Chapter 8 Air Transportation

Book: International Logistics: Global Supply Chain Management by Douglas Long
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Outline

- Air transportation
- Airplanes and aviation equipment
- Air cargo operations
- Aviation economics
- Aviation regulation
- Managing air carriers
1. Air Transportation

- Maritime industry is noted for its long history and tradition, the air transport industry is recognized for its newness and innovation.
- 34% of world trade, by value, is moving by air.
- Cargo characteristics: high value, low density, get somewhere fast
1. Air Transportation

- **Brief history**
  - 1903 the Wright brothers invent the first plane at Kitty Hawk
  - 1909 first international flight - across the English Channel
  - 1918 first regular airmail route – New York City/Washington DC
  - 1944 Chicago Convention: International Civil Aviation Organization (ICAO) established
  - 1946 Bermuda Conference: International Air Transportation Association (IATA) established
1. Air Transportation

- TIACA (The International Air Cargo Association)
- Reason for the growth in air cargo
  - Deregulation and liberalization of the air cargo industry
  - Global interdependence helped by world trade agreements
  - International production and sales of goods and services
  - New inventory management concepts such as JIT and Zero stocks
  - New air-eligible commodities
  - The vast development of high value and limited time-consumable commodities
1. Air Transportation

- Air transportation for business was first developed for mail service
- The industry then evolved into passenger service with air cargo as only a sideline
- Unlike ocean shipping, there is considerable mixing between passenger transport and cargo transport
- Air cargo industry vs. air logistics industry
  - Air cargo only refers to the air portion of the journey
  - Air logistics manages the door to door delivery
2. Airplanes and Aviation Equipment

- Airplanes used in air cargo are essentially the same as for passenger traffic.
- Planes cost billions of dollars to research, design, and build. The technical demands of flight also limit the possibilities of what a plan can do, whereas ships come in a wide variety of designs.
2. Airplanes and Aviation Equipment

- “air cargo” is carried in a few ways, not always by air
  - Bellyspace
  - Flexbelly
  - Freighter
  - Truck
2. Airplanes and Aviation Equipment

- Air transport characteristics
  - Quicker and smoother than land or sea travel
  - Less transport-related stresses
  - Less packaging is needed (save expense)
  - Less insurance expense

- Airplane manufacturing is one of the most concentrated industries in the world.
  - Only two major companies for large planes: Boeing, Airbus
  - Only couple more for smaller planes: Fokker

- Trend in aircraft manufacturing industry
  - Little incentive for faster planes
  - Asking for fuel-efficient, reduce labor costs, operate more quietly
3. Air Cargo Operations

- Two types of carriers
  - Airlines carry cargo as a sideline
  - Dedicated air cargo carriers

- Four major air cargo markets (3/4 of total)
  - North Atlantic
  - Transpacific
  - Europe-Far East
  - US domestic
3. Air Cargo Operations

Air cargo carriers have evolved into three forms:

- Integrated carriers: FedEx, UPS
- Scheduled carriers
- Charter carrier
3. Air Cargo Operations

- Cargo and passengers have different characteristics
  - People do not follow the same paths as cargo
  - Passenger seasonal traffic have very little correlation to cargo traffic seasons
  - Traffic balance is entirely different for passengers as cargo
3. Air Cargo Operations

- Air cargo containers
  - Very different from that used for other modes of transport
  - Intermodal container is tough, designed for bad weather and rough handling
  - Air cargo containers, need to be lighter
  - Intermodal-size containers for air cargo are only used on freighters.
3. Air Cargo Operations

- Four distinct markets in air cargo
  - Mail
    - normally the monopoly market of the official postal service in a given country
    - defined by the size of the letter.
  - Express transportation
    - defined by FedEx
    - emphasis on speed
    - The package is promised to be delivered at a certain time
  - Courier
    - An extension of air express
    - Courier service means either same day service or next flight out
    - The package requires that someone fly with it
  - Freight
    - Covers every thing else that moves air cargo
    - Is mostly the larger package that would be too expensive to be sent air express
3. Air Cargo Operations

- An air cargo company needs to set up its operations one way for international service, yet customers on both sides can have very different expectations.
- An air express carrier can only provide international service by organizing its operations to meet the needs of one market or the other.
- Tailoring its service to both can be difficult and inefficient.
3. Air Cargo Operations

○ Security
  - Is a major concern
  - Luggage can be associated with a specific passenger, cargo flies without anybody
  - Concept of “Known Shipper”
    ○ A person that can be held responsible for their shipment
  - Hazardous cargo
    ○ Highly restricted if it moves by air
    ○ Rules concerning the transport of hazardous goods are developed by the ICAO, but need to be controlled and enforced by national law
3. Air Cargo Operations

- Trucks for an air cargo carrier
  - Bring the cargo from the shipper to the airport
  - Bring the cargo from the plane to the ultimate destination
  - Air carriers may choose to place cargo on a truck for trips under 500 miles
  - Most common is to use trucks to deliver cargo to the consolidation airport
3. Air Cargo Operations

- Interline agreements
  - Air cargo companies can provide service into a market it does not fly to
  - May need partnership
4. Aviation Economics

- Two major factors influence the growth of the air cargo market
  - Economic conditions
  - Rate levels
- Yield management
  - The way an air carrier gets the maximum amount of revenue from each unit (passenger or cargo) carried
4. Aviation Economics

- Air cargo rates are determined by the following factors
  - Volume of traffic
  - Direction of traffic
  - Characteristics of the traffic
  - Value of the service
  - Competition
4. Aviation Economics

- Types of rates
  - Specific commodity rates
    - Usually lower than standard rates
  - Exception rates
    - Usually higher than standard rates
  - Priority reserved rates
    - Usually higher than standard rates
  - Speed package rates
    - Usually higher than standard rates
  - Container rates
    - may or may not be adjusted depending on the commodity
4. Aviation Economics

- **Dimensional weights**
  - Consider both weight and density

- **Stacking losses**
  - The problem of irregular shapes
  - Means space is being wasted
4. Aviation Economics

- **Top 20 air freight carriers**

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<th>Tons (000s)</th>
<th>Carrier</th>
<th>Tons (000s)</th>
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<td>2. UPS</td>
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<td>7. Air France</td>
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<td>19. Air Canada</td>
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<tr>
<td>10. KLM</td>
<td>478</td>
<td>20. DHL</td>
<td>301</td>
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5. Aviation Regulation

- **International Air Transport Association (IATA)**
  - Represents the airlines. Its members are only carriers
  - Used to fix prices up until US deregulation
  - No longer involved in price management

- **International Civil Aeronautics Organization (ICAO)**
  - UN agency, deals with civil aviation issues
  - Agency that brings government representatives together to organize a common set of regulation
  - Mostly include technical standards, safety standards, and to a lesser degree business standards
5. Aviation Regulation

- **Bilateral**
  - Every scheduled flight (passenger and cargo) that moves between two countries needs to be agreed upon in advance in a treaty between the two countries.
  - A treaty between two countries, not between any airlines.
  - A bilateral is a very long and detailed agreement on what rights each country gives each other in regards to airline service.
5. Aviation Regulation

○ Freedoms of the air
  ● Five Freedoms agreement
    ○ First freedom, overflight
    ○ Second freedom, service stops
    ○ Third freedom, passenger deliver
    ○ Fourth freedom, repatriation
    ○ Fifth freedom, oncarriage
  ● Several other "freedoms" have been added, although they are not officially recognized under international treaty
    ○ Sixth freedom, cabotage
    ○ Seventh freedom, cargo
5. Aviation Regulation

- **Mirror effect**
  - When new routes are agreed upon. That route goes from having no service to two airlines at the same time.
  - There is a big jump from no capacity to two airlines.

- **Charter flights**
  - A charter is a one-time flight and not part of a routine schedule.
  - It needed to be for an affinity group.
5. Aviation Regulation

- Airline Deregulation Act, 1978, US
  - Allow airlines to operate whatever routes (domestically) they wanted, and charge whatever they wanted

- Open Skies Agreements
  - Bilaterals that were very liberal to promote competition in international flights
  - Asia have been remarkably liberal in their competition policies
  - The worse cases for liberalization is China, has most dangerous airlines in the world
  - North Korea has also not embraced the open skies approach
6. Managing Air Carriers

- Rapidly growing in air cargo for a few reasons
  - Increased demand for premium service
  - Increased service
  - More competitive service
  - Carrier integration
6. Managing Air Carriers

- Competition among the different modes of transport
  - between air and sea
    - The competition is not very strong
    - a very large difference in the cost and service provided by the two
  - between air and trucking
    - More competition
    - Air cargo is sometimes trucked if the distance is not too great
  - Between non-transportation industries
    - Fax and internet
    - Main threat to air express, mail, and courier services
6. Managing Air Carriers

○ Alliance
  ● A trend in the passenger airlines toward alliances
  ● The biggest one is the Star Alliance
  ● Alliances improve service by increasing the number of destinations while dealing with only one carrier
  ● Air cargo does not seem to have benefited from these alliances
    ○ Maybe that cargo moves mostly point to point, so the interline agreements that passengers enjoy are of no value to the cargo shipper