ANALYSIS AND OPTIMIZATION OF INBOUND AND OUTBOUND LOGISTICS

PROJECT REPORT

Submitted By
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(EM-2003)

As a part of the requirements for the degree of Master of Business Administration (Executive) under the guidance of

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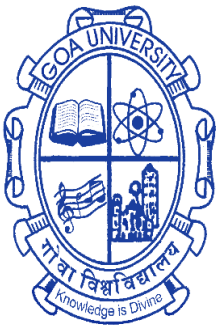

GOA BUSINESS SCHOOL

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ACKNOWLEDGEMENT

A project is never the work of an individual. It is moreover a combination of ideas, suggestions, reviews, contributions and work involving many people. It cannot be completed without guidelines and assistance.

My debts are too numerous to be acknowledged individually. A large number of individuals have contributed directly and indirectly in completion of this project. And I'm thankful to everyone.

It is a pleasure to express my gratitude for assistance received from them. Hence, I would like to take this opportunity to thank them wholehearted for helping me in preparing this project.

Lastly, a special thanks to my mentor Mr. Ramchandra Prabhu Salgaonkar for giving me guidance and encouragement towards carrying out my project.

DECLARATION

I, Rahul Mahesh Baadkar hereby declare that I have completed this Project Report on Analysis and Optimization of Inbound and Outbound Logistics as a part of the requirements for the degree of Master of Business Administration (Executive), Goa Business School, Goa University. The report submitted is my original work, and the conclusions drawn therein are based on the material collected by myself.

I also declare that this project has not been submitted nor shall it be submitted in future to any other University or Institution for the award of any Degree or Diploma.

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Preface

Due to globalization, containerization, international trade and intermodal transport, supply chain management becomes complex in the dynamic business environment. The ultimate objectives are to minimize the cost and improve the logistics efficiency. This study aims to recognize the role and importance of logistics in supply chains in the business context, integrate knowledge and skills in logistics operations across a wide range of business domains and levels, and develop critical thinking and analytical skills to identify and assist the management in solving problems related to logistics and supply chains.

Objectives

This study aims to provide fundamental understanding of principles, concepts and application of global logistics and supply chain management in the business context. It also equips with necessary skills and techniques for coping with logistics challenges and problems in an ever-changing business environment. Critical thinking and analytical skills are developed through experiential learning. This study also helps develop abilities and knowledge in logistics and supply chain management, thereby preparing one for further studies, employment and lifelong learning.

1. Introduction to International Logistics (Inbound and Outbound logistics) Detailed Understanding

Logistics Management is a part of supply chain management that deals with effective planning, implementing and controlling flow of goods and services. Its main objective is to make the flow of product more effective and efficient to increase desired level of customer service.

1.1 Logistics and Supply Chain Management

As the fields of logistics and international logistics evolved, the managers working in those fields changed the definitions that they used to describe their profession. Though “logistics” was the most commonly accepted term for the activities in which these managers engaged, the term was broadened later to include additional activities; eventually, the profession was renamed “supply chain management” after that. Today, the term “logistics” encompasses several activities that are a subset of the activities that constitute Supply Chain Management.

1.2 Logistics

Today, professionals in the field define the term “logistics” in the following manner:
Logistics is that part of the supply chain process that involves planning, implementing, and controlling the efficient, effective forward and reverse flow and storage of goods, services, and logistics related information between source and consumption points to meet customer needs.

From this definition, it is clear that logistics managers see the focus of their profession as those activities that are related to the physical movement of goods from supplier to customer. Logisticians are primarily concerned with transportation, packaging, storage or warehousing, securing, and handling the goods that their companies buy or sell. Logisticians also interact daily with other managers who hold responsibilities closely related to moving these goods, such as manufacturing and production, purchasing and procurement, marketing, inventory management, finance, customer service, and so on.

The role of international logistics in global supply chains mirrors the role of logistics in national contexts: international logisticians focus on the tactical aspects of global supply chains, activities which are involved in movement of goods and paperwork from one country to another, and activities that form the basis of import and export operations.

2. Incoterms and Terminology of International Trade

To promote consistency and eliminate confusion, the International Chamber of Commerce in 1936 developed a standard, unified set of Incoterms for use by traders around the world. Since then, these Incoterms have been playing a key role in world trade. In particular, Incoterms establish or indicate markers on the chain of micro-logistics components and address a number of important responsibilities and obligations.

By interpreting the Incoterms, the economy and trade of the 21st century actually consists of a global market. Although buyers and sellers are often located in different parts of the world, they can be assured that they have a unified and standardized set of international trade terms (Incoterms) to help them conduct international transactions, and outlines also the roles of buyers and sellers. in the transaction supply chain.

The relationship between the Buyers and Sellers is described using Incoterms in the following areas:

1. The delivery method.
2. Who is responsible for handling licenses and customs clearance?
3. Title passage (i.e., ownership of goods).
4. Responsibility for risk transfer and insurance (i.e., who has to obtain insurance of the shipment during transport of goods)
5. What are the terms of delivery?
6. How the parties will split the cost of transportation.
7. When will the shipment be completed?

2.1 Understanding Incoterms:

Incoterms can be broadly categorized into different groupings based on certain characteristics:

• **Group 1-** The "E" group is referred to as Ex-works (name and location).

The main characteristic of this group is that the shipper/exporter guarantees to make the goods available to the consignee/ importer at their company premises. The obligations are

complete once the goods are picked up by the importer. The shipper has very few obligations and low risk of loss. Title is transferred at the beginning. The consignee bears the risk of loss or damages and has to insure or bear the risk transport.

• **Group 2-** The "F" group includes terms like Free alongside (FAS), Free on Board (FOB) and Free Carrier + Named location (FCA). The key characteristics of this group are that importer and exporter have agreed that the exporter is responsible to deliver the goods to a carrier/location chosen by the importer. The responsibility of the exporter ends once delivery has been made to the designated carrier/location, and the responsibility of the importer starts.

• **Group 3-** The "C" group includes terms such as Cost Insurance and Freight (CIF), Cost and Freight (CFR), Carriage Paid To (CPT) and Carriage and Insurance Paid to (CIP). Here the shipper is obliged for the contract and pays for the transportation of the goods, but once the goods have been shipped, neither extra costs nor risk of damage are required to be borne by the shipper.

• **Group 4-** The "D" group includes terms such a Delivered Act Frontier + named location (DAF), Delivered Ex Ship (DES), Delivered Ex Quay (DEQ), Delivered Duty Unpaid (DDU) and Delivered Duty Paid (DDP). This group is the opposite of the Group "E". That is, the shipper is obliged to cover costs, insurance, risks, duties and must make the goods available at the specified place of destination (usually named by the consignee).

2.2 Dangers of Improper Use of Incoterms

When used appropriately, Incoterms can and clearly clarify who is responsible for what risks, costs, liabilities, and obligations. Each party will then be able to quote prices accurately and avoid any hidden or unforeseen charges. These unrecognized and hidden fees are frequently at the center of many conflicts. Hence, before agreeing to the Incoterms, it is necessary that each party is well aware of what they mean, as well as what their respective obligations and costs are. Risks, disputes, and large financial losses can result from improper use or a lack of understanding of Incoterms. Some insurance plans could be void due to misuse of Incoterms.

2.3 Ex-Works

Ex-Works means that it is the shipper's duty to provide the buyer with the goods at their place of factory warehouse. Here the buyer will be responsible for covering all expenses and risks associated with transporting the products from the shipper's location to the desired location. So, the shipper's obligation under this provision is minimal.

2.4 Free on Rail (F.O.R) and Free on Truck (F.O.T)

These terms are used when goods are being transported by rail or by road. The shipper's obligations are complete when the shipment is delivered to the carrier.

2.5 Free alongside Ship (F.A.S)

The shipper's obligations are completed after the goods are placed alongside the ship and when the consignee is notified, he is required to enter into a contract for the transportation of the goods to the destination and pay the freight. The costs and risks of any future loss or damage to the goods in the case of a sea carrier are entirely the responsibility of the consignee.

2.6 Free on Board (F.O.B)

When the goods are loaded onto the ship at a port of loading specified in the sales contract, free of charge to the consignee, the shipper's obligations end. On board means that a receipt for the shipment bill of lading is not sufficient. When such a bill of lading is issued, it must be stamped "Shipped on Board" and converted into a shipped-on-board bill of lading. It also needs to bear the signature of the carrier or designated representative and the date the goods were loaded.

2.7 F.O.A – F.O.B Airport

The basic idea behind "FOB Airport" is the same as that of regular FOB words. The shipper fulfills his obligation by delivering the goods to their carrier at the airport of departure. It should be noted that, unlike the ship rail in the former, the place of delivery in the latter is not bound to the air carrier. In case of sea transport the consignee usually arranges for carriage but in the case of FOB Airport the shipper usually arranges for the carrier.

2.8 Cost and Freight (C & F)

The shipper is required to arrange for the transportation of the goods to the port of destination specified in the sale contract at his own risk and not as the consignee's agent, and pay the freight. This being a shipment contract, the point of delivery is fixed to the ship's rail and the risks of loss or of damage to the goods is transferred from the shipper to the consignee, at that very point. Even when the shipper pays for transportation to the specified location, the risk is already passed to the consignee at the port of shipping.

2.9 Cost Insurance and Freight (C.I.F)

The term is the same as C and F, with the addition that the shipper has to obtain insurance at his cost, against the risks of loss or damage to the goods, during the carriage.

2.10 Freight or Carriage Paid (F.C.P)

Like C & F is used for goods which are to be shipped by sea, the term F.C.P is used for land transport only, including national and international shipment by road, rail and inland waterways. The shipper is responsible for arranging and paying for the transportation of the goods to the specified destination in the sales contract. His obligation is complete when the goods are delivered to the first carrier.

2.11 Ex-Ship (EXS)

This is an arrival contract where the shipper makes the shipment available to the consignee in the ship, at the specified port of destination on the basis of sales contract. The shipper is responsible for covering all transportation expenses and risks. The shipper's obligation is complete before the Customs border of the foreign country and it is for the consignee to incur the cost and risk of obtaining the required import license.

2.12 Ex Quay (EXQ)

EX-Quay states that the shipper makes the goods available to the consignee at a named quay. The points of division of costs and risks are the same as in the term Ex-Ship, but they have been pushed one step further, from the ship to the quay or dock, or after passing through Customs at destination. As a result, the shipper is also responsible for arranging transportation, paying for freight and insurance, as well as offloading the items from the ship. Thus, an Ex-Quay sale is, in a way, a sale in the market of the country of destination. This important difference, compared with the sale Ex-Ship, is usually indicated by adding the words “duty paid” within parenthesis after the words Ex-Quay.

2.13 Delivered at Frontier (D.A.F)

When goods are being transported by rail or road, the term D.A.F is used. When the goods reach the border, or the country specified in the sales contract's customs border, the shipper has completed obligations.

2.14 Delivered Duty Paid (D.D.P)

The term may be used, irrespective of the type of transport involved and denotes seller's maximum obligation as opposed to ex works. The seller has not fulfilled his obligations such time, as the goods are made available at his risk and costs to the buyer, at his premises or any other named destination. In the latter case, necessary documents (e.g., transport documents or warehouse warrant) will have to be made available to the buyer. Taxes, fees, and charges are all considered to be Duties. Therefore, the obligation to pay GST/VAT levied upon importation will fall upon the seller. It is therefore advisable to use the exclusive of GST/VAT after the words “Duty Paid”.

2.15 Free Carrier (Named Point) (F.R.C)

The term has been specifically designed to meet the needs of modern transportation, including multi-mode transportation like container or roll-on/roll-off traffic by trailers and ferries. The underlying idea behind the term is the same as that of FOB, with the exception that the shipper completes his obligations when he places the items in the carrier's possession at the designated point.

2.16 Freight Carriage and Insurance Paid (C.I.P)

Here, insurance also has to be paid by the shipper and provide the consignee the insurance documents in addition to other documentation.

3. Documentation for International Logistics

In the import and export of goods, various types of documentation are used. For the shipping, transportation, and discharge of cargo to occur successfully at the port of destination, the required documentation must be completed and submitted. The documents that are used are determined by the requirements of both the exporting and importing countries. Much of the documentation is routine for freight forwarders or customs brokers who act on company's behalf, but the responsibility for the accuracy of the documentation is of the exporter.

3.1 Air Waybill

Between the shipper and the air carrier, the air waybill serves as a contract of carriage. It serves as a receipt for the shipper and is issued by the airline. The air waybill is obtained from the freight consolidator or forwarder when the shipper delivers the goods to them for transit. Air waybills cannot be issued as a collection instrument as they are not negotiable. Air waybills can come from any airline that participates in the carriage and are not specific to one particular airline.

3.2 Bill of Exchange (Draft)

A bill of exchange is an unconditional written order by one party (the drawer), that orders a second party (the debtor or drawee), to pay a specific amount of money to the drawer (creditor) or a designated third party. In many cases, the exporter is the drawer/payee and the drawee is the importer. When a draft is payable at a specific future date, it is a time draft. It is known as demand or sight draft if it is payable on sight.

3.3 Bill of Lading (B/L)

A contract of carriage between a shipper and a steamship company (carrier) is known as a bill of lading. It certifies ownership and receipt of goods by the carrier for shipment. The carrier issued it to the shipper. If the shipment is made directly to the overseas customer, a straight bill of lading is issued. Such a BL is not negotiable. An order bill of lading is negotiable, because it can be bought, sold or traded. In cases when the exporter is uncertain about payment, the exporter can consign the bill of lading to the order of the shipper and endorse it to the consignee, on payment of the purchase price. The bill of lading may be endorsed to the consignee when payment is not a concern.

3.4 Clean/Claused Bill of Lading

The bill of lading form is normally filled by the shipper in advance. The carrier verifies that the cargo being loaded onto the ship matches the goods listed (quantity, condition, etc.) on the bill of lading. If everything is proper, the carrier issues a clean bill of lading, certifying that the goods have been properly loaded on board the ship. However, if there is a mismatch between the goods loaded and the goods listed on the bill, the carrier issues a claused bill of lading to the shipper. And normally third parties, including the buyer, under a Cost, Insurance and Freight (CIF) contract or bank that is expected to pay under documentary credit on receipt of the bill of lading and other documents do not accept such a bill of lading.

3.5 Inland Bill of Lading

An inland bill of lading is a bill of lading issued by a railway carrier or a trucking company that certifies the transportation of goods from the exporter's location to the point of exit for international shipment. With the help of this document, exporters can consign goods to freight forwarders, who will subsequently transport them by rail to an airport, seaport or truck for shipment.

3.6 Through Bill of Lading

When intermodal transportation is used, that is use of different modes of transportation for shipping the goods a through bill of lading is issued. In general, the first carrier is in charge of delivering the cargo to its final destination and will issue a through bill of lading.

3.7 Consular Invoice

A consular invoice is necessary in some countries for customs, statistical, and other purposes. It must be obtained from the consulate of the country to which the shipment of goods will be delivered and usually must be prepared in that country's official language.

3.8 Certificate of Origin

Certain nations demand a certificate of origin in order to determine whether the product is eligible for preferential duty treatment. It is a declaration of the export product's country of origin and is typically obtained from local chambers of commerce.

3.9 Inspection Certificate

A certificate needed to verify the specifications of the goods shipped, typically completed by a third party, may be required by some importers and countries. These specifications are typically included in the contract and quotation. Inspection certificates are generally required for certain commodities with grade designations, machinery, equipment, and so forth.

3.10 Insurance Certificate

An insurance certificate describing the type, conditions, and scope of the insurance must be provided when the exporter provides insurance. The certificates are negotiable and must be endorsed before presenting to the bank.

3.11 Commercial Invoice

A commercial invoice is a bill for the goods, from the shipper to the consignee. It includes basic information about the transaction, description of goods, trade documents and transportation of the goods, delivery terms and payment terms, order date and number. The importer requires the commercial invoice in order to clear goods from customs, to prove ownership of goods and arrange for payment. Governments of importing countries also use commercial invoices to determine the value of the goods for determining customs duties.

3.12 Dock Receipt

This receipt is used to transfer accountability when the export goods are transported by the domestic carrier to the port of departure and is left with the international carrier for export. The international carrier or agent issues this receipt after delivery of the goods at the carrier’s dock or warehouse. A similar document, when issued by a chartered vessel upon receipt of cargo, is called a mate’s receipt.

3.13 Destination Control Statement (DCS)

The commercial invoice, bill of lading, air waybill, and shipper's export declaration all contain this statement. It is meant to act as an alert to the carrier and other parties that the goods may only be exported to certain destinations.

3.14 Shipper's Export Declaration (SED)

A shipper's export declaration (SED) is issued in order to regulate specific exports and collect trade information. It is necessary for shipments valued at more than, $ 2,500. Exporters and carriers must both declare dangerous cargo.

3.15 Pro Forma Invoice

A pro forma invoice is a provisional invoice that is sent to a potential customer in response to that customer's request for a price quote. A quotation usually describes the product description and states the price at a particular delivery point, delivery date and the terms of payment and shipment. The importer also requires a pro forma invoice to apply for a foreign exchange or import permit. Because there is a time gap between the date of the quotation and the date of the shipment to the overseas customer, quotations on such invoices are subject to change without notice.

3.16 Packing List

A packing list itemizes the goods in each package and indicates the type of package (e.g., box, carton). It shows weight and measurements for each package. Customs officials in the exporting and importing countries use it to inspect the cargo, and exporters use it to calculate the weight, volume, and shipment of the right goods. The packing list should be accompanied in the package or attached to the outside of a package in a waterproof envelope marked "packing list enclosed."

3.17 Manifest

A manifest is a thorough summary of a vessel's entire cargo for customs purposes. It covers the condition of the cargo and summarizes heavy lifts and their locations.

3.18 Other Documents

While importing the goods such as API/ Bulk Drug or any other type of antigen's documents such as Certificate of Analysis, Batch Release Certificate, Product Labels, MSDS, Veterinary Certificate is required to be presented in the customs. In case of electronic machines or instruments, battery MSDS is required to assure the safety while the goods are in transit.

4. Terms of Payment

4.1 Introduction

Without effective and timely payment arrangements, international trade cannot continue to expand and grow. Import payments that are not made in a timely manner or are not made at all could cause many exporting companies to have liquidity problems. Advance payments

from international customers would similarly tie up an importer's limited resources and are not always a guarantee that the agreed-upon goods will be delivered. The best form of payment is one that protects the competing interests of both importer and exporter.

4.2 Consignment Sales

In this method the exporter delivers the goods to an importer on a deferred payment basis; which means, the importer does not pay for the goods until it is sold to a third party. Title to the goods passes to the importer only when payment is made to the exporter. Consignment sales is rarely used between unrelated parties, for example, independent exporters and importers. It works best when there is a rising demand for a product and a proportionate stock is required to satisfy that demand. It is also used when a business wants to test the market for new products, or test the market in a new country. For the exporter, consignment sale is the least preferred method of selling and receiving payment.

4.3 Documentary Collection (Documentary Draft)

One of the most common ways to receive payment in international trade is through a documentary collection or documentary draft. Two banks are typically involved to facilitate the transaction, one in the exporter's country and the other in the importer's country. The banks could be independent banks or branches of the same bank. A draft (documents payable) may be drawn in either the local currency or another foreign currency. This method of payment falls between the open account payment method, which benefits the importer, and the letter of credit, which safeguards the exporter.

4.4 Documents against Payment

In a typical document against payment (D/P) transaction, the exporter draws a draft on the importer (drawee) through a foreign bank (collecting bank) which receives the necessary collection documents from the exporter's remitting bank. In this case, a sight draft is presented along with additional documents that the buyer or the buyer's country has specified, and the collecting bank will give the buyer these additional documents after payment. This means that until payment is made to the collecting bank, the buyer will not receive the documents and, as a result, won't be able to take possession of the goods. This method is widely used in international trade frequently and often referred to as "Sight Draft, Documents Against Payment " (S/D, D/P). In the event that the buyer fails to make payment, the exporter has the option of either having the goods shipped back or selling them to another customer in the importing country.

4.5 Documents against Acceptance

In this method, the exporter gives the importer a certain period of time to complete the shipment's payment. The buyer receives the documents and thus the title to the goods, in exchange for acceptance of the draft, to pay at some determinable future date. A time draft is used to establish the time of payment, meaning that the money must be paid within a specific period of time following the buyer's acceptance of the draft. Sometimes, a date draft is used to specify the payment date. When using a time draft, the customer has the option of delaying payment by delaying the acceptance of the draft. By either using a date draft or tying the payment date to the date on the bill of lading (e.g., Thirty days from the date of the bill of

lading or AWB) or draft an exporter can prevent such delays. The draft is being held by the collecting bank for presentation for payment on the maturity date.

4.6 Direct Collection

Exporters have the option to send documents directly to the foreign collecting bank for payment or acceptance rather than through the remitting bank. It also accelerates the collection process and lowers bank fees. Without the involvement of the remitting bank, the collecting bank serves as the exporter's agent for follow-up and collection in this situation. Liability and Responsibility of the Banks The Uniform Rules for Collections distinguish two types of collection arrangements: clean collections and documentary collections. In the case of clean collections, a draft is offered to the importer without accompanying shipping documents in order to receive payment or acceptance. Documentary collections however, involve the presenting of shipping (commercial) and financial documents (draft or promissory note) by the collecting bank to the importer. In some cases, in which a collection is payable against shipping documents without a draft (invoice is used in lieu of a draft), it is referred as cash against documents.

4.7 Documentary Letter of Credit

By signing a Letter of Credit (L/C), a bank or other financial institution agrees to be responsible for paying the shipper’s invoice on the consignee’s behalf. In the country of the shipper, the bank could transact either directly or with the help of another bank. In all forms of letters of credit, the importer makes arrangements with a bank to finance the exporter in return for specific documentation. The bank makes its credit available to its client, the buyer, in consideration of a security, which often includes a pledge of the documents of title to the goods, or placement of funds in advance, or of a promise to reimburse with a commission. The letter of credit is a legally enforceable commitment by a bank, to pay funds upon the performance of certain conditions, stipulated herein, to the shipper (exporter or beneficiary) for the account of the consignee (importer or applicant).

5. International Sourcing

International Sourcing is the practice of sourcing goods and services across geopolitical boundaries from the global market. Its objective is to use global efficiencies to deliver the goods. Some of these efficiencies are low trade tariffs, low-cost raw materials, cost skilled labor, etc. Communication typically entailed negotiating over prices, complaining about delayed shipments or disputing the quality of goods.

5.1 Strategic sourcing

Sourcing has evolved from a traditional purchasing approach, which was transactional and opportunistic in nature, where companies used to buy in response to immediate demands, choosing freely from among different suppliers, which can potentially meet those needs, to one that is futuristic and uses plans and strategies. Traditional sourcing was transactional, irregular, and treated every purchase as an individual transaction. Communication typically entailed negotiating over prices, complaining about delayed shipments or disputing the quality of goods. As a result, traditional sourcing methods have experienced failures.

Strategic sourcing is a systematic strategy for improving companies' purchasing activities. It ensures cost-effective goods and services purchase for the organization while enhancing value creation. Strategic sourcing is different from traditional purchasing in many ways. To optimize the results of the entire business, it uses relationship management and business strategy to the purchase process. All organizations need strategic sourcing.

5.2 Strategic Sourcing Importance for Companies

Professionals in supply chain management are continuously looking for innovative ways to cut costs, assure and improve the quality of the finished product, and achieve a faster time to market in today's competitive business environment. One strategy that procurement managers can use to assist in achieving these supply chain objectives is strategic sourcing.

Here’s how it works:

5.2.1 Identify Suppliers

Effective procurement managers consistently find the best quality materials from reliable suppliers at the lowest prices. When identifying alternative suppliers, it is important to keep track of logistical considerations that may make one trade partner more beneficial, at certain times of the year, or under certain external conditions. This makes it possible for a steady flow of goods to run smoothly throughout the entire year, regardless of environmental factors.

Another crucial factor when identifying suppliers is competitive differentiation opportunity. Using a particular supplier with a strong brand image within your target market can create a great opportunity for product differentiation and possibly convince the customer to choose your product over others.

5.2.2 Cultivate Relationships

Identifying the best suppliers is important. However, there is more to strategic sourcing. Working closely with suppliers to develop a positive and long-term relationship can result in win-win scenarios for both. Developing strong ties with suppliers will enable suppliers to more efficiently tailor and deliver products to exact customer specifications, which will help sourcing professionals meet cost, speed-to-market, and quality targets.

5.2.3 Continuously Improve Skills

By participating in online courses conducted by leading professionals in the field, procurement managers and professionals can increase their understanding of strategic sourcing techniques. The field of strategic sourcing is constantly developing. Gaining knowledge about this field and maintaining current information can help one understand, plan, and implement a strong strategic sourcing strategy, improve the efficiency and effectiveness of the supply chain infrastructure, and lower overall costs. A strong strategic sourcing plan can also give the business possibilities to cut costs, boost sales and market share, and improve its brand image.

5.3 Benefits

Strategic sourcing enhances the value to price relationship by lowering costs while improving service quality. It examines supplier relations across the whole organization and creates partnerships with suppliers. It uses a systematic, collaborative approach that goes beyond the purchasing department. Instead of relying on individual preferences and opinions, decisions are made using analysis and market intelligence.

5.4 Total Cost of Ownership

Traditional sourcing is driven primarily by price, whereas strategic sourcing is driven by total cost of ownership, a purchasing strategy that involves identifying the costs that are most important for the purchase and usage of a specific good or service. This kind of thinking takes a variety of things into account, such as research, ordering, shipping, inspecting, and the expenses of use and disposal.

5.5 Capability Sourcing

Organizational efficiencies and strategic positioning are enhanced by capability sourcing. To use capability sourcing, the first step is to find the company's key competencies—the activities that it does faster and more efficiently than its competitors. This core is supported by other activities. Outsourcing is considered to be an excellent idea for activities that other companies can execute more effectively and with less proprietary information.

5.6 Risk Assessment

The management of supply risk is an important factor of sourcing. The firm can create alternative plans to reduce risks in the supply chain by having a thorough understanding of such risks. Assessment of supply chain risks helps in protecting against supply disruption for profitability and brand image of the company. Sourcing strategy determines whether the risk is acceptable to the organization or not.

5.7 Process

Prioritizing areas for improvement in spending is the first step in strategic sourcing. The next phase is to gather data related to market supplier capabilities before choosing suppliers in accordance with the total cost of ownership philosophy. Use supplier relationship management to maintain the improvements and establish a trustworthy environment.

6. Transport

In the dim and distant past, selecting the means of transportation for an international consignment was a simple task for the exporter. Either it went by sea or it did not go. Nowadays exporters face not only a range of modes of transport (sea, air, road or rail), but also a wide variety of specialized services within each mode. Choosing whether to ship the goods by air or sea is no longer required; decisions must also be made on the usage of unitized systems, FCL or LCL services, and so on. The exporter seeking to compete in global markets must have a deep awareness of the diverse range of modern freight services.

6.1 Freight Forwarders

Most of the exporters and almost all importers, use freight forwarders. The freight forwarder plays a key role in international logistics. Their basic function is to act as intermediary between shippers and carriers, with goods to be sent till the space to be filled in the carrier, as defined in the Figure below.

Exporting goods overseas can be done via air, water (ocean and inland), and land in three different ways (rail and truck). Air and ocean transport are suited for long-distance travel between countries that do not share a common border, whereas inland water, train, and truck are suitable for domestic travel and the transit of commodities between nearby countries. To deliver goods in a timely and cost-efficient manner, export-import companies may combine these methods. While choosing a mode of transportation, exporters should take into account market location (geographical proximity), speed (air freight for perishables or products in urgent demand, etc.), and cost. Air carriers are more expensive, but there may be a financial benefit with reduced packaging, documentation, and inventory requirements. It is crucial to agree on the goods' final destination with the importer because the latter may want the items to be shipped to a free-trade zone where they can be exempt from import duties while the goods are in the zone.

6.2 Transport

Transport or transportation is the movement of goods from one location to another location. The term is derived from the Latin word’s trans ("across") and portare ("to carry").

6.2.1 Functions of Transport

1. Transportation helps to grow industries whose products require timely marketing. Perishable goods like fish and green vegetables are shipped to various consumers quickly, even in distant markets, through transport.

2. Transportation contributes to rising demand for goods. Via transportation, it is simple to reach out to newer customers in newer locations and introduce them to items. Today's markets have only expanded globally or locally because of transportation.

3. Transportation creates awareness for the utility of a place. The industry is obliged by geographical and climatic conditions to be located in certain places, away from markets and places where there may be no demand for products. The gap between production and consumption centers is filled by transportation.

4. Transportation creates awareness for the utility of time. This has been made possible due to improvements in the transportation speed. It enables the fastest shipment of goods.

5. Transportation helps in price stabilization. Transportation moves goods from surplus to deficit areas, which has a significant impact on the stabilization of the prices of several

commodities. As a result, demand and supply are balanced, resulting in stable and equal commodity prices.

6. Transportation ensures even flow of goods into the hands of the consumers during the whole period of consumption.

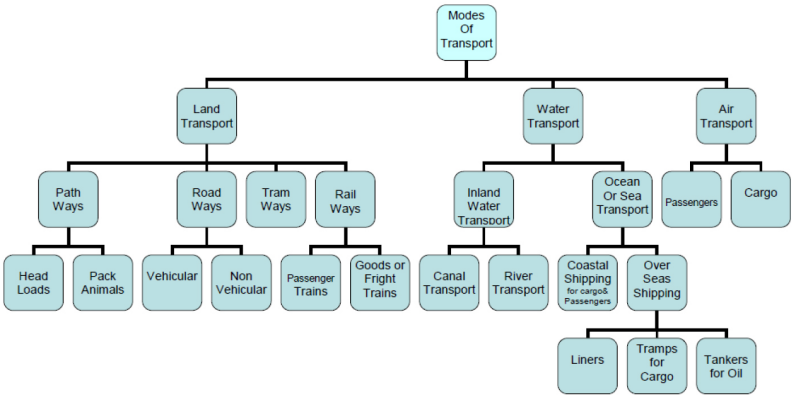
7. Transportation allows consumers to enjoy the benefits of non-locally produced goods. This raises the standard of living and is an important factor in the further development of the market and economy.

8. Transportation fosters competition, which lowers prices. The facilities offered by transport for large-scale production also led to lower prices. Advantages of large-scale production are also made possible because of transportation.

9. Transport increases mobility of labor and capital. It enables people to relocate from one location to another in search of employment. Even capital, machinery and equipment are imported from overseas countries by transport.

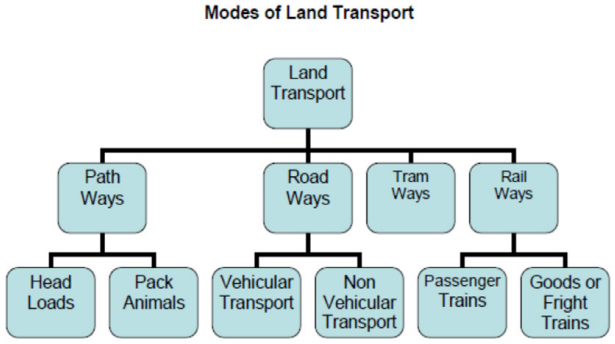
6.3 Means of Transport

The means of transport are classified as below



6.3.1 Land Transport

Land Transport may be classified as:



- **Pathways**

Pathways are still among the most significant routes of transportation in remote areas, forests, and mountainous regions. Head loads are a further division of these (also known as human transport). They are used in hilly regions (where even animals can't travel) and with pack animals (also known as animal transport). They are used in the underdeveloped areas. For this, animals like horses, ponies, donkeys, buffaloes, camels, elephants, yaks, and sheep are used.

• **Roadways**

One of the most significant modes of transportation is road transport. Road transportation has a long history that begins with ancient human civilizations. Soon it became one of the most popular means of transport. Vehicle transport (cars, trucks, buses, lorries, autorickshaws, bullock carts, tonga, tumtums, and other similar road vehicles) and non-vehicular transport are additional subdivisions of road transportation (Hamals, Animals like Camel, Dogs, Elephant, Horse, Mules etc.) Pathways, roads, vehicular, non-vehicular, and head loads are all different types of road transportation.

• **Tramways**

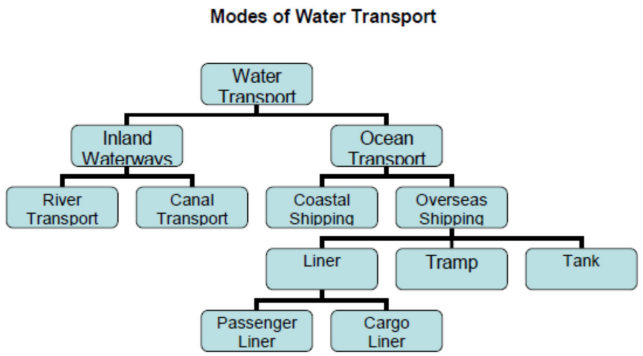
One of the most affordable, more convenient, faster, and safe ways of land transportation that is suitable for big cities is the tramway. Unfortunately, it was replaced by other forms of land transportation due to a number of limitations, including slowness, huge investment, inflexibility, etc.

• **Railways**

Railway has been one of the first means of transport of modern mechanical transportation. It has brought in the biggest revolution in transportation. It accelerated the commercial and economic development of many countries. Even before the invention of motorized transportation, railways dominated the land transportation industry. It is the main mode of transportation in India. More than 80% of goods traffic and more than 70% of passenger traffic are transported through railways.

6.3.2 Water transport

Water transport is the cheapest and the conventional method of transport for heavy and bulk shipment. Waterways are a natural gift, therefore unlike land transportation, they do not require large amounts of capital expenditure for the development of road and railway tracks, with the exception of canal transportation. Also, running costs are extremely low for waterways.



A. Inland Waterways

Inland waterways may be subdivided into

• River Transportation: Rivers are the natural waterways. Small boats and steamers are suitable for river transportation. In the days before railways, it was highly developed. But, as railways developed, river transportation declined and gradually decayed.

• Canal Transportation: Canals are man-made waterways built for irrigation and navigation.

B. Ocean Transport

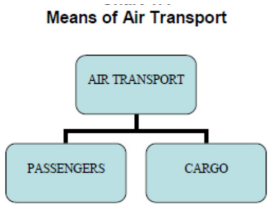
Ocean Transport or shipping may be subdivided into

• **Coastal Shipping:** Coastal shipping is a more affordable, quick, flexible, and efficient mode of transportation for the moving of large and heavy shipments. Coastal shipping is mostly only used for national shipping. Since 1951, only national ships have usually engaged in coastal shipping trade in India.

• **Overseas Shipping:** Ocean ship can be divided according to their operation: Liner (ships that follow predefined routes with fixed destinations and definite times), Tramp (ships that have no set routes or fixed times), and Oil Tanker (special sea carriers of crude oil in very large quantities). Passenger Liners and Cargo Liners are two further categories into which the Liners can be classified.

6.3.3 Air Transport

Air transport is the gift of the twentieth century to the world. It is also the newest means of transportation. Since the first air service in 1919 between London and Paris. It has made significant progress and provided severe competition to the railways. Air traffic can again be divided into passenger and cargo traffic. Cargo planes are completely built for the transport of commodities and passenger flights typically carry passengers with little luggage carried in the hold.



7. Containerization

7.1 Container Shipping

Container shipping is differs from conventional shipping, because it uses containers of several standard sizes, including 20 foot (6.09 m), 40 foot (12.18 m), 45 foot (13.7 m), 48 foot (14.6 m), and 53 foot (16.15 m), to load the cargo, transport, and unload the cargo. As a result, containers can be carried smoothly between ships, trucks, and trains. The 20-foot and 40-foot lengths are currently the most significant and common sizes. The 20-foot and 40-foot lengths are currently the most significant and common sizes. The 20-foot container, also known as a Twenty-foot Equivalent Unit (TEU), was adopted as the industry standard reference and is now commonly used to measure cargo volume and vessel capacity. The Forty-foot Equivalent Unit (FEU), or 40-foot length container—literally 2 TEU—is the most widely used container in use today.

Container sizes must be standardized so that containers can be stacked most efficiently - literally on top of each other, so that ships, trains, trucks and cranes in ports are specially matched or built to a single size specification. This standardization now applies across the global industry, as the International Organization for Standardization (ISO) has already set standard sizes for all containers.

Shipping containers are available in several types, in addition to the standard dry cargo container, often referred to as special equipment. These special containers include open end, open side, open top, half-height, flat rack, refrigerated (known as reefer), liquid bulk (tank) and modular, all built in the same dimensions as the standard dry cargo containers. Open tops are used to enable loading of cargo, such as odd-sized items, machinery, and logs, easier. Boats, automobiles, industrial equipment, and machinery can all be transported on flat racks. Open sides may be used for transporting vegetable items. Several different liquids, including chemicals, wine, and vegetable oil, are transported in tank containers. Every container has a special unit number, commonly referred to as a "box number," that can be used by ship captains, crews, coastguards, dock supervisors, customs officers, and warehouse managers to determine who is the owner of the container, who is using the container to ship goods, and even to track the location of the container anywhere in the world.

Open side

Open top

Tank

Flatrack

7.2 Dry Cargo Container

Although container sizes and structural designs are standardized, variations in units may exist within each size and type category and depending on the owner or operator of the container. Two 40-foot dry cargo containers, for instance, might appear to be similar on the outside but have different cargo handling capacities on the inside depending on whether one was built to handle general cargo loaded onto pallets and the other to handle clothes on hangers that could be easily unloaded and placed right on the sales floor of clothing store.

7.3 Refrigerated Containers

Special refrigerated containers, commonly called reefers, are temperature-controlled and can transport everything from meat, fruit, vegetables and dairy to chemicals and pharmaceuticals around the world.

Refrigerated Container

Although cryogenics might seem like a futuristic technology, reefer containers already come quite close. Products can be kept frozen at temperatures as low as -60 degrees Celsius in special super-freeze reefers. Also, if necessary, alternative reefers can keep items at warmer temperatures. Reefer container interiors have the ideal humidity with dehumidification systems. Some reefers also allow you to control the atmosphere inside the container. For example, fruits or vegetables can be shipped between continents without getting rotten. Even fresh flowers may be transported far and stay fresh for several days in reefer containers. Grocery stores can stock and sell a wide variety of fresh vegetables all year round thanks to reefer containers.

Reefer containers commonly come in lengths of 20 feet and 40 feet, having the same general dimensions as dry cargo containers of a similar size. Due to the refrigeration unit and ventilation equipment using up space inside the reefer container, there is, however, slightly less accessible cargo capacity.

8. Air Cargo

8.1 Introduction

An important factor in a country's economic development is air cargo logistics. The main participants in the whole air cargo supply chain are airlines, air cargo terminal operators, ground handling service providers, integrated express service providers, forwarders, domestic cargo transport service providers, and custom house agents. In order to transfer goods more quickly and effectively, both domestically and globally, a wide range of service providers are

joining forces in the air cargo market. These business entities in the air cargo transportation sector then interact with various cross-border regulatory agencies, the most important among them being the Customs establishment. Faster services in the Air Cargo supply chain enable many different business organizations to boost their performance. Since air cargo accounts for more than one-third of all international trade in goods, it is seen as a good indicator of Global Economic Health.

8.2 Air Cargo Logistics Operations

Airlines, customs, ground services, air cargo forwarders, brokers, domestic transportation, air cargo terminals, distribution centers, and integrated international express services are all part of the air cargo industry's industrial supply chain. Air cargo facilities are particularly important in the air cargo supply chain. Three primary users often use an air cargo terminal: airlines, air cargo terminal operators, and forwarders/cargo agents who are the principal contributors to the revenue of air cargo terminals.

Demand for air freight is limited by cost, which is typically 4-5 times higher than road freight and 12-16 times higher than sea freight. These values vary from country to country, season to season, product to product, and for various volumes as well. As a result, air freight includes items like documents, pharmaceuticals, clothing, production samples, consumer electronics, perishable produce, and seafood that must be delivered quickly or that have high unit costs. Also, they contain some inputs for just-in-time manufacturing and emergency spare parts shipments. There is a natural progression from passenger aircraft to chartered cargo planes of increasing size and ultimately to scheduled cargo services as the volume of air freight increases.

8.3 Stakeholders

It is important to understand the business models and different processes of the different companies involved in the overall air cargo business as it is not the same for everyone involved in the air cargo/express delivery services industry in India. The international air cargo industry deals with the movement of cargo on international flights, both for imports into and exports from India. The domestic air cargo industry focuses on delivering cargo via domestic planes that operate within the country. Within that, there are two variations: one uses specialized freighter aircraft, while the other uses passenger flights to transport cargo through the aircraft's belly.

In contrast to the more traditional General air Cargo services, Express Delivery Services have recently emerged as a key product. When provided via scheduled passenger flights, express delivery services are referred to as Air Express operators. Domestic and international express airlines that operate dedicated freighters have their own particular needs depending on customer demand, growth in handled volumes, etc.

While air carriers receive the majority of attention in the traditional model of the international air cargo industry, freight forwarders and other related services play crucial roles in the growth of air cargo operations. As well as handling customs agency and other critical functions on behalf of shippers, goods forwarders frequently supplement or completely replace the carrier's own in-country sales operations in developing countries.

8.4 Express Delivery Services

The main factors influencing the growth of Express Delivery Services are the globalization of business transactions, the transition to just-in-time manufacturing and inventory control techniques, as well as the expanding demand for industries of all types to send goods quickly by air to far-off customers. The Air Express industry worldwide is both domestic and international. The main features of the air express industry are speed of service, door-to-door delivery (including satisfying all cross-border regulatory requirements), tracking systems, proof of delivery, security and reliability, and access to global connectivity for their customers.

8.5 Air Cargo Rates

The rates which cover the transportation of air cargo between airports of departure and airport of destination is Air Cargo Rate. It is the sum charged by the carrier for the shipment's transportation by a particular unit of weight (kg or lbs.).

8.5.1 Determinants of air cargo rates

The distance to the point of destination, the weight, and the dimensions of the consignment all have a significant role in determining air cargo rates. Freight charges are also influenced by the nature of the goods (commodity description) and the availability of any specialized services. A cheaper cost is applicable if a product is categorized as general cargo (frequently shipped goods). Moreover, goods can be categorized under a particular unit load or a commodity rate (for exports in approved containers) (negotiated rates for merchandise, not classified as general cargo). The cost of special services like charter flights or rapid transportation may significantly rise.

8.5.2 Rate setting

The International Air Transport Association (IATA) serves as the forum where member airlines negotiate tariffs and rates. Such tariffs and rates have recently been determined by the market, and tariff conference proposals have tended to become reference points. IATA's service conferences encourage members to negotiate specific practices for handling cargo, documenting processes, shipping hazardous materials, etc.

8.5.3 International air express services (the integrators)

The integrated air service providers, like Federal Express or UPS, are putting increasing competitive pressure on the major carriers. The integrators have the added benefit of offering direct delivery services to consumers, including customs clearance and payment of import fees at foreign locations, in addition to providing airport-to-airport service like the traditional carriers do. Integrators have always engaged in moving smaller cargo, but they are now providing services for heavy-duty cargo.

9. Multimodal Transportation

A combination of several shipment methods, such as a truck, rail, ocean, or air, is known as multimodal transportation. Bills of lading are used for all goods transfers in multimodal

shipping. It is a process for moving goods using at least two different means of transportation as part of a single contract. The full cost of the carriage is imposed on the carrier. By using a globally standardized transport unit, containers ultimately made it possible to use multimodal transport for most types of general cargo.

10. Role of Intermediaries in International Logistics

Logistics service providers play an important role in the business success of companies engaged in domestic and international trade. They are important for assisting businesses that are directly engaged in buying and selling in international trade and gain competitive advantages. The main objective of engaging a logistics intermediary such as Logistics service providers is to facilitate the organizational operations that deal with purchasing and selling on an international level for the purpose of organizing the shipment and/or delivery of goods. Due to the increasing complexity of business processes and companies involved in international trade, logistics intermediaries on the other hand are qualified to lead certain areas of business operations. Logistics intermediaries come in many forms and names, but they all have the similar goal to assist businesses in transporting, storing, shipping and distributing goods from sellers to buyers or end-users for a specific fee.

10.1 Characteristics of Intermediaries in International Logistics

A person or company acting as a middleman between various parties in order to achieve certain business deals is known as an intermediary. Most commonly, among the different logistics functions, intermediaries specialize in one specific area. It should be noted that over time, the terms used to describe this concept have changed; for example, these intermediaries have also been referred to as middlemen or facilitators. Facilitators perform several tasks and aim to increase the logistics process' overall efficiency.

10.2 The Concept of Intermediaries

Logistics intermediates are organizations that plan the transportation, warehousing, shipping, and distribution of goods and services from the producers to the ultimate customers on behalf of the companies. Logistics Service Providers (LSPs) increase the value of a company's products. They have the expertise to conduct shipping services, thus avoiding any risks. Because they dispose of all pertinent information, LSPs play a significant role in the company's supply chain. Companies must have confidence in their expertise. After introducing the terms "middlemen" and "service providers," we can distinguish between various intermediaries.

10.3 Logistics Intermediaries in International Logistics

Intermediaries involved in the logistics process of international trade are critical links in the supply chain. The intermediaries in International Logistics are international freight forwarders, third-party logistics, fourth-party logistics.

10.3.1 International Freight Forwarders

One of the most common types of intermediaries and an important link in global trade are international freight forwarders. International trade and transportation could not run as efficiently without a system of international freight forwarding. International freight forwarding is important because it plays a role in the exchange and distribution of goods, linking demand and supply as well as production and consumption.

As they offer a wide range of services, which makes them very complicated to fully define. A freight forwarder is an intermediary that organizes the movement of goods and provides other related services along the chain of transportation and logistics operations. By figuring out ways to handle the biggest complexities in international shipments and combining many small shipments into one large shipment, they save their clients time and money. From the selection of the mode of transport, the route, the payments, international shipping requirements and documentation, they actually take care of everything. International freight forwarders are involved in day-to-day logistics and freight forwarding operations and their importance is negligible. The main responsibility of a global freight forwarder is to relieve its client of the efforts and difficulties associated with the shipping, transport, and shipment of goods in international trade.

10.3.2 Third-Party Logistics

Third-party logistics (3PL) mostly handles basic logistical activities and can be very helpful when developing a client's supply chain. 3PLs are incorporated into the client's business in this way. In order to assist businesses from all sectors to save costs, focus on their key differentiating activities, and consequently, to enable them to reach higher levels of performance, 3PLs are becoming increasingly important on a global scale. As a result, 3PLs are currently the form of intermediary that is most frequently used.

Carriers, logistics intermediary companies, and other service providers are coordinated by third-party logistics service providers. These service providers act as an intermediary between the buyer and the seller, providing transportation and warehousing services as well as other tasks like consolidation and deconsolidation, cross-docking, picking and packing, custom clearance, track and trace data, insurance services, payment services, tendering and contracting carriers, and forwarding services. While not completely, 3PLs perform duties that are similar to those of freight forwarders.

10.3.3 Fourth-Party Logistics

It might seem that there are little differences between third-party and fourth-party logistics providers. Contrary, there are several differences between them. It is frequently claimed that 4PLs are superior to 3PLs. 3PLs are mainly in charge of the logistical operations and activities, on the other hand 4PLs are also responsible for the development and maintenance of all logistics projects. The same duties of 3PLs are carried out by 4PLs, but in a more strategic way. They are primarily focused with maintenance and are regarded as asset-free logistics middlemen who provide expertise for the development and control of complex logistical systems, including logistics consulting and the coordination of information infrastructure, transportation, logistics, and financial matters. The services of 4PLs include inventory planning and management, inbound, outbound, and reverse logistics, network analysis and design, consultancy, business planning, change management, and project management. They also include coordinating a large supplier base across many modes of transportation and geographic locations.

11. Customs Clearance

Another aspect of international trade is the process that importers must follow when bringing goods into a country. Customs officials, the government body in charge of collecting import duties and enforcing rules and regulations on what may and may not be admitted into the country, establish guidelines for this process. Generally speaking, clearing customs is a complex process that is full of risks and paperwork. Most countries do not want to import goods and act accordingly if there are any exceptions.

11.1 Duty

Duty is the tax that an importer must pay while bringing the goods into a country. Such duty is calculated in several different ways, typically based upon three factors:

1. The type of imported goods, which is determined in accordance with several rules of classification that are essentially standardized globally.

2. The value of the imported goods, which is determined not only by the invoice value but also in accordance with a number of valuation rules that differ from country to country.

3. The country from which the goods are imported; this choice is made in accordance with the rules of origin, a process that has lately been made simpler but is still quite time-consuming for manufactured goods with components made in multiple countries.

Customs calculates the import tariff, or the tax that the importer must pay on the imported goods, based on these three elements. The tariff is generally a percentage of the value of the goods, but it can also be calculated in other methods, such as depending on the quantity of units shipped or their weight.

11.1.1 Classification (HSN)

The classification of goods follows the same code system all over the world. This is because most countries have adopted the Harmonized Commodity Description and Coding System, also known as the Harmonized System "HS". Classification – formed by the Customs Cooperation Council (also known as the World Customs Organization [WCO]). The Harmonized System is used by 183 countries, representing more than 98% of world trade, to classify both exports and imports. The fact that traders can use the same code when exporting products from one country and importing products into another greatly simplifies the process. In the past, almost every country had its own classification and coding system, which made coding cumbersome. Each product may have a code that uses up to ten digits, as per the Harmonized Commodity Description and Coding System.

The proper classification of an imported good is often determined by the importer and then verified by the customs office, however each country has different standards, and a few places the full classification responsibility on customs. In any case, the commercial invoice must include a complete and accurate description of the goods rather than just a part or item

number. When in doubt, customs officials may request to see the product before releasing it, and this inspection might cause delays.

11.1.2 Valuation

Since most duties are collected ad valorem (on the value of the goods imported into a country), the importer must determine a correct valuation amount by following several valuation rules set forth by the Customs Office of the country in which the goods are imported. The valuation of goods is based on the transaction value of the sale for all member countries of the World Trade Organization (WTO). Hence, the value mentioned on the invoice that the exporter presented to the importer must be the starting point for the valuation of the goods.

The value used in most countries is the "landed" value, also known as the CIF/CIP value of the goods, which is the invoice value plus packaging costs, international transportation costs to the country of destination, domestic transportation costs, and international insurance costs. The FCA or FAS value, which is the invoice value of the goods plus any packaging and transportation expenses incurred in the exporting nation but excluding the costs of international shipping and insurance, is the value used for all other countries.

11.1.3 Rules of Origin

Rules of origin are the criteria required to identify a product's national source. Their importance comes from the fact that duties and other limitations in several instances depend on the source of imports.

Rules of origin are used to define any aspect of commercial law or policy that treats goods differently based on the country of origin. For instance, quotas, countervailing duties, and antidumping laws limit the importation of commodities from specific producing countries of the world. In comparison to exports from countries that do not qualify for most-favored-nation treatment, goods exported by WTO members often face less import restrictions than other WTO members. The products of member countries are exempt from various requirements under many bilateral and regional trade agreements. In every one of these situations, rules of origin are required since it is impossible to determine the identity of the producing country at the point of entry.

11.1.4 Tariffs

Most countries have limited natural resources and their ability to produce certain goods is also limited. To meet the needs and wants of their population, they engage in trade with other countries. Trading partners don't always conduct business in a pleasant way. Trading partners may get unsatisfied due to policies, geopolitics, competitiveness, and many other issues. Tariffs are one tool used by governments to interact with trading partners with whom they disagree. A tariff is a charge that one government imposes on the imports of goods and services from another country in an effort to influence it, generate revenue, or safeguard competitive advantages.

11.1.5 Dumping

Dumping generally involves situations of international price discrimination in which a product's price in the market of the importing country is lower than its price in the market of the exporting country. As a result, the simplest way to recognise dumping is to compare the prices in two markets.

Dumping happens when a country or company exports a good at a cost that is less expensive in the foreign market than it is in the exporter's domestic market. The ability to flood a market with goods at prices that are frequently considered to be unfair is the significant advantage of dumping. According to World Trade Organization (WTO) regulations, dumping is permitted unless the foreign country can clearly show the damage the exporting company has caused to its domestic producers. To prevent negative effects of dumping on domestic producers, countries use tariffs and quotas.

11.1.6 Goods and Services Tax (GST)

Under the GST regime, the importation of goods and services into Indian territory is treated as a supply of goods or services in interstate trade and is subject to IGST tax. The GST on imports will therefore be treated as deemed inter-state supplies and be liable for GST. According to the GST Act, importing goods simply means bringing them into India from abroad. The GST Act treats all imports into India as interstate and subject to IGST as a result. The import would be subject to customs duties in addition to the IGST. As a result, the IGST would be added to the value of the products upon importation into India and collected along with Customs Duty.

In anticipation of the implementation of the GST, the Customs Tariff Act of 1975 has already been modified to include provisions for the imposition of an integrated tax and a compensatory cess on imported goods. In addition to the Basic Customs Duty, the Goods and Services Tax (Compensation to States) Cess Act of 2017 mandates that some luxury and depreciable goods be subject to a GST Compensation Cess. To categorize commodities under the GST system, the HSN (Harmonized System of Nomenclature) code has been used. As a result, the classification of the item for IGST calculation and Customs Duty purposes would be consistent.

11.2 Customs Clearing Process

India's imports and exports surged after trade barriers were lifted. To improve the numbers through liberalization and economic reforms, the Foreign Exchange Regulations Act of 1973 was abolished and replaced with the Foreign Exchange Management Act of 1999. As a result, there was an urgent need for customs clearance services in the country as shipments continued to grow.

Generally, licensing and compliance are required before shipment when importing goods and services. As required by law, all goods imported to India are inspected, valued, assessed, and evaluated at customs to establish the appropriate tax and ensure that no illegal goods are being brought into the country.

11.3 Brief Introduction to Customs Clearance Services in India

In India, customs clearance is a difficult and time-consuming process. Most of the customs clearance documents are the same, but some documents may vary or be added depending on

the type of goods being imported. Customs clearance process includes notifying customers of the acquisition, preparation, submission, customs inspection, evaluation, and payment of necessary documents to facilitate export formalities and import into the country; including bringing it to documentation.

Customs clearance process is needed in the following cases:

- Wherever the goods are loaded for exports
- Seaport and Airport
- International courier services in Airports
- Wherever the goods are unloaded for the importation
- Coastal ports
- Land and Sea customs stations
- Those locations which have inland importation of the goods

11.4 Import Customs Clearance Process

When importing from India, all manufacturers, investors, and companies are required to go through the import customs clearance process. To import their goods, specific guidelines must be followed. Here are some important steps to take:

11.4.1 Calling of vessels

If the goods arrive in a country, whoever is responsible for carrying the vessels must see to it that the ships are called at the customs port. Thus, the pilot is in charge of calling the ships at the sea port if the goods are imported via vessel. The importer is not required to get involved in this process.

11.4.2 IGM (Filing Import General Manifest)

Before the goods arrive or reach their destination, the transporter of the goods or his agent must complete the IGM (Import General Manifest) filing procedures, which can be done electronically. All the information about the goods that the ship imported is detailed in this file.

11.4.3 Operations on post verification

The customs officials will approve the goods for entry after reviewing the IGM (Import General Manifest) and post-verification of the documents. They will assign an IGM number to the manifest and allow the master to get the vessel to this land and unload the cargo. The goods will remain to be in the Custodian's possession once the vessel arrives until it has completed the entire customs procedure. A custodian can be a person who will be given the go-ahead for this entire procedure by the Principal Commissioner or the Commissioner of Customs. If imported goods fulfill particular criteria, they may be unloaded.

11.4.4 Bill of Entry

When importing goods, importers or customs clearance agents must file a bill of entry, which is a legal document. As part of the customs clearance process, it is forwarded to the Customs

department. It is important to remember that when an importer fills out the Bill of Entry and provides information, the importer must certify the correctness of the information in the form of a declaration that can be made at the bottom of the Bill of Entry. But, if the importer makes an incorrect or insufficient declaration, it could have legal consequences. So, the importer must take all necessary precautions while signing and mentioning all relevant information and declarations.

Under the Electronic Data Interchange system, the importer/consignee should not submit documents as such for assessment but has to submit its declarations in electronic format as it contains all the required information. A checklist is then prepared for the verifying of the information given by the importer. The data is then provided to the SCO (Service Center Operator) system after the verification process. The B/E Number is then generated by the system. This number will be on the printed checklist and returned to the importer. No such original documents are obtained/requested at this stage. The original will be taken only during the inspection period. The importer also signs the final documents after import clearance.

11.4.5 Assessment

The customs value appraising officer must then confirm that the commodities being imported are those that the importer claimed in the submitted documentation. Customs assessing officers have the authority to order a full inspection of all imported items if necessary. In these situations, all the individual parts and packets of the goods are delivered to the customs bonded area, where an in-depth inspection of imported goods is arranged. The assigned inspection team of customs is required to send a report on such a 100% inspection to the assessing officer of customs after checking. The customs appraiser sets the rate of duty on imported goods, if applicable, after the completion of the aforementioned assessment procedures. Once the classification of imported goods has been determined, the Customs Tariffs software system is used to electronically reflect the rate of import duty.

11.4.6 EDI Assessment

In an EDI assessment of a bill of entry, the assessing officer receives the cargo declaration and will review it. If necessary, the EDI system also offers information on duty calculation, which automatically takes into account the relevant exchange rate. After the assessment is over, a copy of the assessed Bill of entry and all the other supporting documents are reviewed at the time goods are being inspected. And the system-calculated duty must be paid by the importer.

11.4.7 Examination of goods

All the imported goods are inspected to verify the correctness of the description given in the Bill of entry. However, a portion of the shipment is chosen and randomly examined. Also, the goods will be examined before being assessed if the importer does not have all the necessary information. The goods must be checked before being assessed at the time of importation or even if the assistant commissioner or appraiser for customs asks for it. The appraiser inspects the goods according to the inspection order and records the approval.

11.4.8 Green Channel facility

Some major importers have been given access to green channel clearance facilities. Simple words, it indicates that the clearance process for goods is carried out without routine inspection. When the Bill of Entry is filed, a declaration is made in the declaration form. The appraisement usually follows normal procedures, but no physical inspection of the goods is performed. Just marks and numbers are to be checked in these cases. There are a few exceptional cases. The senior officers or investigative wing-like SIIB may require a physical examination if certain issues about the nature or quantity of the goods come up

11.4.9 Payment of duty

The duty can be easily paid either in the specified banks or via TR-6 challans. Several Custom Houses have given certain banks authorization to accept duty payments. Before importers deposit the duty, it is crucial to verify the bank's name and the location of its branch. The bank approves the challan's payment details prior to submitting it to customs. If there are no such discrepancies when goods are examined, an “Out of Charge” order is given and the goods can be cleared.

11.5 Documents Required for Import Customs Clearance Process

The below mentioned documents are required for the Customs Clearance:

- Bill Of Entry
- Airway Bill (Air Mode) / Bill of Lading (Sea Mode)
- Commercial Invoice
- License related to Import
- Insurance certificate
- Purchase order/ Letter of Credit
- Technical write-up, literature for some specific goods like instruments, machinery etc.
- Information on the Goods or test report of goods (If required)
- Central Excise Duty document (If Any)
- Industrial License (If Any)
- Import Export and Registration cum Membership Certificate
- DEEC (Duty Exemption Entitlement Certificate)/DEPB /ECGC or any other documents for duty benefits
- DGFT/GATT Declaration

12. Warehouse Management

The majority of modern supply networks depend heavily on their warehouses. The handling of raw materials, work-in-progress, and finished goods are all stages in the sourcing, production, and distribution of goods in which they are likely to be involved. As a delivery point, serving the next customer in the chain, it is critical to providing a high level of customer service. Warehouses are an integral part of the supply chains in which they operate and therefore current trends such as increased market volatility, diversification of product ranges and shortening customer lead times all have an effect on the functions that warehouses are expected to carry out. The nature of warehouses within a supply chain can vary widely and there are different types of classifications that can be adopted, for example:

• **By the stage in the supply chain:** raw materials, work-in-progress or finished goods.

• **By geographic area:** a parts warehouse might serve the entire world, a regional warehouse would serve many nations, a national warehouse might serve only one nation, and a local warehouse might serve a particular region of a nation.

• **By product type:** small parts and accessories, large assemblies (e.g. car bodies), frozen food items, perishables goods, security items and dangerous/hazardous material.

• **By function:** inventory holding or sortation (e.g. hub of a parcel carrier).

• **By ownership:** owned by a third-party logistics company or by the user (such as the manufacturer or retailer).

12.1 The Role of Warehouses

The main objective of the warehouses is to facilitate movement of the goods through the supply chain to the final consumer. Express delivery, flexible manufacturing systems, and supply chain visibility are just a few of the techniques used to reduce the need for holding inventory. Many of these techniques have been incorporated into a number of supply chain initiatives, such as Just-in-Time (JIT), Efficient Consumer Response (ECR), and Collaborative Planning, Forecasting, and Replenishment (CPFR). However, holding inventory is often necessary as a part of this movement, particularly when the following two conditions exist:

12.1.1 The product is in constant demand

In industries, like fashion, a particular style might be manufactured only once. In these situations, there is no need to hold inventory in warehouses because the products can be "pushed" through the supply chain to the locations where they are sold. Yet, because most goods are continuously available for sale, they must be "pulled" through the supply chain in response to the customer demand.

12.1.2 The supply lead time is longer than the demand lead time

Where goods are ‘pulled’ through the supply chain, this can only be achieved without inventory, where the supply can take place within the lead time offered to the consumer. For instance, if goods are offered to clients with next-day delivery, it is often not possible to source the raw materials, or manufacture the product, or transport the product within this period. In this case, raw materials or goods must be used from the inventory. Hence, inventory is often beneficial to smooth variations between supply and demand. However, even after taking in the full cost of inventory, it might still be more economical to store inventory in order to reduce cost elsewhere in the supply chain.

12.2 Warehouse Operations

Every warehouse should be designed to specifically fulfill the needs of the supply chain it is a part of. However, the most warehouse operations performed are common. These tend to apply depending on whether a warehouse is manual in nature, uses fairly basic equipment, or

is fully automated with complex storage and handling systems. The following are the functions:

12.2.1 Receiving

This typically involves physically unloading of incoming goods, ensuring that all purchase orders are being followed, and recording the incoming goods into the computer system. It may also involve tasks like unpacking and repackaging in a manner suitable for the operations that will occur in the warehouse. This activity may include carrying out quality control checks. The goods are then stored in the warehouse after this.

12.2.2 Reserve Storage

The largest space available in many warehouses is the reserve or back-up storage area, where goods are usually placed. The majority of the warehouse inventory is stored here in easily accessible areas. When required, the items are taken from reserve storage and either sent directly to marshaling (for instance, if a customer requests a complete pallet) or used to restock a picking station.

12.2.3 Order Picking

Goods must be retrieved from the warehouse in the correct quantity and immediately after a customer order is received in order to meet the required service level. A typical order will have several order lines, each requesting a specific quantity of an individual product line. The reserve storage area can be easily accessed if the order line is for a full unit load, such as a pallet. However, the goods will often be picked up from the picking location if the order line is for less than a unit load, such as a few cases or items. If a warehouse only holds small quantities of a given commodity, reserve and picking stock may be combined, and goods may be picked from this consolidated area. Order picking is an important warehousing operation from both a cost and service perspective. This function typically requires a large portion of your warehouse staff and is essential to achieving a high level of order accuracy.

12.2.4 Sortation

It is sometimes appropriate to group many orders together for picking purposes and treat them as one order for small order quantities. In this case, the picked batch must be sorted into individual orders before being shipped.

12.2.5 Collation and Added Value Services

Goods must be assembled into complete customer orders that are ready for shipment. Unless the goods are picked directly into shipping containers (e.g., direct roll containers or boxes), these are assembled after picking or packed together. The goods might be delivered to a packaging station, for instance, where they would be placed inside of a carton. To prepare for transit, these could then be stretch- or shrink-wrapped onto a wooden pallet. This process might involve final production postponement activities and value-added services, such as kitting and labeling.

12.2.6 Marshaling and Dispatch

In the dispatch area, goods are gathered into vehicle loads before being loaded into outbound vehicles for further dispatch to the next "node" in the supply chain (for example, to a trans-shipment depot or to a freight forwarders depot for group aging/consolidation).

13. Logistics Activities

Logistics manager could be responsible for following activities:

- Transportation
- Warehousing and Storage
- Industrial Packaging
- Materials Handling
- Inventory Control
- Order Fulfillment
- Inventory Forecasting
- Production Planning and Scheduling
- Procurement
- Customer Service
- Facility Location
- Other Activities

The list is extensive, and some companies with established logistics departments might not assign responsibility for all of these activities to the logistics department. When changes are made to one or more of the aforementioned activities, decisions about these activities have an influence on overall logistics expenses and require input from logistics managers to analyze the costs and benefits.

13.1 Transportation

Transportation is very important component in a logistics activity and is usually the largest variable logistics cost. The actual movement or flow of goods in the network that carries raw materials and finished goods is a major focus in logistics and supply chains. The network is usually made up of transportation companies and businesses that provide similar services, such as 3PLs. To transport raw materials, components, and finished goods, importers analyze, select, and use them. If not, a private fleet is required. Transport provides the physical connection between the many companies in a supply chain, making it clear that transportation is a key component of supply chains.

13.2 Warehousing and Storage

Storage is a second aspect of logistics that is in a trade-off relationship with transportation. Inventory management and warehousing are two distinct but related activities that are involved in storage. Transportation directly impacts the quantity of goods and the number of warehouses required. For instance, firms would often keep higher inventory levels and require more storage space for products if they use a somewhat slow mode of transportation. An excellent example of such a situation would be global transportation in a container ship.

To reduce the cost of warehouse space and inventory, a company can consider using a quicker, more expensive means of delivery like air service. The costs of the tradeoffs would need to be evaluated. Generally, the higher the value of goods, the more significant the cost of inventory and storage.

13.3 Industrial Packaging

Industrial (exterior) packaging is a third aspect in logistics. Stretch wrap, banding, bags, and other materials are used in industrial packaging to safeguard goods during transportation and storage. For instance, because there is a greater risk of damage during transit, shipping via rail or sea usually requires higher packaging costs. Logistics managers usually evaluate how the changes may affect packing costs when considering tradeoffs for proposed changes in transportation modes. In many cases, moving to a more premium form of transportation, like air, will lower packaging costs because there is less chance of goods being damaged.

13.4 Materials Handling

Materials handling is a fourth area that should be taken into account because it may be relevant to other functions in a typical manufacturing company. Because logistics companies are concerned about the movement of goods into a warehouse from a transportation vehicle, the placement of goods in a warehouse, the movement of goods from storage to order-picking areas, and eventually the movement of goods to dock areas for transportation out of the warehouse, materials handling is essential to consider in warehouse design and warehouse operations.

For such short-distance warehouse movement, materials handling equipment is generally used, and this includes equipment like conveyors, forklift trucks, overhead cranes, and automated storage and retrieval systems (ASRS). Due to the rapid technological advances including robots and automated retrieval systems, materials handling has evolved as one of logistics' most dynamic areas during the recent decade. Moreover, the emphasis on timely product delivery has increased automation in storage facilities. For instance, it is important to coordinate materials handling designs with manufacturing to ensure compatibility between the equipment utilized and the storage devices are moving.

13.5 Inventory Control

Inventory control, the fifth area to look at, includes two aspects: ensuring proper inventory levels for manufacturing and order fulfillment, and ensuring inventory correctness. Monitoring current inventory levels and executing the appropriate replenishment orders from manufacturing or suppliers to avoid stockouts are necessary to ensure adequate inventory levels. Another dimension of inventory control is certifying accuracy of inventory.

A facility's information system monitors the status of current inventory levels as inventory is being used up to fulfill customer orders in order to replace stock and minimize stockouts. Cycle counts are regularly done on selected items at regular intervals throughout the year to ensure that the actual physical inventory levels match those reflected in the information system. This process is now more effective and efficient because of the use of RFID tags and barcodes. Also, there has been a greater focus on using technology to improve supply chain inventory visibility. Inventory visibility that is effective can minimize uncertainty, lower inventory costs, and enhance customer service.

13.6 Order Fulfillment

The activities involved in processing and shipping customer orders are referred to as order fulfillment. Order fulfillment is crucial since it has an immediate impact on how long it takes for a customer to get their order after placing an order. This could also be known as the order lead time. Order transmittal, order processing, order preparation, and order delivery are the four basic activities or activities of order fulfillment or lead time.

13.7 Inventory Forecasting

Demand forecasting is another important task. To satisfy customer demands and inventory needs for efficient manufacturing, reliable forecasting is crucial. To ensure that the right inventory levels are maintained to meet consumer demands, logistics and supply chain personnel should generate inventory forecasts in conjunction with manufacturing schedules and marketing forecasts of demand.

13.8 Production Planning and Scheduling

Production scheduling and planning for effective inventory control are another area of importance to logistics. Production managers can determine the number of units to manufacture to ensure adequate market coverage once a forecast is developed, the current level of inventory on hand, and the usage rate are determined. Yet, businesses that have several product lines and need to time their manufacturing processes may need to closely coordinate or even take direct control of production planning and scheduling.

13.9 Procurement

Another activity that falls under the category of logistics is procurement. The main rationale for including procurement into logistics is that the costs of transportation and inventory relating to the physical location (distance) of raw materials and other goods required for manufacturing. The entire cost of logistics is also affected by the quantities purchased.

A manufacturing facility in the United States would, for example, need a transportation lead time of an inventory holding space for 10 to 12 weeks if it purchases large quantities of components from China. The inventory levels required at the manufacturing facility to prevent a plant shutdown would be directly impacted by this. Reducing this lead time by using a premium method of transportation or ordering in smaller quantities would result in lower inventory levels but probably higher transportation expenses. To reduce overall costs, procurement decisions must also be made from a systems perspective.

13.10 Customer Service

Two aspects of customer service are important in this discussion. (1) the process of interacting with the customer directly in order to influence or take the order; and (2) the levels of service a company provides to its consumers. When it comes to taking orders, logistics is all about being capable of informing the customer when they place their order if the product they want is in stock and when it will be delivered. This requires coordination between inventory management, manufacturing, warehousing and transportation when accepting orders for delivery times and product availability. As previously mentioned,

demographic changes have made customer service more important for supply chain management.

The second dimension of customer service relates to the level of service a company promises to its customers. Order fill rates and delivery on-time rates are examples of these service dimensions. Customer service levels are impacted by decisions made about stocks, transportation, and warehousing. Logistics plays a key role In ensuring that the consumer receives the appropriate goods in the appropriate quantity and at the appropriate time. The availability of products and lead times, both of which are essential to customer service, are impacted by logistics decisions.

13.11 Facility Location

The location of plants and warehouses is another area of interest to logistics. A change in the site's location could impact the timing and position of connections between facilities and markets, or between supply sources and manufacturing facilities. These changes will have an impact on customer service, inventory requirements, and transportation costs and services. As a result, the logistics manager needs to be involved and give input on facility placement decisions. The importance of supply chain input into the location decision has increased as companies' operations have become increasingly global in scope.

13.12 Other Activities

Other areas that can be considered a part of logistics include parts and services, the handling of returned goods, and the disposal of salvage and scrap. Since decisions about storage and transportation have an impact on these decisions, logistics managers can also make important contributions to product design as well as maintenance and supply services. These areas may require the development of a reverse logistics system, which will enable the supplier to receive used, damaged, or obsolete goods for disposal. This process is typically managed in the logistics department directly or through a third-party logistics service provider.

14. Process Involved in Inbound and Outbound Logistics

14.1 Import:

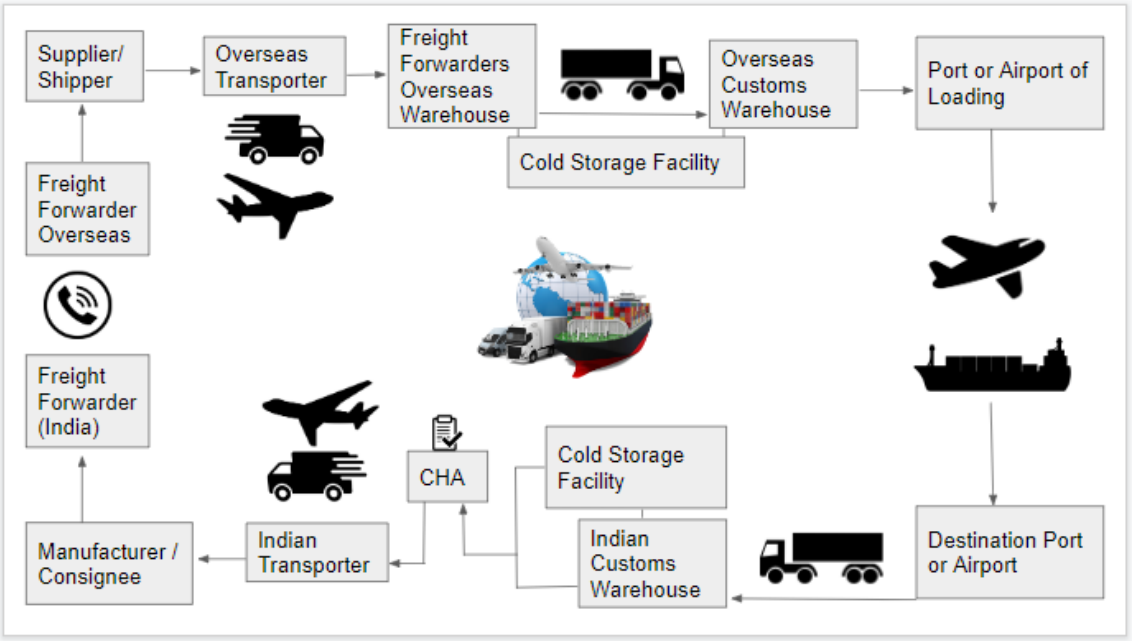
- Identifying Supplier for Raw Material
- Ordering Samples for evaluation purpose through DHL/FedEx
- Once Samples approved placing Purchase Order
- Payment Terms: Advance, DA-30, DA-45, DA-60, DA-90
- Incoterms: EXW, CPT, CIP, CIF, FOB, C+F, FCA
- Approving Shipping Documents
- Nominating Freight Forwarder depending on Incoterms
- Goods Transported to the Customs warehouse and cleared
- Perishable Items: (Cold Chain) Temperature Controlled Air Cargo Shipment
- Instruments or Large Quantity Goods: Sea Shipment
- Warehousing

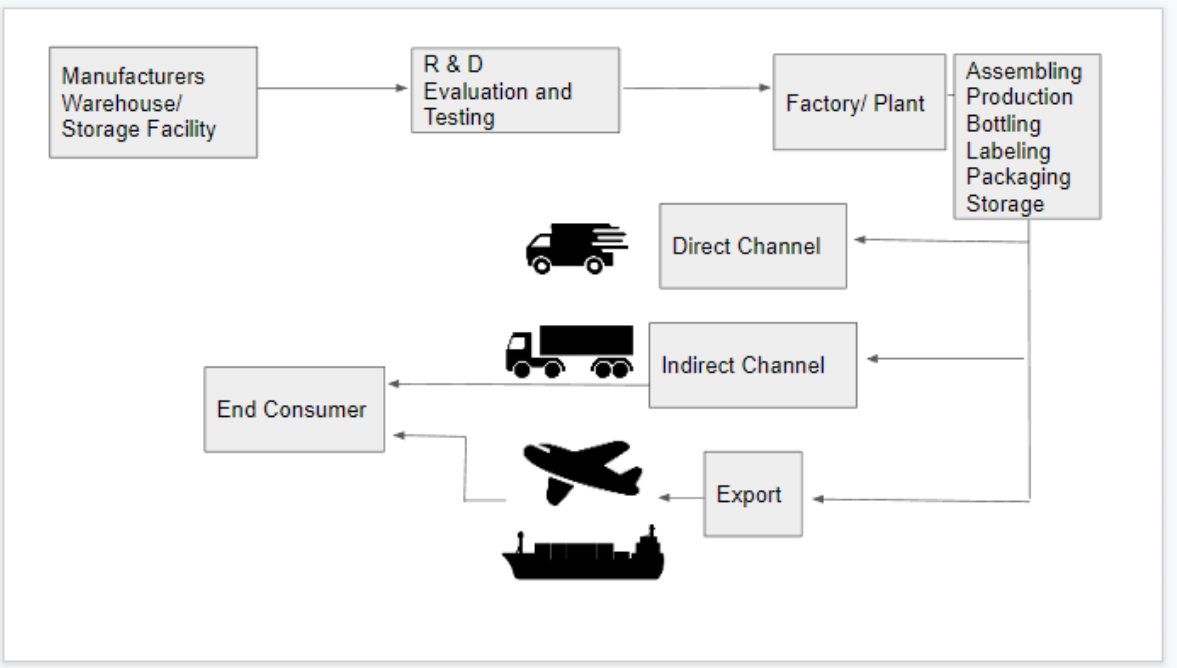
- CHA appointed to Clear the Goods from Customs
- Transporter arranged by CHA after clearance
- Temperature Controlled material by Air and other materials by Roadways to the factory warehouse.

14.2 Export:

- Purchase Order received from customer
- Sending Samples for evaluation purpose through DHL/FedEx if required
- Once Samples approved by customer Proforma Invoice is sent for payment if required
- Payment Terms: Advance, DA-30, DA-45, DA-60, DA-90
- Incoterms: EXW, CPT, CIP, CIF, FOB, C+F, FCA
- Once Shipping Documents approved
- Nominating Freight Forwarder depending on Incoterms
- Goods Transported to the Customs warehouse and cleared by freight forwarder
- Perishable Items: (Cold Chain) Temperature Controlled Air Cargo Shipment
- Instruments or Large Quantity Goods: Sea Shipment
- Warehousing at overseas port or airport
- Goods are cleared by customers at overseas CHA
- Transporter arranged by CHA after clearance
- Temperature Controlled material by Air and other materials by Roadways to the customers factory warehouse.

15. Chart of Intermediaries in the Process





16. Identification and Analysis of Inbound and Outbound Logistics from Goa.

a) Questionnaire Design

A Google form survey questionnaire was prepared to collect the data and was shared among different companies in Goa. The questionnaire consisted of eight sections. First two sections consisted of an overview of survey questionnaire and questions related to the company profile, and the rest of the sections consisted of questions related to inward & outward of goods, mode of transportation used, quantity imported and exported by companies, transportations service quality and technologies used. A structured questionnaire was developed with a combination of multiple-choice questions, checkbox and a five-point Likert scale. The objective of the survey was to gather the necessary information required for study. After finalizing the survey questionnaire, it was administered in different companies in Goa.

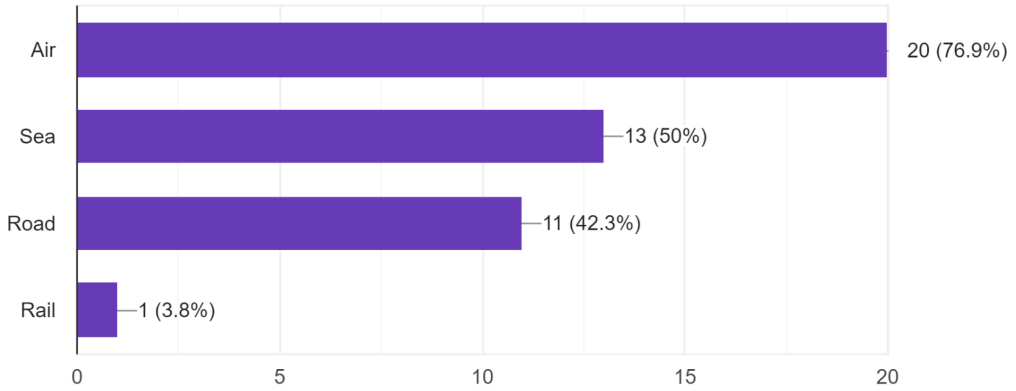
b) Data Collection and Limitations

The final version of the questionnaire was sent by email, WhatsApp to the logistics managers and logistics in charge in different companies in Goa. After several reminders, phone calls, e-mails only few responses were gathered. A personal visit was made in the industrial estate and filled in the questionnaire in person with the logistics manager and logistics in charge after taking the permission of HR of the respective companies and thus most of the responses were gathered by visiting the companies.

Visiting each company and surveying them was time consuming due to the company's protocols. For surveying the company long procedures were to be followed before entering any company like taking appointments from the HR, security checks, filling the gate pass and then waiting for the call from the concerned manager. Most of the companies did not respond as they were concerned about their confidential information related to companies and kept themselves away from being surveyed. Some companies were closed on weekends and some companies had long waiting lists.

c) Findings from the Survey

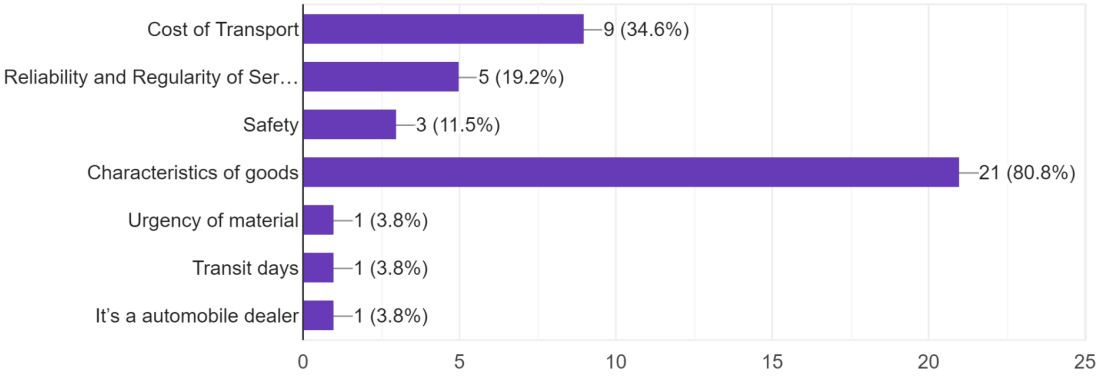
A survey questionnaire was presented to either Logistics Managers or Logistics In charge or any employee involved in the movement of goods in the company. Following are the findings from the survey.



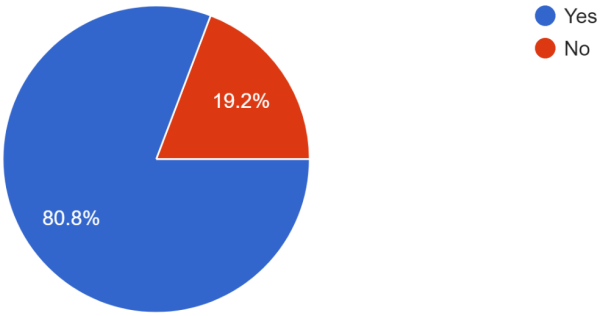
Based on the survey responses it was found that the majority of companies prefer air mode for inward of goods followed by sea and road. It is also noticed that very few companies in Goa use rail.

When companies were asked about the approximate volume of goods carried in each mode per month, it can be noticed that by air and sea mode majority of companies bring in the goods of 1000 kgs and above, few companies brought in the goods approximately 100-500 Kgs volume and very less companies range between 501-1000 Kgs. By Road it is again the

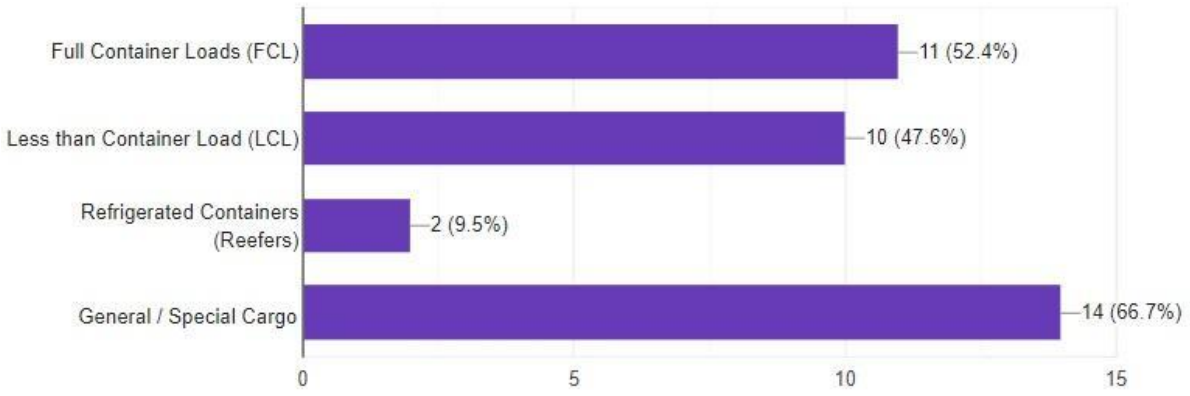
majority of the companies that bring in material about 1000 Kgs and above very few companies range in 100 - 500 Kgs. By Rail very few companies brought in the materials in all three weight category ranges.



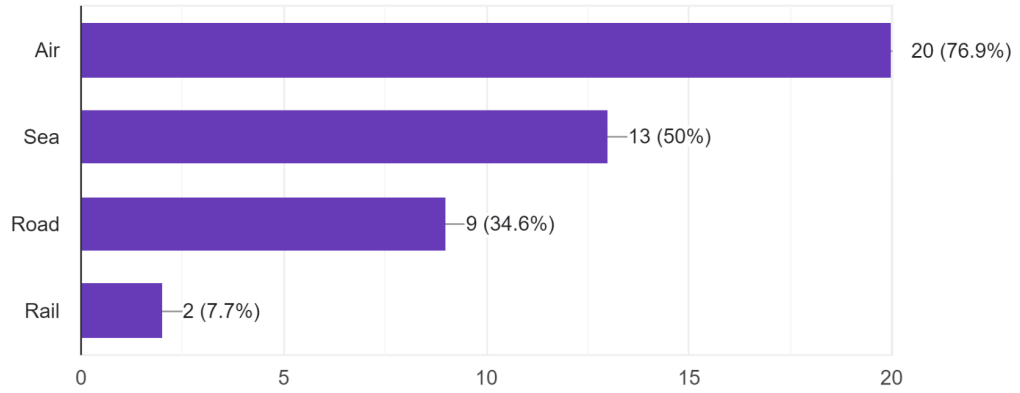
When companies were asked about the reason for selecting a particular mode of transport almost all companies pointed out that it was due to the characteristics of goods which was followed by the cost of transport. Only few companies were concerned about reliability and regularity of service and safety of the goods. Some companies also brought into notice that it is due to urgency of material and transit days they selected a particular more of transport.



Out of the companies surveyed it was found that 80% of the companies involved in importation of goods from the international market.

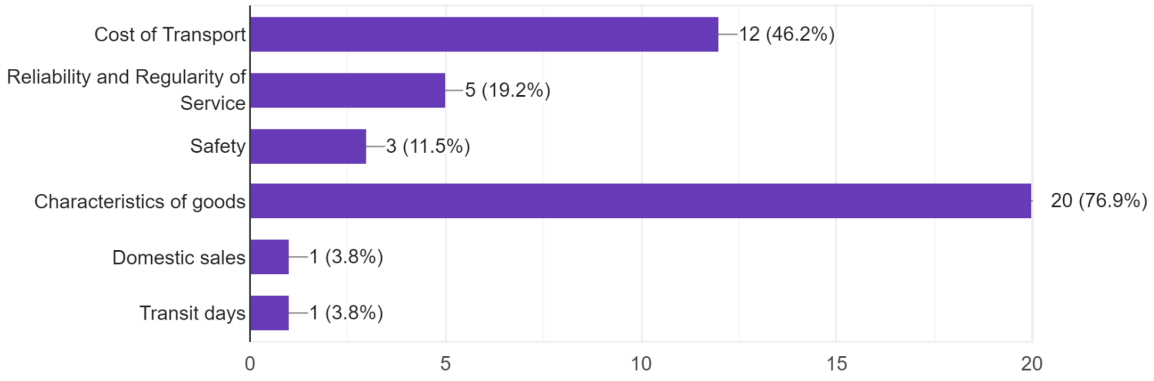


It was noticed that the size of the cargo during importation of companies bringing in the goods by General/ Special cargo. Also, most of the companies used FCL and LCL containers, only few companies used refrigerated containers.



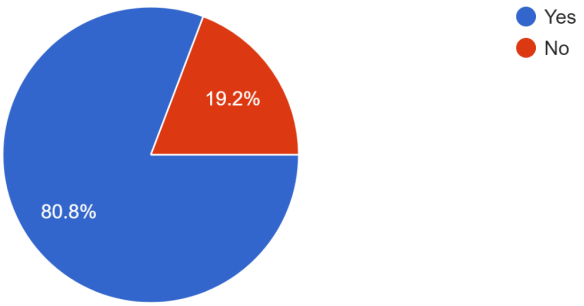
During the outward of goods, it was again noticed that air mode was highly preferred by the companies followed by sea and Road and very few companies used rail.

When companies were asked about the approximate volume of goods carried out in each mode per month, it can be noticed that by air mode majority of companies outward the goods of 1000 kgs and above, few companies sent the goods approximately 100-500 Kgs volume and very less companies range between 501-1000 Kgs. By sea, the majority of companies sent the goods out 1000 Kgs and above. As very few companies used Road the majority of the company's sent material about 1000 Kgs and above very few companies range in 100 - 500 Kgs. By Rail hardly a company sent in the materials and that too between 501 -1000 Kgs.



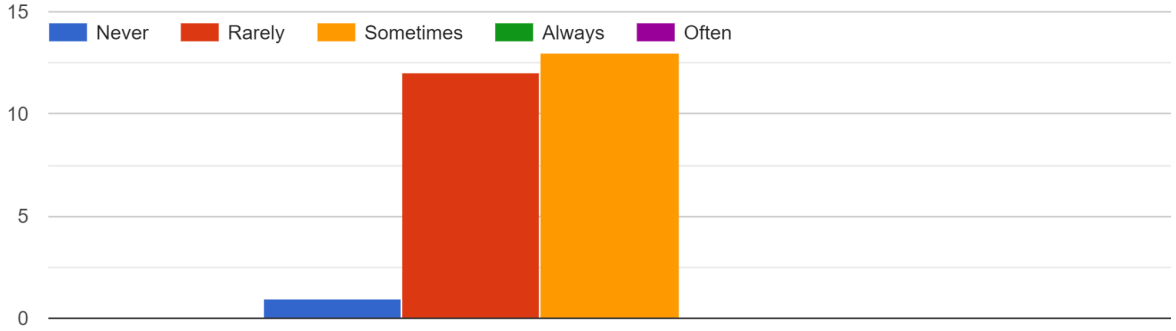
Likewise, also during inward of goods It was again noticed that the majority of the companies used a particular mode of transport due to characteristics of goods when they outward the

goods followed by cost of transport. Few companies felt due to reliability and regularity of service very little number of companies were concerned about safety.

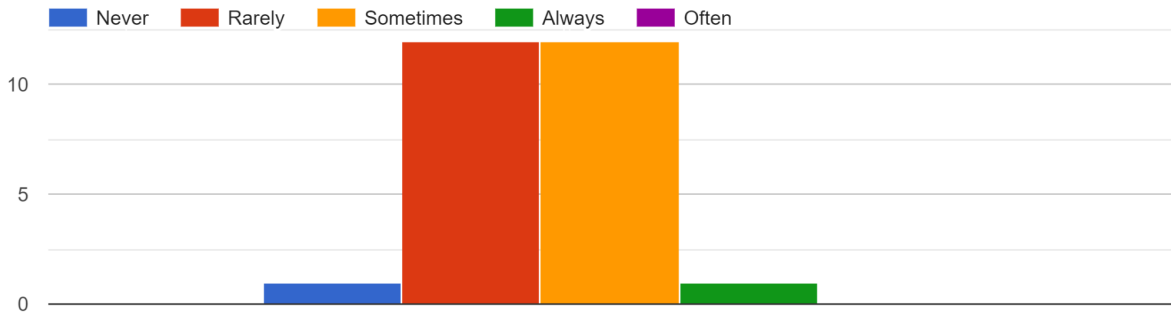


Out of the companies surveyed, it was found 80% of the companies were involved in exportation of goods in the international market.

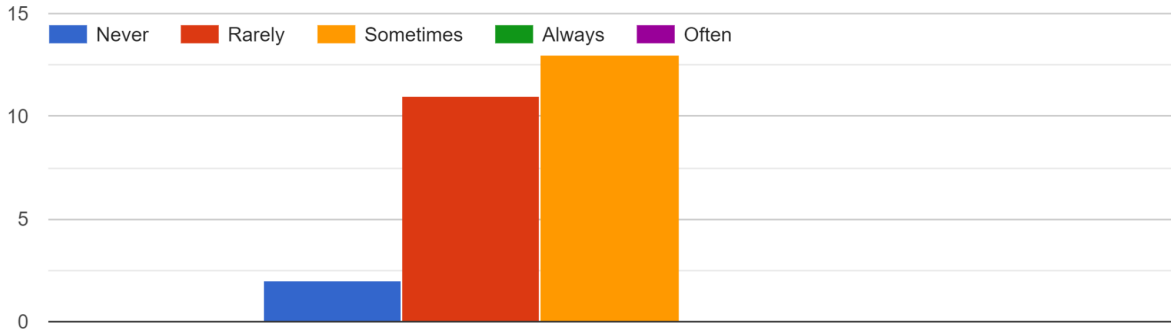
During exportation of goods, it was noticed that almost all companies in the same number export the goods In General/Special cargo, FCL and LCL containers. But none of the companies used refrigerated containers.



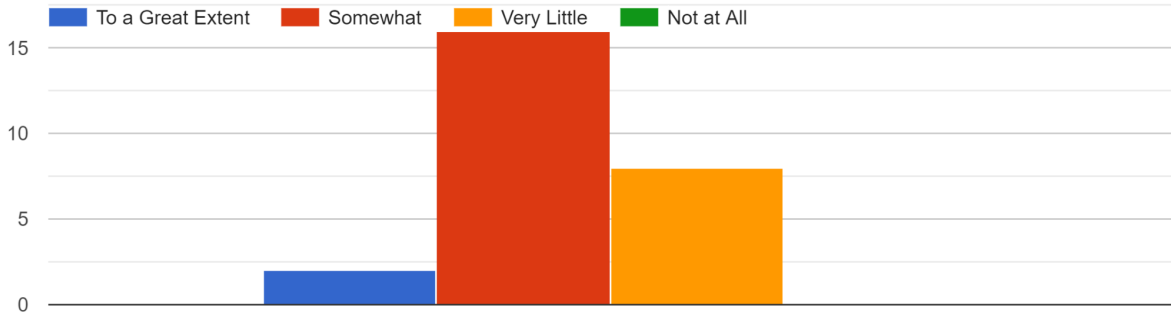
When companies were asked about any issues faced in terms of delivery time. It was found that the majority of the companies faced problems sometimes, for less than 50% of companies thought this problem was rare, only few companies never face problems in terms of the delivery time.



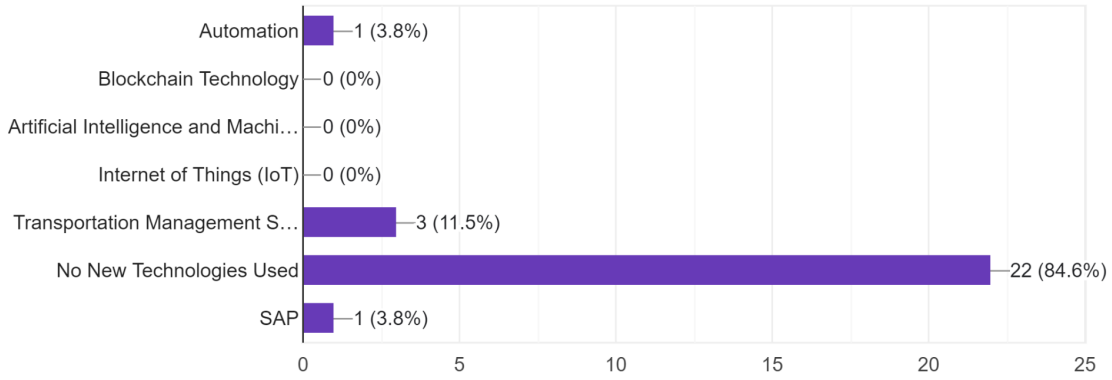
When it was asked about transit damages for goods, half of the companies felt that goods were sometimes damaged and half companies felt it rarely received in damaged condition. Hardly one or two companies said that the goods were never damaged or goods were always damaged.



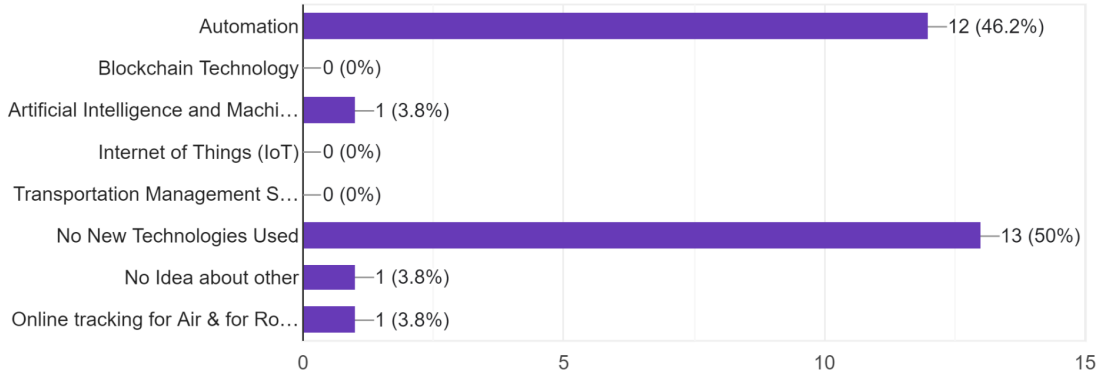
It was noticed that during the inward of goods majority of the companies faced issues sometimes. Less than half of the companies thought that the problems are rare and very few companies said that they never face problems.



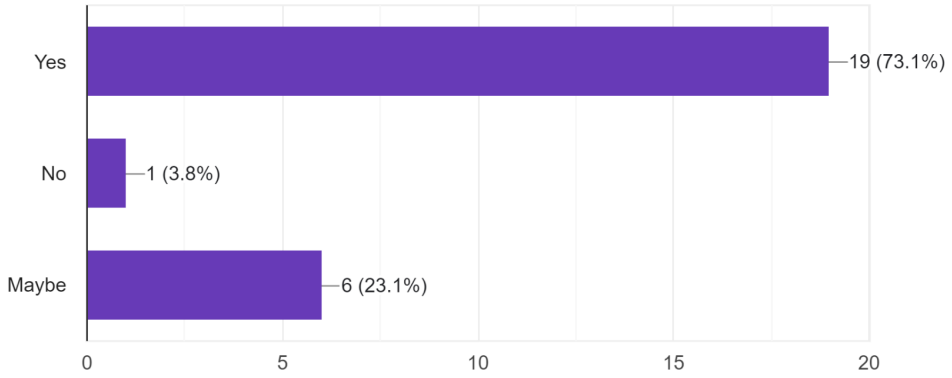
It was found that the majority of the company were somewhat satisfied with overall pricing of the transportation. One fourth of the companies were very little satisfied. And very few companies were satisfied to a great extent with the overall pricing for the transportation.



When it was asked about any new technologies used by the companies, almost all companies were not introduced to new technologies. Although few companies used Automation, Transportation Management Systems, but were outnumbered by majority.



When it was asked about any new technologies used by the company's logistics partner, 50% of the companies thought that their logistics partners were also not introduced to new technology. But 46% of the companies thought that they use automation. Rest companies had no idea about their logistics partners' operational upgradation.



It was found that almost all companies considered ecologically sustainable logistics.

d) Analysis and Recommendations on Mode of Transport and Mode of Cargo:

Based on the findings it can be clearly noticed that in terms of both inward and outward of goods most of the companies prefer air mode. Though the cost of air shipment is higher but due to the characteristics of goods the cargo needs to be kept under temperature control while in transit, it is also noticed that due to low shelf life of the product or due to urgency of

materials, companies prefer air shipment. Transit time in air shipment is very low as compared to the other modes that's also one of the reasons companies prefer air mode.

Secondly, speaking about sea mode, the characteristics of goods again come into picture. Heavy cargo like Break Bulk, Neo Bulk, Containerized, Liquid bulk and Dry Bulk which cannot be imported by air mode and companies have to ship with this type of materials by sea mode only. The transit time is more but the cost of transport is low and for heavy shipments like this sea shipment is highly recommended.

The companies in Goa prefer Sahar air cargo that is Mumbai Airport for Air shipment and Nhava Sheva port for Sea shipment. And as we can see the inwards and outwards volume of goods are mostly 1000 kgs and above, the transportation by road from the point of destination to the factory becomes costlier. In case of perishable material, the cost is even higher due to refrigerated vehicles. Sometimes in case of urgency companies prefer costly but quicker air transport services.

In case of heavy and large cargoes, the transportation cost is very high. And as we know most of the companies in Goa do not use rail service. In this case it becomes a huge scope for rail transport as the cost is also less and companies in the industrial estates can easily access the railway network. Taking this into notice Konkan Railway should focus on developing the new railway cargo hub near the Industrial estates for cargo transportation services. This will not only be beneficial for companies in terms of cost saving on transportation but will also generate more revenue to the railways.

We can see that 80% of the companies import and export goods from the international market. And most of them use general cargo/ special cargo, this is because most of the companies use Air mode. Sometimes companies cannot use sea shipment for their requirements like electronics items, laboratory equipment, hardware and machinery and spares, and consumer and retail goods which are less in quantities, as a result they are more involved in general cargo. Similarly, goods are sometimes over-dimensional and heavy weight items, dangerous goods and hazardous materials, and temperature-controlled goods which are perishable, so companies prefer special cargo. Also due to the urgency of particular material companies largely depend on general cargo.

There is not much difference in terms of importing or exporting the goods as FCL or LCL. When the shipper does not have enough cargo to fill an entire 20 foot or 40-foot container, it is recommended less-than-container load shipping. LCL is generally consolidated shipments of loose cargo which are boxed, palletized, crated or shipped in bags. LCL is cheaper because the cost of the full container is shared between multiple shippers and only need to pay for the space used. However, the rate per equivalent weight of a LCL shipment is much higher than FCL. LCL allows visibility and control over cargo despite a container being shared with other shippers. FCL on other hand shipping is the most efficient and cost-effective container shipping method. FCL has only one shipper and one consignee. That is, you need not have to share space in the container with other shippers. Many companies choose to ship FCL just to

simplify the process and reduce risk. FCL is cheaper than LCL because if the cargo is not stackable then the company has to pay for all of the space other shipments cannot use because of your goods. LCL takes more time to arrive than FCL shipments because to consolidate the goods with that of other shippers it requires additional days. But LCL may be a better option for those companies who deal with smaller shipments.

Air Cargo should be preferred if shipment is less than 1 CBM and weighs less than 200 Kgs because the ocean freight will be quite similar to air freight if compared. Shipment palletizing and packing should be improvised so that it can be used as stackable cargo and the cost of unused space can be saved in FCL. In Case of non-stackable cargo, forwarders can be instructed to place light weight boxes on the pallets again to save cost of unused space in the container. Orders from multiple shippers of a particular country could be clubbed together in one container to make full use of container space (FCL) as cost of FCL is less than LCL when compared with the rate per equivalent weight. If goods take more space in a particular container, then bulk goods can be shipped in FCL and remaining goods can be shipped in LCL rather than paying for a large size container.

e) Analysis on Transportation Service Quality:

In terms of transportation service quality companies face issues with respect to delivery time sometimes or it is rarely seen in the shipment. These problems are common during shipping because sometimes there may be labor shortages, there may be holiday seasons, extreme weather conditions and other supply chain issues like global pandemic, war conflicts and port congestion or sometimes because of inaccurate shipping information or improper documentation.

In terms of transit damages for the goods it is again between rare and sometimes. As we know that during the transit of goods the cargo goes through hands of different parties from the manufacturer/supplier to the local trucker, from the local company moving from the warehouse to the terminal from there it goes to the origin terminal and then the transshipment terminal. From the arrival port terminal to the customs and from customs to the local trucker at the arrival port. So, there are high chances for damages occurring if the cargo is not handled carefully. If the container is wrongly balanced, or sometimes heavy cargo, cargo not secured correctly, or packed incorrectly, it can damage the goods during transport. Even sometimes the surrounding environment can influence the quality of the goods.

Companies also face issues for inward transportation like sometimes there is paperwork misplaced from the transporters and the goods are shipped to the wrong warehouse. Sometimes there are last-minute route changes or poor routing strategies used by transporters which results in delays.

When it comes to overall pricing for transportation most companies are somewhat satisfied. This is because of the competitive environment between the freight forwarders. Companies can negotiate the freight charges with the freight forwarders and get the competitive rates,

this gives advantage to the companies and thus most of them are satisfied with the freight charges. Though there are few companies which are very little satisfied with the overall pricing this may occur due to volatile shipping prices. Freight charges can be hard to predict due to the various factors, from hike in fuel prices and seasonal surcharges to labor costs and political factors Sometimes repackaging of the goods increases the weight of the cargo which increases the freight cost. Even sometimes there are unexpected charges like trucker waiting time fees or inspection charges of the products.

f) Recommendation on Transportation Service Quality:

So, in order to avoid delays in delivery time first of all shipment tracking is necessary. Real time shipment tracking ensures that the order is on its way even when there is a delay. It will also explain why there is delay in the shipment. Secondly consistent communication between the forwarder and consignee is must. There should be an open channel of communication and transparency between them. The forwarders and Customs house clearing agent should be provided with the correct and proper set of documents or else it may also lead to shipment delays and the goods may be held up in customs if an incomplete set of documents are provided. Companies must also nominate transporters based on their punctuality. Automation will also redirect drivers to faster and safer routes which will reduce the delays.

In order to reduce damages during the shipment proper packaging is very important. If the goods are shipped in containers, it should be properly packed, stacked and palletized. Sometimes the goods may get damaged even during the initial stage of containerization. The consignee must confirm with the shipper whether the goods are stackable or non-stackable and accordingly inform the forwarder about the placement of goods in the container. In case of perishable goods proper information should be provided to the forwarder so that they can inform Airlines to maintain the proper storage temperature during the transit of goods. Also, the companies must confirm with the shipper whether the adequate amount of dry ice is accompanied with the shipment or whether it is required to be refilled whenever necessary.

Company must approve all documents before the shipment is shipped so there is no confusion or any other issues during the shipment clearance and while handling the material. The consignee must properly check the shipping address with the forwarder which needs to be mentioned on BL copy or AWB copy, any wrong information can lead to shipment misplacement. The consignee should properly check the description of goods, HSN code which are needed to be mentioned on the bill of entry. Any wrong information can lead to problems during custom clearance. Transporters must be given proper addresses so that the goods are delivered at the correct warehouse.

Talking about overall pricing of the transportation the freight charges should be properly compared between different forwarders and also the previous shipment rates should be rechecked. Proper documents should be provided to the forwarders with characteristics of material before nominating them in order to avoid any additional charges after the forwarder is nominated. Also, the mode of shipment should be clearly identified based on the weight,

urgency and the characteristics of goods so that companies do not get the material by paying higher charges. The cost can also be saved by consolidating large shipments of different products or shipments from different shippers into one shipment from the port or airport of destination. Proper use of Incoterms can also be helpful in reducing logistics cost like sometimes suppliers can cover some direct logistics costs. So, companies need to work together with suppliers to reduce costs by agreeing on the best possible Incoterms.

g) Analysis on New Technology and Sustainable Logistics:

Talking about the use of new technology and sustainable logistics, about 84% of companies still have not adopted any new technology; they are still dependent on old traditional methods of logistics operations. Only a few companies have adopted some new technologies like automation and shipment tracking systems. But talking about the technologies used by the logistics partner, half of the companies think that the logistics companies also use old methods for logistics operations but around 46% of companies think that they have adopted automation. So, it becomes necessary for the companies to adopt new technologies in order to match with their logistics partner. And even 73% of Companies have agreed that they consider ecologically sustainable logistics.

h) Recommendations on New Technology and Sustainable Logistics:

Transportation and logistics companies are constantly looking for innovative strategies to boost flexibility, sustainability, and transparency as supply chains broaden their worldwide reach. New technology is essential to addressing these issues and can help top supply chain companies financially and operationally. New technologies are increasing the productivity, efficiency, and cost-effectiveness of supply chains, from initial product development to "last mile" delivery options.

It becomes necessary for the companies to adopt new technologies so that they are able to match with transportation and logistics companies. With this the companies will be able to improve efficiency, there will be increased visibility, companies will be able to reduce cost in terms of supply chain process, there will be faster delivery and increased sustainability.

Automation will create touchless supply chain infrastructure in the company. First of all, companies should automate their back office as it will make regular administrative tasks and business processes much easier. Most of the companies use software like ERP and SAP. If companies also introduce new automation technology, they can automatically pull out the product data of their purchase order or sales order through the software’s. Then accounting and financing tasks will also be automated by automatically processing orders and also maintaining purchases, sales and finance records without spending hours gathering data.

In case of transportation, automation tools will give companies better supply chain visibility with real time transit tracking. Route optimization tools will automatically redirect drivers to

faster and safer routes which will reduce operational cost and transit times. Companies will be able to accurately predict the estimated time of arrival.

Warehouse automation is also necessary. This type of software determines where to best store inventory in order to make best use of available space. Use of box selection algorithms will ensure that goods are shipped out with ideal packaging so that dimensional weight is reduced and there is less risk of damage. Companies should also automate inventory management. This tool will notify the companies whenever restocking is required. It will prevent stockouts and backorders.

Blockchain system is a form of decentralized public ledger system, a system where all records of transactions, operations and documentations are on a network. It documents the changes to a record in real time. It will help companies to eliminate unnecessary steps in the delivery process and also be able to implement faster routes. This type of decentralized ledger reduces mistakes and saves time. It also increases transparency and profit while decreasing delivery time and costly errors. Blockchain improves efficiency, improves delivery process, it will also speed up the payment process as it keeps all the records between everybody involved in the delivery process and will make any action trackable.

Talking about Artificial Intelligence and Machine Learning, in order to avoid human errors, to optimize the supply chain process and to predict future opportunities and challenges AI and Machine Learning in logistics becomes more important.

Implementing machine learning will help in analyzing huge data with the help of AI algorithms which will help the companies to balance demand and supply, also they will be able to optimize the delivery process. Machine learning and its forecasting features will help in warehouse and inventory management, AI will help in predicting demand and logistic route optimization.

Machine learning and artificial intelligence will be able to monitor and predict traffic and other factors which can impact shipping transit time. It will also help in selecting reliable suppliers and monitor supplier relationship management.

Implementation of the Internet of Things is very important in industries like manufacturing, transportation and utilities. IoT boosts the communication system, vehicle tracking, supply chain monitoring system and IT security.

Transportation management system is a technology that helps in business planning, executing and optimizing the physical movement of goods. It also makes sure the shipment is compliant and proper documentation is available. It will also provide visibility into day-to-day transportation operations, trade compliance information and documentations and will ensure timely delivery of goods. This system focuses on procurement product life cycle management, supply chain planning, order management, manufacturing, inventory and warehouse management.

17. Ecological sustainable Logistics

It means making logistics operations more sustainable, it is also called as Eco-logistics or Green Logistics. It is built upon the foundation laid by traditional logistics. In traditional logistics the main focus was only on the operational activities but consideration for the environment was not taken into account. So, the goal of ecologically sustainable logistics is not only to improve the business operations but also the sustainability of the organization. Green logistics is important as it will also help to reduce the carbon footprints.

As we have seen most of the companies consider sustainability to be important as it will not only reduce impact on the environment but also help the organization in reducing costs. Going green will always result in cost saving because sustainable ecological logistics practices are focused more on boosting efficiency and reducing waste which will result in financial savings.

Converting to green energy supply sources like solar power, wind energy and other eco friendly fuels companies can reduce costs. Also, by removing unnecessary weights from the cargo planes, overall fuel consumption will be reduced.

Going green will also improve operations in logistics management by using more efficient equipment and ways to load cargo on to transport vehicles by switching to cleaner or less energy-intensive tech. Introduction of fleet efficiency program will also help in reducing carbon footprints.

Companies can use Green Logistics strategies in order to reduce their energy consumption in offices, warehouses where goods need refrigeration. They can invest in green energy sources such as solar and wind to power in their warehouses which will lower their carbon footprint.

Companies should also implement reduce, reuse and recycle practices in their operations like minimizing packaging for their products. Employees must also be trained, who work on site like minimum use of electricity and switching off the electric appliances when it is not in use, also reducing printing of papers and implementing zero-paper policy in case of documentation.

Companies can also invest in more sustainable transport like electrified vehicles with eco-friendly fuels. But for small organizations it is not feasible, in this case they should focus on route optimization. As route optimization will cut down travel distance and reduce fuel cost and greenhouse gas emissions.

So overall such practices not only optimize last mile delivery but also each and every step from fulfilling orders and processing them till the returns.

So ecological sustainable logistics will help in saving cost and contribute in lowering carbon footprints. By implementing sustainable strategies companies can improve efficiency and also it will contribute to a clean and green environment for the future generation.

18. Conclusion:

This research covers broadly from logistics activities to ecologically sustainable logistics and attempts to determine the role of logistics in supply chain management. The main contents of the research include Inward and Outward Transportation, Transportation Service Quality and Use of New Technology & Sustainable Logistics.

Logistics has become a critical part of supply chain management and has influenced product movement to fulfill the customers' needs. Companies can lower costs and increase productivity by managing logistics from the selection of proper mode of transport to efficient type of cargo with the use of the most efficient tools and techniques.

By creating partnerships with suppliers, freight forwarders, transporters and warehousers, and getting connected with them through automated systems, will help companies to reduce overhead costs and there will be faster delivery goods. New technologies will also help in reducing transit damages and getting better freight rates with the use of AI algorithms.

Simplifying communication between the parties involved in logistics operation, using the best transportation system, developing logistics strategies will help create a workflow blueprint that will reduce costs by increasing visibility. Introduction of new software systems will enable companies to receive purchase requests within a matter of seconds rather than days.

By reducing warehousing costs and purchasing goods based on forecasts, advanced inventory management, shipping the goods via the most reliable means to the end-user will help in cost savings, reduce risk of damage and improve the transit time.

The improvement of transport efficiency and adopting ecological sustainable logistics could change the overall performance of a logistics system.

To ensure that the correct product arrives at the right location at the right time, logistics helps companies in understanding the critical key metrics, core processes, and long-term objectives of their supply chain.

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