MEASI INSTITUTE OF MANAGEMENT

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Semester - IV

PMF29- DOMESTIC AND INTERNATIONAL LOGISTICS

Course Material Prepared

By

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ELECTIVE COURSE – XXIX

Subject Code		L	T	P	S	C
PMF29	DOMESTIC AND INTERNATIONAL LOGISTICS	3	0	0	1	3

Course Objectives	
C1	To familiarize students with the basic logistics concepts and the terminology used in the logistics field and various types of vehicle selection.
C2	To provide insights on planning & Decision making. To examine the role that logistics plays with the rest of the corporate functions.
C3	To throw light on legislation such as licensing, drivers working hours and vehicle dimensions.
C4	To examine logistics functions interface with Order Management, Inventory Control, Transportation, and Distribution channels as integral part of the supply chain.
C5	To provide a general understanding of strategic challenges of the material sourcing, reverse logistics and material production as a means of supply chain strategies.

SYLLABUS

Unit. No.	Details	Hours
Unit I	Vehicle Selection – Types of Vehicles – Types of Operations – Load types and characteristics – main types of vehicle body – Implications of vehicle selection – vehicle acquisition.	9
Unit II	Need for planning – fleet management – main types of road freight transport – transport resource requirements – vehicle routing and scheduling issues – data requirements – computer routing and scheduling – information system applications – GPS – RFID.	9
Unit III	Legislation – Operator licensing – Driver licensing – Driver's Hours regulations – Road transport directive – tachographs – vehicle dimensions.	9
Unit IV	Introduction to Air Cargo; Aviation and airline terminology – IATA areas – Country – Currency – Airlines – Aircraft layout – different types of aircraft – aircraft manufacturers – ULD – International Air Routes – Airports – codes – Consortium – Hub and spoke – Process Flow.	9
Unit V	Air freight forwarding; Air Freight Exports and Imports – Special Cargoes – Consolidation – Documentation – Air way Bill (AWB) – Communications – Handling COD Shipments – POD – conditions of contract – Dangerous (DGR) or Hazardous goods.	9
	TOTAL HOURS	45

Reference Books

1.	Air transport Logistics by Simon Taylor (Hampton)
2.	Air Cargo distributions; a management analysis of its economic and marketing benefits by Paul Jackson and William Brackenridge (Gower Press)
3.	Fundamentals of air transport management by P.S. Senguttuvan
4.	Aviation century ; wings of change – a global survey – Ratandeep Singh – Jain book
E-Sources	
1.	https://tradestart.ca/domestic-vs-international

2.	http://www.corporate-traffic.com/ocean-freight-services.html		
3.	http://www.joppa.cz		
4.	http://www.logisticsworldwide.com		
5.	www.ukessays.com		
Assessment Tools Used			
1.	Assignments	6.	Group Discussions
2.	Internal Assessment Tests	7.	Management games
3.	Model Exam	8.	Role play
4.	Seminar	9.	Simulation
5.	Case studies	10.	Synetics
Content Beyond Syllabus			
1.	Logistical geography and the development of skills to solve logistical transportation problems and issues		
2.	Carrier responsibilities and services		
3.	Freight classification, rates, tariffs and public policy and regulations		
Additional Reference Books			
1.	Supply chain and logistics management made easy; methods and applications for planning, operation, integration (1st edition); Paul. A. Myerson		
2.	Warehouse management; a complete guide to improving efficiency and minimizing cost (2nd Edition); Gwynne Richards		
3.	International Logistics; The management of International Trade Operations (4th edition); Pierre A.David		
4.	Business Logistics; Supply chain management (5th edition) L Ronald Ballou		

Course Outcomes		
CO. No.	On completion of this course successfully the students will;	**Program Outcomes (PO)**
C329.1	Be aware of the basic logistics concepts and the terminology used in the logistics field and various types of vehicle selection.	PO2, PO6
C329.2	Possess knowledge on planning & decision making. They will examine the role that logistics plays with the rest of the corporate functions.	PO2, PO4, PO6, PO7
C329.3	Have insights on legislation such as licensing, drivers working hours and vehicle dimensions.	PO6, PO7
C329.4	Examine logistics functions interface with Order Management, Inventory Control, Transportation, and Distribution channels as integral part of the supply chain.	PO6, PO7
C329.5	Have better understanding of strategic challenges of the material sourcing, reverse logistics and material production as a means of supply chain strategies.	PO4, PO5, PO6, PO7

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1; Placement: To equip the students with requisite knowledge skills and right attitude necessary to get placed as efficient managers in corporate companies.

PEO 2; Entrepreneur: To create effective entrepreneurs by enhancing their critical thinking, problem solving and decision-making skill.

PEO 3; Research and Development: To make sustained efforts for holistic development of the students by encouraging them towards research and development.

PEO4: Contribution to Society: To produce proficient professionals with strong integrity to contribute to society.

Program Outcome

PO1: Problem Solving Skill

Apply knowledge of management theories and practices to solve business problems.

PO2: Decision Making Skill

Foster analytical and critical thinking abilities for data-based decision making.

PO3: Ethical Value

Ability to develop value based leadership ability.

PO4: Communication Skill

Ability to understand, analyze and communicate global, economic, legal and ethical aspects of business.

PO5: Individual and Leadership Skill

Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

PO6: Employability Skill

Foster and enhance employability skills through subject knowledge.

PO7: Entrepreneurial Skill

Equipped with skills and competencies to become an entrepreneur.

PO8: Contribution to Community

Succeed in career endeavors and contribute significantly to the community.

unit 1

Vehicle Selection – Types of Vehicles – Types of Operations –Load types and characteristics – main types of vehicle body – Implications of vehicle selection – vehicle acquisition.

SUPPLY CHAIN MANAGEMENT

Supply Chain Management can be defined as the management of flow of products and services, which begins from the origin of products and ends at the product's consumption. It also comprises movement and storage of raw materials that are involved in work in progress, inventory and fully furnished goods.

Supply chain management (SCM) is the broad range of activities required to plan, control and execute a product's flow, from acquiring raw materials and production through distribution to the final customer, in the most streamlined and cost-effective way possible.

The supply chain encompasses all activities involved in the transformation of goods from the raw material stage to the final stage, until the goods and services reach the end customer.

DEFINITIONS:

The design and management of seamless, value-added process across organizational boundaries to meet the real needs of the end customer.

-Institute for Supply Management

Christopher (1998) defined the supply chain as the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer.

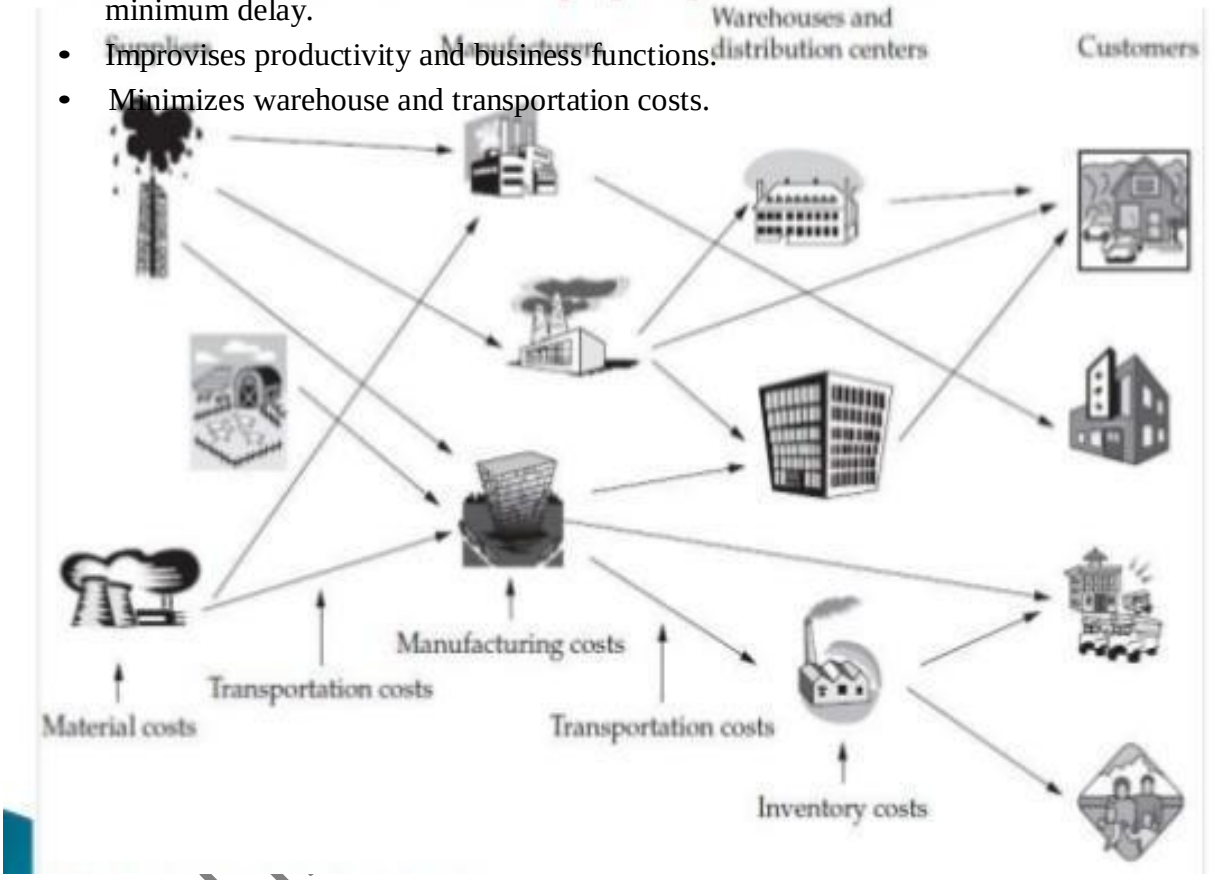
Chopra and meindl (2001) "A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request".

Handfield & Nichols (1999) "A supply chain encompasses all activities associated with the flow and transformation of goods from the raw material stage, through to

the end user, as well as the associated information flows".

The **key benefits of supply chain management** are as follows −

- Develops better customer relationship and service.
- Creates better delivery mechanisms for products and services in demand with minimum delay.
- Improvises productivity and business functions.
- Minimizes warehouse and transportation costs.



Transportation:

The transportation system is the physical link connecting a company with the customers, raw material suppliers, plants, ware houses and distribution channel members. It's interesting to note that all these elements of logistic system are fixed points, transportation is the connecting medium. The better is the performance and efficiency of transportation system the

better will be organisational performance in terms of cost and customer's satisfaction. Knowledge of logistics and transportation is fundamental to the operations of any business. Transportation adds value to the goods by providing time and place utility, by ensuring availability of items when they are needed, and where they are needed. For most companies there is a geographical spread between the source and market of goods produced because of economies of scale and mass production, specialization of labour, infrastructural facilities, etc. Transportation is the connecting link.

In any organisation involved in manufacturing or production of goods and services, management of logistics assumes significance. Appropriate planning, implementing and controlling the flow of goods, its storage and the effectiveness with which several activities follow, from the point of origin, to the point of consumption, occupies a significant place in modern business. The function of logistics includes sourcing, procurement, production planning, scheduling, packaging, assembly and customer services. Each one of these activities is very important. The developments in the field of transportation and communication are resulting in emergence of global supply chains and logistics processes. Technology is also having impact on logistics management.

Transportation Infrastructure

Transportation infrastructure can broadly be classified as hardware and software. Hardware consists of physical assets that comprise terminals, storage facilities, right of way for movement and vehicles/equipment. Software, which is essentially the service superstructure, consists primarily of maintenance, operations and value added services.

The nature of the infrastructure also determines a variety of economic and legal characteristics for each mode or inter-modal (multimodal) system. A mode identifies the basic transportation method or form. Bulk goods are typically transported in large shipment sizes. Therefore, dedicated vehicles and specialized modes of transport and handling are important. Industrial goods have high value and are often critical. Therefore, there is a need for speedier transport of goods. The selection of the mode of transportation is based on these

criteria.

Transportation infrastructure consists of the rights-of-way, vehicles, and carrier organizations that offer transportation services on a for-hire or internal basis. The nature of the infrastructure also determines a variety of economic and legal characteristics for each mode

or multimodal system. A mode identifies the basic transportation method or form.

Motor carriers:

Highway transportation has expanded rapidly since the end of World War II. To a significant degree the rapid growth of the motor carrier industry results from door-to-door operating flexibility and speed of intercity movement.

Motor carriers have flexibility because they are able to operate on all types of roadways. In comparison to railroads, motor carriers have relatively small fixed investments in terminal facilities and operate on publicly maintained highways. Although the cost of license fees, user fees and tolls is considerable, these expenses are directly related to the number of over-the-road units and miles operated. The variable cost per mile for motor carriers is high because a separate power unit and driver are required for each trailer or combination of tandem trailers. Labour requirements are also high because of driver safety restrictions and the need for substantial dock labour.

The characteristics of motor carriers favour manufacturing and distributive trades, short distances, and high-value products. Motor carriers have made significant inroads into rail traffic for medium and light manufacturing. Because of flexibility of delivery, they have captured almost all freight moving from wholesalers or warehouses to retail stores. The prospect for maintaining stable market share in highway transport remains bright.

The primary difficulties relate to increasing cost to replace equipment, maintenance, driver wages, and platform and dock wages. Although accelerating labour rates influence all modes of transport, motor carriers are more labour-intensive, which causes higher wages to be a major concern. To counteract this trend, carriers have placed considerable attention on improved line- haul scheduling that bypasses terminals, computerized billing systems, mechanized terminals, tandem operations that pull two or three trailers by a single power unit, and utilization of coordinated intermodal systems. These enhancements reduce labour intensity and, thus cost.

Specialty carriers include package haulers such as Federal Express and United Parcel Service. These firms focus on specific requirements of a market or product. Despite the

aforementioned problems, it is quite apparent that highway transportation will continue to function as the backbone of logistical operations for the foreseeable future.

Vehicle selection

When selecting any vehicle it is important that the choice is seen as fit for the purpose. The primary needs can be considered as consisting of the following.

- The vehicle is constructed with respect to current legal requirements.
- The construction and the use of the vehicle conforms to the users requirements.
- Any load and/or passengers carried are done so safely and with maximum efficiency including anthropometric and ergonomic factors.
- The vehicle has a good operational history of reliability and minimum costs in operation.
- Operational factors.
- Construction factors.

Vehicle types:

Different types of trucks are used to transport goods from one place to another. Logistics is one of the largest industries in the world, transporting various materials to different places.

There are different trucks that can capacitate different quantities of goods. The needs of logistics department are specific but changes according to the type of good transported or the quantity of it.

Each truck has different capabilities which cannot change. So the transporter carefully chooses the means of transportation. This also affects the profit margin of the transporter.

So they have to choose wisely what kind of transportation has to be used to transport their goods.

One of the biggest challenges while transporting goods is to move goods from one point to another without damaging it and also in a time frame.

Here we will discuss the different types of trucks used in logistics worldwide.

1. Semi-Trailer Trucks

A majority of cargoes are transported in these trucks. Semi-trailer trucks (one popular types of trucks used in logistics) are very much common on the roads.

One can load a semi-trailer truck from removing its tent cover from above, or from the side or through its back side. It has a maximum capacity of 24,000 kilogram. It is ideal for goods that can be stacked.

2. Tail Lift Trucks

These trucks have a lifting mechanism so as to load goods onto the truck. These are relatively small in size ending upon the tail lift it can carry a maximum of 2000 kilogram.

The goods can be loaded only from the back side and is used mainly on distribution freights.

3. Jumbo Trailer Trucks

Similar to semi-trailer trucks these trucks can carry a maximum of 24,000 kilograms and has more capacity as it has a lesser wheel diameter and a G-shaped floor.

4. Flatbed Trucks

These trucks are named so as it has an open cargo bed trailer along with the driver's cabin. As flatbed trucks don't have a roof or sides it is easy to load or unload goods on or from it.

It is an ideal truck for durable and bulky freight like wood, pipes, construction material, carts, etc. which can easily loaded in to the extended trailer. These materials can be unloaded or loaded from the top using a crane.

5. Straight Trucks

This is one of the types of trucks used in logistics that are commonly used to transport small items like furniture, home goods, and similar freight deliveries. It is also known as box truck,

cube track or cube van.

This is a popular choice among many drivers as it requires fewer licensing requirements. It is one of those trucks that carry the same chassis for the power unit as well as the cabin.

6. Refrigerated Trucks

These are types of trucks that are used to transport perishable goods like agricultural products, pharmaceuticals, vegetables or fruits.

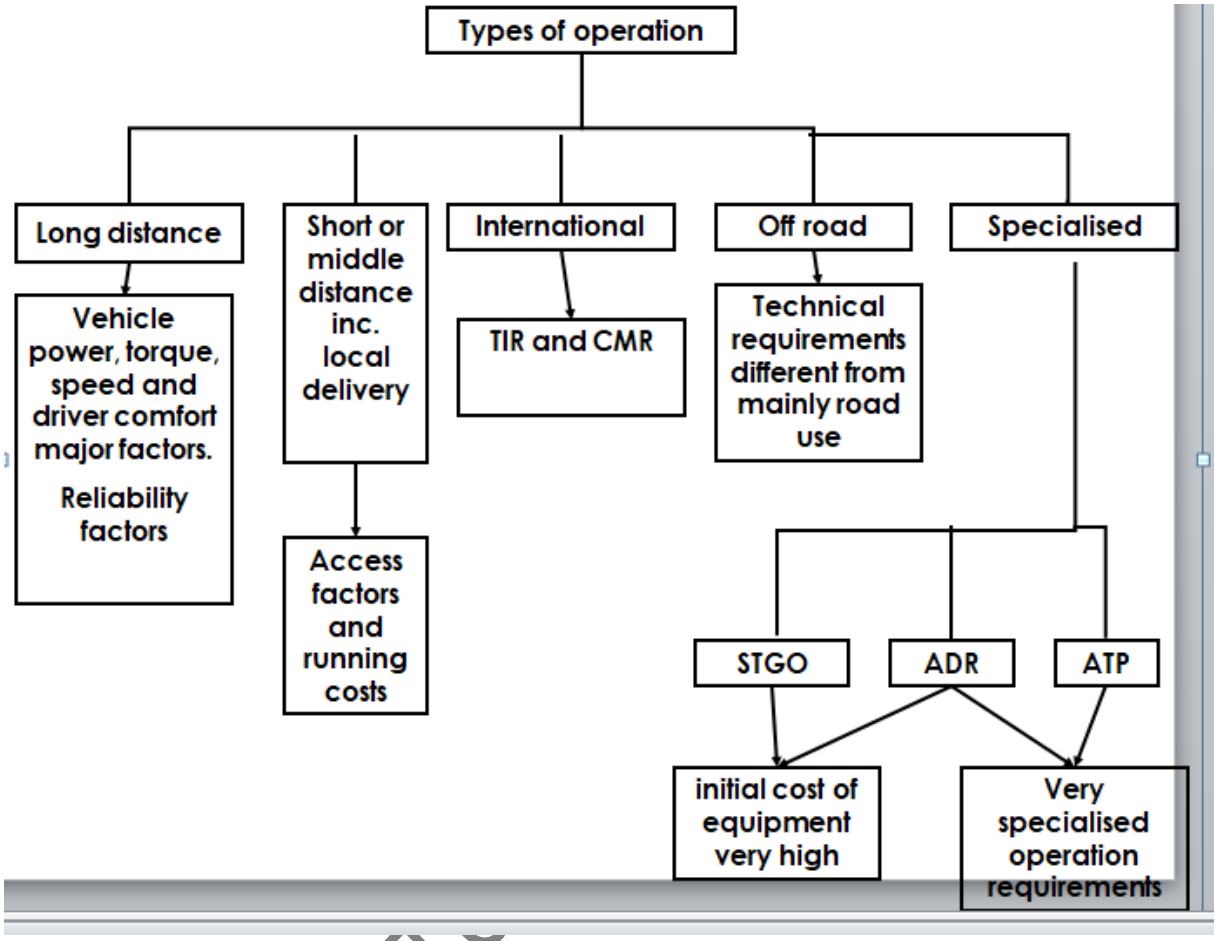
Types of operations:

The management of transportation operations is comprised of all types and modes, including tracking and managing every aspect of vehicle maintenance, fuel costing, routing and mapping, warehousing, communications, EDI implementations, cargo handling, carrier selection and management, and even accounting.

The costs and challenges for those who run transport operations continue to increase. The ability to run a transport operation efficiently and effectively can no longer be left to chance.

It's thus classified into 5 types

- Long distance.
- Short distance.
- International.
- Off road.
- Specialized.



- **Long distance** Here major considerations will be vehicle power, torque, fuel economy and driver comfort to allow long distances to be covered during a driving day
- **Multiple deliveries** Here the vehicle spends more time being loaded and unloaded than being driven. Hence the body specifications is crucial, and designs which speed the loading and unloading procedures will be an advantage eg sliding doors, curtain sided.
- **Local deliveries** vehicle must be able to gain access easily congestion charging may require alternative fuel engines to avoid payment of the charge
- **Site work** vehicles have to contend with the hazards of soft ground, buried rubble

and metal. Robust suspension, tyres, twin drive axles, double reduction and diff locks

- **International operations** vehicles engaged on international operations require conformity in construction with legal requirements of each state they will operate in. Conformity with **Transport International Routier** (TIR) will be necessary(not required in the EU).

Types of load

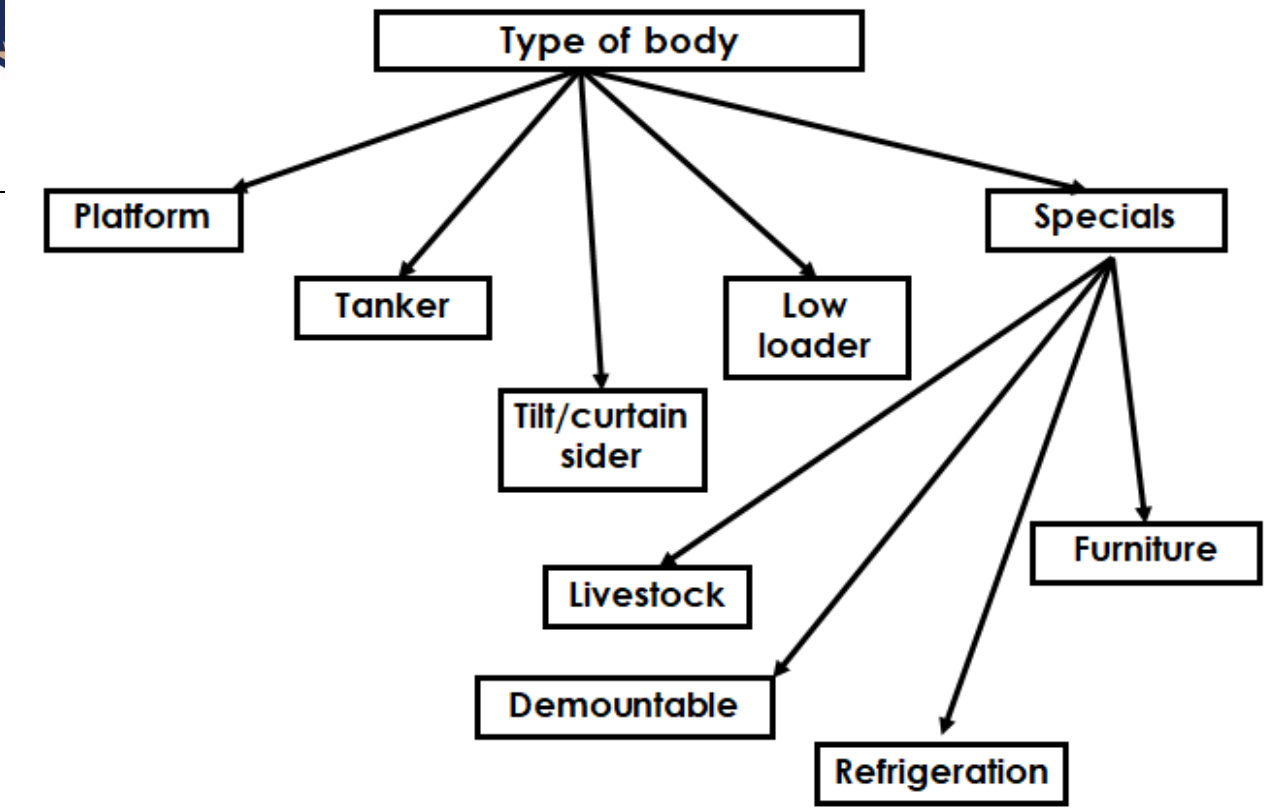
- **Light** There are many examples of very light weight products where the cubic capacity of such loads has far more significance than the weight
- **Heavy Vehicles** which will carry heavy loads are often operated under STGO. Similarly vehicle carrying very heavy loads but low volume appear less obtrusive than low mass large bulk
- **Valuable** Vehicles likely to carry high value cargos must be designed with high levels of security for protection of the load. The level of security would be a condition of the goods in transit insurance. Bonded cargos will require very high levels of fidelity to comply with the Customs and Excise requirements
- **Hazardous cargos** Vehicle engaged in any transportation of certain categories of material are required to conform with specified regulations with respect to their construction and the driver qualification. Such international requirements are Accord Dangereux Routier (ADR)
- **Specialised** These include the carriage of animals, for which there are significant legislative factors that affect the vehicle and body construction. The carriage of perishable foodstuffs (Accord Transports Perishables) ATP also has much legislative factors affecting both construction and operation.

Main types of vehicle body:

Types of vehicle body is classified into

1. Platform.
2. Tanker.
3. Tilt/curtain slider.
4. Low loader.
5. Specials.

   Further this special is classified into furniture, refrigeration, livestock and demountable.



Implication of vehicle selection:

Various factors must be considered before to select a vehicle.The selection must be looked at from the construction, maintenance and economic points.

1. Are the proven models in service?
2. Running and administration costs
3. Reliability
4. Maintenance
5. Conformance to current and projected legislation
6. Crew comfort
7. Costs.

Vehicle Acquisition Process

The general criteria for selection of a vehicle should be in conformity with the standard recommended vehicles.

The standard tender process is adopted for vehicles, as for all other goods and services, bulk

items and items bought on a regular basis. In some cases, the process may result in outsourcing of some aspects of the vehicle management or leasing of vehicles. For small daily purchases such as spark plugs, filters etc. Petty cash/float may be used by the fleet manager.

Unit 2

Need for planning – fleet management – main types of road freight transport – transport resource requirements – vehicle routing and scheduling issues – data requirements – computer routing and scheduling – information system applications – GPS – RFID

Need for planning:

Transportation planning is the process of defining future policies, goals, investments, and designs to prepare for future needs to move people and goods to destinations. As practiced today, it is a collaborative process that incorporates the input of many stakeholders including various government agencies, the public and private businesses. Transportation planners apply a multi-modal and/or comprehensive approach to analysing the wide range of alternatives and impacts on the transportation system to influence beneficial outcomes.

Fleet management is the function that oversees, coordinates and facilitates various transport and transport related activities. For the purpose of this document it will cover vehicles involved in the movement of goods; the management of light vehicle fleets used in the transportation of people and light cargo; possibly motorbikes and other equipment such as generators and warehouse handling equipment. Fleet management underpins and supports transport related activities through the management of the assets that are used.

Effective fleet management aims at reducing and minimizing overall costs through maximum, cost effective utilization of resources such as vehicles, fuel, spare parts, etc.

The administration and financial management of fleet is very organisational specific. It largely depends on donor requirements and organisational policies. For example, in some organizations vehicles are restricted to specific projects and others utilize vehicle pools to serve multiple projects. Driving policies can vary from a strict reliance on a dedicated driver from the organization, to using staff to drive the vehicles. The administrative policies of the individual organization will dictate which approach will be utilized. This results in the custodian of the fleet management function to be very much dependant on organizational policies and structures.

Aspects of Fleet Management

- Identifying needs
- Acquisition Process

- Insurance
- Vehicle leasing (Internal & external)
- Vehicle Management
- Fleet management systems
- Vehicle maintenance and up-keep
- Vehicle usage

- Vehicle disposal
- Health, Safety & Security
- Complying with Legislature and security requirements
- Drivers

Identifying needs

Identification of fleet needs is dependent on the nature of emergency and operations, and the size and area of operation - urban operations could utilise smaller saloon cars whereas remote field operation may require larger four-wheel drive vehicles for extreme terrain. Vehicle selection criteria are guided by:

- donor criteria applicable to the purchase;
- uniformity of fleet;
- the appropriate vehicle type for local fuel availability;
- the purpose of the vehicle (cargo or passenger);
- the terrain in which the vehicle will operate;
- global acquisition cost;
- availability of local dealers;
- local availability of spare parts for the intended vehicle;
- warranties; and
- local availability of competent mechanics.

Depending on the level of emergency the criteria may vary.

Main types of road freight transport

Road carriers are classified into many types based on their purpose and their objective

1. Motor vehicle.
2. Dual purpose vehicle.
3. Trailer.
4. Semi-trailer.
5. Articulated vehicle.
6. Good vehicle.
7. Motor tractor.
8. Light motor vehicles.
9. Heavy locomotives.
10. Composite trailer.

Transport resource requirements

Transport resource is requirement is depends on the amount of demand. Transportation resource planning allows retailers and manufacturers to discover transportation value within their global supply chains. By redefining the transport management process and transportations strategic role in the global enterprise, significant business benefit is possible.

An operating plan explains how a company will manage its corporate activities in order to meet consumer expectations. This is slightly different from an operational plan, which explains specific department objectives within an active organization. Organizations write an operating plan to reduce risk, enhance productivity, create efficient systems and establish protocols. Effective planning considers the integration of internal and external support functions.

ROUTINE FUNCTIONS OF TRANSPORT RESOURCES REQUIREMENT:

- Booking, Job Ordering
- Fleet Management & Dispatch
- Multi-legging or multiple drop Manifesting
- Track and Trace
- Consolidation, deconsolidation, pooling
- Invoicing
- Sub-contracting/ Outsourcing
- Fulfilment / POD
- Reverse logistics

Vehicle routing and scheduling issues:

Vehicle routing problem (VRP) and its extension is an area of importance to Operation Research theoreticians as well as very useful for real world applications. Recent research in this field has provided significant breakthroughs in problem formulation and in the design and analysis of algorithms. This study attempts to develop a daily truck routing and scheduling software, which will improve the efficiency of the perishable distribution in Bangkok of the food company. The scheduling will be done in such a way that it can satisfy all of the orders, while in the meantime, will attempt in order to improve the total distribution distance.

Vehicle routing and scheduling process needs to fulfil the following objectives:

• maximising vehicle payload (by maximising vehicle fill out and back) and maximising vehicle utilisation (by maximising number of loaded journeys per vehicle);

• minimising distance (e.g. by minimising overlapping deliveries) and minimising time (e.g. by minimising non moving time); and

• meeting customer requirements, in terms of cost, service and time and meeting legal requirements, in terms of vehicle capacity and driver's hours.

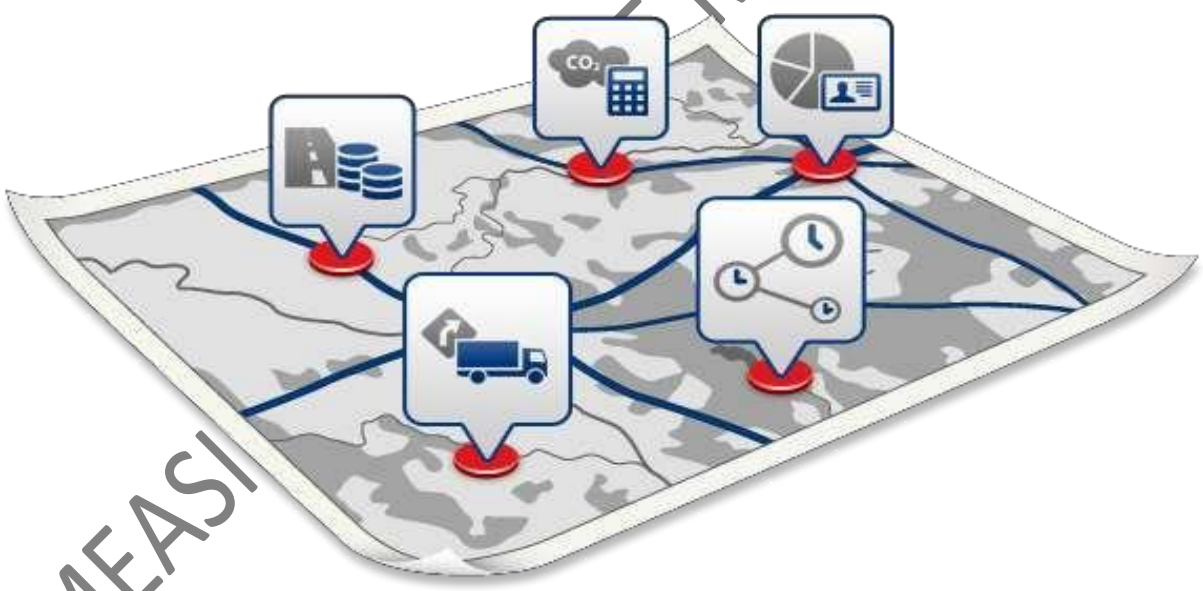
Data requirements:

Fleet Management comprises the target-oriented, optimal planning, supervision and control of the fleet operations based on the available resources, considering internal and external influencing factors. A special focus is on the integration of organizational processes with modern information systems.

Computer routing and scheduling:

Route Planning serves to arrange different transport orders to tours of a vehicle fleet. It checks with the best possible and optimum way to route based on algorithms. The most known routing problem is

1. The travelling salesman problem.
2. The vehicle routing problem.
3. The pickup and delivery problem.



Travelling Salesman Problem (TSP):

Goal:
Find the shortest way of a circular tour (starting point = end point) that is as cost effective as possible that visits a certain amount of customers exactly once.

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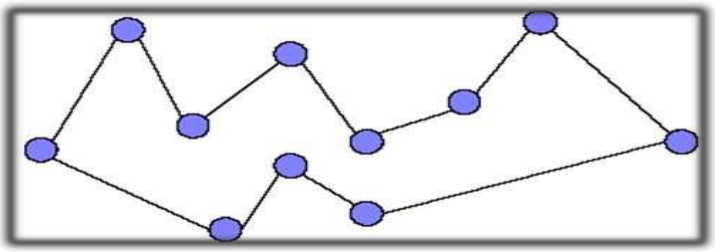
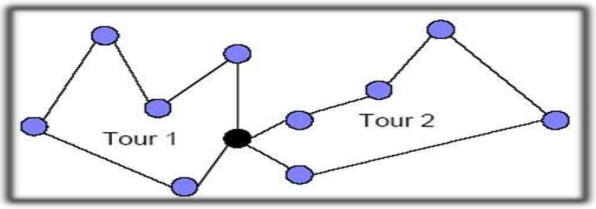


Vehicle Routing Problem (VRP)

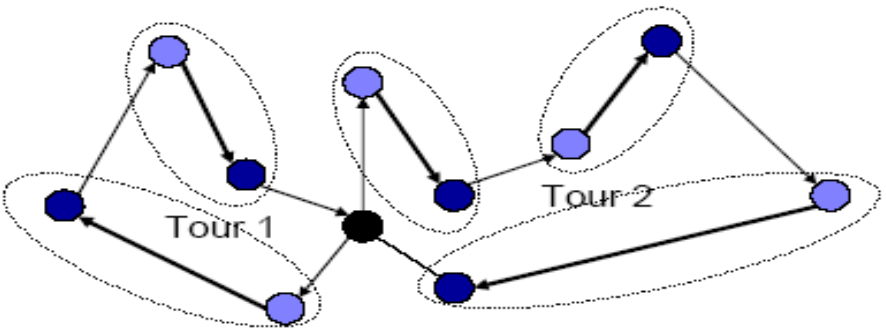
- The VRP is an extension of the TSP in which various vehicles are available at a depot.

- The VRP is therefore a combined assignment- and circular tour-problem.



Pickup and Delivery Problem (PDP):
In PDP, consignments are picked up at one place and transported to their destination.

- The PDP is an amplified VRP
- Pick up locations and the destinations have to be in the same tour
- Full-Truckload PDP.



Information system applications:

Information is one of the critical resource in today's world to have control over transportation system.

An efficient transport system is essential for sustainable economic development of the country and plays a significant role in promoting national and global integration.

■Efficient transport is indispensable to the economic development of nation.

■From past few years Intelligent Transportation Systems (ITS) are copiously deployed in the modern transportation systems to efficiently control and manage transportation.

■By using certain ITS techniques like Advanced Traveller Information System (ATIS), Automatic Vehicle Location (AVL), Variable Message Service (VMS), etc., real-time information about travel, traffic, and cautionary measures are provided.

Applications

■ Real-time Bus Arrival Information System

■ Usage in Indian Railways

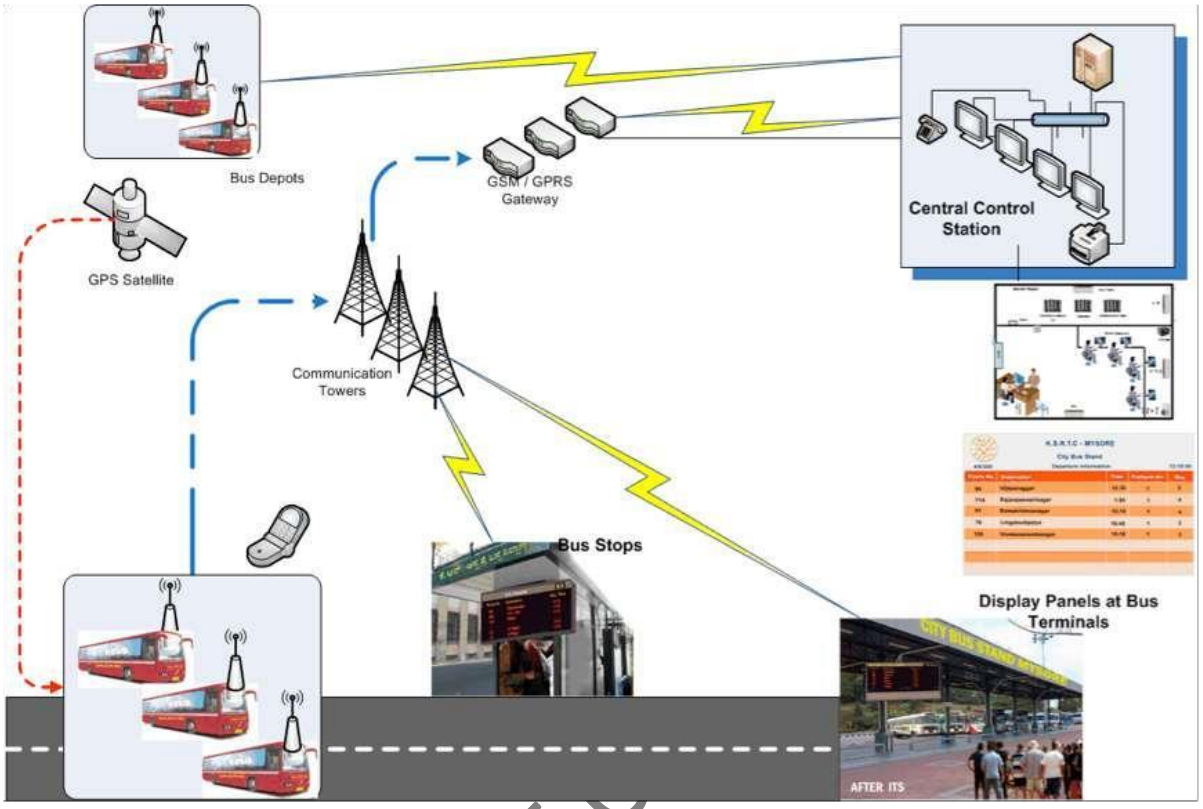
■ Real-time Traffic Information- VMS

■ Freight Management

Real-Time Bus Arrival Information System

- Reduce the uncertainty associated with public transport trips and improve the overall level of service.
- By In Vehicle Display and Automated Voice announcement system, Public transportation is made convenient.
- Gives Real-time passenger information.
- Improves passenger safety, fleet efficiency, services and traffic situation through transmission of real time information.

Real-Time Bus Arrival Information System



Application of Real-time Information systems:

- Improve Monitoring.
- Better planning of train Schedules.

- Helps Railways in running
- Trains at higher speed.
- Real-time Informational
- Updates to passengers.

Location-Tracking

Location-tracking helps companies to

- streamline and control supply chains
- move products to the market faster
- monitor assets
- prevent inventory loss
- track vehicle f leets

Location tracking is not one, single technology.

- Local Area & Indoor Tracking
- RFID: Small, battery-less microchips is attached to consumer goods, vehicles, objects to track movements.
- Wide Area Tracking
- GPS: Signals received from Satellites to track movements of objects moving great distances.

GPS:
Every vehicle must be equipped with a GPS receiver.

- As the vehicle moves around the world, satellites track the

vehicle's position.

- Positioning can be requested at any time.

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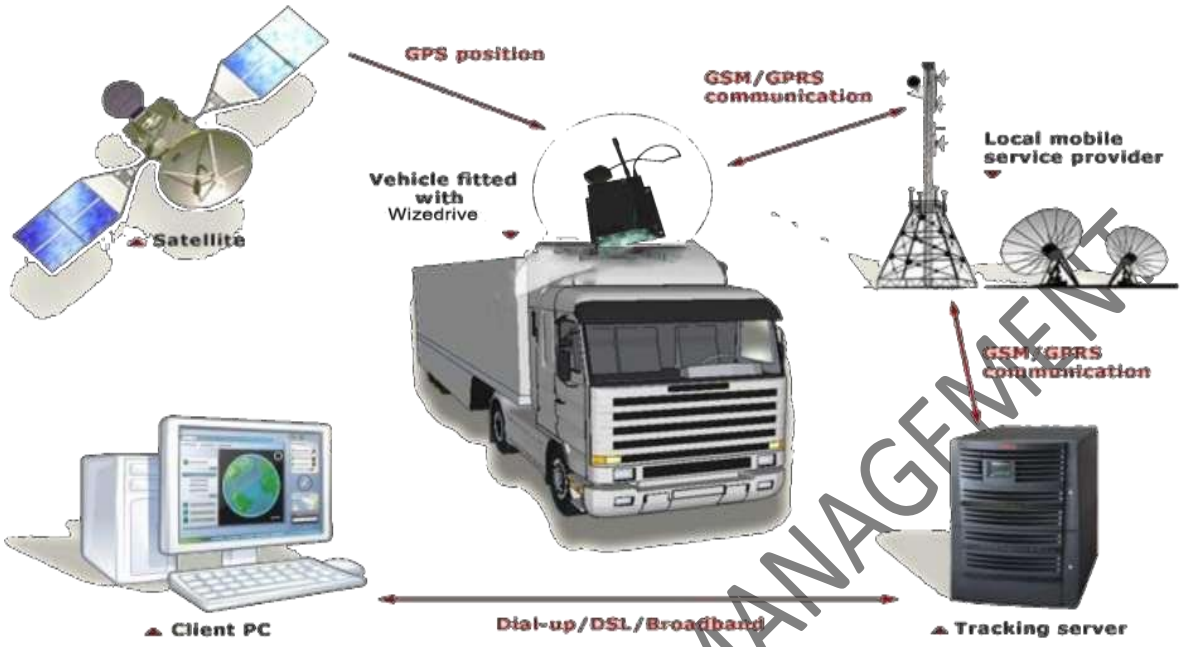


ADVANTAGES:

- Improve efficiency & productivity
- Reduce operating costs
- Speed up logistics activities
- Transparency of all the transport events
- Automatic data transfer from the order entry system
- Optimal order distribution to the tours (cost-, time and customer optimal)

RFID:
RFID = Radio Frequency IDentification

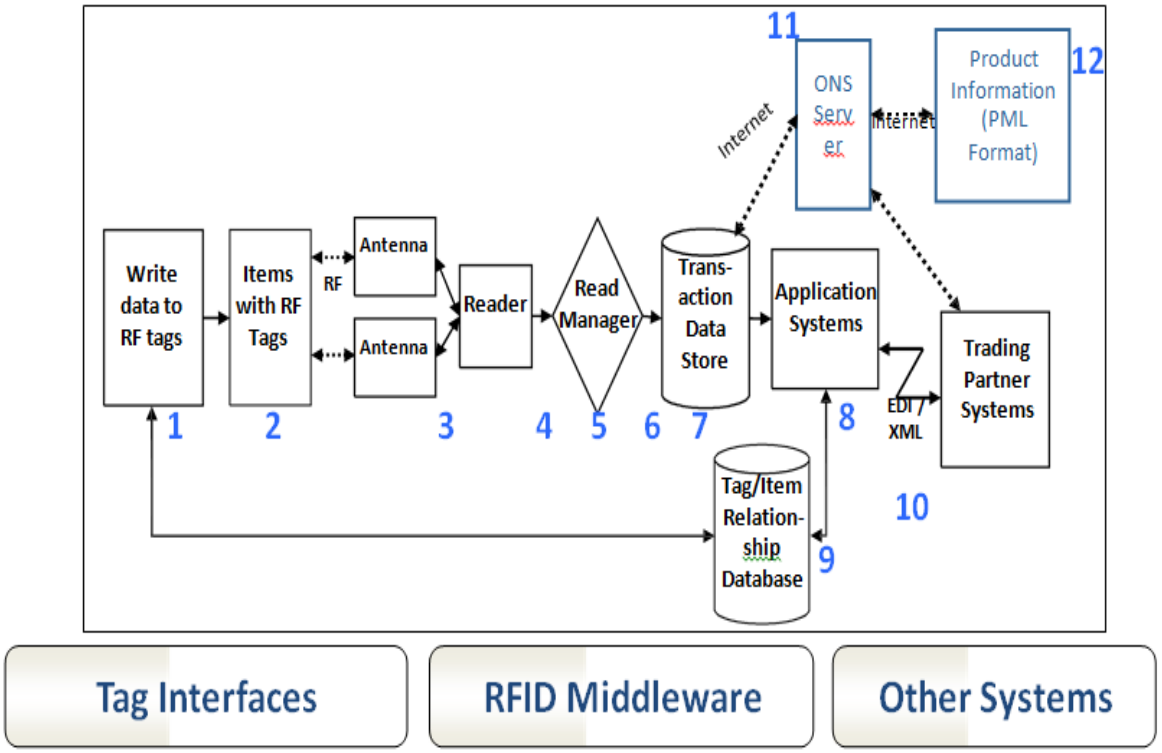
• An ADC (Automated Data Collection) technology that:

–Uses radio-frequency waves to transfer data between a reader and a movable item to identify, categorize, track

–Is fast and does not require physical sight or contact between reader/scanner and the tagged item
– Performs the operation using low cost components
–Attempts to provide unique identification and backend integration that allows for wide range of applications

• Other ADC technologies: Bar codes, OCR

RFID Systems: Logical View



RFID System Components

1. RFID tag

2. RFID Antenna

3. Workstation.

4. Network.

RFID Advantages over Bar-Codes

• No line of sight required for reading

• Multiple items can be read with a single scan

• Each tag can carry a lot of data (read/write)

• Individual items identified and not just the category

• Passive tags have a virtually unlimited lifetime

• Active tags can be read from great distances

RFID Applications

• Manufacturing and Processing

• Inventory and production process monitoring

• Warehouse order fulfilment

• Supply Chain Management

• Inventory tracking systems

• Logistics management

• Retail

• Inventory control and customer insight

• Auto checkout with reverse logistics

• Security

- Access control
- Counterfeiting and Theft control/prevention
- Location Tracking
- Traffic movement control and parking management

Unit 3

Legislation – Operator licensing – Driver licensing – Driver's Hours regulations – Road transport directive – tachographs – vehicle dimensions.

Legislation

(1) This Act may be called the Motor Transport Workers Act, 1961.

(2) It extends to the whole of India 2[***].

(3) It shall come into force on such date, not being later than the 31st day of March, 1962, as the central Government may, by notification in the Official Gazette, appoint and different dates may be appointed for different States:

3[Provided that it shall come into force in the state of Jammu and Kashmir on the commencement of the Central Labour Laws (Extension to Jammu and Kashmir) Act 1970 (51 of 1970].

(4) It applies to every motor transport undertaking employing five or more motor transport workers : Provided that the state Government may, after giving not less than two months' notice of its intention so to do, by notification in the Official Gazette, apply all or any of the provisions of this Act to any motor transport undertaking employing less than five motor transport workers.

2. Definitions.-In this Act, unless the context otherwise requires,-

(a) "adolescent" means a person who has completed his fifteenth year but has not completed his eighteenth year:

(b) "adult" means a person who has completed his eighteenth year:

(c) "child" means a person who has not completed his fifteenth year

(d) "day" means a period of twenty-four hours beginning at midnight:

(f) "hours of work" means the time during which a motor transport worker is at the disposal of the employer or of any other person entitled to claim his services and includes-

(i) The time spent in work done during the running time of the transport vehicle; (ii) The time spent in subsidiary work; and

(iii) Periods of mere attendance at terminals of less than fifteen minutes. Explanation. - For the purpose of this clause –

(1) "running time" in relation to a working day means the time from the moment a transport vehicle starts functioning at the beginning of the working day until the moment when the transport vehicle ceases to function at the end of the working day, excluding any time during which the running of the transport vehicle is interrupted for a period exceeding such duration as may be prescribed during which period the persons who drive, or perform any other work in connection with the transport vehicle are free to dispose of their time as they please or are engaged in subsidiary work;

(2) "subsidiary work" means work in connection with a transport vehicle, its passengers or its load which is done outside the running time of the transport vehicle, including in particular

(i) work in connection with accounts, the paying in of cash, the signing of registers, the handling in of service sheets, the checking of tickets and other similar work;

(ii) the taking over and garaging of the transport vehicles;

(iii) traveling from the place where a person signs on to the place where he takes over the transport vehicle and from the place where he leaves the transport vehicle to the place where he signs off;

(iv) work in connection with the upkeep and repair of the transport vehicle; and

(v) the loading and unloading of the transport vehicle;

(3) "period of mere attendance" means the period during which a person remains at his post solely in order to reply to possible calls or to resume action at the time fixed in the duty schedule;

(g) "motor transport undertaking" means a motor transport undertaking engaged in carrying passengers or goods or both by road for hire or reward, and includes a private

carrier;

(h)"motor transport worker" means a person who is employed in a motor transport undertaking directly or through an agency, whether for wages or not, to work in a professional capacity on a transport vehicle or to attend to duties in connection with

the arrival, departure, loading or unloading of such transport vehicle and includes a driver, conductor, cleaner, station staff, line checking staff, booking clerk, cash clerk, depot clerk, time-keeper, watchman or attendant, but except in section 8 does not include-

(i) any such person who is employed in a factory as defined in the Factories Act, 1948 (63 of 1948); (ii) any such person to whom the provisions of any law for the time being in force regulating the conditions of service of persons employed in shops or commercial establishments apply;

(i) "prescribed" means prescribed by rules made under this Act;

(j) "qualified medical practitioner" means a person having a certificate granted by an authority specified in the Schedule to the Indian Medical Degrees Act, 1916 (7 of 1916), or notified under section 3 of that Act or specified in the schedules to the Indian medical council Act, 1956 (102 of1956), and includes any person having a certificate granted under any Provincial or State Medical Council Act;

(k) "spread-over" means the period between the commencement of duty on any day and the termination of duty on that day;

(l) "Wages" has the meaning assigned to it in clause (vi) of section 2 of the Payment of Wages Act, 1936 (4 of 1936);

Operator licensing

Multimodal transport operator means any person who engaged in the business of carriage of goods and using at least two different modes of transport under a Multimodal transport contract, from the place of acceptance of the goods in India to a place of delivery of the goods outside India or Within India; registered under the Multimodal Transportation of Goods Act, 1993

As per provisions of the Act No person shall carry on or commence the business of Multimodal transportation unless he is registered under this Act;

The criteria to be satisfied for being enrolled as a multi-modular transport administrator are as per the following:

1. The candidate ought to be a company, firm or exclusive concern.

2. Turnover of Rs.50 Lakh OR Capital Should be Rs. 50 Lakh or more

3. Two agents from two different foreign countries.

Document Required:

1. Certificate from C.A. showing Annual Turnover of the applicant for the preceding three financial years OR subscribed &paid-up share capital / aggregate balance in the capital account

2. Income Tax Returns (front page) for the preceding three financial years.

3. Complete audited accounts of the applicant, including auditor's report, all schedules and notes to the accounts for the preceding financial year.

4. Copies of agency agreements, reflecting multi-modal operations of the applicant with two agents (from two different foreign countries) AND confirmation of the validity of these agreements from the same foreign agents through e-Mail.

5. A Certificate of Incorporation with a copy of the Memorandum and Articles of Association, if the applicant is a company OR registration under Partnership Act OR registered deed of proprietorship AND documentary proof reflecting the registered office address of the applicant / presence in India

6. Name/s of all the Directors / Partners / Proprietor of the applicant with their contact details in India and

7. List of offices, with key staff who will be authorized signatories to sign the Multimodal Transport Documents (MTDs) with their names, designation and specimen signature on the

letterhead of applicant AND proof of their employment, viz. PF returns OR the Tax Deducted at source on salaries.

8. An undertaking on the applicant's letter head with signature of responsible person, for to issue MTD for taking charge of goods for exports from India [as prescribed by the DGS].

Driver licensing

Application for driving License (CMVR 14, MMVR 5) – (1) An application for Driving License is required to be made in Form 4 accompanied by

a) An effective learner's license to drive the vehicle of the type to which the application relates;

b) Appropriate fee as specified in CMVR 32, for the test of competence to drive and issue of license;

c) Three copies of the applicant's recent passport size photograph;

d) A medical certificate in Form 1-A, if applicable ;

e) A driving certificate in Form 5 issued by the school, from where the applicant received instruction;

f) Proof of residence;

g) Proof of age;

h) Proof of citizenship;

(2) Upon the receipt of an application for a driving license, the licensing authority is empowered to make enquiries to establish the identity of the applicant and to ascertain that the applicant is not disqualified for holding or obtaining a driving license**.**

Driving Test (CMVR 15) – (1) The driver should not only be competent in driving, he should aslo be aware of the traffic regulations, signs, signals. He should also have knowledge of maintaining vehicles. A candidate is required to

be appear for the test of competence after completion of a period of 30 days before the licencing authority. The Inspector of motor vehicle is required to conduct a driving test as specified in CMV R15. While conducting the test, the testing officer is required to sit by the side of the candidate so that he can observe all the items specified in CMV R15. The

testing officer should satisfied himself that the candidate is competent to drive. The test of competence is required to be carried out in a vehicle of the type to which the application refers to. The vehicle for driving test is required to be arranged either by driving school or by the candidate himself and should have dual control, except for two wheeler. A person who passed a test in driving a motor cycle with gear should be deemed also to have passed a test in driving a motor cycle without gear. (MVA S 9(6)).

(2) If the applicant does not pass the test of competence, he is permitted to re- appear for the test after a period of seven days. Where the applicant does not pass the test even after three appearances, he is disqualified to re-appear for such test before the expiry of a period sixty days from the date of last such test. (MVA S 9(5)).

(3) The testing officer is required to endorse on the application form, whether the applicant has passed the test- or failed it. This report is required to be submitted to the Licensing Authority.

23 International Driving Permit (CMV R 2(t)) - ―International Driving Permit‖ means the license issued by a licensing authority in India to an Indian National, authorising the person to drive any categories of motor vehicles as specified in Form 6-A in the areas or territories of countries other than India that are Parties to the Convention on Road Traffic signed at Geneva on 19th day of September, 1949.

Issue of International driving permit (I.D.P.) [CMV R 14(2)] -

(1) An application for an International Driving Permit is required to be made in Form 4-A accompanied by—

(a) valid driving license issued by the licensing authority

(b) appropriate fee as specified in CMVR 32;

(c) three copies of the applicant's rec ent passport photograph; (d) a medical certificate in Form 1-A;

(e) valid proof of Indian Nationals; (f) valid proof of passport; and

(g) valid proof of visa, wherever applicable.

(2) Licensing authority is required to issue International Driving Permit in Form 6-A and is valid for a period of not more than one year from the date of issue, or till the validity of the driving license, whichever is earlier. [CMVR 16(4)]

Driver's Hours regulations

'working time' is the time from the beginning to the end of work. during this time, the mobile worker is at their workstation, available to their employer and carrying out their:

- road transport functions, or
- other activities

Road transport functions include the time spent on:

- driving;
- loading and unloading vehicles;
- assisting passengers getting on and getting off the vehicle;
- cleaning and technical maintenance;
- work to ensure the safety of the vehicle, its cargo and passengers; and administrative duties to meet any of the particular transport activity's legal or regulatory obligations, for example for customs or police.

The time spent on other activities includes:

- time during which the mobile worker cannot use their time freely and must be at their workstation ready to take up normal work;
- any waiting periods where the length of time is not known in advance. in the case of self- employed drivers, the same working time definition applies from the beginning to the end of work when the self- employed driver is at their workstation, at the disposal of a client or carrying out duties or activities other than general administrative work that is not directly linked to the job in hand.

Working time does not include:

- routine travel between home and the mobile worker's normal place of work,
- rest and breaks when no work is done, and periods of availability

Periods of availability:

Under the Road Transport working Time directive, a 'period of availability' is waiting time whose duration is known in advance by the mobile worker or self- employed driver.During this waiting time, the mobile worker or self- employed driver does not have to stay at their work station, but they must be available to:

- answer calls,
- start work or resume driving,
- Carry out other work.

periods of availability include, for example, time spent accompanying a vehicle being transported by train or ferry, time waiting at border crossings or delays due to traffic restrictions.

Here are some other examples.

- When a mobile worker arrives at work, they are told they will not be required to carry out any duties for a specified period but that they must remain on site to answer calls or be ready to take up work.
- If the mobile worker is told of a one-hour delay but is then told before the end of the first hour that a further delay of one hour is expected, then the second hour also counts as a period of availability.
- Unless they're doing other work, the time spent by a relief driver travelling as a passenger would count as a period of availability - this time or part of it could also be treated as a break.
- If a driver knows that they are usually delayed at a shopping Centre for an hour, this time counts as a period of availability. However, if the driver experiences a two-hour

delay when they normally only expect one hour, the second hour is counted as working time.

Breaks and rest periods:

'Breaks' are short intervals of at least 15 minutes' duration when the worker stops their work activity completely. The worker or self- employed driver may use them only for recuperation – that is, they must actually rest and not use the time to do other work.

A 'rest period' is an unbroken period of time when the self- employed driver or worker is free to use their time as they wish.

All mobile workers and self- employed drivers are subject to the break and rest provisions of EU Rules on drivers Hours when travelling. See page 12 of this document for the legal requirements on how breaks and rest should be taken.

Reference period:

A 'reference period' is the period of time over which the working time is averaged. employers, workers and self- employed drivers must know in advance when the reference period starts and ends for calculating working time.

Three options are available for selection as a reference period on agreement with employees:

1. A fixed 17 successive week period
2. A fixed 26 successive week period
3. A rolling 17 week period

Night Work:

'night' work is work performed during 'night-time' which, under the directive and irish

regulations, is:

- the time between midnight and 4am hours for the transport of goods and between 1am and 5am hours for the transport of passengers.

- mobile workers and self- employed drivers may do a maximum of 10 hours' work during the night-time in each 24-hour period, even if only five minutes of that work occurs during night-time.

Any person who spends any amount of time working between the hours of midnight and 4am for the transport of goods and between 1am and 5am for the transport of passengers are subject to a working limit of 10 hours for that 24 hour period.

Road transport directive

The Road Transport working Time directive is the law which lays down the basic standards for how working time in the road transport sector is organised in eU countries. The directive applies to all bus and truck drivers and other mobile workers who use tachographs for recording driving times, breaks and rest periods.

The directive:

- places limits on working time, including night work, for mobile workers;
- specifies rest and breaks periods between work; and
- sets out the obligations of employers, workers and self- employed drivers in relation to record keeping.

Through these measures, the directive seeks to:

- protect the health and safety of mobile workers in road transport;
- Improve road safety; and
- harmonize conditions of competition

Tachographs

The Government of India felt the need for a permanent agency to expedite the publication of standards and development of test facilities in parallel when the work on the preparation of the standards is going on, as the development of improved safety critical parts can be undertaken only after the publication of the standard and commissioning of test

facilities. To this end, the Ministry of Surface Transport (MOST) has constituted a permanent Automotive Industry Standard Committee (AISC) vide order No. RT-11028/11/97-MVL dated September 15, 1997. The standards prepared by AISC will be approved by the permanent CMVR Technical Standing Committee (CTSC). After approval, the Automotive Research Association of India, (ARAI), Pune, being the secretariat of the AIS Committee, has published this standard. For better dissemination of this information ARAI may publish this document on their web site.

Recording Equipment (Tachograph) means

Equipment intended for installation in road vehicles to show and record automatically or semi-automatically details of the movement of those vehicles and of the certain working periods of their drivers;

Record Sheet means

A sheet designed to accept and retain recorded data, to be placed in the tachograph and on which the marking devices of the latter inscribe a continuous record of the information to be recorded;

The Constant of the Tachograph means

The numerical characteristic giving the value of the input signal required to show and record a distance traveled of one kilometer; this constant must be expressed either in revolutions per kilometer (k = . . . rev/km), or in impulses per kilometer (k = . . . imp/km);

Characteristic Coefficient of the Vehicle means

The numerical characteristic giving the value of the output signal emitted by the part of the vehicle linking it with the tachograph (gearbox output shaft or axle) while the vehicle travels a distance of one measured kilometre under normal test conditions. The characteristic coefficient is expressed either in revolutions per kilometre (w = . . . rev/km) or in impulses per kilometre (w = . . . imp/km);

Effective Circumference of Wheel Tyres means

The average of the distances travelled by the several wheels moving the vehicle (driving wheels) in the course of one complete rotation. The measurement of these distances must be made under normal test conditions and is expressed in the form: L = . . . mm.

GENERAL FUNCTIONS OF TACHOGRAPH

The equipment must be able to record the following

i) Distance travelled by the vehicle;

ii) Speed of the vehicle;

iii) Driving time;

iv) Other periods of work or of availability;

v) breaks from work and daily rest periods;

vi) Opening of the case containing the record sheet. The equipment must have the facility to retrieve the record on board and must be able to record distinctly in case of multi-driver operation the details of the periods listed under iii, iv and v.

vii) Driver's Identity

The equipment must be capable of recording on sheets details of the periods listed under iii, iv and v for at least one driver and for two drivers as option.

viii) For electronic recording equipment (tachograph), which is equipment operating by electrical signals transmitted from the distance and speed sensor, any interruption exceeding 100 milli second, in the power supply of the recording equipment (except lighting), in the power supply of the distance and speed sensor and any interruption in

the signal lead to the distance and speed sensor.

Vehicle dimensions.

As per the NHDP 65% of Freight and 40% of passenger traffic is carried by roads. National Highways account for 2% of the entire network of roads but carries 40% of the annual traffic. Currently approx.15km of Road network is being laid every day.

- An average vehicle covers 300km in a day.
- Transport Sector accounts for 6.4% of GDP. Size of Road Freight is estimated at $10 Billion.

Types of vehicles and dimension:

Types of Vehicles (As per RTO)			
Type	**Capacity (MT)**	**Dimensions (FT)**	**Distance per Day (Km)**
Light Commercial Vehicle (LCV)	3.50	14x6x6	300
LPT	5.50	17x6x6	300
Full Truck Load (FTL)	9.00	18x7x7	300
Taurus	16.00	22x7x7	300
20 ft Open Truck	9.00	20x8x8	300
20 ft Trailer	20.00	20x8x8	200
40 ft trailer (double Axle)	22.00	40x8x8	200
40 ft Trailer (Triple Axle)	27.00	40x8x8	200
Semi Low Bed Trailer	22.00	40x8x10	200
Low Bed Trailor	22.00	40x10x12	100
Multi Axle Trailer (Hydraulic)	per Axle 7 MT	Depends	100

Average Drive Time: 10 Hrs

Over Dimensional shipments

- Increase in dimensions of freight over the RTO limit leads to excess charges. Receipt is issued for the same by Govt. officials. Few states issuing reciepts are MH, GJ, MP and a few southern states.
- Approximate Freight Charges for Extra Size is 5% per foot (Above RTO permitted).

- LBT (Mechanical Trailer) can carry height max. upto 15 ft except in 3 states i.e. CG, AP & Orissa and the freight rates for this type of vehicle depends on weight and the size of vehicle.
- In AP, special permission needs to be taken from RTO, Hyderabad for overweight consignments.
- Normally for such type of ODC shipments, sometimes, route survey is required to ensure smooth passage.

Unit 4

Introduction to Air Cargo: Aviation and airline terminology – IATA areas – Country – Currency – Airlines – Aircraft layout – different types of aircraft – aircraft manufacturers – ULD – International Air Routes – Airports – codes – Consortium – Hub and spoke – Process Flow.

Introduction to Air Cargo:

Air cargo supply chains, the process of moving consignments from origin to destination, are often complex and subject to a range of regulatory requirements, especially when they include international movements and transport by air.

Air cargo is highly diverse in its physical characteristics and value. It may originate from, and be delivered to, almost anywhere in the world, most commonly as goods being sent from a seller to a buyer or from a consignor to a consignee. It can take the form of personal belongings, gifts and donations, product samples or equipment and even live animals for professional activities and events. It may be considered low risk – a regular shipment from a known source in a relatively safe region – or high risk – such as a more unusual shipment from an unknown source, presenting anomalies or identified by intelligence.

The cargo will be handled along the chain by a number of entities with varying responsibilities, including aircraft operators, express carriers, postal operators, regulated agents, consignors, consignees, hauliers and ground handlers. As a further complication, these entities will often be known by different names according to the State or region in which they are located.

The cargo may transfer between several different flights before it reaches its destination and consignments will be subjected to a variety of procedures and documentary requirements in accordance with legal and commercial frameworks. Authorities' responsible forthe safety and security of aviation, for the prevention of crime and protection of fiscal revenues, will all have an interest and their own rules.

All those involved in these often complicated movements share the responsibility for ensuring the safety and security of the cargo and for operating within the law. In particular, they are responsible for ensuring that nothing contained in the cargo will endanger an aircraft and the lives of those travelling it.

Roles and responsibilities

A single entity may fulfil multiple role in the supply chain and take on the combined responsibilities

Broker

A broker is an independent agent who facilitates the movement of goods from buyer to seller, for instance by arranging air transport or meeting Customs requirements, goods declarations. Brokering functions are often integrated with forwarding, consolidation and even warehousing functions within a single entity.

Buyer

The buyer is the purchaser of the goods and, in the international trade context, is also known as the importer. The buyer or importer either clears consignments on its own or utilizes the services of a broker to assist with various requirements of border regulatory agencies.

Consignor

A consignor is the entity or individual who initiates the movement or transport of the goods. In other words, it is the sender. (A 'known consignor' is an entity recognized in some States as meeting specified security requirements). The term 'shipper' is often describing the entity or individual who initiates the trade in goods. Consignor and shipper are separate roles but can be the same entity or individual.

Consignee

The consignee is the party designated on the invoice or packing list as the recipient of the goods at the end of the transport movement.

Freight forwarders

Freight forwarders are part of the transport logistics process within the supply chain and their

main task is to arrange for air shipments to be managed in such a way that they are ready for transportation by aircraft operators. Such arrangements might include the consolidation of cargo.

A freight forwarder and logistics service provider may offer a service relating to the preparation, storage, carriage and final delivery of goods, including applicable documentary

and facilitation formalities. A forwarder rarely acts as carrier of the goods. Usually, it is the organizer of multiple carriages in several modes of transport and other services that contribute

to the building of a supply chain. Such carriage may be performed by single or multimodal transport means. Multimodal transports occur when air cargo services are combined with sea, rail, or pre-carriage trucking from the shipper or manufacturer to the airport of departure and from the airport of destination to the consignee. Services offered by the forwarder may include consolidation, storage, handling, packing, or distribution of the goods. In addition the forwarder can provide a range of ancillary and advisory services in relation to the physical movement of the goods. These services will often include Customs and fiscal matters, declaring the goods for official purposes, procuring insurance for the goods, and collecting or procuring payment or documents relating to the goods.

Freight forwarding services also include logistical services with modern information and communication technology in connection with the carriage, handling, or storage of goods and, de facto, total supply chain management.

For air cargo shipments, a freight forwarder normally books and contracts with an aircraft operator in the form of an air transport service agreement from the airport of departure to the airport of destination. The freight forwarder will then proceed with the shipment from its warehouse or another location and deliver it directly to the aircraft operator or its representative. This process normally starts well before Customs export formalities have been resolved.

AIR CARGO MOVEMENT:

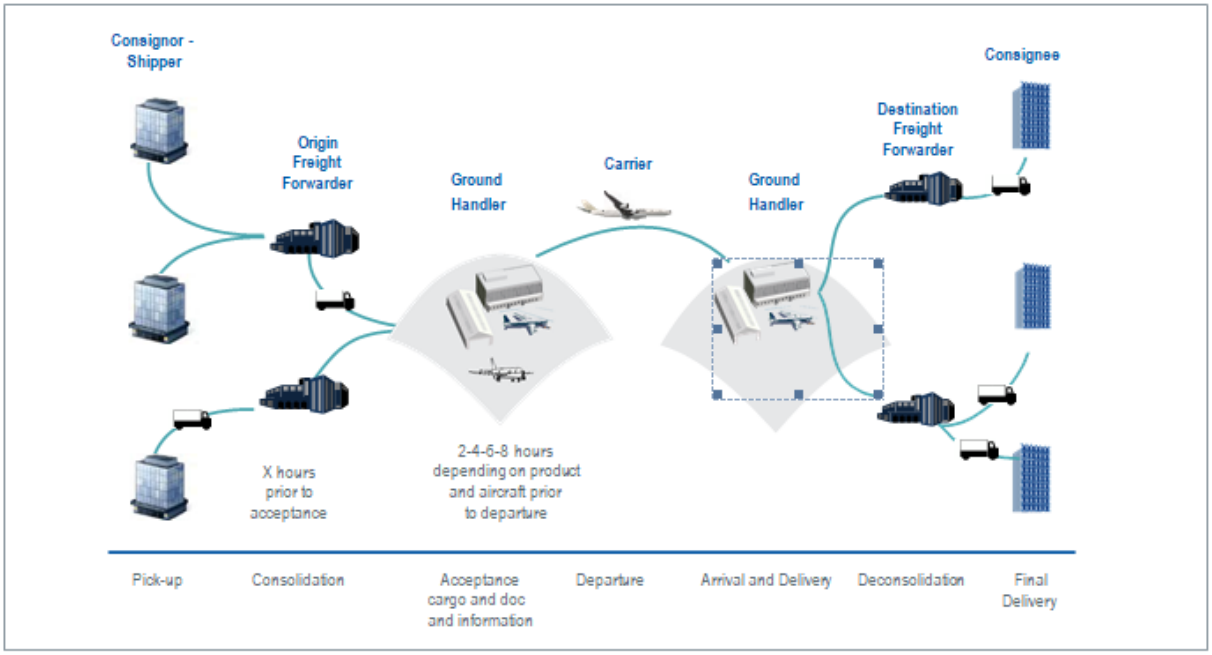


Figure 1 - Air cargo movement overview.

Aviation and airline terminology

An aviation glossary of common terms used in the analysis of data on the United States airline industry. The US uses English units and flight lengths are therefore measured in statute miles and fuel usage in gallons. In contrast, the airline industry in the rest of the world uses similar quantities, but defined using metric system units, such as kilometres.

Aileron

A control surface located on the trailing edge of each wing tip. Deflection of these surfaces controls the roll or bank angle of the aircraft.

Air foil

Any surface such as an airplane wing, aileron, or rudder designed to obtain a useful reaction from the air moving past it.

Airworthiness

A term used to describe both the legal and mechanical status of an aircraft with regard to its readiness for flight.

Altimeter

An instrument which displays the altitude above mean sea level (MSL) of an aircraft.

Artificial Horizon

An instrument which enables a pilot to determine the attitude of the aircraft in relation to the horizon, i.e. whether the aircraft is nose-up, nose-down, or banking left or right.

Available Seat Mile (ASM)

One seat flown one mile. An airliner with 100 passenger seats, flown a distance of 100 miles, represents 10,000 available seat miles (ASMs).

Cargo

Anything other than passengers, carried for hire, including both mail and freight.

Cockpit Voice Recorder (CVR)

A device that records the sounds audible in the cockpit, as well as all radio transmissions made and received by the aircraft, and all intercom and public address announcements made in the aircraft. It generally is a continuous loop recorder that retains the sounds of the last 30 minutes.

Code sharing

A marketing practice in which two airlines share the same two-letter code used to identify carriers in the computer reservation systems used by travel agents.

Combi

A type of aircraft whose main deck is divided into two sections, one of which is fitted with seats and one which is used for cargo.

Compressor

A fan-like disk, or several disks, at the front end of a jet engine that draws air into the engine and compresses the air. The compressed air is then passed into a combustion chamber where

it is mixed with fuel and burned, producing thermodynamic energy.

Computer Reservation System (CRS)

A system for reserving seats on commercial flights electronically. Several airlines own and market such systems, which are used by travel agents.

Connecting Flight

A flight requiring passengers to change aircraft and/or airlines at an intermediate stop.

Deregulation

The term commonly used in referring to the Airlines Deregulation Act of 1978 ,Which ended government regulation of airline routes and rates

Direct Flight

A flight with one or more intermediate stops, but no change of aircraft

Dispatcher

An airline employee who is responsible for authorizing the departure of an aircraft. The dispatcher must ensure, among other things, that the aircraft's crew have all the proper information necessary for their flight and that the aircraft is in proper mechanical condition.

Elevator

A control surface, usually on the trailing edge of the horizontal stabilizer, which is used to control the pitch attitude of an aircraft. Movement of the elevator will force the nose of an aircraft up or down.

Empennage

A collective term that refers to all of the various tail surfaces of an aircraft, i,e., the vertical and horizontal stabilizers.

Enplanements

The number of passengers boarding a flight, including origination, stopovers and connections.

En Route Center

Formally known as an Air Route Traffic Control Center (ARTCC), it houses the air traffic controllers and equipment needed to identify and direct aircraft, primarily during the en route portion of their flights.

Flaps

Control surfaces installed on the trailing edge of a wing and used to increase the amount of lift generated by the wing at slower speeds. Flaps also have the effect of slowing an aircraft during its landing approach.

Flight Data Recorder (FDR)

Records pertinent technical information about a flight. An FDR will record information about the performance of various aircraft systems, as well as the aircraft's speed, altitude, heading and other flight parameters. Like a cockpit voice recorder (CVR), a flight data recorder is designed to withstand the forces of a crash so that its information may be used to reconstruct the circumstances leading up to the accident (in some cases, a digital flight data recorder, or DFDR).

Flight Deck

Also called the cockpit, it the section of an aircraft where pilots sit and control the aircraft.

Flight Plan

A required planning document that covers the expected operational details of a flight such as destination, route, fuel on board, etc. It is filed with the appropriate FAA air traffic control facility. There are both VFR and IFR flight plans. VFR plans are not mandatory.

Flight Service Station (FSS)

An FAA facility that provides specialized flight-related services to pilots. It can provide weather briefings and en route advisories, among other things.

Freight

All air cargo excluding mail.

Freight-Ton Mile

A ton of freight moved one mile. It is the standard measure of air freight activity.

Frequent-Flyer Programs

Airline marketing programs designed to win customer loyalty by giving them "points" for each mile flown. Points can be cashed in later for free flights or upgrades in cabin service, or in some instances, non-airline services or items.

Fuselage

The main body of an aircraft is cylindrical in shape. It contains the cockpit, main cabin and cargo compartments.

Glideslope

The ideal descent path of run-way. It can be electronically defined by radio signals transmitted from the ground. An aircraft carrying a special radio receiver can detect this electronic glide path and follow it down to the runway.

Hub and Spoke

A system for deploying aircraft that enables a carrier to increase service options at all airports encompassed by the system. It entails the use of a strategically located airport (the hub) as a passenger exchange point for flights to and from outlying towns and cities (the spokes).

Instrument Landing System (ILS)

Provides radio-based horizontal and vertical guidance to an aircraft approaching a runway. It is used to guide landing aircraft during conditions of low visibility.

Knot

An abbreviation for one nautical mile per hour. Since a nautical mile is 15 percent longer than a statute mile, a speed expressed in knots is 15% higher than it would be if expressed in miles per hour.

Load Factor

The percentage of available seats that are filled with paying passengers or the percent of freight capacity that is utilized. Technically, revenue passenger miles divided by available seat miles or cargo ton miles divided by available cargo ton miles.

IATA areas

Sub-areas in IATA World Map		
AREA 1	**AREA 2**	**AREA 3**
North America Canada, USA, Mexico, Puerto Rico, US virgin Islands, Greenland.	**Europe** Albania, **Algeria**, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, France, Georgia, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland (Republic of), Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia FYROM (Former Yugoslav Republic of), Malta, Monaco, Moldova (Republic of), **Morocco**, Netherlands, Norway, Poland, Portugal (including Azores and Madeira), Romania, Russia (in Europe), San Marino, Serbia and Montenegro (formerly Yugoslavia) Slovakia, Slovenia, Spain (including Canary Islands), Sweden, Switzerland, **Tunisia**, Turkey, Ukraine, United Kingdom.	**South East Asia Sub-area (SEA)** Brunei Darussalam, Cambodia, China (excluding Hong Kong SAR and Macao SAR), Chinese Taipei, Guam, Hong Kong SAR (China), Indonesia, Kazakhstan, Kyrgyzstan, Lao (People's Democratic Republic), Macao SAR (China), Malaysia, Marshall Islands, Micronesia (includes Caroline Islands except Palau Islands Group), Mongolia, Myanmar, Northern Mariana Islands, Palau, Philippines, Russia (in Asia), Singapore, Tajikistan, Thailand, Timor Leste, Turkmenistan, Uzbekistan, Vietnam.
Central America Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua.		

The Caribbean Islands Anguilla, Antigua and Barbuda, Aruba, Barbados, Bonaire Saba and St. Eustatius, Cayman Islands, Cuba, Curaçao, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Saint Barthelemy, St. Kitts and Nevis, St. Lucia, St. Martin, St. Vincent and the Grenadines, St. Maarten (Dutch part), Trinidad and Tobago, Turks and Caicos Islands, Virgin Islands (British).	**Middle East** Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, United Arab Emirates (comprised of Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah, Umm al Qaiwain), Yemen (Republic of).		**South Asian Subcontinent Sub-area (SASC)** Afghanistan, Bangladesh, Bhutan, India (including Andaman Islands), Maldives, Nepal, Pakistan, Sri Lanka.
	Libya		**Japan, Korea Sub-area** Japan, Korea Democratic Republic, Korea Republic.
South America Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Falkland Islands, Panama, Paraguay, Peru, Pitcairn, Uruguay, South Georgia and South Sandwich Islands, Tokelau, Venezuela.	**Western Africa** Angola, Benin, Burkina Faso, Cameroon (Republic of), Cape Verde (Republic of), Central African Republic, Chad, Congo (Brazzaville), Congo (Kinshasa), Côte d'Ivoire, Equatorial Guinea,Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo.	**Eastern Africa** Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Tanzania, Uganda.	**South West Pacific Sub-area (SWP)** American Samoa, Australia, Cook Islands, Fiji, French Polynesia, Kiribati (Canton and Enderbury Islands), Nauru, New Caledonia (including Loyalty Islands), New Zealand, Niue, Papua New Guinea, Samoa (Independent State of), Solomon Islands, Tonga, Tuvalu, Vanuatu, Wallis and Futuna Islands.
	Central Africa Malawi, Zambia, Zimbabwe.		
	Southern Africa Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland.		
	Indian Ocean Islands Comoros, Madagascar, Mauritius, Mayotte, Reunion, Seychelles.		

Country and Currency:

LIST OF CURRENCIES SORTED BY ISO CURRENCY CODE AND COUNTRY OR AREA NAME

Currency ISO code	Currency name	Country name
AED	UAE Dirham	United Arab Emirates
AFN	Afghani	Afghanistan

ALL	Lek	Albania
AMD	Armeniam Dram	Armenia
ANG	Netherlands Antillian Guilder	Curaçao
ANG	Netherlands Antillian Guilder	Sint Maarten
AOA	Kwanza	Angola
ARS	Argentine Peso	Argentina
AUD	Australian Dollar	Australia
AUD	Australian Dollar	Christmas Island
AUD	Australian Dollar	Cocos (Keeling) Islands

AUD	Australian Dollar	Kiribati
AUD	Australian Dollar	Nauru
AUD	Australian Dollar	Tuvalu
AWG	Aruban Florin	Aruba
AZN	Azerbaijanian Manat	Azerbaijan
BAM	Convertible Mark	Bosnia and Herzegovina
BBD	Barbados Dollar	Barbados
BDT	Taka	Bangladesh
BGN	Bulgarian Lev	Bulgaria
BHD	Bahraini Dinar	Bahrain
BIF	Burundi Franc	Burundi
BMD	Bermudian Dollar	Bermuda
BND	Brunei Dollar	Brunei Darussalam
BOB	Boliviano	Bolivia (Plurinat.State)
BRL	Brazilian Real	Brazil
BSD	Bahamian Dollar	Bahamas
BTN	Ngultrum	Bhutan
BWP	Pula	Botswana
BYN	Belarusian Ruble	Belarus
BZD	Belize Dollar	Belize
CAD	Canadian Dollar	Canada
CDF	Congolese Franc	Congo, Dem. Rep. of the
CHF	Swiss Franc	Liechtenstein
CHF	Swiss Franc	Switzerland
CLP	Chilean Peso	Chile
CNY	Yuan Renminbi	China
COP	Colombian Peso	Colombia
CRC	Costa Rican Colón	Costa Rica
CUP	Cuban Peso	Cuba
CVE	Cabo Verde Escudo	Cabo Verde
CZK	Czech Koruna	Czechia
DJF	Djibouti Franc	Djibouti
DKK	Danish Krone	Denmark
DKK	Danish Krone	Faroe Islands
DKK	Danish Krone	Greenland
DOP	Dominican Peso	Dominican Republic
DZD	Algerian Dinar	Algeria
EGP	Egyptian Pound	Egypt
ERN	Nakfa	Eritrea
ETB	Ethiopian Birr	Ethiopia

Aircraft manufacturers

The major airplane manufacturers at a glance

- Airbus Corporate Jets.
- Boeing Business Jets.
- Bombardier Aerospace.
- Dassault Falcon.
- Embraer-Empresa Brasileira

- DR AeronÁutica. .
- Gulfstream Aerospace.
- Pilatus Business Aircraft.
- Textron Aviation.

Airlines

World's Top Airlines, the heavyweights of the airline industry. Below is a sortable list of the world's largest airlines ranked by the amount of passengers. Ranked are airlines with more than 10 million passengers annually. Leading on top, three of the biggest US airlines: Delta Airlines, Southwest Airlines, and American Airlines.

The World's biggest Airlines

Airline	Passengers (in million) 2009	Passengers (in million) 2010	Main Hub	Headquarter City	Country
Africa/Middle East					
Emirates Airline	27,454	31,422	Dubai International Airport	Dubai	United Arab Emirates
Qatar Airways	10,212	12,392	Doha International Airport	Doha	Qatar
Saudi Arabian Airlines	18,334	18,172	Jeddah-King Abdulaziz International	Jeddah	Saudi Arabia
Asia/Pacific					
AirAsia	14,253	16,055	Kuala Lumpur International Airport	Kuala Lumpur	Malaysia
Air China	39,841	46,241	Beijing Capital International Airport	Beijing	China

Aircraft layout

A cargo aircraft (also known as freight aircraft, freighter, airlifter or cargo jet) is a fixed-wing aircraft that is designed or converted for the carriage of cargo rather than passengers. Such

aircraft usually do not incorporate passenger amenities and generally feature one or more large doors for loading cargo. Freighters may be operated by civil passenger or cargo airlines, by private individuals or by the armed forces of individual countries (the latter is further discussed at military transport aircraft).

Aircraft designed for cargo flight usually have features that distinguish them from conventional passenger aircraft: a wide/tall fuselage cross-section, a high-wing to allow the cargo a area to sit near the ground, numerous wheels to allow it to land at unprepared locations, and a high-mounted tail to allow cargo to be driven directly into and off the aircraft**.**

Different types of aircraft

There are different kinds of aircrafts based on their purpose.

1.Dedicated civilian cargo aircraft

2. Joint civil-military cargo aircraft

3. Unpiloted cargo aircraft

4. Early air mail and airlift logistics aircraft

5. Civilian cargo/freight aircraft

6. Light aircraft

7. Military cargo aircraft

8. Experimental cargo aircraft

ULD

Unit Load Devices are specially designed cargo pallets and containers that are used to load

freight, luggage and mail onto aircraft. These devices allow large quantities of cargo to be bundled and strapped together securely onto 1 mobile unit, so they can safely and securely transported.

The International Air Transport Association (IATA) is responsible for publishing regulations around the use of Unit Load Devices. The following images and specifications illustrates the average external dimensions and weight limitations of popular ULDs. These images are to be used as a guide only. Please note that the exact weight limitations and dimensions will vary by manufacturer.

Types

ULDs come in two forms: pallets and containers. ULD pallets are rugged sheets of aluminium with rims designed to lock onto cargo net lugs. ULD containers, also known as cans and pods, are closed containers made of aluminium or combination of aluminium (frame) and Lexan (walls), which, depending on the nature of the goods to be transported, may have built-in refrigeration units. Examples of common ULDs and their specifics are listed below.

International Air Routes

what is the busiest international airline route in the world? New York to Paris? Los Angeles to Tokyo? Forget marquee international routes. The actual list of top contenders is led by relative short-hauls. Given the ascendency of the Asian airline marketplace, it should come as no surprise that the top seven routes are within Asia, with 14 of the top 20 routes overall taking place in Asia and specifically involving the hubs of Hong Kong, Osaka, Seoul and Singapore. The only long-haul route on the entire list, in fact, is New York JFK to London Heathrow, which is ranked 14th in terms of passenger traffic and 16th in terms of number of daily flights.

Here's the full list.

1. Kuala Lumpur – Singapore: 30,537 flights
2. Hong Kong – Taipei: 28,887 flights
3. Jakarta – Singapore: 27,304 flights

4. Hong Kong – Shanghai: 21,888 flights
5. Jakarta – Kuala Lumpur: 19,849 flights
6. Seoul Incheon – Osaka: 17,488 flights
7. Hong Kong – Seoul Incheon: 17,075 flights
8. New York LaGuardia – Toronto: 16,956 flights

9. Dubai – Kuwait: 15,332 flights
10. Hong Kong – Singapore: 15,029 flights
11. Bangkok – Singapore: 14,859 flights
12. Hong Kong – Beijing: 14,543 flights
13. Dublin – London Heathrow: 14,390 flights
14. Osaka – Taipei: 14,186 flights
15. New York JFK – London Heathrow: 13,888 flights
16. Osaka – Shanghai: 13,576 flights
17. Seoul Incheon – Tokyo Narita: 13,517 flights
18. Amsterdam – London Heathrow: 13,170 flights
19. Chicago O'Hare – Toronto: 13,100 flights

Airports and codes

India Airport Codes (IATA / ICAO)

- Mumbai Chattrapathi Shivaji International Airport [Code BOM]
- Bangalore Bengaluru International Airport [Code BLR]
- New Delhi Indira Gandhi International Airport [Code DEL]
- Hyderabad Rajiv Gandhi International Airport [Code HYD]
- Chennai Meenambarkkam International Airport [Code MAA]
- Kolkata Netaji Subhash Chandra Bose International Airport [Code CCU]
- Ahmedabad Sardar Vallabhbhai Patel International Airport [Code AMD]
- Dabolim Goa International Airport [Code GOI]
- Pune Pune Airport [Code PNQ]
- Guwahati Lokpriya Gopinath Bordoloi International Airport [Code GAU]
- Lucknow Chaudhary Charan Singh Airport [Code LKO]
- Jaipur Jaipur International Airport [Code JAI]
- Bhubaneswar Biju Patnaik International Airport [Code BBI]

- Patna Jaya Prakash Narayan Airport [Code PAT]

Consortium

An alliance or consortium is an agreement between a number of airlines to pool resources. This, in turn, gives them a greater ability to compete against other airlines. The first benefit

this brings is Codeshare flights. While codeshare agreements do exist outside of alliances, the highest density will be found within alliance members.

There are three big airline alliances, Star Alliance, OneWorld, and SkyTeam.

The next biggest benefit is arguably how the airlines share their frequent flyer rewards. With my British Airways Avios, I am able to book reward flights all over the world, as every member of the alliance will accept my points. Likewise, the benefits of frequent flyer status are shared. When I was travelling in America, I was able to use the American Airlines lounges with my British Airways silver status. While this is seen as a benefit for passengers, it is also a huge benefit for the airlines. Take the example given. American Airlines won my business because of the benefits I would receive. Had it not been for the alliance, I would've looked at other options too.

Hub and spoke Process Flow

Airline networks and schedules are increasingly being seen as key marketing tools in their own right, and one of the most important changes to airline operations in recent years has been the shift towards hub and spoke networks. Here, in the first of two articles on hubbing, Dr Nigel Dennis, senior research fellow at the University of Westminster's Transport Studies Group, examines why hubbing is so important and why it lies at the centre of any attempt to maximise the potential of an airline network.

Increase in market coverage

The most immediate benefit of hub and spoke networks is to increase greatly the number of city pair markets that an airline can serve for a given volume of output. Consolidating many different traffic flows together through a hub can thus offer a very efficient means of relating supply to demand.

Minimising the transfer time If the passenger is prepared to wait an indefinite time at the hub, connections can be achieved between all services operating to and from it. In reality, long delays at the transfer airport are unattractive especially where the actual flying time is short. If alternative routes are available, a considerable drain of traffic may be experienced (for every 30 minutes spent on the ground, the passenger could fly another 400km).

An essential element of any serious attempt to maximise the scope of an airport as a hub is to concentrate activity into a limited number of peaks or waves during the day. These should see a large number of inbound flights arriving in a short space of time, then departing again as soon as a sufficient interval in which to redistribute passengers and their luggage has elapsed.

Although the volume of flights at a busy airport such as Heathrow ensures that many connection possibilities will exist by chance, it is only through operating waves of flights that a consistent connecting timetable can be provided, with services in both directions in each city–pair market and a transfer time close to the optimal. But high frequencies are not a prerequisite for hubbing. Indeed at many US hubs only about three flights per day are

operated on most routes.

Costs will increase as a consequence of creating these artificial peaks of activity but this can be offset through the economies of consolidating traffic onto larger aircraft or operating at higher load factors. The marketing benefits are potentially much greater.

Elimination of interlining Commercial agreements between airlines have been a major component of regulation in air passenger transport. Multilateral interline procedures were recognised as being in both the operators' and the public's interest. For the airlines it was seen as essential to attract business that they could not otherwise serve.

The demise of these traditional arrangements has been most marked since deregulation in the US. Whereas half the passengers changing aircraft in the US in 1977 also changed airlines, this figure has fallen to less than 10% today. In Europe too, on–line or code–share connections are increasingly dominating the market. Whereas the proportion of transfers at Heathrow that were BA–BA was only 27% in 1984, this had risen to 43% by 1991 and is nearer 60% today. BA–BA pairings, however, account for only about 16% of the possible linkages at Heathrow. This means BA–BA transfers sell on average six times better than those involving any other pairing of airlines. If one further removed code–share connections such as those between British Midland and various carriers, the remaining interline transfers such as AF–BA or SK–AA are clearly little used.

The reasons behind this shift to hubbing are as follows: without restrictions on route entry, airlines have been able to enter markets previously closed to them. By routing these services through a common hub, on–line travel can be provided. Furthermore, waving of flight schedules ensures that the probability of the first outgoing service to any particular destination being by the same airline as the delivering flight is disproportionately high. Consequently, it no longer becomes necessary for airlines to offer interline–able fares in many important markets, since it is possible for them to supply an optimal service of their own.

Subsequent expansion of point–to–point services in the US by airlines such as Southwest has been largely counter–balanced by the disappearance of Eastern in the N.E.-Florida market and Air Cal and PSA in California. Other new entrants such as America West, Midwest Express, Reno Air and even Air Tran (the renamed Valujet) operate essentially hubbed networks. In Europe, Virgin Express is a hub–and–spoke operation. The Majors have tended

to divert the resources from merged airlines to strengthen their hubs. It should, however, also be noted that hubbing has not led to a huge switch from direct to indirect travel. Although some non–hub cities have lost certain non–stop links, many new non–stop flights have become available from the hub cities themselves.

An extension of the on–line connection concept involves bilateral interlining with complementary carriers. This has grown considerably in recent years, assisted by devices such as code–sharing. It is thus increasingly individual airlines, or groups of airlines, that form a hub at a particular location. The traditional concept of a hub simply as a large airport is no longer very valid.

Maximising the number of marketable connections: directional hubs

It is apparent that not all possible connections through a hub will be of value. Where a significant back–track is involved, passengers are likely to be deterred by the increased flying time while airlines may be unable to offer a viable fare by the circuitous route.

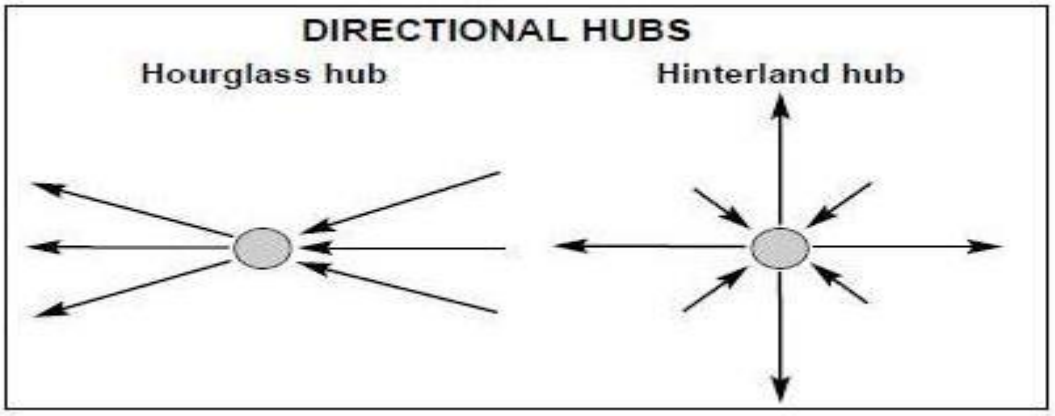
Connections within a hub wave will be universally good while those between waves will be relatively poor. Although the greatest number of linkages would be achieved by concentrating all activity into one or two huge waves each day, this is usually impractical. The aim therefore is to reduce the number of flights in each wave while ensuring as far as possible that it is the least marketable linkages which are lost. This can be achieved by seeking sub–groups within the set of routes operated from the airport between which there is a major demand for connecting travel but within which there is not. Whereas with traditional scheduling methods, aircraft return back on the same route from which they originated, they should now proceed on through the hub to a location from the contrasting set. This ensures that all the immediate connections will be marketable, which cannot be achieved with a random timetable and maximises the efficiency of the hub for any given level of resources.

The most straightforward separation that may be adopted is to introduce a geographical orientation such as East–West so that flights from one region operate through the hub to points broadly in the opposite direction beyond it — so–called hourglass hubs. It is demonstrated in the classic East–West hubs of the US such as Chicago, St Louis and Dallas. The schedules facilitate journeys such as Boston–San Diego or Miami–Seattle but not Boston–Miami or San Diego–Seattle. In Europe, Copenhagen (Scandinavia–Europe) and Vienna (East–West) follow this pattern, albeit on a smaller scale.

If this arrangement is not appropriate, the principal alternative is a differentiation by length of route. This features short sectors operated between the hub and nearby cities in order to generate feed for the longer distance trunk routes. As one stage of the journey is much longer than the other, the hub can become multi–directional for connections between these groups as

back–tracks and dog–legs will not be of significance. These can be described as hinterland hubs because the central airport serves as a distribution point for air travel to and from its surrounding catchment area.

There are several examples of 'niche' hubs in the US following this pattern — Midwest Express at Milwaukee and the former USAir hub at Dayton — while in Europe, a number of airports such as Amsterdam and Zurich are primarily aimed at being interfaces between short–haul and long haul flights.



Unit 5

Air freight forwarding: Air Freight Exports and Imports – Special Cargoes – Consolidation – Documentation – Air way Bill (AWB) – Communications – Handling COD Shipments – POD – conditions of contract – Dangerous (DGR) or Hazardous goods.

Air Freight forwarding

Freight forwarders are part of the transport logistics process within the supply chain and their main task is to arrange for air shipments to be managed in such a way that they are ready for transportation by aircraft operators. Such arrangements might include the consolidation of cargo.

A freight forwarder and logistics service provider may offer a service relating to the preparation, storage, carriage and final delivery of goods, including applicable documentary and facilitation formalities. A forwarder rarely acts as carrier of the goods. Usually, it is the organizer of multiple carriages in several modes of transport and other services that contribute

to the building of a supply chain. Such carriage may be performed by single or multimodal transport means. Multimodal transports occur when air cargo services are combined with sea, rail, or pre-carriage trucking from the shipper or manufacturer to the airport of departure and from the airport of destination to the consignee. Services offered by the forwarder may include consolidation, storage, handling, packing, or distribution of the goods. In addition the forwarder can provide a range of ancillary and advisory services in relation to the physical movement of the goods. These services will often include Customs and fiscal matters, declaring the goods for official purposes, procuring insurance for the goods, and collecting or procuring payment or documents relating to the goods.

Freight forwarding services also include logistical services with modern information and communication technology in connection with the carriage, handling, or storage of goods

and, de facto, total supply chain management.

For air cargo shipments, a freight forwarder normally books and contracts with an aircraft operator in the form of an air transport service agreement from the airport of departure to the airport of destination. The freight forwarder will then proceed with the shipment from its

warehouse or another location and deliver it directly to the aircraft operator or its representative. This process normally starts well before Customs export formalities have been resolved.

Air Freight Exports and Imports:

An air freight forwarding company is hired by importers and exporters to expedite their air cargo supply chain. Because of this, they are called as shipment "expeditors".

They act as organizer of the following supply chain processes:

- Export and import handling
- Customs clearing
- Air transport and delivery

Transacting with the carrier

If you think that getting your cargo on board an aircraft is as easy as booking for a passenger ticket, then you are most definitely wrong. Airline carriers have a different process when accepting cargo for air freight. Most of which are due to the additional security they need to perform to ensure you are not loading dangerous goods into their craft.

So unless you are friend with the owner of an airline company, it would be difficult to get your cargo land a space on the plane on your own. You may try your best to try, but it would be a stroke of luck if you do get your parcel on board the plane without a freight forwarder – that's how important a freight forwarding company is to the import and export process.

Negotiating airline pricing

An air freight forwarding company that has regular transactions with an airline company has more chances of getting a space on board with better deals. Thus one of the reasons why its always best to choose a freight forwarding company with years of experience in the industry.

One of the reasons – they have established relationships with carriers which gives them the special privilege of getting better rates. Carriers would rather deal with a freight forwarder they have been working with for decades rather than a newbie. Why? Because this freight forwarding company has established its credibility. So how do they negotiate on the price of

your cargo?Air cargo is sold for a fixed price or a fixed rate per kilogram. However, this varies on certain season, as shown in this graph

Major roles of an air freight forwarding company

Understanding dimensional weight conversion

With very limited space available for air freight, it is important for airline to charge not solely on weight, rather they do it by calculating weight and space altogether. The image below shows how this is to be calculated.

Booking your cargo

After the freight forwarding company settles the price for your cargo, they will now prepare the airline booking for the shipment together with its confirmation. This will ensure your space is reserved on their aircraft. This confirmation will contain the following data:

- Assigned Airline (Master) Air Waybill number
- Origin and final destination
- Type of goods

- Flight date and number
- Issuing agent and its contact details
- Volume, weight and dimensions of shipment
- Eventual assignment to customer or agent's allotment

This will be validated against the airline's capacity, commodity and revenue management criteria, and prior to confirmation to complete the booking process.

Special Cargo

The main types of special cargo include:

- Hazardous Goods(will be covered in the following part)
- Fragile Cargo
- Outsized Cargo
- Perishable Cargo
- High-Value Cargo

Fragile Cargo

Any item is defined as 'fragile cargo' if it can be easily damaged by jolting, dropping, bumping or rough handling during transit. This includes many commodities made of clay, pottery, china, stone and glass as well as commodities containing liquids.

Outsized Cargo

We classify cargo as 'outsized' if it cannot be loaded in the lower compartments of a vessel or on one pallet. Such cargo will demand special arrangements for port-side equipment, loading/unloading procedures and ground stops as well as special storage facilities.

Perishable Cargo

Cargo which need special methods and time-sensitive techniques to handle items subject to decay, deterioration or decomposition. Such commodities will typically include dairy

products, meats, deep frozen products, fish, fruits and vegetables, plants, flower bulbs, serum and vaccines. Whenever we are assigned to handle perishables, we create a special cargo-handling plan. This includes an in-depth analysis of government requirements at the destination market to reduce delay and risk.

High-Value Cargo

High value cargo is the high-value items with a declared value exceeding $5000. Our handling methods include a series of special precautions and safeguards to ensure that such goods reach their destination safely. Items included on our 'high value' list include works of art, banknotes, gems and jewellery, precious metals, negotiable securities, stock certificates and antiques.

Consolidation

What is consolidation or what is consolidated freight? Shipments or consignments from several shippers booked under a single master air way bill goes by the name of consolidation of freight consolidation. The freight forwarders call this as consol. Shipments from each shipper travel under individual house air way bills (also called house bills). Air cargo consolidation bookings are usually for flights leaving on the weekend. If the amount of freight expected is very large, bookings are done for the middle of the week. Such consolidations are called midweek-consol (consol is the short form for consolidation and is often used in the freight forwarding industry). Freight consolidation saves cost and helps airlines to plan freight movements. It helps businesses to grow by giving them an opportunity to move goods in a cheaper and effective way.

Loose Consolidation and ULD Consolidation

ULD means Unit Loading Device. It is the term used for air freight containers. The freight forwarder can put all the consignments of a particle consolidation into one container (ULD) and get a so-called ULD Booking. A loose consolidation means the freight forwarder tenders to the airline all the consignments belonging one particular consolidation without a container.

The airline can then decide to organise a container or fly the pieces without a container.

Apart from passenger airlines there is also a class called cargo airlines. These are companies that fly mainly cargo aircraft or only cargo aircraft. Cargolux is an example of a fully cargo

airline. Cargo airlines also carry consolidated freight. They may also operate chartered flights.

COMMON EXPORT DOCUMENTS

Commercial Invoice

A commercial invoice is a bill for the goods from the seller to the buyer. These invoices are often used by governments to determine the true value of goods when assessing customs duties. Governments that use the commercial invoice to control imports will often specify its form, content, number of copies, language to be used, and other characteristics.

Export Packing List

Considerably more detailed and informative than a standard domestic packing list, an export packing list lists seller, buyer, shipper, invoice number, date of shipment, mode of transport, carrier, and itemizes quantity, description, the type of package, such as a box, crate, drum, or carton, the quantity of packages, total net and gross weight (in kilograms), package marks, and dimensions, if appropriate. Both commercial stationers and freight forwarders carry packing list forms. A packing list may serve as conforming document. It is not a substitute for a commercial invoice. In addition, U.S. and foreign customs officials may use the export packing list to check the cargo.

Pro Forma Invoice

A pro forma invoice is an invoice prepared by the exporter before shipping the goods, informing the buyer of the goods to be sent, their value, and other key specifications. It also can be used as an offering of sale or price quotation.

TRANSPORTATION DOCUMENTS

Airway Bill

Air freight shipments require airway bills. Airway bills are shipper-specific (i.e., USPS, Fed-Ex, UPS, DHL, etc.).

Bill of Lading

A bill of lading is a contract between the owner of the goods and the carrier (as with domestic shipments). For vessels, there are two types: a straight bill of lading, which is non-negotiable, and a negotiable or shipper's order bill of lading. The latter can be bought, sold, or traded while the goods are in transit. The customer usually needs an original as proof of ownership to take possession of the goods. See also: straight bill of lading and liner bill of lading.

EXPORT COMPLIANCE DOCUMENTS

Export Licenses

An export license is a government document that authorizes the export of specific goods in specific quantities to a particular destination. This document may be required for most or all exports to some countries or for other countries only under special circumstances. Examples of export license certificates include those issued by the Department of Commerce's Bureau of Industry and Security (dual use articles), the State Department's Directorate of Defense Trade Controls (defense articles), the Nuclear Regulatory Commission (nuclear materials), and the U.S. Drug Enforcement Administration (controlled substances and precursor chemicals).

Several videos are available on export licenses, including: Export Compliance Introduction, Exporting Commercial Items: ECCNs and EAR99, The Commerce Control List and Self-Classification, and Exporting EAR99 Items: Screening Your Transaction, Lists to Check and Red Flags.

Destination Control Statement

A Destination Control Statement (DCS) is required for exports from the United States for items on the Commerce Control List that are outside of EAR99 (products for which no

license is required) or controlled under the International Traffic in Arms Regulations (ITAR). A DCS appears on the commercial invoice, ocean bill of lading, or airway bill to notify the carrier and all foreign parties that the item can be exported only to certain destinations. For more information, watch relevant videos: Export Compliance Introduction, and Exporting Commercial Items: ECCNs and EAR99.

CERTIFICATES OF ORGIN

Generic Certificate of Origin

The Certificate of Origin (CO) is required by some countries for all or only certain products. In many cases, a statement of origin printed on company letterhead will suffice. The exporter should verify whether a CO is required with the buyer and/or an experienced shipper/freight forwarder or the Trade Information Center.

Note: Some countries (i.e., numerous Middle Eastern countries) require that certificate of origin be notarized, certified by local chamber of commerce and legalized by the commercial section of the consulate of the destination country. For certain Middle Eastern countries, the National U.S.-Arab Chamber of Commerce may also provide such services.

For textile products, an importing country may require a certificate of origin issued by the manufacturer. The number of required copies and language may vary from country to country.

Certificate of Origin for claiming benefits under Free Trade Agreements

Special certificates may be required for countries with which the United States has free trade agreements (FTAs). Watch our FTA webinar for more information. Some certificate of origin including those required by the North American Free Trade Agreement (NAFTA), and the

FTAs with Israel and Jordan, are prepared by the exporter. Others including those required by the FTAs with Australia; the Dominican Republic-Central America-United States Free Trade Agreement (CAFTA-DR) countries; Chile; and Morocco; are the importer's responsibility). Click on a specific country below to learn details on how to document origin.

Certificate of Analysis:

A certificate of analysis can be required for seeds, grain, health foods, dietary supplements, fruits and vegetables, and pharmaceutical products.

Certificate of Free Sale

Certificate of free sale may be issued for biologics, food, drugs, medical devices and veterinary medicine. More information is available from the Food and Drug Administration. Health authorities in some states as well as some trade associations also issue Certificates of Free Sale.

Dangerous Goods Certificate

Exports submitted for handling by air carriers and air freight forwarders classified as dangerous goods need to be accompanied by the Shipper's Declaration for Dangerous Goods required by the International Air Transport Association (IATA). The exporter is responsible for accuracy of the form and ensuring that requirements related to packaging, marking, and other required information by IATA have been met.

For shipment of dangerous goods it is critical to identify goods by proper name, comply with packaging and labeling requirements, which vary depending upon the type of product shipper and the country shipped to. More information on labeling/regulations is available from the International Air Transportation Association or Department of Transportation - HAZMAT websites.

For ocean exports, hazardous material regulations are contained in the International Maritime Dangerous Goods regulations.

Fisheries Certificate

The National Marine Fisheries Service conducts inspections and analyses of fishery commodities for export.

Fumigation Certificate

The Fumigation Certificate provides evidence of the fumigation of exported goods (especially agricultural products, used clothing, etc.). This form assists in the quarantine clearance of any goods of plant or animal origin. The seller is typically required to fumigate the commodity at his or her expense a maximum of 15 days prior to loading.

Halal Certificate

Required by most countries in the Middle East, this certificate states that the fresh or frozen meat or poultry products were slaughtered in accordance with Islamic law. Certification by an appropriate chamber and legalization by the consulate of the destination country is usually required.

Health Certificate

For shipment of live animals and animal products (processed foodstuffs, poultry, meat, fish, seafood, dairy products, and eggs and egg products). Note: some countries require that health certificates be notarized or certified by a chamber and legalized by a consulate. Health certificates are issued by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS).

Ingredients Certificate

A certificate of ingredients may be requested for food products with labels that are inadequate or incomplete. The certificate may be issued by the manufacturer and must give a description of the product, contents, and percentage of each ingredient; chemical data; microbiological standards; storage instructions; shelf life; and date of manufacture. If animal fats are used, the

certificate must state the type of fat used and that the product contains no pork, artificial pork flavor, or pork fat. All foodstuffs are subject to analysis by Ministry of Health laboratories to establish their fitness for use.

Inspection Certificate

Weight and Quality certificates should be provided in accordance with governing USDA/GIPSA regulations for loading at port and loading at source/mill site as appropriate. A certificate of origin certified by the local chamber of commerce at the load port and a phytosanitary certificate issued by APHIS/USDA and fumigation certificate are to be provided to the buyer. Costs of all inspection, as well as certificates/documents at the load port, are usually the responsibility of the seller. Independent inspection certificates may required in some instances.

Pre-Shipment Inspections

The governments of a number of countries have contracted with international inspection companies to verify the quantity, quality, and price of shipments imported into their countries. The purpose of such inspections is to ensure that the price charged by the exporter reflects the true value of the goods, to prevent substandard goods from entering the country, and to deflect attempts to avoid payment of customs duties. Requirements for pre-shipment inspection are normally spelled out in letter-of-credit or other documentary requirements. Inspections companies include Bureau Veritas, SGS and Intertek. Some countries require pre-shipment inspection certificates for shipments of used merchandise.

Insurance Certificate

Insurance certificates are used to assure the consignee that insurance will cover the loss of or damage to the cargo during transit. These can be obtained from your freight forwarder or publishing house. Note: an airway bill can serve as an insurance certificate for a shipment by air. Some countries may require certification or notification.

Phytosanitary Certificate

All shipments of fresh fruits and vegetables, seeds, nuts, flour, rice, grains, lumber, plants, and plant materials require a federal phytosanitary certificate. The certificate must verify that the product is free from specified epidemics and/or agricultural diseases. Additional information and forms are available from Animal and Plant Health Inspection Service (APHIS).

Radiation Certificate

Some counties including Saudi Arabia may require this certificate for some plant and animal imports. The certificate states that the products are not contaminated by radioactivity.

Other (Product-Specific) Certificates

Shaving brushes and articles made of raw hair must be accompanied by a recognized official certificate showing the consignment to be free from anthrax germs. Used clothing requires a disinfection certificate. Grain requires a fumigation certificate, and grain and seeds require a certificate of weight. Many countries in the Middle East require special certificates for imports of animal fodder additives, livestock, pets, and horses.

Weight Certificate

A certificate of weight is a document issued by customs, certifying gross weight of the exported goods

Air way Bill (AWB) &Communications

Preparing the shipment

The official document between the forwarder and the airline carriers is referred to as the Master Air Waybill (MAWB). This serves as:

Communication of the applicable contract terms, conditions and liability to all parties involved

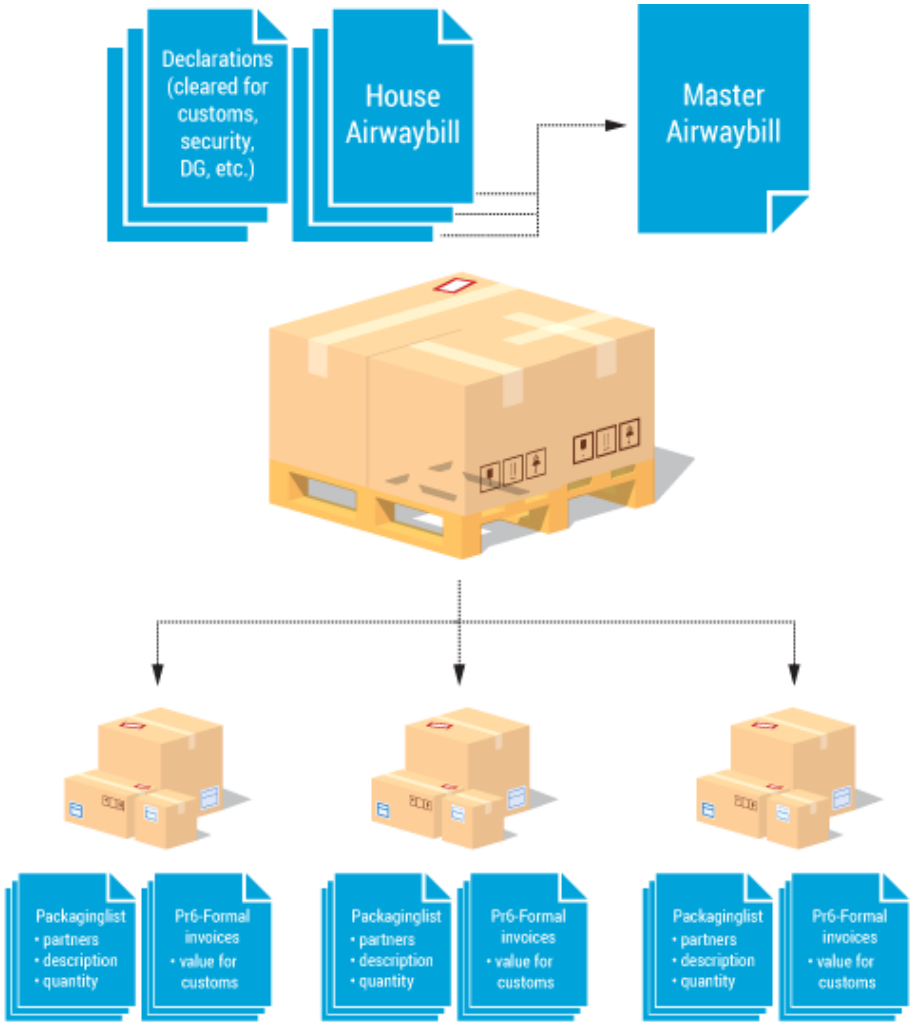
Proof of delivery (POD) of the goods to the carrier

Provide handling instructions to all parties involved and basis for invoicing for both the airline and the freight forwarding company

Act as an insurance certificate (if applicable and indicated on the Air Waybill) and key for other related documents required at Customs

However, for the purpose of ensuring all the different customers of the freight forwarding company is properly tracked, freight forwarding companies makes a House Air Waybill (HWB) for each shipment. This becomes the shipment contract between the end-customer and the forwarder.

The illustration below shows the relationship between MAWB and HWB



Relationship between master air waybill and house air waybill

Handling COD Shipments:

What is COD (Cash on Delivery)?

Cash on delivery or COD is a popular form of payment for purchases made online. In this method, buyers make payments for their purchases in cash or card at the time of delivery of materials. In this process of payment, a buyer is most confident about purchases made and the sales are also higher for online sellers.

The COD Methodology

The methodology of COD system is simple. Delivery boys collect the invoice amount of a consignment from its consignee in form of cash at the time of delivery. The collected cash is then deposited at the local office of the e-Commerce company that made the sale. In this method of payment, both the

buyer and seller are satisfied. From seller's point of view, cash handling is simple and does not involve technology. Proceeds from a sale are realized instantly and the possibilities of bad payment are entirely removed. COD could only pose a problem if the amount concerned is too high.

From buyer's viewpoint, cash on the delivery system is preferable as payments are made only after physical verification of a consignment. Further, in cases of damaged or wrong deliveries, the good might be returned and payment made only after the ordered product is delivered. Payment could be deferred until delivery of the required item is effectuated.

COD model of payment is popular in India and there are several reasons for this. Essentially, most Indians are comfortable dealing in cash rather than in debit or credit cards for making payments.

Working of Cash on Delivery (CoD) and its Process Flow

The entire process of order placement and execution is carried except for the payment

collection. In COD process, only cash payment is made to the supplier by the buyer after consignment is delivered. However, the process of COD begins from the moment your order is placed.

Normally, e-Commerce companies have their own logistics. If not, they hire a separate logistics company for delivering consignments and collecting payment.

After an order is placed with an e-Commerce company the concerned material is sourced from a supplier of the concerning good. Once sourced, an invoice-cum-delivery challan is prepared by the e-Commerce company. This invoice-cum-challan is in most cases attached with the consignment for easy retrieval.

The consignment together with the invoice is handed over to a logistics company for delivering the material and collect payment in cash.

The delivery boy is authorized to collect cash immediately on delivery of the said consignment to the addressee. On product delivery, the payment is always collected in cash, from which 'cash on delivery' phrase originated. However, some companies accept card payments on delivering materials. For this purpose delivery boys also carry a card swiping machine.

Delivery boy after collecting the invoice amount deposits it in his office. The logistics company, in turn, hands over the cash to the supplier or e-Commerce company after deducting handling charges.

The money ultimately reaches the seller or e-Commerce company.

Cash on Delivery is a fairly risk-free process of buying products and services online. This is especially true for the first time online buyers, and for products that are expensive. COD has been instrumental in the unprecedented growth of online commerce in Morocco. It is an easy concept for the masses to understand and accept. In India, it is a payment process that is expected to stay for several years.

POD – conditions of contract :

What is Proof of Delivery?

A Proof of Delivery (POD) is an essential component of the delivery as it serves as an important acknowledgement to mark that the delivery has been completed.

By using the POD feature available in the Driver App, not only do companies have the assurance that packages were delivered successfully, they can also track the progress of the delivery. This helps companies identify potential issues before they become major liabilities.

A POD is a fast-growing trend that more companies are implementing into their delivery workflows to make the processes hassle-free.

Proof of Delivery (POD) is a document that confirms receipt of an item. Recipients must sign for receipt of the mail indicating the date when the mail item was delivered to them. A copy of the Proof of Delivery receipt is provided to the sender.

How do I use the POD function?

In order to complete the job, the driver has the customer to sign on your app or take a photo as Proof of Delivery

Click Sign and have the customer to sign with their finger, and click “Sign” on the top left corner to save

Click Photo to take a photo of the item and the recipient/location

Click Barcode to scan the item

Why is POD important?

PODs will save organizations time and prevent frictions between customers and businesses.

Drivers can capture customer signatures, photos, and text notes through the POD feature in the Driver App. The attachments will sync to orders within the web dashboard, making it easy for your operations team to collect and store information.

With easy access to Proof of Delivery files, your company will easily be able to you can ensure that there are no disputes between your organization and customers as well as improve customer service and stay organized.

With POD, your team can manage the last-mile more efficiently and reduce friction throughout the day to keep your drivers, operations team and customers satisfied!

Benefits of using POD

reduce friction and potential disputes between companies and consumers

monitor driver accountability

eliminate unnecessary paperwork from your operations .

If customers need proof of delivery, you can easily stay connected to your drivers' recorded details and check customer accounts and access files, notes, answer questions or confirm delivery was completed.

Dangerous (DGR) or Hazardous goods.

These are articles and substances that can pose a significant risk to health, safety or property. They can be shipped by air when sipping risks are reduced to acceptable levels by limiting the quantity per package and by careful packing to afford suitable protection during normal transit. Dangerous goods are classified into hazard classes, according to the level of risk. These are defined as follows:

Class 1. Explosives - These are articles and substances capable of mass explosion. They can have a projection hazard, a fire or minor blast hazard, or be very insensitive substances liable to mass explosion.

Class 2. Compressed gases - These include flammable gas, non-flammable gas and toxic gas.

Class 3. Flammable Liquids

Class 4. Flammable Solids - These include flammable solids, spontaneously combustible materials and materials that are dangerous when wet.

Class 5. Oxidizing Substances and Organic Peroxides

Class 6. Toxic and Infectious Substances

Class 7. Radioactive Materials

Class 8. Corrosive Materials

Class 9. Miscellaneous Dangerous Goods

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