UNLOCKING INSIGHTS INTO THE GLOBAL AIR TRANSPORTATION NETWORK WITH TABLEAU

INTRODUCTION

Overview:

The Global Air Transportation Network dataset is a comprehensive collection of information on airports, airlines and their routes. It contains information such as names, cities, countries, codes, longitudes, latitudes and altitudes. Datasource include aviation industry reports, government agencies and airline data. Advanced analytics and machine learning can help process and extract valuable insights from these source to inform decision-making and optimize the global air transportation network

Purpose:

 It helps airlines, airports and aviation authorities optimize their operations, including flight scheduling, resource allocation and capacity planning. Understanding passenger and cargo traffic trends, market demand allows airlines and airports to make decisions about route expansion and market positioning. Using tableau in this project makes it easier to present complex data related to flight routes, cargo volumes and etc. Visualization can include maps, charts and graphs that make patterns and trends in air transportation data more accessible and understandable.

Unlocking insights into the Global Air Transportation Network is essential for improving safety, efficiency while supporting economic development and connectivity on a global scale.

PROBLEM DEFINITION AND DESIGN THINKING

Empathy map

An empathy map is a widely used visualization tool within the field of UX and HCL practice. In relation to empathetic design, the primary purpose of an empathy map is to bridge the understanding of the end user
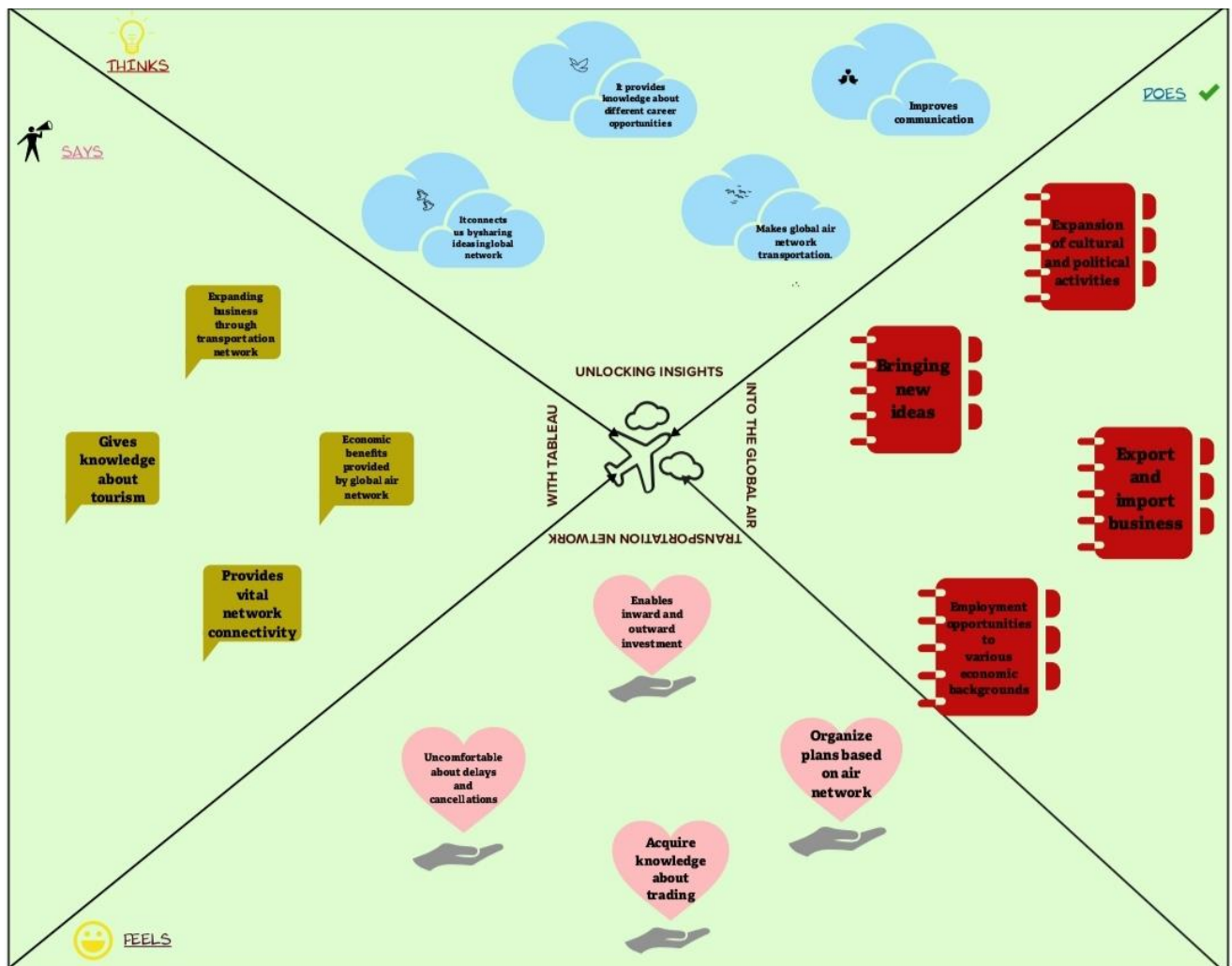
Ideation & Brainstorming Map

Brainstorming map is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members.
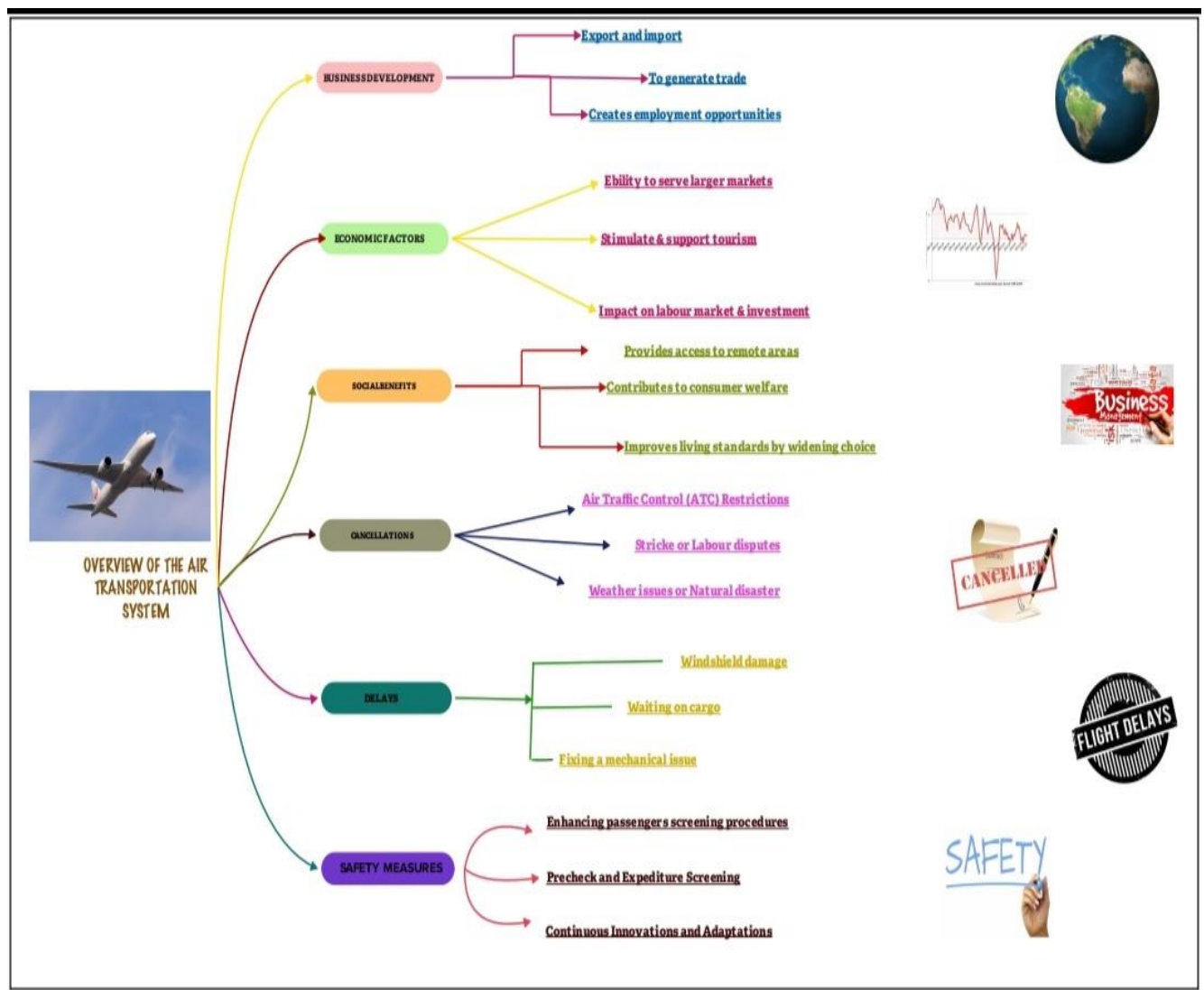
RESULT:

Dashboard:

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format.
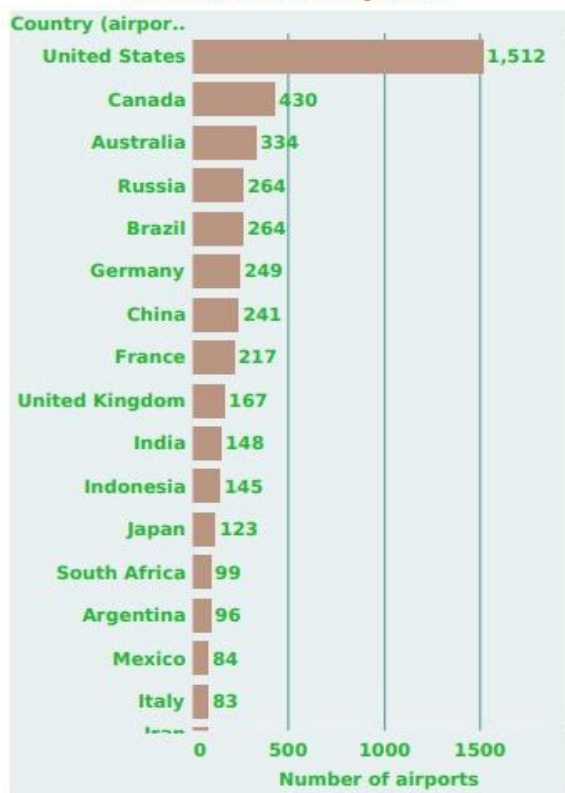
Airports at higher altitude within a country

Index no.	Name (airports...	City	ICAO (airpor..	
1	Ubaydah Bin Al Jarrah Airport	Al Cut	ORUB	68
	Tall Afar Army Air Field	Tall Afar	ORTF	996
	Sulaymaniyah International ..	Sulaymaniy..	ORSU	2,494

Airports at higher altitude in the world

Name (airports.csv)	City	ICAO (airports.csv)	
Daocheng Yading Airport	Daocheng	ZUDC	14,472
Qamdo Bangda Airport	Bangda	ZUBD	14,219
Kangding Airport	Kangding	ZUKD	14,042
Ngari Gunsa Airport	Shiquanhe	ZUAL	14,022
El Alto International Airport	La Paz	SLLP	13,355
Capitan Nicolas Rojas Airport	Potosi	SLPO	12,913
Yushu Batang Airport	Yushu	ZYLS	12,816
Copacabana Airport	Copacabana	SLCC	12,591
Inca Manco Capac International Airport	Juliaca	SPJL	12,552
Golog Maqin Airport	Golog	ZLGL	12,426

Country with maximum number of airports

Country (airpor..	Number of airports
United States	1,512
Canada	430
Australia	334
Russia	264
Brazil	264
Germany	249
China	241
France	217
United Kingdom	167
India	148
Indonesia	145
Japan	123
South Africa	99
Argentina	96
Mexico	84
Italy	83

Number of airports: 0 500 1000 1500

Number of flights from Airport

Source a..	no. of records
ATL	23,476,187
ORD	21,482,014
PEK	18,304,548
FRA	17,416,866
LAX	17,142,578
IST	16,237,623
SIN	16,127,206
DEN	16,010,002
BCN	15,831,358
LGW	15,303,537
DFW	15,218,115
AMS	14,550,436
DME	13,983,959
ICN	13,632,471
MAN	13,225,170

no. of records: 0M 5M 10M 15M 20M 25M 30M

Airlines within a country

Airline ID	Name	Icao	Callsign	
97	Aerofumigaciones Sam	AEG	FUMIGACIONES SAM	■
171	Aerogala	AGQ	GALASERVICE	■
200	Alpine Air Chile	AIH	ALPINE CHILE	■
427	Aeromet Servicios	ARS	METSERVICE	■
660	Aeropuelche	PUE	PUELCHE	■
752	Aerocardal	CDA	CARDAL	■
795	Aerovias DAP	DAP	DAP	■
809	Aerolineas Del Sur	DLU	DEL SUR	■
852	Aerosec	ERK	AEROSEC	■
936	Aerohein	HEI	AEROHEIN	■
958	Aeroingenieria	ING	AEROINGE	■
1100	Aeromet Linea Aerea	MTE	AEROMET	■
1670	Carranza	CRR	CARRANZA	■
1782	Cirrus	RRU	HELICIRRUS	■
1950	DAP Helicopteros	DHE	HELIDAP	■
2026	Didier Borrast Bus	DBB	DIDIER	■

Country: Chile

Active: N Y

Active: (All) N Y

Country: Chile

Number of Airlines

44

Storyline**:**

   A storyline is a way of presenting data and analysis in a narrative format, intending to make the information more engaging and easier to understand.
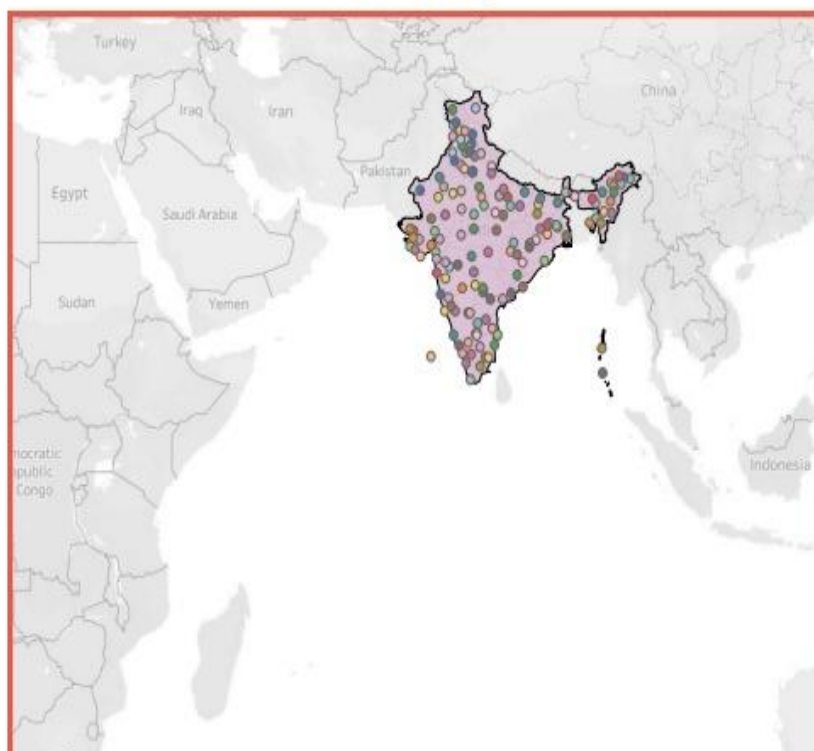
GLOBAL AIR TRANSPORTATION NETWORK

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GLOBAL AIR TRANSPORTATION NETWORK

World Map showing countries with details of Airports. | Tables showing Airports which are at Higher Altitude in the world and within the country | Table showing list of all airlines within the country | Bar Graph showing Countries with Max no. of Airports and number of flights from airports.

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752	Aerocardal	CDA	CARDAL	■
795	Aerovias DAP	DAP	DAP	■
809	Aerolineas Del Sur	DLU	DEL SUR	■
852	Aerosec	ERK	AEROSEC	■
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1100	Aeromet Linea Aerea	MTE	AEROMET	■
1670	Carranza	CRR	CARRANZA	■
1782	Cirrus	RRU	HELICIRRUS	■
1950	DAP Helicopteros	DHE	HELIDAP	■
2026	Didier Rousset Buy	DRB	DIDIER	■
2190	Empresa Aero-Servi..	PRG	ASPAR	■

Country
Chile

Active
■ N
■ Y

Active
☑ N
☑ Y

Country
Chile

Number of Airlines

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ADVANTAGES AND DISADVANTAGES:

Advantages:

   * By accomplishing our project we came across many benefits from it, some advantages are

   * The aviation industry contributes to the global economy. So we can make use of the insights to increase economic growth and job creation.

   * Insights can help us create innovation in aviation technology leads to ecofriendly aircraft, airport facilities etc.

Disadvantages*:*

    * By gathering and analyzing data it becomes quite expensive to undergo and struggle to collect the struggles for comprehensive insights.

    * While making our project it was hard to extract meaningful insights. Since aviation data is extremely complex.

APPLICATIONS:

    * By analyzing passenger preferences and feedback we can improve services, in-flight experiences and loyalty programs.

    * Guiding airport expansion plans and infrastructure investments based on passenger traffic and growth projections.

    * Enhancing air traffic control systems and airspace management for improved efficiency and safety.

    * Researching and developing more fuel-efficient and eco-friendly aircraft designs.

CONCLUSION:

    The air transportation network plays a pivotal role in connecting people and goods across the globe. It facilitates economic growth, cultural exchange, and tourism. However, it also faces challenges such as environmental concerns and capacity constraints. As technology continues to advance, addressing these challenges will be crucial to ensure a sustainable and efficient air transportation system for the future.

FUTURE SCOPE:

- ➢ **Data Analytics and Machine Learning**: Utilizing advanced data analytics and machine learning algorithms to analyze vast amounts of data generated by the air transportation network can help identify trends, optimize routes, and improve operational efficiency.
- ➢ **Infrastructure development**: Identifying the need for and planning new airports, runways, and air traffic management systems to accommodate growing demand and reduce congestion.