance measurement. This paper proposes a process-based approach to mapping and analyzing supply chain networks. A process-based performance measurement system is also proposed, using a method called "performance of activity" to identify performance measures and metrics.

Measuring supply chain performance by Benita M. Beamon (1999)

Choosing appropriate supply chain performance measures is difficult due to the complexity of these systems. This paper presents an overview and evaluation of the performance measures used in supply chain models and a framework for selecting performance measurement systems for manufacturing supply chains. Three types of performance measures are identified as necessary components in any supply chain performance measurement system. New flexibility measures for supply chains are developed.

Assessing Effectiveness of Coordination in Food Supply Chain by Rajesh Kr Singh (2014)

The agriculture sector is crucial for India's economic growth, but its supply chain faces challenges due to poor infrastructure, unorganized retail, and lack of coordination. This study identifies major factors responsible for coordination in the food supply chain and develops a framework to quantify its effectiveness. The framework is illustrated with a case study and can be used to improve the performance of supply chains in other sectors as well.

The Role of Supply Chain Features in the Effectiveness of Sustainability Practices in the Service Supply Chain by Fahimeh Aliakbari Nouri, Mohsen Shafiei Nikabadi, and Laya Olfat (2019)

This study analyzes the factors that affect the relationship between sustainability practice and performance in the service supply chain. The identified factors are classified into a hierarchical structure using the Fuzzy Analytic Hierarchy Process (FAHP). The FAHP is applied to identify the importance of each factor in the hospital supply chain as an example. A fuzzy inference system (FIS) is developed to extract and predict the interactions between the factors. The results show that the macro environment features, especially government regulations, are crucial factors influencing the movement toward sustainability.

Drivers and barriers to environmental supply chain management practices by Helen Walker, Lucio Di Sisto and Darian McBain (2008)

This study explores the factors driving or hindering green supply chain management (GSCM) implementation. A literature review identifies organizational factors, regulation, customers, competitors, and society as main drivers of GSCM practices. Cost and lack of legitimacy are internal barriers, while regulation, poor supplier commitment, and industry-specific factors are external barriers. An explorative study is conducted, identifying more drivers than barriers to environmental supply chain management, with organizations being more influenced by external drivers.

Supply chain sustainability: a relationship management approach by Yan Ki Fiona Cheung and Steve Rowlinson (2011)

A sustainable supply chain is like a tripod, with organizational culture, structure, and commitment as the legs. When all three legs are strong and aligned, the tripod stands firmly. But if even one leg is weak, the tripod can wobble and eventually collapse. Organizational culture and structure, when aligned, can enhance staff commitment, which is essential for a sustainable supply chain.

Supply chain management practices in small retailers by James W. Hamister (2012)

This research suggests that supply chain management (SCM) practices are positively related to performance at both the retail and supplier levels. However, small retailers report moderate levels of SCM implementations practices improve performance for retailers and suppliers, but small retailers implement fewer SCM practices.

CHAPTER 3

RESEARCH METHODOLOGY

3.1. METHODOLOGY

The research methodology for the study includes, Identify the SCM practices and supply chain performance indicators (KPIs) to be studied. This could be done by reviewing the literature. Collect data on the SCM practices and supply chain performance of L&T Construction. This data is collected from a variety of sources, such as company records, interviews, and surveys with employees. Analyze the data to identify any relationships between the SCM practices and supply chain performance of L&T Construction. This could be done using a variety of statistical methods, such as regression analysis and correlation analysis and Draw conclusions about the impact of SCM practices on supply chain performance in L&T Construction. This could involve identifying the SCM practices that are most strongly associated with good supply chain performance and developing recommendations for how L&T Construction can improve its SCM practices to further enhance its supply chain performance.

3.2 RESEARCH DESIGN

Qualitative Research Design

Qualitative research involves gathering and examining non-numerical data, which includes observational data, focus group transcripts, and interview transcripts. These types of data are frequently utilized to investigate detailed subjects or gain perspective on the experiences of individuals or groups.

3.3 SAMPLING TECHNIQUE

Probability sampling

Every person in the population has an equal chance of getting chosen when using probability sampling. Since it yields the most representative samples, this kind of sampling is frequently employed in research investigations. Cluster sampling is selected under probability sampling.

Cluster sampling is a method, in which the participant groups are chosen from the population.

3.4 SOURCES OF DATA

A place where data is generated or stored is called a data source. There are two categories of data sources, primary and secondary data. A combination of primary and secondary data is used for research purposes.

- **Primary data sources**

Primary data are those from which fresh information is initially gathered. A variety of methods, including surveys, interviews, focus groups, experiments, and observations, can be used to gather primary data. A questionnaire is being used to collect primary data for the research purposes.

- **Secondary data sources**

Secondary data are those that include information that has previously been gathered by another party. A range of sources, including government data, industry reports, scholarly publications, news articles, and online articles, can be used to gather secondary data. The data provided by the SCM department is being utilized as secondary data in the study.

3.5 STRUCTURE OF QUESTIONNAIRE

The questionnaire has twenty questions total, beginning with an overview of the project that explains the goal of the questionnaire and its introduction. The demographic questions that follow ask about the respondents' age, gender, and other details. The questions in the questionnaire's body are of the Linkert scale questions and are related to the topic and the question's aim.

- Introduction
- Personal details
- Research related questions
- Likert scaling questions

3.6. SAMPLING SIZE

The sample size of this research project is 110.

3.7. SAMPLE DESIGN

The process of choosing a subset of a population to represent the entire population is known as sample design. It is an essential stage in any research project since it can greatly affect the validity and dependability of the findings. Probability sampling and non-probability sampling are the two categories of sample design. Cluster sampling under probability sampling is being utilized in the study.

3.8. SAMPLING

- Sampling Design : Probability Sampling
- Sampling Techniques :Cluster Sampling
- Sample Unit :Employees
- Sample Size :110 Respondents

3.9. PERIOD OF STUDY

The period of the study is to determine the research process is carried out for 3 months.

3.10. AREA OF THE STUDY

The targeted people are the employees under SCM department in Power Transmission and Distribution IC under L&T Constructions.

3.11. HYPOTHESIS

A hypothesis is a proposed explanation for a phenomenon. It is an educated guess based on observation and prior knowledge. A hypothesis is not a fact, but it can be tested through experimentation or further observation. If a hypothesis is supported by evidence, it can become a theory.

HYPOTHESIS 1

H0: There is no significant relationship between regular review and update of SCM performance and SCM collaboration.

H1: There is a significant relationship between regular review and update of SCM performance and SCM collaboration.

HYPOTHESIS 2

H0: There is no significant relationship between the effects of SCM practices on overall performance improvement and customer satisfaction.

H1: There is a significant relationship between the effects of SCM practices on overall performance improvement and customer satisfaction.

3.12. TOOLS FOR ANALYSIS

A questionnaire was created to get the response from the sample required to achieve the research objective. Following are the tools used for data analysis,

3.12.1. PERCENTAGE ANALYSIS

Analyzing data by representing it as a percentage of a total is known as percentage analysis. It is an effective tool for comparing many data points and discovering similarities. When it is essential to know how many of the participants gave a specific answer, percentage analysis is appropriate.

3.12.2. ANALYTICAL TOOLS

SPSS tool is used to test hypothesis.

CORRELATION

Correlation measures the strength and direction of the relationship between two variables. Correlation is a useful tool for identifying trends and making predictions. It is calculated using a correlation coefficient, which can range from -1 to 1.

- Correlation coefficient of 1: Perfect positive correlation, meaning that as one variable increases, the other variable also increases.
- Correlation coefficient of -1: Perfect negative correlation, meaning that as one variable increases, the other variable decreases.
- Correlation coefficient of 0: No correlation between the two variables.

PEARSON CORRELATION

A linear correlation can be measured using the Pearson correlation coefficient (r). The correlation coefficient, which ranges from -1 to 1, indicates the degree and direction of the relationship between two variables.

CHI-SQUARE

The chi-square test is a statistical analysis tool used to determine whether there is a significant relationship between two categorical variables. It is a non-parametric test, meaning it does not make any assumptions about the underlying distribution of the data. The chi-square test is based on the comparison of observed frequencies to expected frequencies. The observed frequencies are the actual counts of the data, while the expected frequencies are the counts we would expect to see if there were no relationship between the two variables.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

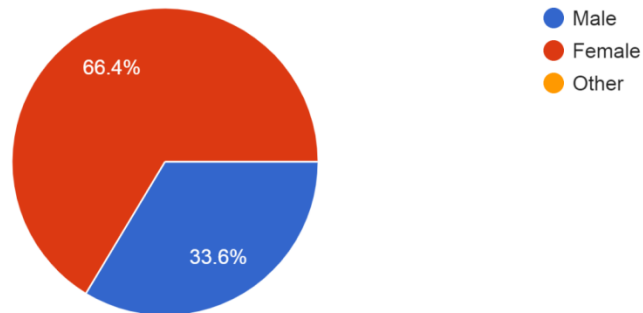
PERCENTAGE ANALYSIS

4.1.1. Gender of respondents

S. no.	Gender	No. of respondents	Percentage analysis
1	Male	73	66.4%
2	Female	33	33.6%
Total		110	

CHART

Gender
110 responses



INTERPRETATION

66.4% of respondents were given by female employees and 33.6% were given by male Employees.

INFERENCE

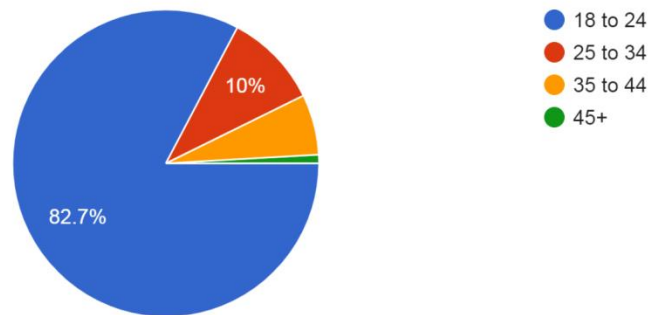
Majority i.e., 66.4% of the response were given by female employees.

4.1.2. AGE OF RESPONDENTS

S. no.	Age	No. Of respondents	Percentage analysis
1	18 to 24	91	82.7%
2	25 to 34	11	10%
3	35 to 44	7	6.4%
4	45+	1	0.9%
Total		110	

CHART

Age
110 responses



INTERPRETATION

The respondents., 82.7% of employees were between the age group of 18 to 24, 10% of the employees were between the age group of 25 to 34, 6.4% of the employees were between the age group of 35 to 44, and 0.9% of the employees were above 45 years.

INFERENCE

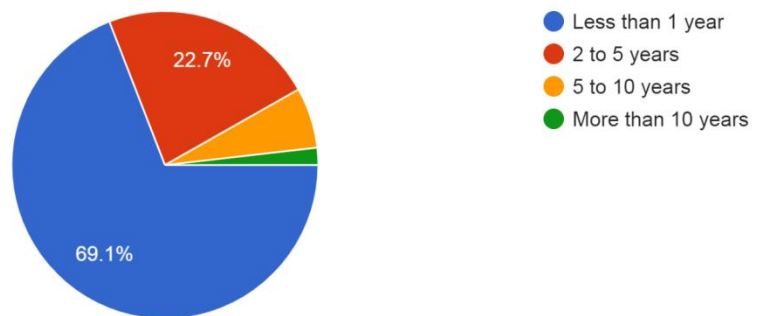
Most responses, i.e., 82.7%, were given by employees in the age group of 18 to 24.

4.1.3. EXPERIENCE OF THE RESPONDENTS

S. no.	Experience of the respondents	No. Of respondents	Percentage analysis
1	Less than 1 year	76	69.1%
2	2 to 5 years	25	22.7%
3	5 to 10 years	7	6.4%
4	More than 10 years	2	1.8%
Total		110	

CHART

How long have you been with the company?
110 responses



INTERPRETATION

According to the respondents, 69.1% of employees have less than a year's experience, 22.7% have two to five years' experience, 6.4% have five to ten years' experience, and 1.8% have more than ten years' experience.

INFERENCE

Most responses, or 69.1%, were given by employees with less than a year's experience.

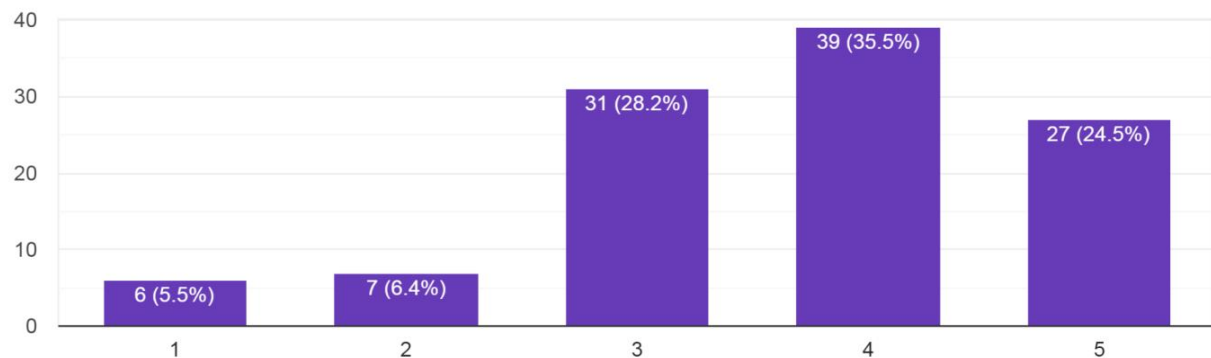
4.1.4. PRACTICES BOOST PERFORMANCE

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very little	6	5.5%
2	2	Somewhat little	7	6.4%
3	3	Moderate	31	28.2%
4	4	Somewhat much	39	35.5%
5	5	Very much	27	24.5%
Total			110	

CHART

To what extent SCM Practices contribute to overall performance effectiveness

110 responses



INTERPRETATION

The employee's response indicates that 5.5% of respondents hold the view that SCM practices will very little enhance performance, 6.4% will somewhat improve performance, 28.2% will moderately improve performance, 35.5% will somewhat improve performance, and 5.5% will greatly improve performance.

INFERENCE

The majority, 35.5% of respondents, agree that SCM practices will somewhat boost its performance.

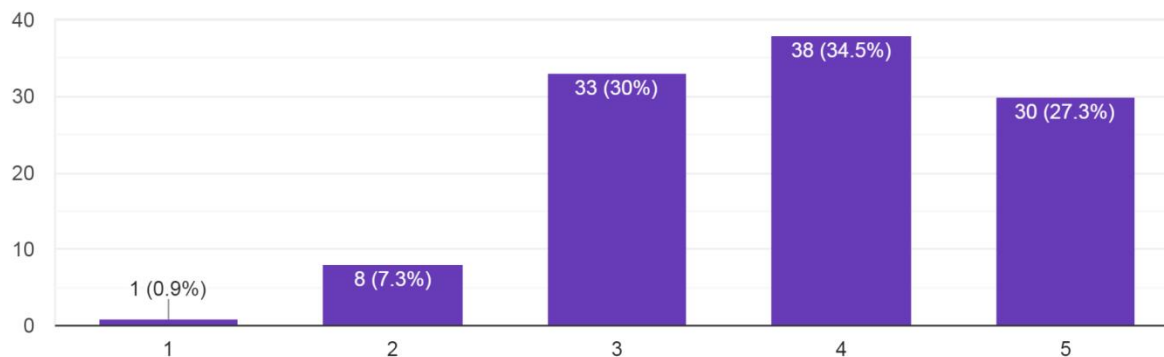
4.1.5. SCM PERFORMANCE REVIEW AND UPDATES

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Strongly disagree	1	0.9%
2	2	Disagree	8	7.9%
3	3	Neutral	33	30%
4	4	Agree	38	34.5%
5	5	strongly agree	30	27.3%
Total			110	

CHART

Performance of SCM should be regularly reviewed and updated to reflect the changes in Supply chain environment.

110 responses



INTERPRETATION

According to the employee's response, 27.3% strongly agree, 30% hold a neutral view, 0.9% strongly disagree, 7.9% disagree, and 34.5% agree that SCM performance should be routinely reviewed and updated.

INFERENCE

The majority, i.e., 34.5% of respondents agree with the statement SCM performance should be routinely reviewed and updated.

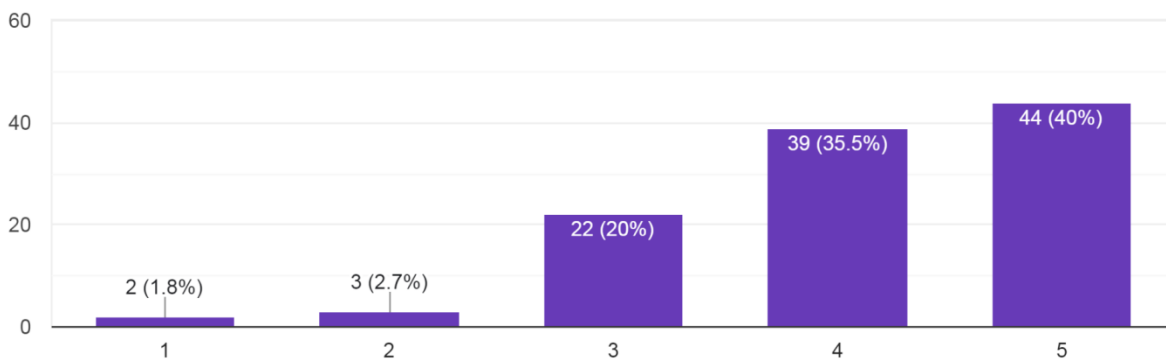
4.1.6. CUSTOMER SATISFACTION OF SCM

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very Unimportant	44	1.8%
2	2	Unimportant	39	2.7%
3	3	Neutral	22	20%
4	4	Important	3	35.5%
5	5	Very Important	2	40%
Total			110	

CHART

How important is SCM for customer satisfaction?

110 responses



INTERPRETATION

According to the response, employees feel that SCM is 40% very important, 35.5% important, 20% has a neutral view, 2.7% unimportant and 1.8% is very unimportant for customer satisfaction.

INFERENCE

The majority, i.e., 40% of the respondents, feel that SCM is very important for customer satisfaction.

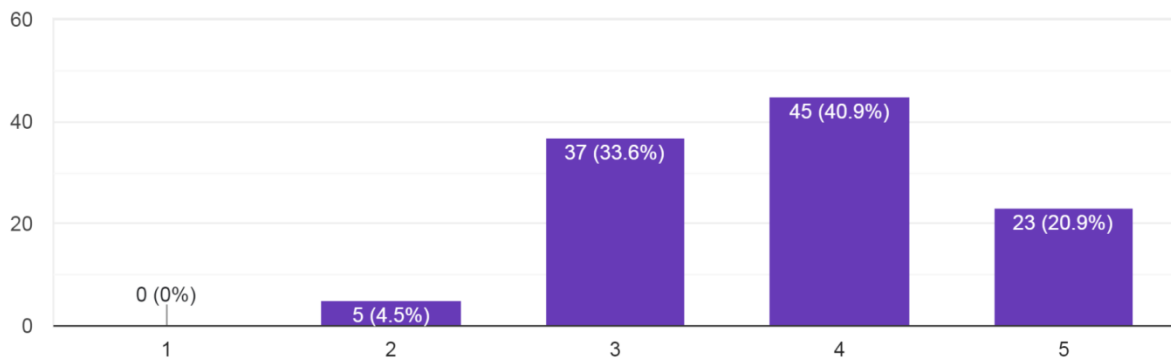
4.1.7. USE OF AI OF SUPPLY CHAIN PLANNING AND DECISION MAKING

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Not at all Effective	0	0
2	2	Slightly effective	5	4.5%
3	3	Moderately effective	37	33.6%
4	4	Very effective	45	40.9%
5	5	Extremely effective	23	20.9%
Total			110	

CHART

How effectively you use AI to optimize supply chain planning and decision making?

110 responses



INTERPRETATION

According to the response, employees feel that. Usage of AI for supply chain planning and decision making is 0% not at all effective, 4.5% slightly effective, 33.6% moderately effective 40.9% very effective and 20.9% extremely effective.

INFERENCE

The majority, i.e., 40.9% of the respondents, feel that Usage of AI of supply chain planning and decision making is very effective.

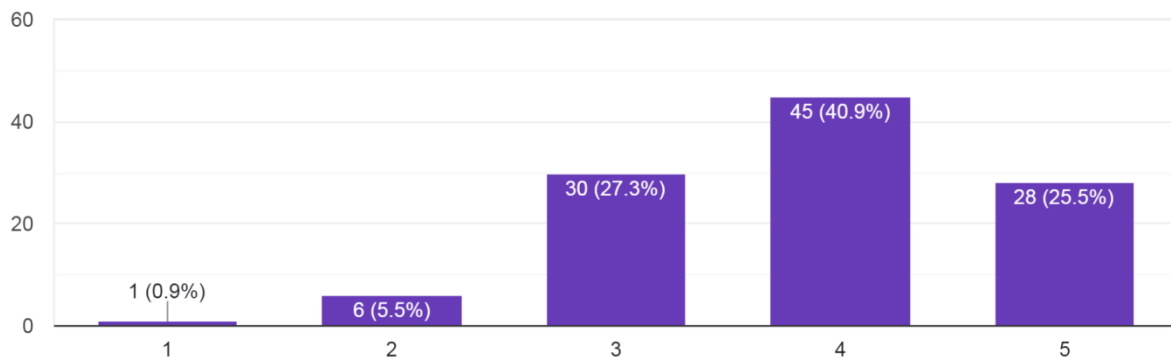
4.1.8. SCM SYSTEM OTD TRACKING AND MEASUREMENT

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very poorly	0	0
2	2	Poorly	6	5.5%
3	3	Moderately	30	27.3%
4	4	Well	45	40.9%
5	5	Very well	28	25.5%
Total			110	

CHART

How well does SCM system track and measure on time delivery performance?

110 responses



INTERPRETATION

According to the employees' response 0% feel very poor, 5.5% feel poor, 27.3% feel moderate, 40.9% feel well and 25.5% feel very well about tracking and measuring of OTD by SCM System.

INFERENCE

The majority, i.e., 40.9% of the respondents, feel very well about tracking and measuring of OTD by SCM System.

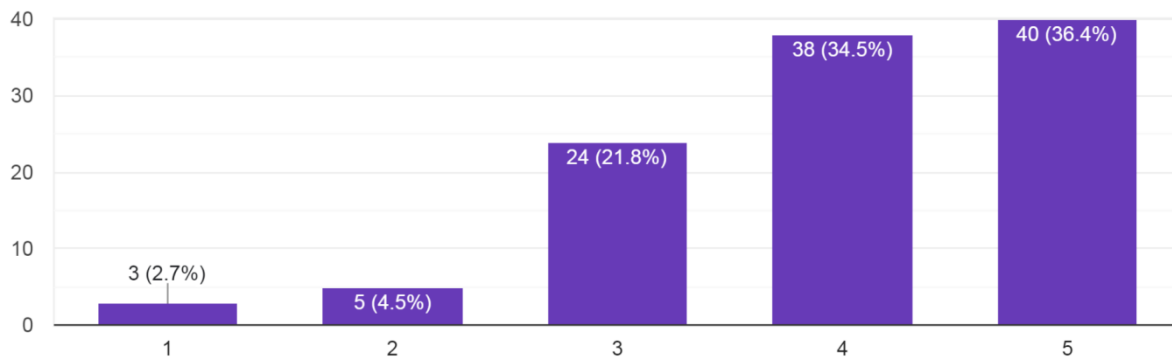
4.1.9. DIGITAL TOOLS AND TECHNOLOGY ESSENTIAL FOR SCM

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very Unimportant	3	2.7%
2	2	Unimportant	5	4.5%
3	3	Neutral	24	21.8%
4	4	Important	38	34.5%
5	5	Very Important	40	36.4%
Total			110	

CHART

How important is the use of digital tools and technologies for SCM

110 responses



INTERPRETATION

According to the employees' response 2.7% feel very unimportant, 4.5% feel unimportant, 21.8% feel neutral, 34.5% feel important and 36.4% feel very important about the usage of digital tools and technology for SCM.

INFERENCE

The majority, i.e., 36.4% of the respondents, feel important about usage of digital tools and technology for SCM.

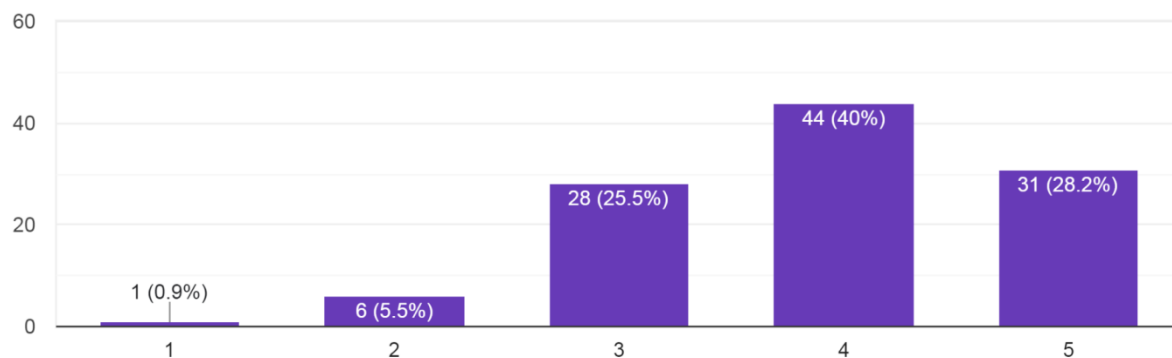
4.1.10. IMPACT OF LOGISTICS DISRUPTIONS IN SUPPLY CHAIN PERFORMANCE

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very little impact	1	0.9%
2	2	Little impact	6	5.5%
3	3	Moderate impact	28	25.5%
4	4	Large impact	44	40%
5	5	Very large impact	31	28.2%
Total			110	

CHART

How much impact of Logistics disruptions have on Supply Chain Performance

110 responses



INTERPRETATION

According to the response employees feel 0.9% have very little impact, 5.5% have little impact, 25.5% have moderate impact 40% have large impact and 28.2% have very large impact on logistics disruptions in supply chain performance.

INFERENCE

The majority, i.e., 40% of the respondents, feel logistics disruptions have a large impact on supply chain performance.

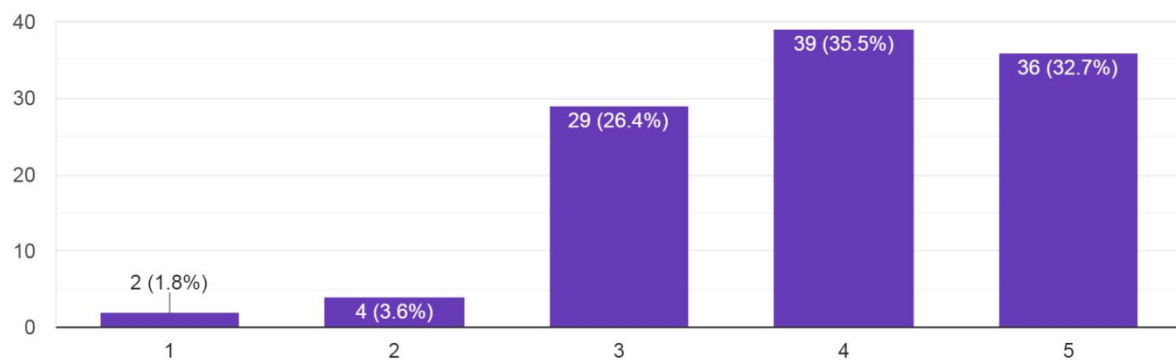
4.1.11. SCM EFFICIENCY: COST, TIME AND QUALITY

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very inefficient	2	1.8%
2	2	Inefficient	4	3.6%
3	3	Moderately	29	26.4%
4	4	Efficient	39	35.5%
5	5	Very efficient	36	32.7%
Total			110	

CHART

How efficient is SCM in terms of cost, time and quality?

110 responses



INTERPRETATION

According to the response employees feel 1.8% feel very inefficient, 3.6% inefficient 26.4% moderate, 35.5% efficient and 32.7% very efficient about SCM in terms of cost, time, and quality.

INFERENCE

The majority, 35.5% of the respondents, feel SCM is efficient in terms of cost, time, and quality.

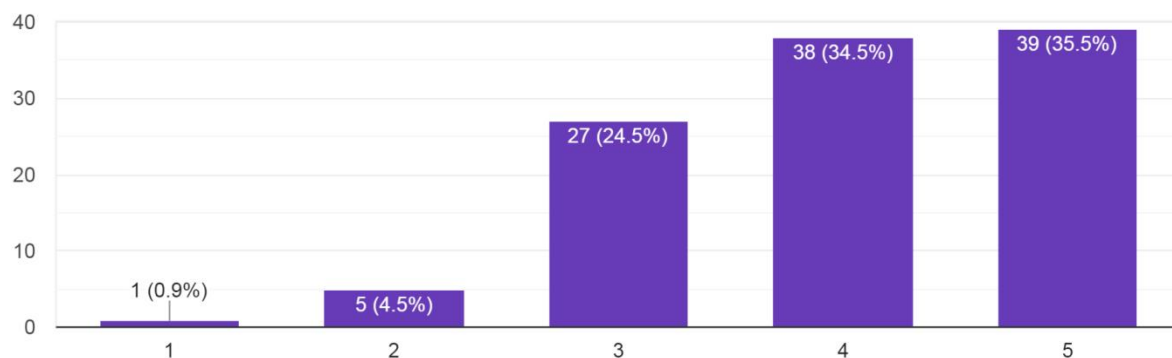
4.1.12. SCM COLLABORATING WITH SUPPLIERS AND CUSTOMERS

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Strongly disagree	1	0.9%
2	2	Disagree	5	4.5%
3	3	Neutral	27	24.5%
4	4	Agree	38	34.5%
5	5	Strongly agree	39	35.5%
Total			110	

CHART

SCM supports collaborations and partnerships with suppliers and customers

110 responses



INTERPRETATION

According to the employees' response, 0.9% strongly disagree, 4.5% disagree, 24.5% neutral 34.5%disagree and 35.5% strongly disagree about SCM collaborating with suppliers and customers.

INFERENCE

The majority, 35.5%, of the respondents strongly agree about SCM collaborating with suppliers and customers.

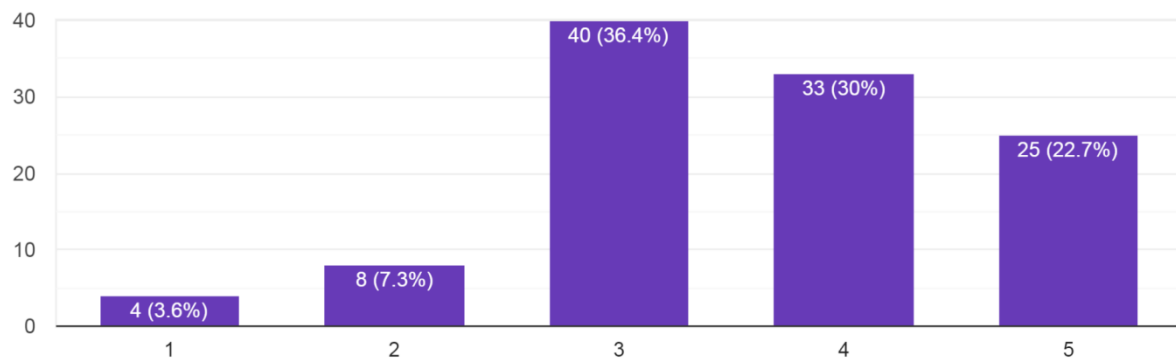
4.1.13. ECONOMIC MARKET CONDITIONS AND SUPPLY CHAIN DISRUPTIONS

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very often	4	3.6%
2	2	Often	8	7.3%
3	3	Sometimes	40	36.4%
4	4	Rarely	33	30%
5	5	Never	25	27.7%
Total			110	

CHART

How often have Supply Chain been disrupted by economic market conditions in the past years ?

110 responses



INTERPRETATION

According to the employee's response, 3.6% feel very often, 7.3% often 36.4% feel sometimes, 30% rarely and 27.7% feel never that supply chain has been disrupted by economic market condition in the past years.

INFERENCE

The majority, i.e., 36.4% of the respondents sometimes feel the supply chain has been disrupted by economic market conditions in the past years.

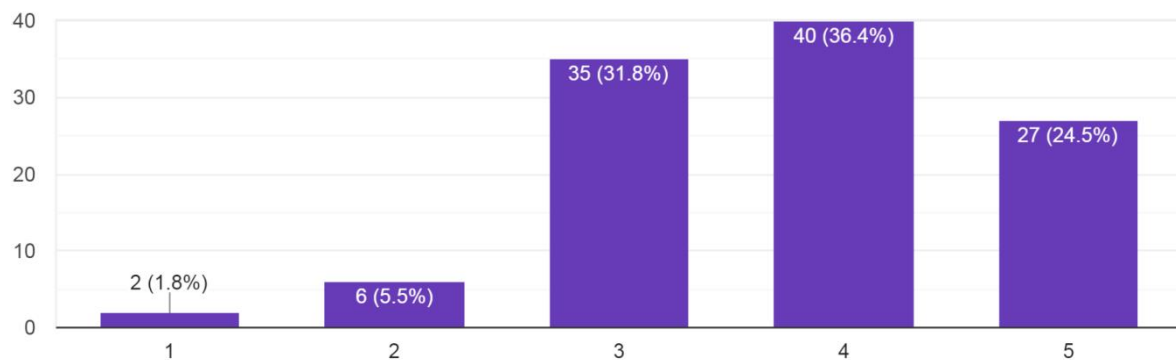
4.1.14. IDENTIFYING AND PRIORITIZING AREAS FOR IMPROVEMENT IN SUPPLY CHAIN PERFORMANCE

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Strongly disagree	2	1.8%
2	2	Disagree	6	5.5%
3	3	Neutral	35	31.8%
4	4	Agree	40	36.4%
5	5	strongly agree	27	24.5%
Total			110	

CHART

Supply Chain Performance are used to identify and prioritize the areas of improvement in Supply chain management practices.

110 responses



INTERPRETATION

According to the employee's response, 1.8% strongly disagree 5.5% disagree, 31.8% neutral 36.4% agree and 24.5% strongly agree about identifying and prioritizing areas of improvement in SCM practices.

INFERENCE

The majority, i.e., 36.4% of the respondents agree about identifying and prioritizing areas of improvement in SCM practices.

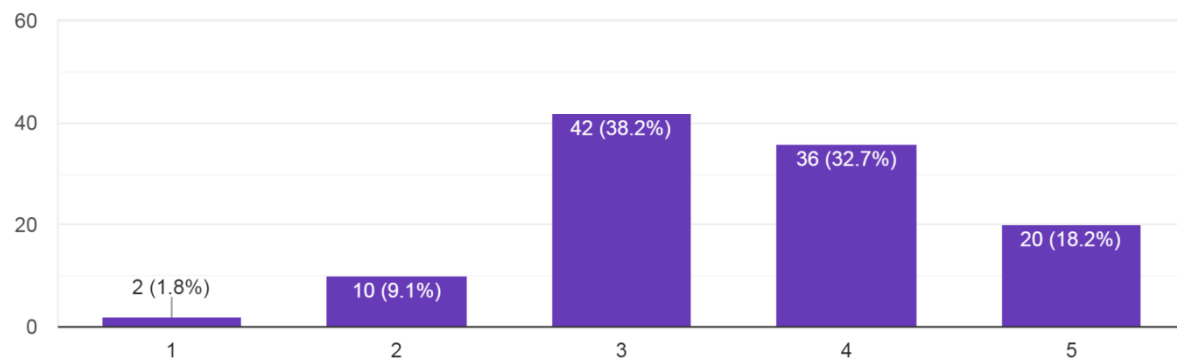
4.1.15. HISTORICAL DATA OVER REAL TIME DATA FOR IMPROVEMENT RECOMMENDATIONS

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Strongly Agree	2	1.8%
2	2	Agree	10	9.1%
3	3	Neutral	42	38.2%
4	4	Disagree	36	32.7%
5	5	Strongly Disagree	20	18.2%
Total			110	

CHART

It's better to make improvements and recommendations based on historical data rather than real time data.

110 responses



INTERPRETATION

According to the employee's response, 1.8% strongly agree, 9.1% agree, 38.2% neutral 32.7% disagree and 18.2% strongly disagree about improvements & recommendations based on historical data.

INFERENCE

The majority, i.e., 38.2% of the respondents are neutral about improvements & recommendations based on historical data.

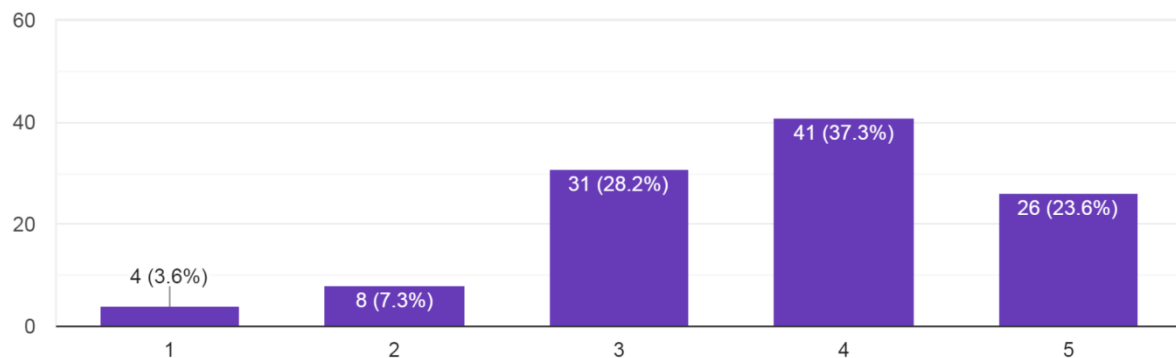
4.1.16. COMPANY INVESTMENT IN SUPPLY CHAIN INNOVATION

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very small extent	4	3.6%
2	2	Small extent	8	7.3%
3	3	Moderate extent	31	28.2%
4	4	Great extent	41	37.3%
5	5	Very great extent	26	23.6%
Total			110	

CHART

To what extent does company invest in supply chain innovation to improve efficiency, sustainability and resilience?

110 responses



INTERPRETATION

According to the employee's response, 3.6% has very small extent, 7.3% has small extent, 28.2% has moderate extent 37.3% has great extent and 23.6% has very great extent about company investment in supply chain innovation.

INFERENCE

The majority, i.e., 37.3% of the respondents have a great extent about company investment in supply chain innovation.

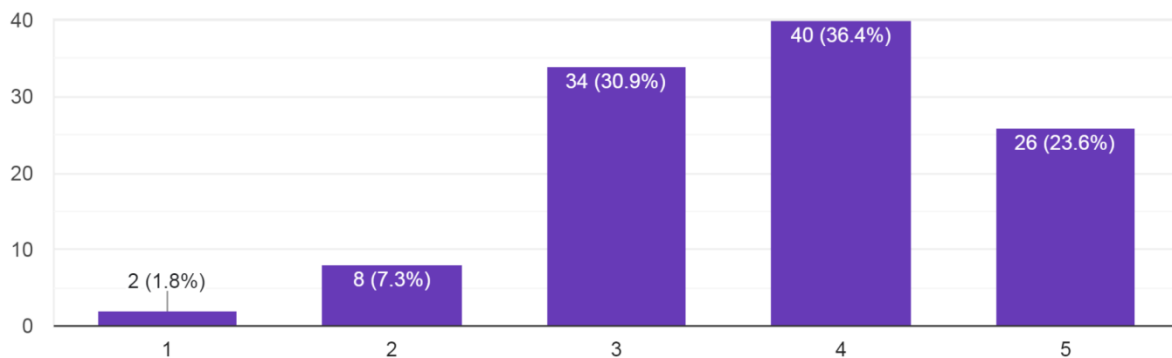
4.1.17. SOCIAL RESPONSIBILITY IN COMPANIES SUPPLY CHAIN

S. no.	Numerical value	Experience of the respondents	No. Of respondents	Percentage analysis
1	1	Not at all	2	1.8%
2	2	Small extent	8	7.3%
3	3	Moderate extent	34	30.9%
4	4	Great extent	40	36.4%
5	5	Very great extent	26	23.6%
Total			110	

CHART

How well does the company's supply chain support social responsibility initiatives such as fair labor practices and human rights protection?

110 responses



INTERPRETATION

According to the employees response, 1.8% feel not at all, 7.3% feel some extent 30.9% feel moderate extent, 36.4% feel great extent and 23.6% feel very great extent about company support on supply chain social responsibility.

INFERENCE

The majority, i.e., 36.4% of the respondents feel the company has great extent to support supply chain social responsibility.

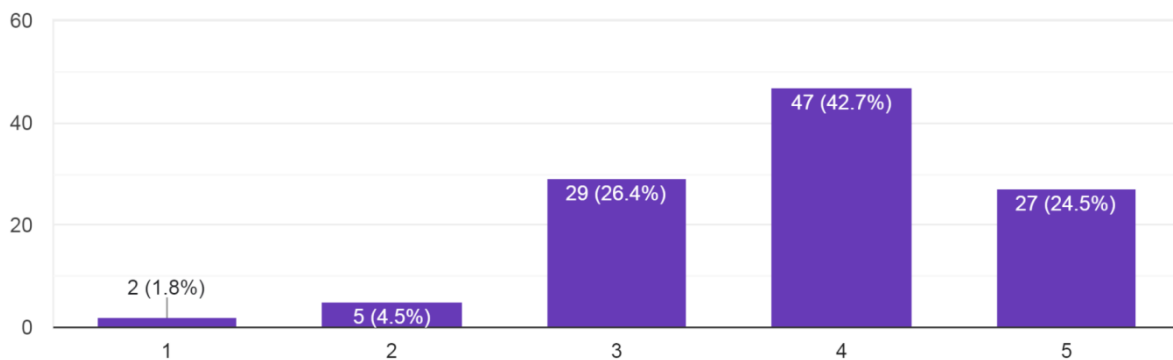
4.1.18. SCM RESILIENCE IN THE FACE OF UNEXPECTED DISRUPTIONS

S. no.	Numerical value	Response categories	No. Of respondents	Percentage analysis
1	1	Very poorly	2	1.8%
2	2	Poorly	5	4.5%
3	3	Moderately	29	26.4%
4	4	Well	47	42.7%
5	5	Strongly agree	27	24.5%
Total			110	

CHART

How well does SCM respond to unexpected disruptions such as natural disasters, pandemic and geopolitical events

110 responses



INTERPRETATION

According to the employee's response, 1.8% feel very poor, 4.5% feel poor, 26.4% feel moderate, 42.7% feel well, and 24.5% strongly agree about SCM resilience in case of unexpected disruptions.

INFERENCE

The majority, 42.7% of the respondents, feel well about SCM resilience in case of unexpected disruptions.

HYPOTHESIS 1

H0: There is no significant relationship between regular review and update of SCM performance and SCM collaboration.

H1: There is a significant relationship between regular review and update of SCM performance and SCM collaboration.

CORRELATIONS

Correlations

		To what extent SCM Practices contribute to overall performance effectiveness	How important is SCM for customer satisfaction?
To what extent SCM Practices contribute to overall performance effectiveness	Pearson Correlation	1	.373**
	Sig. (2-tailed)		.000
	N	110	110
How important is SCM for customer satisfaction?	Pearson Correlation	.373**	1
	Sig. (2-tailed)	.000	
	N	110	110

** . Correlation is significant at the 0.01 level (2-tailed).

Interpretation: The table shows the correlation between SCM practices and customer satisfaction. The correlation coefficient is 0.373, which is statistically significant ($p < 0.01$). This means that there is a positive relationship between SCM practices and customer satisfaction. The stronger the SCM practices, the higher the customer satisfaction.

Inference: The study suggests that SCM practices are important for customer satisfaction. Businesses can improve their customer satisfaction by implementing effective SCM practices .Hence (H1), alternate hypothesis is accepted and (H0), null hypothesis is rejected.

CHI-SQUARE TESTS

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	84.115 ^a	16	.000
Likelihood Ratio	66.605	16	.000
Linear-by-Linear Association	41.834	1	.000
N of Valid Cases	110		

a. 16 cells (64.0%) have expected count less than 5. The minimum expected count is .01.

Interpretation: The chi-square test statistic is 84.115, with 16 degrees of freedom. The p-value is less than 0.000, which indicates that there is a statistically significant association between the two variables.

Inference: There is a significant relationship between regular review and update of SCM practices and SCM supports collaborations and partnerships with suppliers and customers. Hence (H1), alternate hypothesis is accepted and (H0), null hypothesis is rejected.

HYPOTHESIS 2

H0: There is no significant relationship between the effects of SCM practices on overall performance improvement and customer satisfaction.

H1: There is a significant relationship between the effects of SCM practices on overall performance improvement and customer satisfaction.

CORRELATIONS

Correlations			
		SCM Practices contribute to performance effectiveness	SCM for customer satisfaction
SCM Practices contribute to performance effectiveness	Pearson Correlation	1	.373**
	Sig. (2-tailed)		.000
	N	110	110
SCM for customer satisfaction	Pearson Correlation	.373**	1
	Sig. (2-tailed)	.000	
	N	110	110

** . Correlation is significant at the 0.01 level (2-tailed).

Interpretation: The correlation coefficient between SCM practices and customer satisfaction is 0.373, which is statistically significant ($p < 0.01$). This means that there is a positive relationship between SCM practices and customer satisfaction. The stronger the SCM practices, the higher the customer satisfaction.

Inference: There is a real and positive relationship between SCM practices and customer satisfaction in the population. This means that businesses can improve their customer satisfaction by implementing effective SCM practices. Hence (H1), alternate hypothesis is accepted and (H0), null hypothesis is rejected.

CHI SQUARE TEST

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	58.385 ^a	16	.000
Likelihood Ratio	56.066	16	.000
Linear-by-Linear Association	15.173	1	.000
N of Valid Cases	110		

a. 16 cells (64.0%) have expected count less than 5. The minimum expected count is .11.

Interpretation: The chi-square test statistic is 58.385, with 16 degrees of freedom. The p-value is less than 0.000, which indicates that there is a statistically significant association between the two variables. SCM practices contribute to performance effectiveness and SCM for customer satisfaction.

Inference: Companies that have SCM practices that contribute to performance effectiveness are more likely to have SCM that supports customer satisfaction. Hence (H1), alternate hypothesis is accepted and (H0), null hypothesis is rejected.

CHAPTER 5

FINDINGS, SUGGESTIONS AND CONCLUSIONS.

5.1 FINDINGS

- Majority i.e.,66.4% of the response were given by female employees.
- Most responses, i.e., 82.7%, were given by employees in the age group of 18 to 24.
- Most responses, or 69.1%, were given by employees with less than a year's experience.
- The majority, 35.5% of respondents, agree that SCM practices will somewhat much boost its performance.
- The majority, i.e.,34.5% of respondents agree with the statement SCM performance should be routinely reviewed and updated.
- The majority, i.e., 40% of the respondents, feel that SCM is very important for customer satisfaction.
- The majority, i.e., 40.9% of the respondents, feel that Usage of AI of supply chain planning and decision making is very effective.
- The majority, i.e., 40.9% of the respondents, feel very well about tracking and measuring of OTD by SCM System.
- The majority, i.e., 36.4% of the respondents, feel important about usage of digital tools and technology for SCM.
- The majority, i.e., 40% of the respondents, feel logistics disruptions have a large impact on supply chain performance.
- The majority, 35.5% of the respondents, feel SCM is efficient in terms of cost, time, and quality.

The majority, 35.5%, of the respondents strongly agree about SCM collaborating with suppliers and customers.

The majority, i.e., 36.6% of the respondents sometimes feel the supply chain has been disrupted by economic market conditions in the past years.

- The majority, i.e., 36.4% of the respondents agree about identifying and prioritizing areas of improvement in SCM practices.
- The majority, i.e., 38.2% of the respondents are neutral about improvements & recommendations based on historical data.
- The majority, i.e., 37.3% of the respondents have a great extent about company investment in supply chain innovation.
- The majority, i.e., 36.4% of the respondents feel the company has great extent to support supply chain social responsibility.
- The majority, 42.7% of the respondents, feel well about SCM resilience in case of unexpected disruptions.
- Based on the correlation analysis, there is a strong positive relationship between regular review and update of SCM practices and SCM supports collaborations and partnerships with suppliers and customers. The correlation coefficient (r) of 0.620 is statistically significant ($p < 0.01$), which means that there is a real relationship between the two variables in the population. Hence (H1), alternate hypothesis is accepted and (H0), null hypothesis is rejected.
- Based on the regression analysis , There is a strong positive relationship between SCM supports collaborations and partnerships with suppliers and customers and regular review and update of SCM practices because The regression model is statistically significant ($F(1, 108) = 67.268, p < 0.001$),The coefficient for SCM supports collaborations and partnerships with suppliers and customers is 0.620 ($t(108) = 8.202, p < 0.001$) and The R-square value is 0.620,Hence (H1), alternate hypothesis is accepted and (H0) , null hypothesis is rejected.
- Based on the correlation analysis There is a real relationship between SCM Practices contributing to performance effectiveness and SCM for customer satisfaction in the population. The correlation coefficient (r) is 0.373, which means that there is a 37% overlap between the two variables. Hence (H1), alternate hypothesis is accepted and (H0), null hypothesis is rejected.

- Based on the regression analysis ,There is a real relationship between SCM supports collaborations and partnerships with suppliers and customers and regular review and update of SCM practices in the population because The regression output shows the statistically significant ($F(1,108) = 67.268$, $p < 0.001$), the coefficient for the independent variable is 1.267 ($SE = 0.318$, $p = 0.000$)and The standardized coefficient for the independent variable is 0.620, Hence (H1), alternate hypothesis is accepted and (H0) , null hypothesis is rejected

5.2. SUGGESTIONS

- List the most crucial SCM techniques for PT&D. Choosing suppliers, managing suppliers, maintaining inventory, storing goods, and moving goods are a few examples of this.
- Establish a system for measuring how efficiently supply networks operate. Based on the unique requirements of PT&D, this must include both quantitative data (such as cost, time, and quality) and qualitative data (such as customer satisfaction and reliability).
- Obtain information from other PT&D companies on their SCM procedures and supply chain performance. Surveys, interviews, and case studies can be used for this.
- Recognize the issues and how they affect the economy and business, then work with stakeholders to develop and put into practice solutions. Working with governments to simplify regulations, negotiating better terms with logistics service providers, and investing in cutting-edge technology are a few examples of what this may entail.
- Review the issues and solutions on a regular basis. This will make sure that the tactics are effective and that any new issues are found and dealt with right away.

- Pay attention to customer satisfaction. Delivering goods and services to customers on time and in full is the ultimate goal of SCM. As a result, it's crucial to consider customer satisfaction when making judgments about SCM procedures.
- Take initiative. SCM teams must act proactively rather than wait for issues to arise. Instead, they must take the initiative to spot and address any issues.
- Be adaptable. It is a dynamic and intricate system, the supply chain. SCM teams must therefore be flexible and adaptable to react to environmental change.

5.3. CONCLUSIONS

- In PT&D, SCM is the intermediary process that handles the acquisition and administration of materials from suppliers to end users.
- For PT&D, the SCM process starts when the Operations department submits a purchase request (PR), and it concludes when the vendor receives a purchase offer (PO).
- An online platform for gathering and managing vendor data is known as a vendor database platform. It enables companies to compile a searchable digital database of all of their providers.
- "Identify, Review, Record, retrieve with various filters, Track performance & Build relation" is the stated goal of a vendor database.
- Partner databases are responsible for managing Connect, Visits, Assessments, Dispute Records, data sanitization and updating, rating current vendors, administering data records, and adding new vendors to the list on a regular basis.
- Employees consider regular reviews and updates of SCM performance unnecessary and that SCM practices will just slightly improve performance.
- Employees contend that SCM has very little bearing on client satisfaction. This implies that in order to satisfy the needs of its clients, the business must concentrate on enhancing its supply chain management procedures.

- Employees consider AI is a very effective tool for supply chain planning and decision-making. This implies that to enhance its SCM performance, the business should invest in AI technologies.
- Employees believed it's critical to use technology and digital tools for supply chain management. This implies that to enhance its SCM performance, the business should keep making investments in digital technologies.
- Employees claim that supply chain performance is significantly impacted by logistics disruptions. This implies that the business must create strategies for reducing the effects of supply chain disruptions caused by logistics issues.

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ANNEXURE-QUESTIONNAIRE

A STUDY ON SUPPLY CHAIN MANAGEMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE EFFECTIVENESS UNDER POWER TRANSMISSION AND DISTRIBUTION DEPARTMENT IN L&T CONSTRUCTION

1. Email

2. Name

3. Gender

a) Male b) female c) other

4. Age

a) 18—24 b) 25-34 c) 35-44 d) above 45

5. How long have you been with the company?

a) less than 1 year b) 2 to 5 years

c) 5 to 10 years d) more than 10 years

6. To what extent SCM practices contribute to overall performance effectiveness

Very little	Somewhat little	Moderate	Somewhat much	Very much
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7. The performance of SCM should be regularly reviewed & updated to reflect the changes in the supply chain environment.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
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8. How important is SCM for customer satisfaction?

Very unimportant	Unimportant	Neutral	Important	Very important
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9. How effectively do you use AI to optimize supply chain planning and decision making?

Not at all effective	Slightly effective	Moderately effective	Very effective	Extremely effective
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10. How well does the SCM system track & measure on time delivery performance?

Very poorly	Poorly	Moderately	Well	Very well
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11.How important is the use of digital tools and technologies for SCM?

Very unimportant	Unimportant	Neutral	Important	Very important
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12.How much impact of logistics disruptions have on supply chain performance?

Very little impact	Little impact	Moderate impact	Large impact	Very large impact
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13.How efficient is SCM in terms of cost, time, and quality?

Very efficient	Efficient	Moderately	Inefficient	Very inefficient
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14.SCM supports collaborations and partnerships with suppliers and customers.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
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15.How often has the supply chain been disrupted by economic market conditions in the past years?

Never	Rarely	Sometimes	Often	Very often
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16.Supply chain performance are used to identify & prioritize the areas of improvement in SCM practices.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
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17. It's better to make improvements & recommendations based on historical data rather than real time data.

Strongly agree	Agree	Neutral	Disagree	Strongly disagree
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18. To what extent does a company invest in supply chain innovation to improve efficiency, sustainability, and resilience?

Very small extent	Small extent	Moderate extent	Great extent	Very great extent
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19.How well does the company's supply chain support social responsibility initiatives?

Not at all	Small extent	Moderate extent	Great extent	Very great extent
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20. How well does SCM respond to unexpected disruptions?

Very poorly	Poorly	Moderately	Well	Strongly agree
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A STUDY ON SUPPLY CHAIN MANAGEMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE EFFECTIVENESS

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ABSTRACT

In this research, we investigate the impact of SCM practices on supply chain performance effectiveness in the Power Transmission and Distribution (T&D) department of Larsen & Toubro (L&T) Construction. We identified key SCM practices that have a positive impact on supply chain performance. These practices are categorized into three main areas: strategic SCM, operational SCM, and relationship management. We also identified several areas where L&T Construction's T&D department can improve its SCM practices. Our findings provide valuable insights into the importance of SCM practices for improving supply chain performance in the construction industry.

KEY WORDS

Supply chain management (SCM), Larsen & Toubro (L&T) Construction, Power Transmission and Distribution (T&D), strategic SCM, operational SCM, relationship management

INTRODUCTION

Supply chain management (SCM) is the essential function in the power transmission and distribution (PT&D) industry. PT&D companies must manage a variety of suppliers, customers, and internal processes to ensure that power is delivered reliably and efficiently. In recent years, PT&D companies have faced a number of challenges, such as pandemics, natural disasters, and geopolitical crises. These challenges have highlighted the importance of SCM resilience and the need for PT&D companies to adopt cutting-edge SCM practices. This study examines the SCM practices and performance of the Power Transmission and Distribution Department at L&T Constructions, a leading Indian engineering and construction company. The study's findings will help other PT&D organizations improve their own SCM performance by providing insights into the SCM practices that are effective in the industry. The study's conclusions will also help PT&D companies develop more successful SCM processes and improve their overall performance.

OBJECTIVES

- Understand the importance of SCM practices across different functions of an organization.
- Identify key performance indicators (KPIs) to measure SCM performance and impact.
- Assess the role of digital tools and technologies in SCM and their impact on performance.
- Develop recommendations for improving SCM by involving in a real-time supply chain activity.
- Explore and identify the real-time causes of SCM performance disruptions in logistics and economic market conditions.

SCOPE OF THE STUDY:

- Identify and evaluate the main supply chain management (SCM) practices used by L&T Constructions' power transmission and distribution division.
- Analyze the efficacy of these practices in relation to supply chain performance measures.
- Identify areas where SCM practices could be improved to further enhance performance.

NEEDS OF THE STUDY:

- Identify and implement best practices to improve efficiency and reduce costs across the supply chain.
- Track supply chain performance and its impact on the business.
- Use technology to improve supply chain visibility, efficiency, and resilience.

REVIEW OF LITERATURE

Green supply chain management practices and performance by Kenneth W. Green Jr, Pamela J. Zelbst, Jeremy Meacham, Vikram S. Bhadauria (2012)

Green supply chain management (GSCM) practices can have a significant positive impact on organizational performance, including environmental, economic, and operational performance. Organizations can improve their performance by adopting GSCM practices.

Effects of supply chain management practices, integration and competition capability on performance by Soo Wook Kim (2006)

Supply chain integration (SCI) plays a more critical role in sustainable performance improvement for small firms, while the close interrelationship between the level of

supply chain management (SCM) practices and competition capability has a more significant effect on performance improvement for large firms.

The impact of supply chain management practices on performance of SMEs by S.C. Lenny Koh, Mehmet Demirbag, Erkan Bayraktar, Ekrem Tatoglu, Selim Zaim (2007).

Outsourcing and multi-suppliers (OMS) and strategic collaboration and lean practices (SCLP) have a direct positive and significant impact on operational performance (OPER), but not on organizational performance (ORG). However, both SCLP and OMS have an indirect and significant positive effect on ORG through OPER.

Measuring supply chain management practices by Ana Beatriz Lopes de Sousa Jabbour, Alceu Gomes Alves Filho, Adriana Backx Noronha Viana, Charbel José Chiappetta Jabbour (2011)

This study proposes a new framework for measuring supply chain management (SCM) practices, with four constructs: Supply chain (SC) integration for production planning and control (PPC) support, Information sharing about products and targeting strategies, Strategic relationship with customer and supplier. Support customer order. This framework is more concise and easier to use than previous frameworks, and it has been validated to have adequate levels of validity and reliability.

A framework for sustainable performance assessment of supply chain management practices by Emilie Hardine-Baumann, Valérie Botta-Genoulaz (2014)

This study proposes a framework and an analytical model to evaluate the impact of SCM practices on sustainable performance. The framework characterizes a company's sustainable performance in three fields: economic, environmental, and social. The analytical model assesses the sustainable performance of an SCM practice based on its relationships with the three fields.

**Benchmarking supply chain management practice in New Zealand by
Chuda Basnet, Jim Corner, Joel Wisner, Keah-Choon Tan (2003)**

New Zealand manufacturing firms are aware of SCM, but adoption of newer SCM concepts is lagging. A postal survey found that New Zealand manufacturers need to focus on adopting newer SCM concepts to improve their supply chains.

**The effect of supply chain management practices on supply chain and
manufacturing firms' performance by Moh'd Anwer Radwan Al-Shboul, Kevin D.
Barber, Jose Arturo Garza-Reyes, Vikas Kumar, M. Reza Abdi (2017)**

This study is among the first to examine SCM practices in the Jordanian manufacturing sector. Jordanian manufacturing firms need to adopt specific SCM practices to improve their competitiveness. These practices include supply chain integration, information sharing, strategic relationships, and customer order support. The results have broader implications for manufacturing companies in developing economies.

RESEARCH DESIGN

Qualitative Research Design

Qualitative research involves gathering and examining non-numerical data, which includes observational data, focus group transcripts, and interview transcripts. These types of data are frequently utilized to investigate detailed subjects or gain perspective on the experiences of individuals or groups.

HYPOTHESIS 1

H0: There is no significant relationship between regular review and update of SCM performance and SCM collaboration.

H1: There is a significant relationship between regular review and update of SCM performance and SCM collaboration.

HYPOTHESIS 2

H0: There is no significant relationship between the effects of SCM practices on overall performance improvement and customer satisfaction.

H1: There is a significant relationship between the effects of SCM practices on overall performance improvement and customer satisfaction.

Percentage analysis

Percentage analysis is used in research to compare and contrast various aspects and express the proportion of participants who provide a particular response. It helps in comparing and reviewing the results and progress.

Particulars	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
SCM performance review and updates	27.3	34.5	30	7.9	0.9
SCM collaborating with suppliers and customers	35.5	34.5	24.5	4.5	0.9
Identifying and prioritizing areas of improvement in supply chain performance	24.5	36.4	31.8	5.5	1.8
Historical data over real time data for improvement recommendations	1.8	9.1	38.2	32.7	18.2

INTERPRETATIONS

- According to the employee's response, 27.3% strongly agree, 30% hold a neutral view, 0.9% strongly disagree, 7.9% disagree, and 34.5% agree that SCM performance should be routinely reviewed and updated.
- According to the employees' response, 0.9% strongly disagree, 4.5% disagree, 24.5% neutral 34.5%disagree and 35.5% strongly disagree about SCM collaborating with suppliers and customers.

- According to the employee's response, 1.8% strongly disagree 5.5% disagree, 31.8% neutral 36.4% agree and 24.5% strongly agree about identifying and prioritizing areas of improvement in SCM practices.
- According to the employee's response, 1.8% strongly agree, 9.1% agree, 38.2% neutral 32.7% disagree and 18.2% strongly disagree about improvements & recommendations based on historical data.

INFERENCES

- The majority, i.e., 34.5% of respondents agree with the statement SCM performance should be routinely reviewed and updated.
- The majority, 35.5%, of the respondents strongly agree about SCM collaborating with suppliers and customers.
- The majority, i.e., 36.4% of the respondents agree about identifying and prioritizing areas of improvement in SCM practices.
- The majority, i.e., 38.2% of the respondents are neutral about improvements & recommendations based on historical data.

CORRELATIONS

Correlations

		To what extent SCM Practices contribute to overall performance effectiveness	How important is SCM for customer satisfaction?
To what extent SCM Practices contribute to overall performance effectiveness	Pearson Correlation	1	.373**
	Sig. (2-tailed)		.000
	N	110	110
How important is SCM for customer satisfaction?	Pearson Correlation	.373**	1
	Sig. (2-tailed)	.000	
	N	110	110

** . Correlation is significant at the 0.01 level (2-tailed).

Interpretation: The table shows the correlation between SCM practices and customer satisfaction. The correlation coefficient is 0.373, which is statistically significant ($p < 0.01$). This means that there is a positive relationship between SCM practices and customer satisfaction. The stronger the SCM practices, the higher the customer satisfaction.

CHI-SQUARE TESTS

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	84.115 ^a	16	.000
Likelihood Ratio	66.605	16	.000
Linear-by-Linear Association	41.834	1	.000
N of Valid Cases	110		

a. 16 cells (64.0%) have expected count less than 5. The minimum expected count is .01.

Interpretation: The chi-square test statistic is 84.115, with 16 degrees of freedom. The p-value is less than 0.000, which indicates that there is a statistically significant association between the two variables.

FINDINGS

- Majority i.e., 66.4% of the response were given by female employees.
- Most responses, i.e., 82.7%, were given by employees in the age group of 18 to 24.
- Most responses, or 69.1%, were given by employees with less than a year's experience.
- The majority, 35.5% of respondents, agree that SCM practices will somewhat much boost its performance.

- The majority, i.e., 34.5% of respondents agree with the statement SCM performance should be routinely reviewed and updated.
- The majority, i.e., 40% of the respondents, feel that SCM is very important for customer satisfaction.
- The majority, i.e., 40.9% of the respondents, feel that Usage of AI of supply chain planning and decision making is very effective.
- The majority, i.e., 40.9% of the respondents, feel very well about tracking and measuring of OTD by SCM System.
- The majority, i.e., 36.4% of the respondents, feel important about usage of digital tools and technology for SCM.
- The majority, i.e., 40% of the respondents, feel logistics disruptions have a large impact on supply chain performance.
- The majority, 35.5% of the respondents, feel SCM is efficient in terms of cost, time, and quality.
- The majority, 35.5%, of the respondents strongly agree about SCM collaborating with suppliers and customers.
- The majority, i.e., 36.6% of the respondents sometimes feel the supply chain has been disrupted by economic market conditions in the past years.
- The majority, i.e., 36.4% of the respondents agree about identifying and prioritizing areas of improvement in SCM practices.
- The majority, i.e., 38.2% of the respondents are neutral about improvements & recommendations based on historical data.
- The majority, i.e., 37.3% of the respondents have a great extent about company investment in supply chain innovation.
- The majority, i.e., 36.4% of the respondents feel the company has great extent to support supply chain social responsibility.
- The majority, 42.7% of the respondents, feel well about SCM resilience in case of unexpected disruptions.

SUGGESTION

- Choose and manage suppliers effectively. This includes establishing clear performance standards, negotiating favorable terms, and monitoring supplier performance on a regular basis.
- Establish a system for measuring supply chain efficiency. This should include both quantitative and qualitative data, and it should be tailored to the specific needs of the PT&D industry.
- Benchmark against other PT&D companies. This can be done through surveys, interviews, and case studies.
- Identify and address supply chain issues. This may involve working with governments to simplify regulations, negotiating better terms with logistics providers, or investing in new technology.
- Be proactive and adaptable. SCM teams should not wait for problems to arise. Instead, they should proactively identify and address potential issues. They should also be adaptable to changes in the environment.

LIMITATIONS OF THIS STUDY

- The study is limited to only 110 employees of L&T CONSTRUCTIONS. This means that the results may not be representative of the entire company or the industry as a whole.
- The respondents chosen were busy, which may have limited the number of responses and the diversity of perspectives.
- Self-reported surveys were used to gather data for the research. This means that the results may be biased by the respondents' own perceptions and memories.
- The report is being created for a specific project, and the study may not be specific enough to be applied to other projects or contexts.
- The study may not be relevant to the intended audience for the report.

CONCLUSIONS

- SCM is an essential process in PT&D, responsible for managing the flow of materials from suppliers to end users.
- The SCM process in PT&D begins with a purchase request (PR) from the Operations department and ends with the issuance of a purchase order (PO) to the vendor.
- A vendor database platform is a digital repository for storing and managing vendor information, enabling efficient vendor management.
- The core objectives of a vendor database include identifying, reviewing, recording, retrieving, tracking performance, and building relationships with vendors.
- Partner databases are responsible for managing various aspects of vendor relations, including Connect, Visits, Assessments, Dispute Records, data sanitization and updating, vendor ratings, data record administration, and vendor onboarding.
- Employees generally believe that regular reviews and updates of SCM performance are unnecessary and that SCM practices have minimal impact on overall performance.
- Employees also believe that AI is a valuable tool for supply chain planning and decision-making, and that investing in AI technologies can significantly improve SCM performance.

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