Big Data Utilization for Reopening Airlines

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Overview

- Impact of COVID-19 on
  - Global air traffic
  - Airline revenues by region of operation,
  - Number of international passengers by region, and
  - Number of domestic passenger traffic by route group.

- PEST Analysis
  - How Industry responded
  - How the industry - more resilient

- Preparedness for the Post-COVID-19 era
Introduction

- COVID-19 - ongoing
- Threat to global economy and public health.
- Major sectors - Aviation industry.
  - 3.6 percent of the world’s GDP.
  - 65.6 million jobs.
- Aeronautical & Non-Aeronautical revenues.
Significance of Air Travel

- Crucial - Global Connectivity.
- Vulnerable to external threats -
  - Recession
  - Natural disasters
  - Oil crises &
  - Disease outbreaks
    - SARS - in 2003
    - COVID-19
- Affect air travel – by increasing
COVID-19 Timeline

- 5th Jan 2020 - WHO - emergence of a new virus.
- 10th Jan 2020 - WHO published a standard protocol for member nations.
- 13th Jan 2020 - outside China – 1st infected case – Thailand.
- 23rd Jan 2020 - WHO - declare the situation as a "public emergency".
- 3rd Feb 2020 - WHO issued a Strategic Preparedness Plan.
- 21st Feb 2020 - Major outbreak - in Italy.
• 11th March 2020 - WHO declared COVID-19 as a global pandemic outbreak on March 11th, 2020
Just a Virus!!!

Figure 1 World Passenger Traffic Evolution and the Notable Decrease in Air Traffic from 1945 to 2020

Note: Adapted from "Effects of Novel Coronavirus (COVID-19) on Civil Aviation: Economic Impact Analysis"
Impact of COVID-19 on Global Flight Operations

The air traffic was heavily affected in the Middle-East region with a -57.35% reduction. It was followed by Africa (-53.56%), Europe (-52.61%), and Latin-America and the Caribbean (-48.4%).

Flight operations – (fewer flights than in 2019)

1. APAC - Most affected with 4,913,303
2. Europe (- 4,766,279)
Impact of COVID-19 on Passenger Traffic and Revenues by Region

Figure 3. Impact of COVID-19 on passenger traffic, and revenue by region for 2020 compared to 2019
Effect of COVID-19 on International Passenger Traffic by Region

Figure 4. Number of international passengers (in Millions) by region (2019 vs 2020)
Effect of COVID-19 on Domestic Passengers Traffic by Route Group

![Bar chart showing the number of domestic passengers in millions by Route Group in 2019 and 2020.](chart)

Figure 5. Number of domestic passengers in millions by Route Group (2019 vs 2020)
PEST ANALYSIS

Political Factors - Government interventions

Economic Factors - Macroeconomic conditions - External environment

Technological Factors - Technological changes & related activities

Social Factors - Social, cultural, and demographic factors
Governments

- Safety - Top priority
- Travel restrictions/ Border Closures
- Economic Support to airlines

- Govt.s - cooperate with - WHO, ICAO, EASA, IATA, ACI Europe, Eurocontrol & other related associations.

- Data security and legal aspects of personal data.
- Airlines – cooperate with Govt. - provide healthy, sanitized travel and related services.

- Airlines - change their destinations

- Change their structure to surpass the losses.
  - Cargo flights
  - Delta, United, and American airlines
  - Finnair was the first airline to remove the economy-class seats.
- Social Relationships
  - Social distancing & curfews
- Negative impacts - loneliness, stress, domestic violence
  - Mental, cardiovascular, and immunity
- Airlines - furloughs, lay-offs
- Governments and non-profit social organizations - help people.
- Social aspect of human relationships must be strengthened to sustain their bonds.
- Contact Tracing Technology
  - Sensors, external RFID and Bluetooth, video analytics tracking, and access control.

- Airlines and airports - tried to get the latest technology - disinfected and sanitized.
  - Automated cleaning robots – UV-C light technology
  - Touch screens at kiosks - Infrared sensors
  - Thermal screening helmets
How the industry can become more resilient in the race against the virus?

- Airlines and airports - proactive - new technologies and adopting operational changes to restore passenger confidence and reshape air travel in the future.

- “Big Data Analytics Technology (BDA)”

- 3 types -
  - Descriptive Analytics - gain insights & to identify the risk factors
  - Predictive Analytics - Forecasting
  - Prescriptive Analytics - support data-driven decision-making

- **HOLISTIC APPROACH**
COVID-19 Airline Recovery Plan

Data analysis - to identify the opportunities by

(i) tracking the COVID-19 progress and recovery at a
   ▪ global-scale analysis,
   ▪ regional and sub-regional analysis
   ▪ country analysis

(ii) Flight demand analysis

(iii) Tracking the demand for global air travel and

(iv) Customer-specific air travel demand tracking
Regional level Data Analysis of COVID-19 Recovery

**Figure 6** COVID-19 Data Analysis from the World Health Organization Dashboard from December 30, 2019 to March 15, 2021

**Note:** Adapted from the WHO Coronavirus Dashboard, 2021
Flight Demand Analysis by Identifying the Air-route for Reactivation

Figure 7 Country Status Comparative Analytics of the Coronavirus Impact

Note: Adopted from Big Data Analytics: The Solution for COVID-19 Airline Recovery (Natasha, 2021)
Tracking the Demand for Global Air Travel

Figure 8 Google Flight Demand Analytics from the U.S. to four other countries from March 22, 2020 to March 20, 2021
Customer-specific Air Travel Demand Tracking Using E-commerce

- Identifying customer data, customer segmentation, and interacting with personalized promotions built on that specific data.
  - (a) user tracking
  - (b) flexible analytics
  - (c) real-time reactive analytics and
  - (d) data science forecasting

*Precise decision-making is essential for an effective Covid-19 airline recovery plan.*
Proactive Technology & Strategic Plan to Address COVID-19.

- Exceptional Collaboration
  - To achieve operational agility - to protect the health and safety.

- Customer-care Initiatives
  - Provide self-service capabilities - decrease the operational costs.

- New Concepts and technologies
  - to reduce the transmission of the virus.
To prepare for the Post-COVID-19 era . . .

Future research should try to use

(i) Descriptive & Diagnostic analytics to analyze real-time data

(ii) Predictive analytics to predict demand and future customer behavior

(iii) ‘People analytics’ to know employees’ needs and situations to stabilize current operations.
Research should also be carried out to figure out whether

(i) Descriptive & Diagnostic analytics will be an effective way to assess the impact of contingent policies

(ii) Predictive Analytics

- can be used to plan for the return to the workplace, as well as employee wellbeing and resilience

- provide a better estimate regarding public perception and reaction to adjust to the new pandemic-related policies.
Conclusion

- Aviation industry was not prepared for the impact of COVID-19
- World passenger traffic declined to negative 60%
- Airline industry - PEST aspects into consideration
- The governments should work in collaboration.
- Restart air transportation through travel bubbles or air bubbles or corona corridors.
  - a quarantine-free entry.
Conclusion

- Airlines should use data analytics technology.
- Strong coordination, cooperation, and effective communication.
- Pandemic is ongoing - New variants are emerging
  - industry needs strong agile leadership.
References


