

UNLOCKING INSIGHTS INTO THE GLOBAL AIR TRANSPORTATION NETWORK WITH TABLEAU

PROJECT REPORT

Submitted to the Manomaniam Sundaranar University Tirunelveli, in partial
fulfilment of the requirements for the award of the Degree in

BACHELOR OF SCIENCE IN PHYSICS

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ACKNOWLEDGEMENT

Adores our heart humbly silently & gratefully reflecting the will & Blessings showed by our Lord Almighty who made us turn every challenge in to success till this day of seeing our project work in print.

I also express our gratefulness to **Dr. C. Veerabahu M.Sc., Ph.D., The Principal**, for giving us the permission to do the project work.

With a deep sense of gratitude, we express our sincere thanks to our project supervisor **Dr. S. Subramanian Assistant Professor** for his valuable guidance & constant encouragement in completing this project work.

I would like to thank our **H.O.D. Dr. John Prince Soundranayagam Associate Professor** for his valuable advices whenever we approached him.

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We would like to express our heartfelt thanks to **Mr. Teles Rayer, Mr. K. Veerabahu and Mr. Rajesh**, Lab Assistants for their valuable help.

I am greatly indebted to **our parents & family members, friends** for their moral support which helped us to complete this work.

INTRODUCTION

This 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 (IATA and ICAO) longitudes, latitudes and altitudes of airports across the world with detailed time zone and daylight-saving time data. Additionally, this includes information about airlines including their IDs, name aliases, IATA and ICAO codes, callsigns country of origin and active/inactive status. Similarly, it also covers route details such as airline sources to destination airports along with essential details like codeshare stakeholder if any stops required during this journey along with the type of aircraft being used for that particular journey. This dataset has been compiled through meticulous labor by researchers all over the world to give you a comprehensive detail into air transportation networks from around the globe. It requires your generous donations

in order for them to keep updating this data source so please do donate if possible.

So, in this project work we are going to elaborate about the Worldwide Airways Network with the help of Tableau by plotting the following Chart

- ♣ Empathy Map.
- ♣ Brain Storming and Idea Prioritization.
- ♣ World Map with Airport Details.
- ♣ Number of Airports in the Countries.
- ♣ Airports at High Altitude within the Countries,
- ♣ Top 10 Airports at High Altitude.
- ♣ Airlines within the Countries.
- ♣ Number of Flights from the Country.
- ♣ Number of Airlines in the Country.
- ♣ Bar Graph showing Number of Flights from the Countries.

PROJECT FLOW

- ♣ Empathy Map.
- ♣ Brain storming and Idea Prioritization.
- ♣ Data Preparation.

Prepare the Data for Visualization

- ♣ Data Visualization.

No of Unique Visualization

- ♣ Dashboard.

Responsive and Design of Dashboard

- ♣ Story.

No of Scenes of Story

- ♣ Performance Testing.

Amount of Data Rendered to Tableau

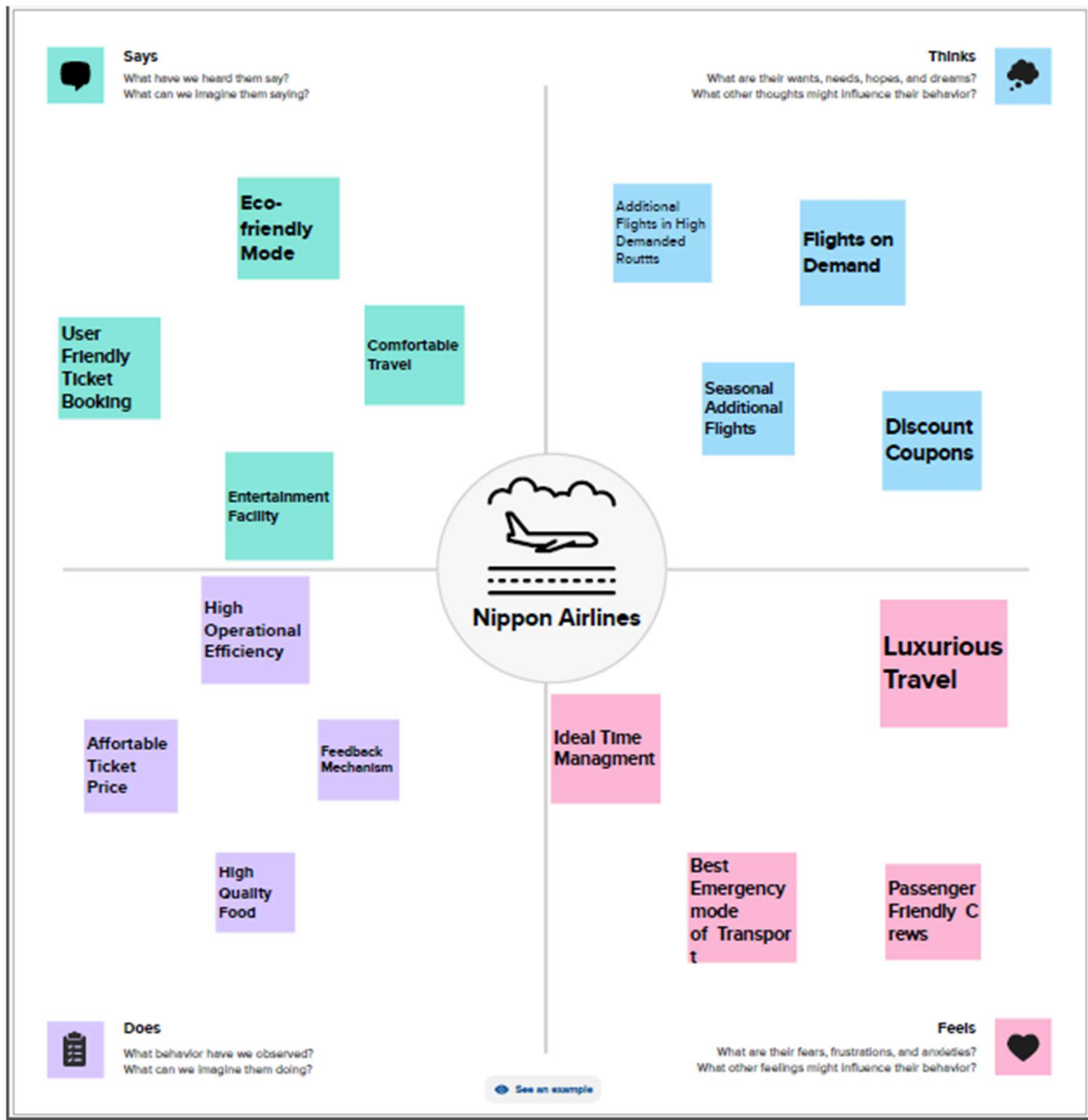
- ♣ Publishing.

Publish Dashboard & Story to Tableau Public

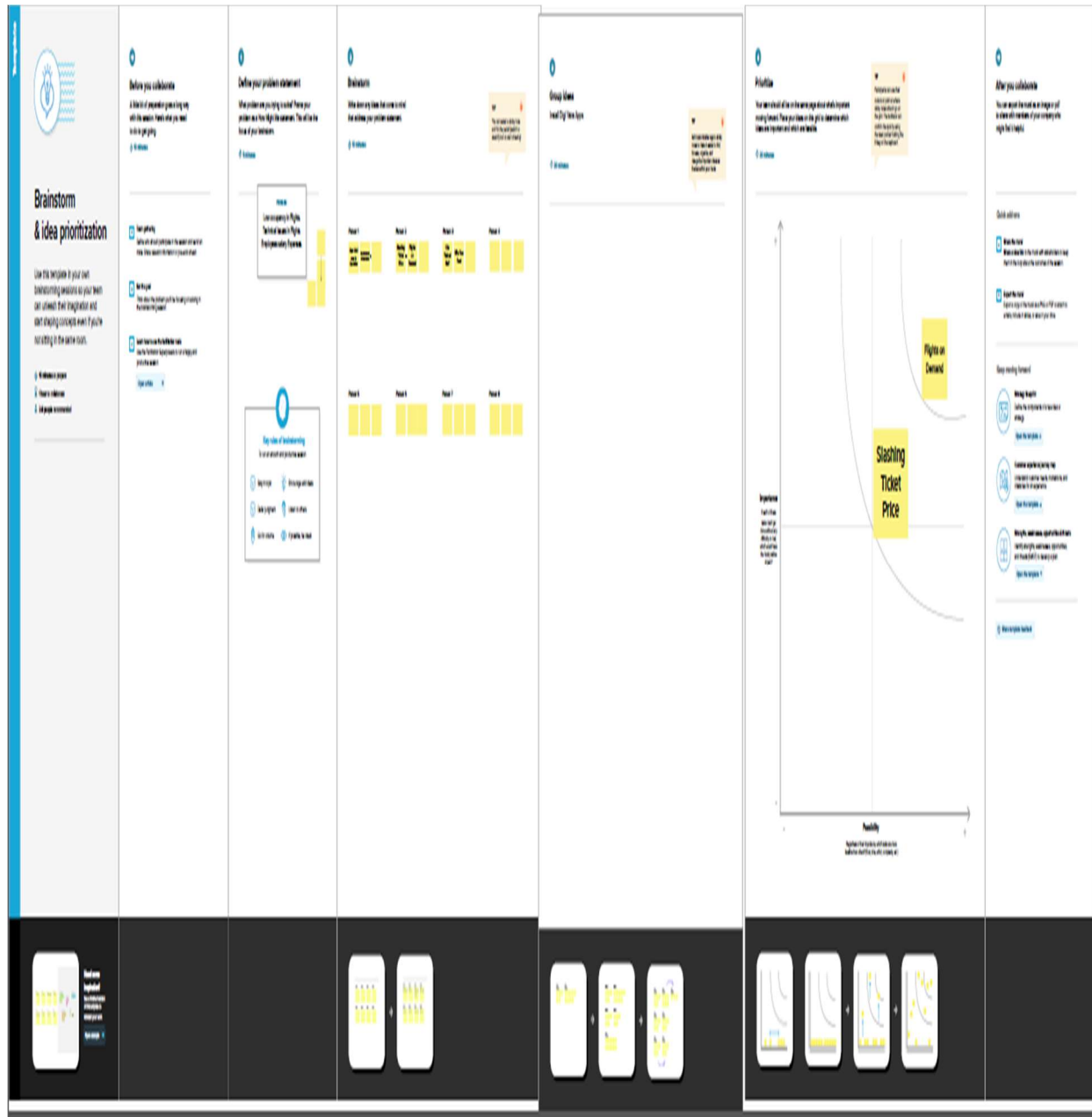
- ♣ Project Demonstration & Documentation.

Record explanation Video for project end to
end solution Project Documentation-Step by step
project development procedure

EMPATHY MAP.



BRAIN STORMING AND IDEA PRIORITIZATION.



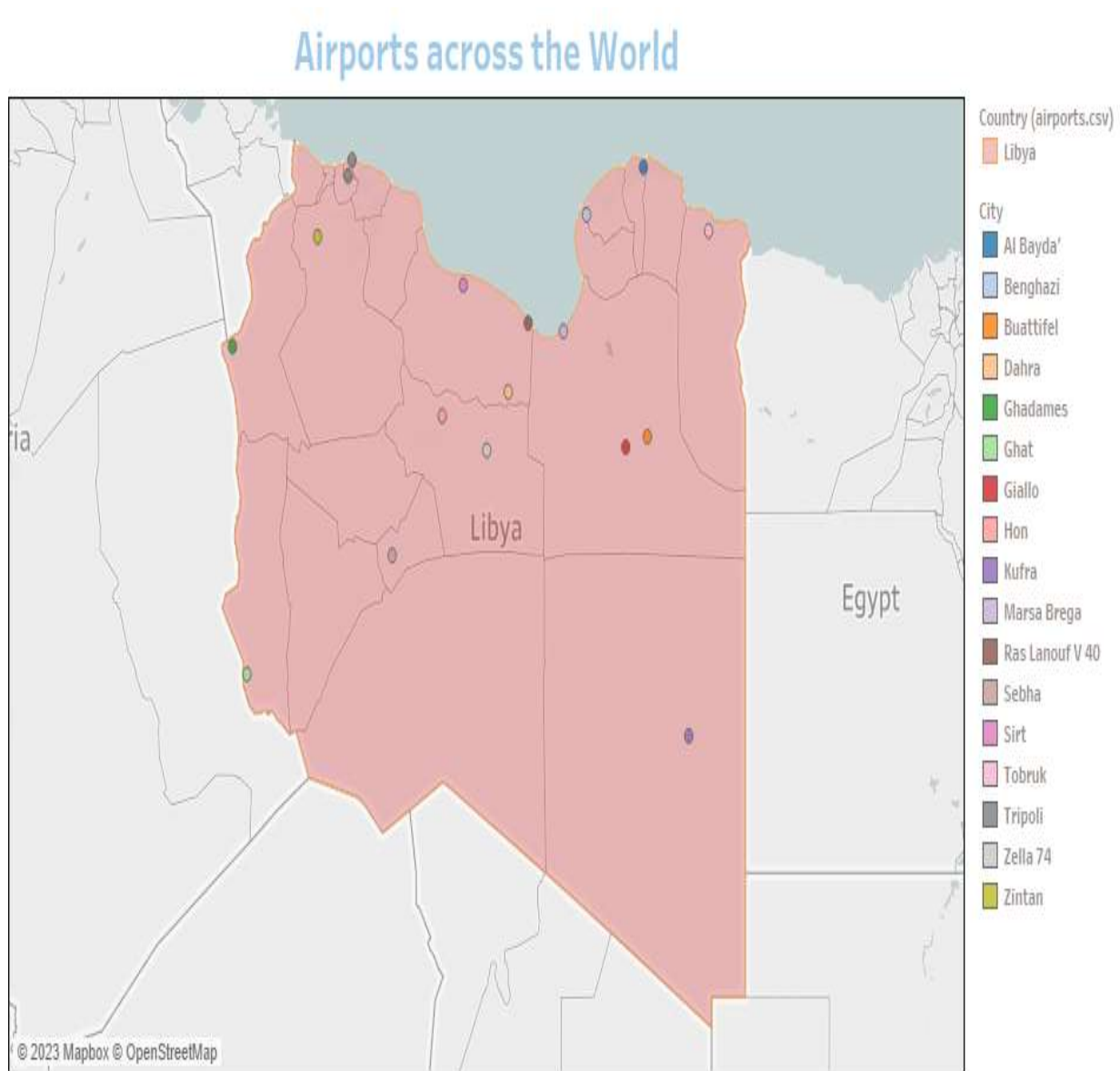
DATA PREPARATION

Data modules are containers that describe data and rules for combining and shaping data to prepare it for analysis and visualization in Tableau. Data module sources. Data modules can be based on data servers, packages, uploaded files, data sets, and other data modules.

DATA VISALIZATION

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

SHEET 1- World Map with Airport Details



Map based on average of Longitude and average of Longitude and average of Latitude. For pane Average of Longitude: Color shows details about Country (airports.csv). For pane Average of Longitude (2): Color shows details about City. Details are shown for various dimensions. The data is filtered on no of airport, which keeps all values. The view is filtered on Country (airports.csv), which keeps Libya.

It shows the detail of airport within the country with city, altitude, latitude, longitude, ICAO code, IATA code.

SHEET 2-Number of Airports in the Countries.



This visualizes the total number of airports in a particular country.

SHEET 3-Airports at High Altitude within the Countries.

High Altitude Airports in Kazakhstan				
Ind..	Name (airports.csv)	City	ICA..	
1	Ak Bashat Airport	Taldykorgan	UAAT	0
2	Aktau Airport	Aktau	UATE	73
3	Aktobe Airport	Aktyubinsk	UATT	738

Sum of Altitude broken down by Index., Name (airports.csv), City and ICAO (airports.csv). The data is filtered on Country (airports.csv) and top 10. The Country (airports.csv) filter keeps Kazakhstan. The top 10 filter keeps True.

This sheet shows the airports in high altitude with it's city and ICAO code.

SHEET 4-Top 10 Airports at High Altitude.

High Altitude Airports across 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 Gunsai 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 Internatio..	Juliaca	SPJL	12,552
Golog Maqin Airport	Golog	ZLGL	12,426

Sum of Altitude broken down by Name (airports.csv), City and ICAO (airports.csv). The view is filtered on ICAO (airports.csv), which keeps 10 of 7,698 members.

This gives the information about top list of high-altitude airports across the world with its city and ICAO code.

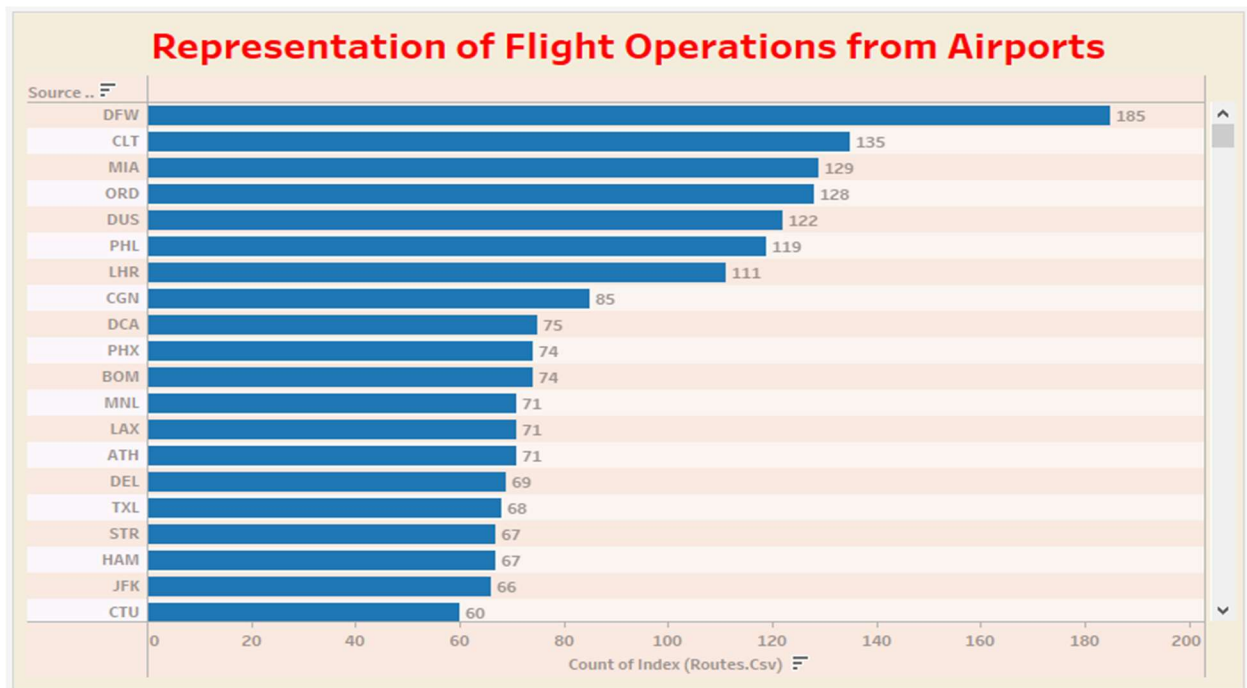
SHEET 5-Airlines within the Countries.

Colombia's Aircarriers					Active ■ N
Airline ..	Name	Icao	Callsign		
45	APSA Colombia	ABO	AEROEXPRESO	■	
46	Aerovias Bueno	ABU	AEROBUENO	■	
98	Aeroexpreso I..	AEI	INTERAM	■	
245	Aeroejecutivo..	AJS	AEROEJECUTI..	■	
258	Arca Aerovias ..	AKC	ARCA	■	
270	Aeroalas Colo..	ALE	AEROALAS	■	
297	Aerolineas Me..	AMD	AEROLINEAS ..	■	
339	Aerol	ANQ	ANTIOQUIA	■	
359	Aeroatlantico ..	AOK	Null	■	
375	Aerotaxi Del V..	AOX	AEROVALLE	■	
385	Aerotransport..	PET	AEROPETRO	■	
428	Aerotat Aeroli..	ART	AEROTAL	■	
474	AeroTACA	ATK	AEROTACA	■	
479	ASTRAL Colom..	ATP	ASTRAL	■	
670	Aerovilla	VVG	AEROVILLA	■	
735	AVESCA	VSC	AVESCA	■	
1000	AeroSucre	KRE	AEROSUCRE	■	
1294	Aerotranscolo..	TCO	TRANSCOLOM..	■	
1468	British Petrole..	BPX	Null	■	
1895	Coronado Aero..	CRA	CORAL	■	
2722	Helicol	HEL	HELICOL	■	
2869	InteliJet Airwa..	IJT	INTELIJET	■	
2885	Intercontinent..	ICT	CONTAVIA	■	
3280	Lineas Aereas ..	EDR	ELDORADRO	■	
3343	L	LAU	SURAMERICAN..	■	
3947	Petroleum Hel..	PHC	HELICOPTERS	■	
4314	SAM Colombia	SAM	SAM	■	
4363	SADELCA - Soc..	SDK	SADELCA	■	
4367	Servicios Aere..	SDV	SELVA	■	
4468	Searca	SRC	SEARCA	■	
4655	Servicios Aere..	KSP	SAEP	■	
4885	Transporte del..	TCB	TRANSCARIBE	■	
5409	West Caribbea..	WCW	Null	■	
18673	Royal Souther..	RS1	RSA	■	

Active (color) broken down by Airline ID, Name, Icao and Callsign. Details are shown for Country and Active. The view is filtered on Active and Country. The Active filter keeps N. The Country filter keeps Colombia.

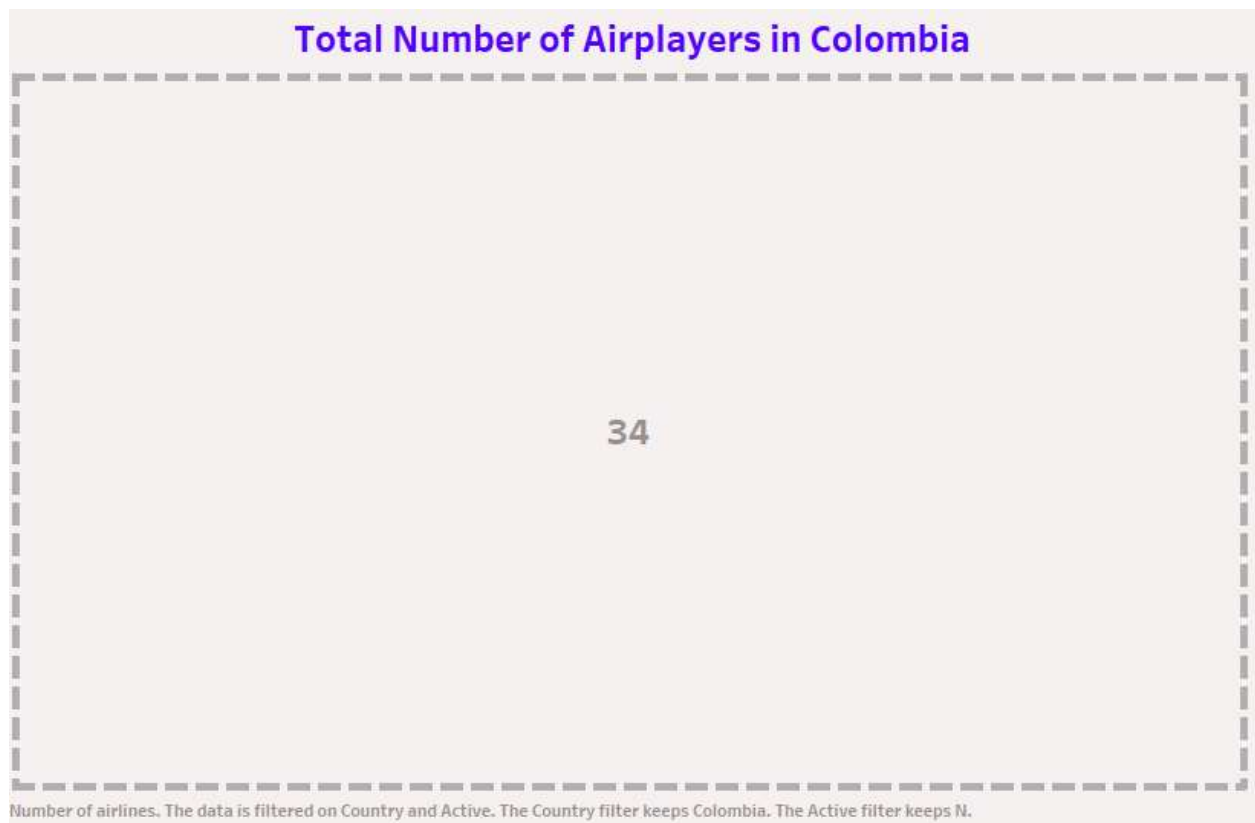
This table shows the details of flight which are at active and inactive state in the countries. In this orange box shows the flight is in active state and brown box shows the flights are in inactive state.

SHEET 6-Number of Flights from the Country.



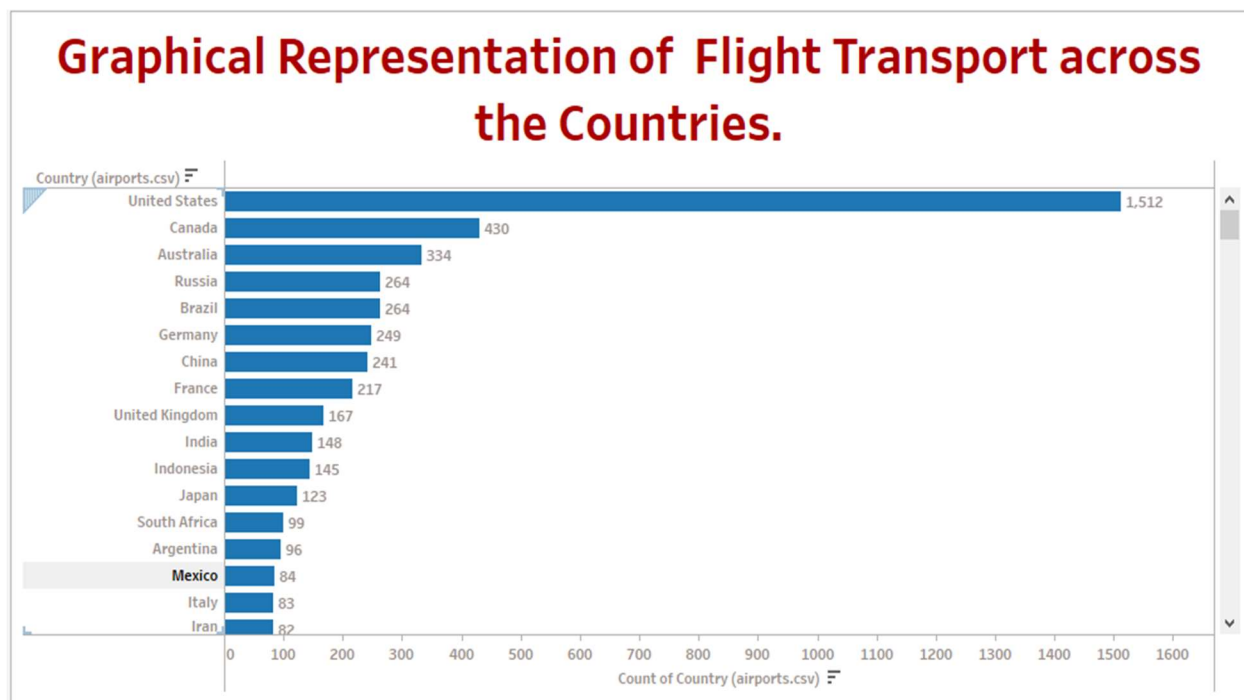
This Bar graph shows the descending order of active flights from the airport across the world. It shows the count of flights too.

SHEET 7 -Number of Airlines in the Country



This shows the count of airlines for the country.

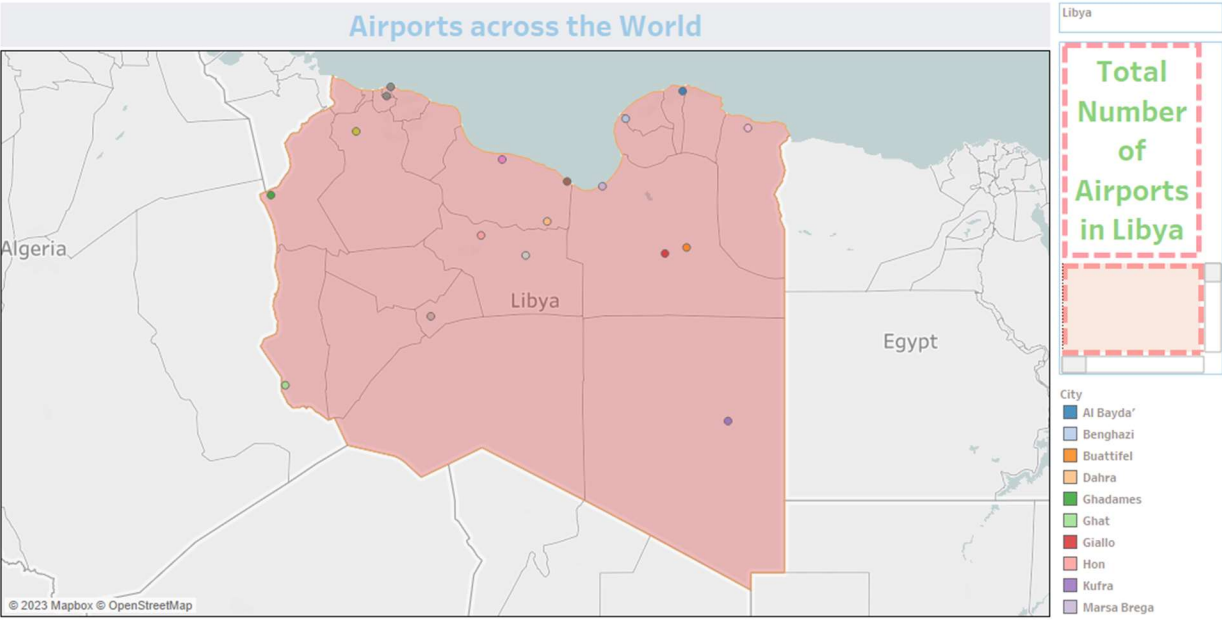
SHEET 8- Bar Graph showing Number of Flights from the Countries.



This bar graph shows the country which has maximum number of flights in operating condition.

DASHBOARD

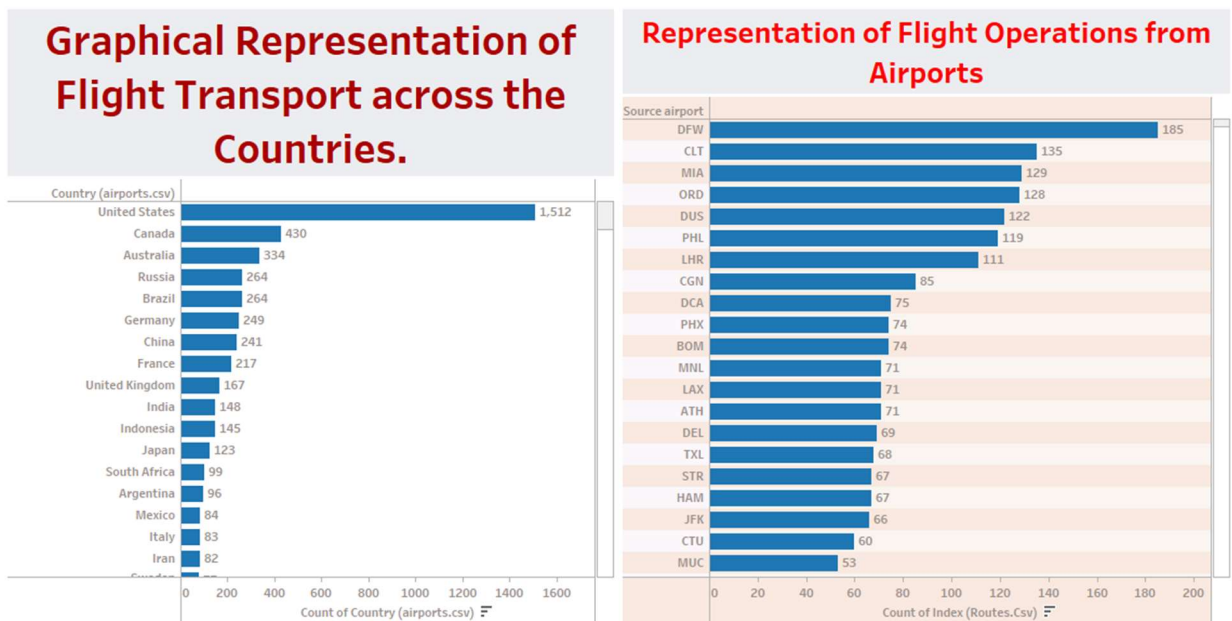
A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.



Colombia's Aircarriers					Country
Airline ..	Name	Icao	Callsign		Colombia
45	APSA Colombia	ABO	AEROEXPRESO		Active
46	Aerovias Bueno	ABU	AEROBUENO		N
98	Aeroexpreso I..	AEI	INTERAM		Active
245	Aeroejecutivo..	AJS	AEROEJECUTI..		N
258	Arca Aerovias ..	AKC	ARCA		Total
270	Aeroalas Colo..	ALE	AEROALAS		Number of
297	Aerolineas Me..	AMD	AEROLINEAS ..		Airplayers in
339	Aerol	ANQ	ANTIOQUIA		Colombia
359	Aeroatlantico ..	AOK	Null		Country
375	Aerotaxi Del V..	AOX	AEROVALLE		Colombia
385	Aerotransport	DET	AERODETRO		

High Altitude Airports in Kazakhstan					Country (airp.. Kazakhstan
Ind..	Name (airports.csv)	City	ICA..		
1	Ak Bashat Airport	Taldykorgan	UAAT	0	
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High Altitude Airports across the World			
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Qamdo Banqda Airport	Banqda	ZUBD	



These four dashboards give the information of number of airports within the countries with its map, Airline which are at active state in the country with its details, Airports at high altitude within the world and within the country, Operating flights from the airport across the countries.

STORY

A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

This below is the link for story.

https://drive.google.com/file/d/1YZN6S5XlpTzNYlMfilsrIYg_ebgpV2Bb/view?usp=share_link

PUBLISH DASHBOARD & STORY TO TABLEAU PUBLIC

We have published the results of our analysis in tableau public and the given the link below

<https://public.tableau.com/app/profile/deepika.kombayah/vizzes>

PROJECT DEMONSTRATION

Video explanation of our work have been recorded and the link for access is given here.

https://drive.google.com/file/d/1S5QK4M4m5Hqk500SFhuosKxKtVAkN-4T/view?usp=share_link

RESULTS AND DISCUSSIONS

From the given database, Global air transport network with the use of Data Analytics tool Tableau, by creating the following Charts

- ♣ Empathy Map.
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- ♣ Number of Airlines in the Country.
- ♣ Bar Graph showing Number of Flights from the Countries.

This provides stakeholders in the aviation industry with accurate, up-to-date information on the worldwide air transportation network. Through this Project, The Current analysis of Air Transport Service have been studied using Data Science software Tableau.

THANK YOU