SKY TALKS
WORKSHOPS
Air Connectivity and Competition

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Concept of Connectivity in Air Transport

Movement of passengers, mail and cargo involving the **minimum of transit points** which:

- makes the **trip as short as possible**;
- with **optimal user satisfaction**;
- at the **minimum price** possible.
Airline Competition

- Airline competition has evolved from an era of economic regulation and intervention to an increasing trend towards liberalization.

- This in turn has resulted in the global air transport network transiting from simple networks structures with limited competition and connectivity options of the past to complex structures of today responding dynamically to the changes in regulations and the business opportunities offered by liberalization.
Air Transport Network Characteristics

• The global air transport network is characterized by more connectivity options to customers with a variety of competitive network strategies pursued by the major aviation stakeholders.

• Some of these strategies include decisions related to
  • point to point versus hub and spoke systems
  • yield management to respond effectively to demand through pricing and product differentiation and
  • alliances and mergers.

• These strategies are invariably a trade-off between the most economically efficient path to transport passengers through the various nodes available in the network constrained by real time factors that prevent the network from being the most optimized or efficient.
Factors Impacting Route Network

- Size of the market (existing demand) and pricing strategies of existing competitors
- Policy factors—air carrier ownership and control, liberalization and regulation of traffic rights to fly (market access), cross ownerships of aviation verticals, taxation and charging policies.
- Slot availability and other restrictions like lack of infrastructure, night and noise curfews
- Presence of alternative models on a route i.e. low cost carriers versus legacy carriers
Air Transport Diagnostics Project
Introduction

• ICAO and the Interdisciplinary Centre for Mathematical and Computational Modelling (ICM) of the University of Warsaw have initiated a joint air transport diagnostics project.

• The project aims to better understand the complex dynamics and interlinkages between the various policy factors and market realities that influence the competitive strategies of the aviation stakeholders and the optimization of the global air transport network.

• Outcome of this study could assist policymakers in optimizing connectivity and maintaining sustainable growth of air transport.
Concept of the Project (1)
Decision Support Systems for Informed Policy Making

- A visual interactive decision support system (DSS) to ICAO Member States and other stakeholders.
- Indicates areas where the market forces provide potential opportunities to States to further increase connectivity and optimization of the air transport network through appropriate policy initiatives and addresses of constraining factors.
Concept of the Project (2)
Decision Support Systems for Informed Policy Making

• The application leverages nearly four decades of ICAO data in its Enterprise Wide Data Management (EDM) repository supplemented with external data sources.

• The Big Data so available is being processed by ICAO and ICM using contemporary ICT applications and sophisticated statistical models.

• The DSS will be a single platform where States have the information to better gauge the valuation of their granting of traffic rights to fly and the opportunity costs associated with their policy initiatives.
Preliminary Analysis Results

• ICAO and ICM have initially analyzed as a prerequisite for this project, the two major existing factors namely demand and price that influence competitive strategies of the aviation stakeholders and the optimization of the global air transport network.

• A segment of the preliminary analysis based on most recently available data for the year 2015 is presented in the Appendix and includes the following –
  • Global passenger flows to true origin-destination going direct and indirect (via connecting nodes)
  • Direct and indirect passenger flows by region of departure and by route groups.
  • Direct and indirect connectivity ratios for region and route group pairs along with average fare in US dollars. The fare used is average of discount economy round trip fare and excludes taxes and charges not retained by the air carrier.
Global Passenger Flow
2015 (In millions)

Total Passengers: 1271.9

880.2 (69%)

391.8 (31%)

Passengers Flow by Region of Departure 2015
Regional Passenger Flow (Europe)

Region Pair Passenger Flow (Middle East)
Route Group Connectivity (Exclusive of Domestic Connections in International Trips)

- Intra North America
- Intra North Asia
- Central America/Caribbean - North America
- Central South West Asia - North Asia
- Intra Middle East
- Intra Pacific South East Asia
- Intra Central South West Asia
- North America - North Asia
- Intra Europe
- Europe - North Africa
- Intra South America
- North Asia - Pacific South East Asia
- Central South West Asia - Pacific South East Asia
- Intra Africa
- Africa - Middle East
- Intra Central America/Caribbean
- Central South West Asia - North America
- North America - South America
- Middle East - South West Asia
- Europe - Middle East
- Europe - North America

% of Total Passengers

Route Group Average Fare (Exclusive of Domestic Connections in International Trips)

- Average All Flights Fare
- Average Direct Fare
- Average Indirect Fare

Average Fare (USD)
Route Group Connectivity (Exclusive of Domestic Connections in International Trips)

- Middle East - North Asia & Pacific South East Asia
- Central South West Asia - Middle East
- Central America/Caribbean - Europe
- Central America/Caribbean - South America
- China - Europe
- Europe - South West Asia
- Europe - North Asia
- Europe - South America
- Europe - Sub Saharan Africa
- North America - Pacific South East Asia
- Middle East - North America
- Africa & Middle East - South America
- Africa - North America
- Europe - Pacific South East Asia
- Africa - Asia/Pacific
- North America - South West Asia
- Latin America/Caribbean - North Asia & Pacific South...
- Latin America/Caribbean - Central South West Asia
- Africa & Middle East - Central America/Caribbean
- Latin America/Southwest Asia

% of Total Passengers

Route Group Average Fare (Exclusive of Domestic Connections in International Trips)

- Average All Flights Fare
- Average Direct Fare
- Average Indirect Fare

Average Fare (USD)
Observations of Preliminary Analysis

- The results of the preliminary analysis encompassing the entire big data set leads to the following overarching observations:

- With the inclusion of domestic legs on international trips 69% of the passengers in 2015 flew direct to their destination and 31% flew though connecting nodes in the air transport network. Around half of indirect passengers include domestic connections on the international trip.

- There exists differences in the direct and indirect connectivity at the country pair level which when summarized is reflected at the region pair or route group pair level.

- Inclusion of domestic legs on the international trip results in higher average indirect fares compared to average direct fares.
Preliminary Conclusions from the Observations

• Market forces primarily the presence of demand or otherwise on a route determines the competitive strategies and economic efficiencies of providing direct or indirect routes in the global air transport network.

• Poor Demand translates to poor connectivity and optimization is achieved through indirect flights. Lack of policy initiatives in many cases act as a constraint in achieving an optimized indirect route flow network.

• Fare levels are deeply influenced by the competition between carriers on a route. Average direct fares appear to have a premium over indirect fares on long haul routes. On the rest of the routes, the spread between average direct and indirect fares reflects a degree of competitive advantage of hubs on routes in the air transport network.

• Significant demand on some long haul routes and forecasted strong growth rates along with new aircraft technologies has resulted in traditional hubs that have been existing over several decades competing with more recent hubs leading to increasing connectivity and more nodes being introduced in the air transport network.

• Demand exists on some high density long haul routes that could make it more efficient for air carriers to fly direct routes or integrate it with their existing network or alliances. A trend in this direction could suggest the potential of further optimizing the global air transport network impacting infrastructure development in the different regions as well as capacity available through traditional and new hubs.
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THANK YOU

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