LRG ARTS COLLEGE FOR WOMEN, TIRUPUR

DEPARTMENT OF MATHEMATICS

Course Name: Data Analytics with Tableau

Academic Year: 2023 – 2024

A project report entitled as

"Unlocking Insights into the Global Air Transportation Network with Tableau"

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L.R.G. ATRS COLLEGE FOR WOMEN

UNLOCKING INSIGHTS INTO THE GLOBAL AIR TRANSPORTATION NETWORK WITH TABLEAU

INTRODUCTION:

Overview:

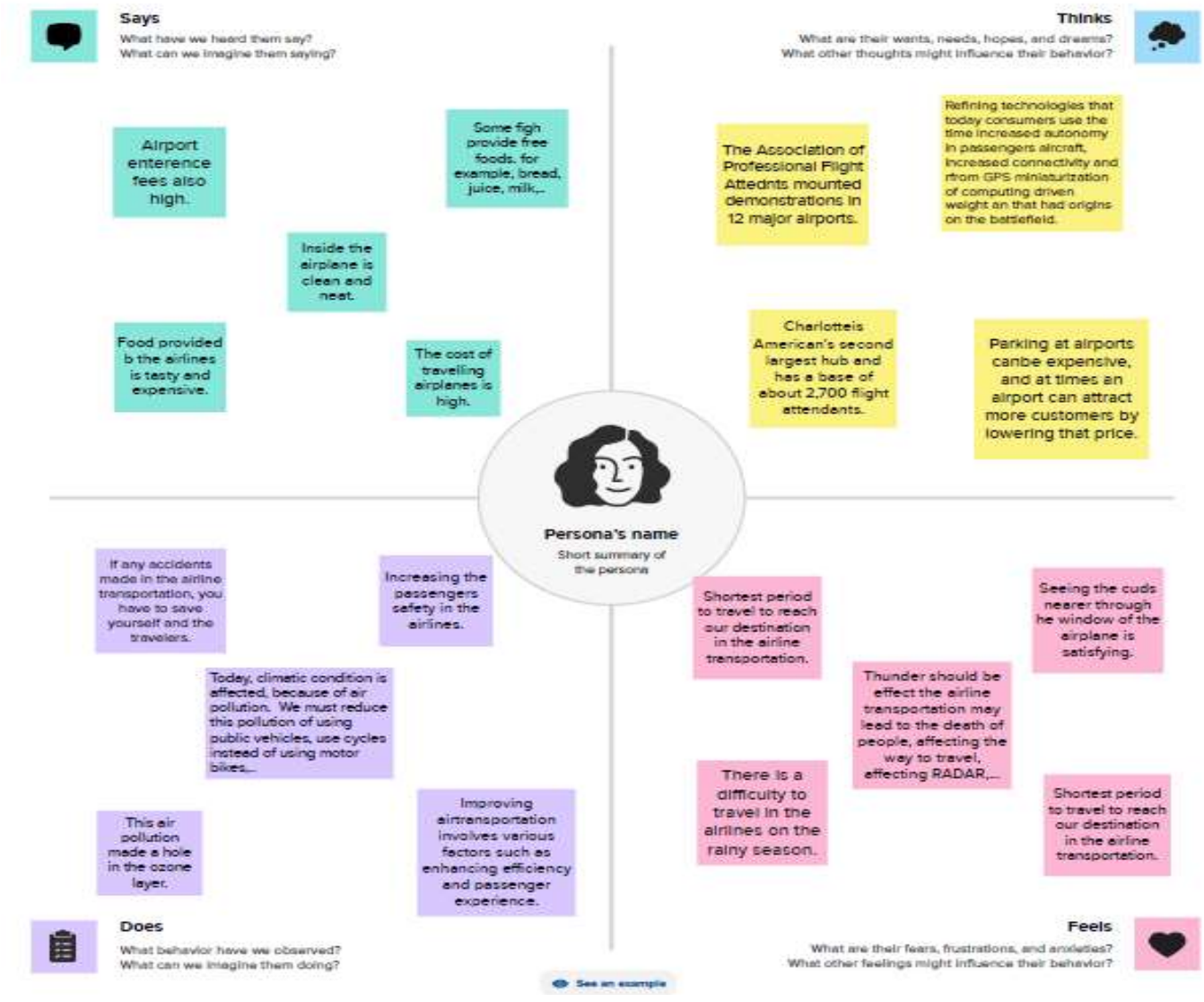
Air transport is the fastest network. It is useful to travel from one place to other. It has reduced distances by minimising the travel time. It is very essential and fast network. It is useful to migrate from country to other country where the distances are large and climatic conditions are diverse. The air transport includes airports, airlines and air control traffic. The cost for air transportation is very high comparing to roadway transportation. In addition to every country's economic development depends largely on the transportation. This air transportation have a several advantages and disadvantages.

Purpose:

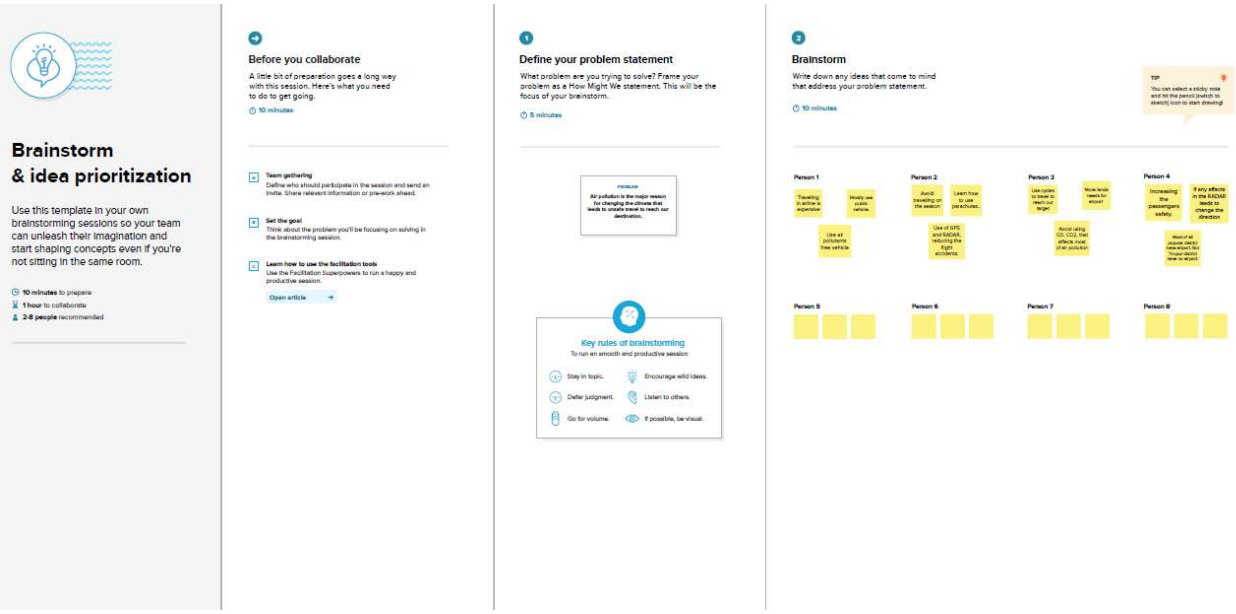
Air transport can transport goods to areas that are not easily accessible by other means of transport. Air transport is an important enabler to achieving economic growth. It plays a vital role in national, regional, and international scale. To assist clients in establishing a safe, functional, efficient, affordable, and reliable air transport network.

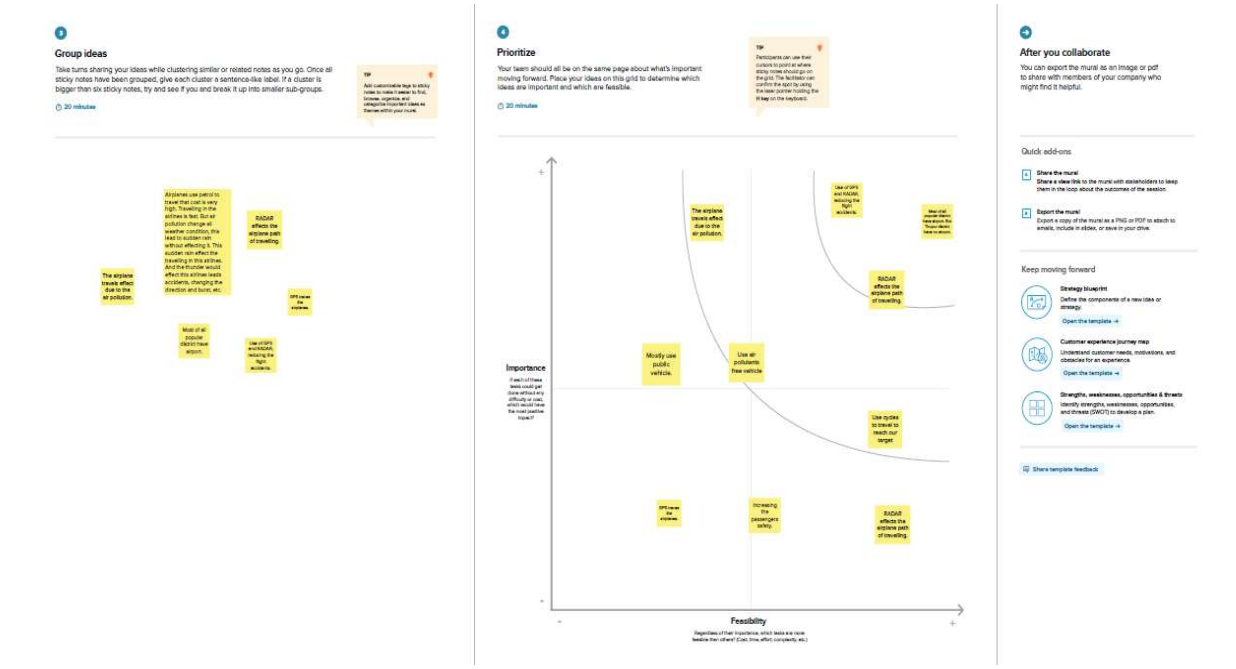
PROBLEM DEFINITION AND DESIGN THINKING:

Empathy map:



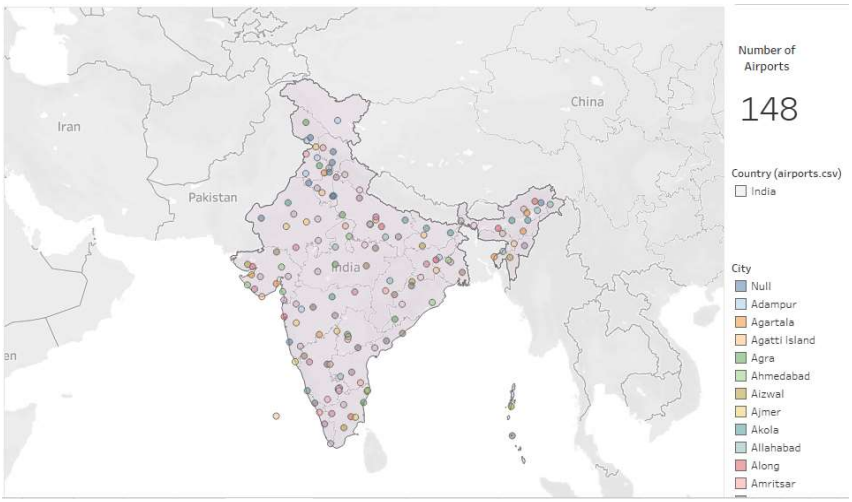
Ideation & brainstorming mapping:





RESULT:

Dashboard 1:



Dashboard 2:

Airports at higher altitude within a country

index nos	Name (airports.csv)	City	ICAO (airpo..	
2,048	Herat Airport	Herat	OAHR	3,206
2,049	Jalalabad Airport	Jalalabad	OAJL	1,814
2,050	Hamid Karzai Internation..	Kabul	OAKB	5,877

Country (airports.csv)
Afghanistan

Airports at Highest Altitude in World

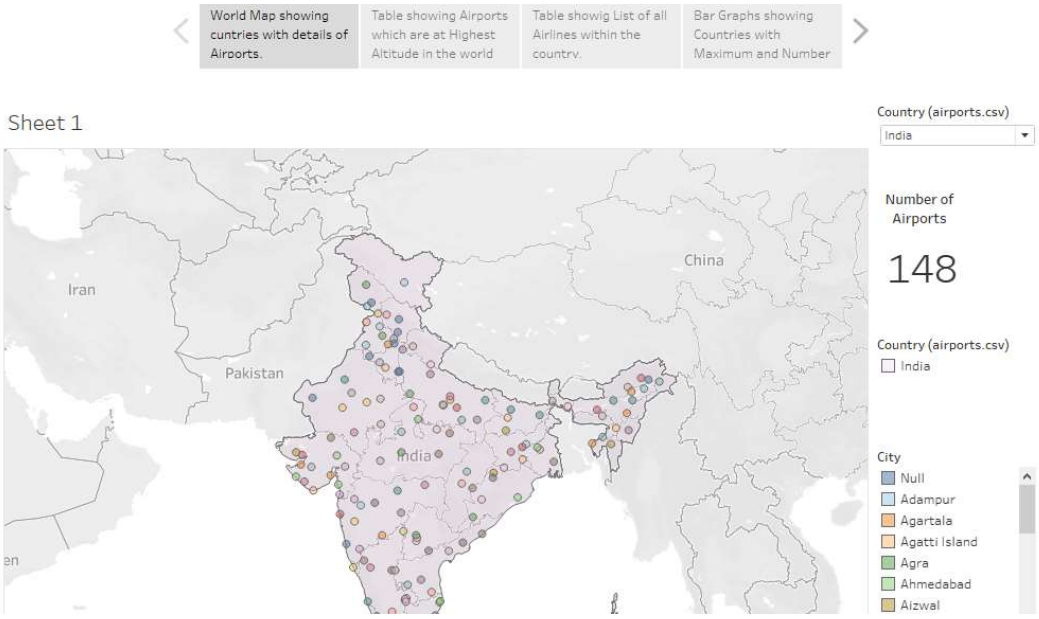
Name (airports.csv)	Country (airports.c..	ICAO (airports...	
Daocheng Yading Airport	China	ZUDC	14,472
Qamdo Bangda Airport	China	ZUBD	14,219
Kangding Airport	China	ZUKD	14,042
Ngari Gunsa Airport	China	ZUAL	14,022
El Alto International Airport	Bolivia	SLLP	13,355
Capitan Nicolas Rojas Airport	Bolivia	SLPO	12,913

Dashboard 3:

Dashboard 4:

STORY:

Story 1:



Story 1:

Airports at higher altitude within a country

Country (airports.csv): Afghanistan

index nos	Name (airports.csv)	City	ICAO (airpo..	
2,048	Herat Airport	Herat	OAHR	3,206
2,049	Jalalabad Airport	Jalalabad	OAJL	1,814
2,050	Hamid Karzai Internation..	Kabul	OAKB	5,877

Airports at Highest Altitude in World

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Ngari Gunsa Airport	China	ZUAL	14,022
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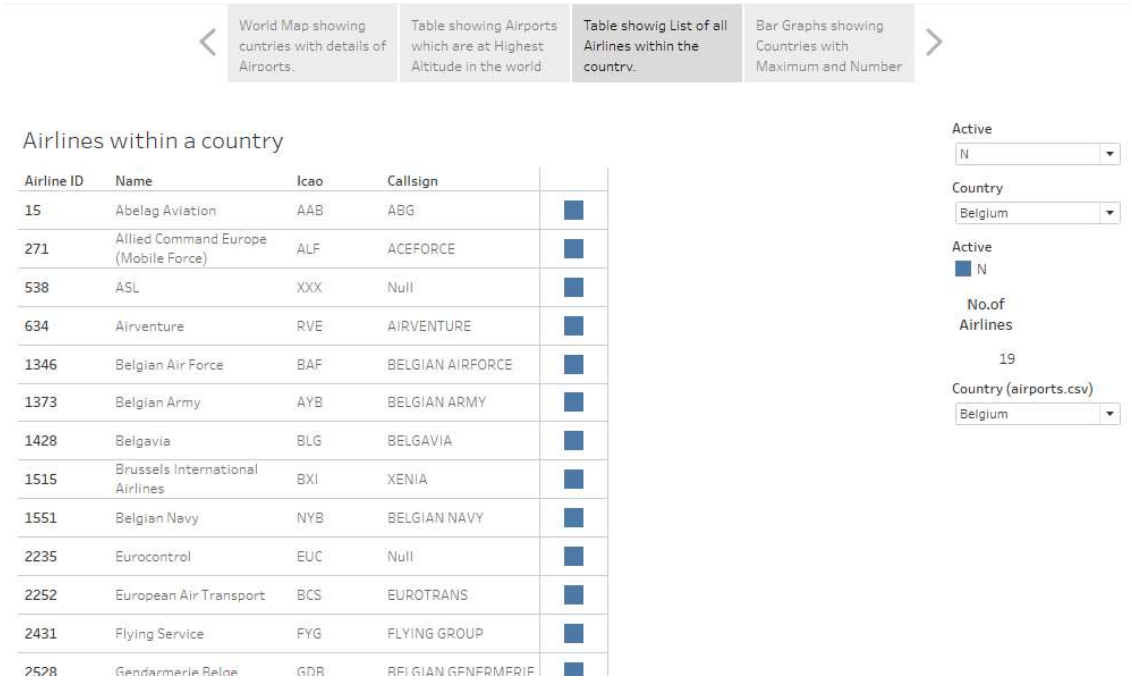
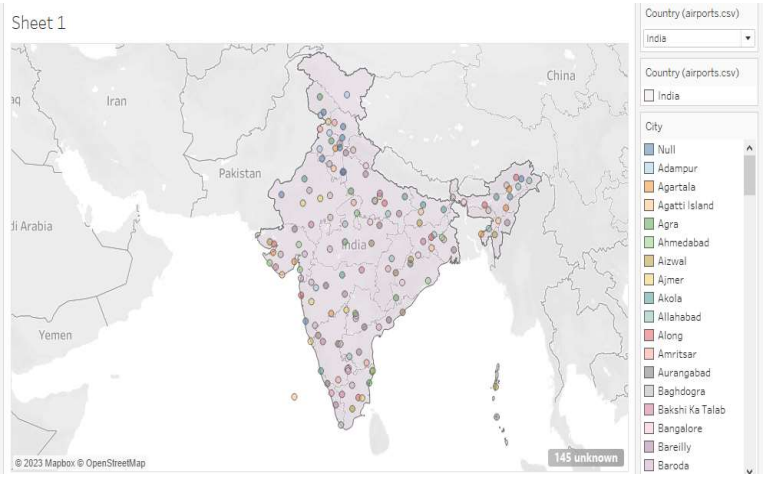
Story 1:



Story 1:

VISUALIZATIONS:

1. **WORLD MAP SHOWING DETAILS OF ALL AIRPORTS WITHIN A COUNTRY**



2. **NUMBER OF AIRPORTS**

3. **AIRPORTS AT HIGHER ALTITUDE WITHIN A COUNTRY**

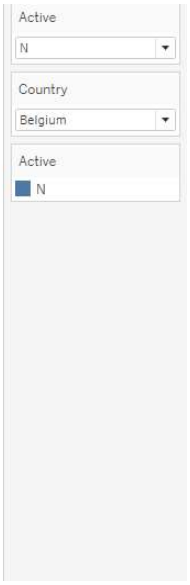
4. AIRPORTS AT HIGHEST ALTITUDE IN WORLD

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

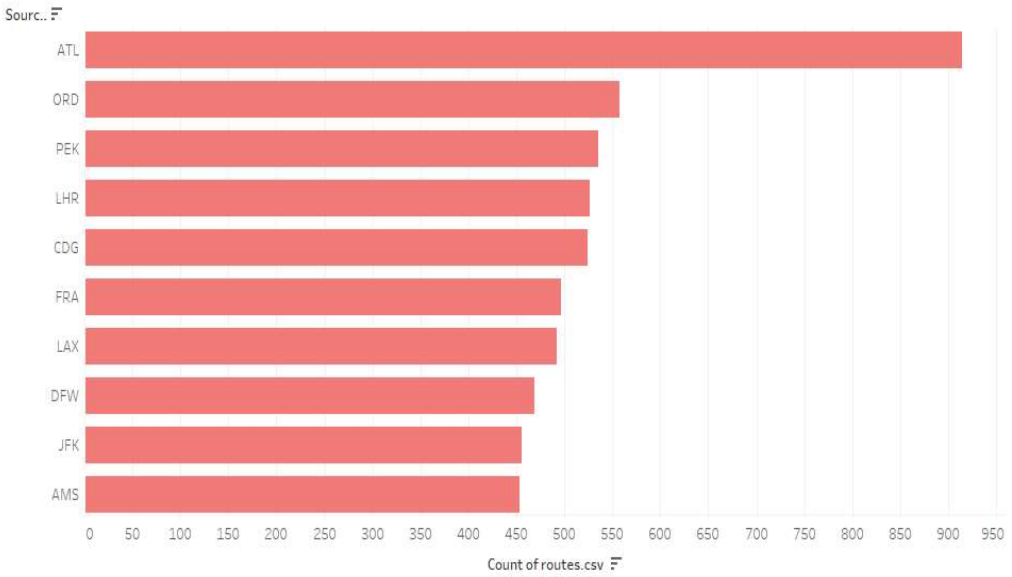
5. AIRLINES WITHIN A COUNTRY

Airlines within a country

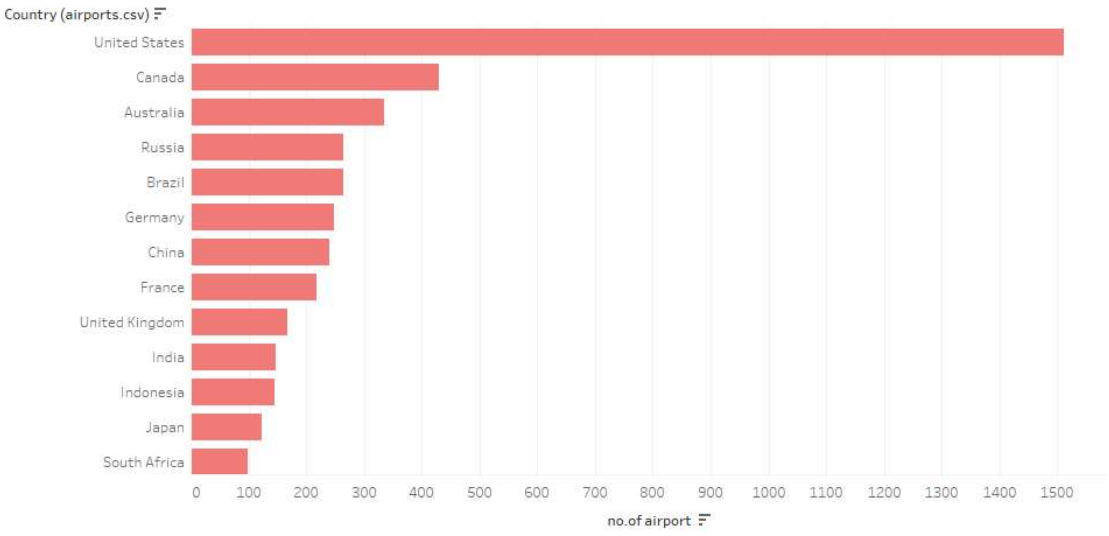
Airline ID	Name	Icao	Callsign	
15	Abelag Aviation	AAB	ABG	
271	Allied Command Europe (..	ALF	ACEFORCE	
538	ASL	XXX	Null	
634	Airventure	RVE	AIRVENTURE	
1346	Belgian Air Force	BAF	BELGIAN AIRFORCE	
1373	Belgian Army	AYB	BELGIAN ARMY	
1428	Belgavia	BLG	BELGAVIA	
1515	Brussels International Air..	BXI	XENIA	
1551	Belgian Navy	NYB	BELGIAN NAVY	
2235	Eurocontrol	EUC	Null	
2252	European Air Transport	BCS	EUROTRANS	
2431	Flying Service	FYG	FLYING GROUP	
2528	Gendarmerie Belge	GDB	BELGIAN GENERMERIE	
2800	International Air Carrier A..	ITC	Null	
3821	Ostend Air College	OCO	AIR COLLEGE	
4445	SITA	SIT	Null	
4734	Sky Service	SKS	SKY SERVICE	
4873	TNT Airways	TAY	QUALITY	
5169	Thalys	Null	Null	
6002	TUI Airlines Belgium	TUB	BEAUTY	
17963	VG Airlines (IV)	FVG	Nico	



6. NUMBER OF FLIGHTS FROM AIRPORT



7. COUNTRY WITH MAXIMUM NUMBER OF AIRPORTS



ADVANTAGES & DISADVANTAGES:

Advantages:

1. **Defence service:**

   Airforce service is essential to nation. The airforce provides much quicker and easir approach. It plays a very important role in saving lives and giving people extra assistance in difficult time.

2. **High speed:**

   Large amount of weight carried and fastest way to reach our destination. It is far quicker than any other transportation, comparing road, rail or water.

3. **Security:**

   It is convenient to travel across large distances with particularly fragile or valuable products in air transportation.

Disadvantages:

1. **High cost:**

   This having more cost comparing to land, rail, and water transportation. If passengers situation could be better, they cannot travel frequently.

2. **Risky:**

   Air travel follows a natural route and is entirely reliant on the weather. So it have so many risk to travel in this way of transportation.

3. **Limited capacity:**

Air transport is a quick method of transportation, it has the problem of having following a weather condition. These are restrictions on the number of passengers who may travel, which could be better for handling goods. Some products include gases, heated solids, liquids, etc.

4. **Large investment:**

It needs a large amount of land for airport. It effects the agricultural land more for airports.

APPLICATIONS:

Applications:

The air transportation network is a complex network which has the properties of small-world networks.

The hubs of the network have connectivities and long-distance connectivities at the same time. The worldwide air transport network defines communities. These communities are mainly determined by geographical factors.

Modeling air transport networks aims airline companies to organize their routes in a cost-efficiency way. Air transport network models are also the tool to investigate system.

An alternative application is modeling human disease networks. Air transport network is used by millions of people every day.

The growth of the market is mainly driven by the increasing demand for air travel, airport expansion project, and rising demand for air freight services.

CONCLUSION:

Conclusion:

We analyze the global structure of the worldwide air transportation network, a critical infrastructure with an enormous impact on local, national and international economies. We find that worldwide air transportation network is a scale-free small-world network.

The air transportation system is also responsible, indirectly for the propagation of diseases such as influenza and recently, SARS.

The structure of the air transportation network is mostly determined by the concurrent actions of airline companies of both private and national.

FUTURE SCOPE:

Future scope:

Mobility and its pillars of transport are at the very center of our socio-economic fabric. The small aircraft transportation system concept originated as a guide for the general aviation technology programs of the National Aeronautics and Space Administration (NASA). NASA foresees the application of advanced technologies to small aircraft to make them much easier to pilot, more reliable, safer, and less expensive to own, maintain, and operate than high-performance GA aircraft today.

The main rationale for promoting SATS is that could help alleviate congestion and delay in the commercial aviation sector and increase transportation options for people and business residing in many small and remote communities with limited access to airline service.

APPENDIX:

Github link:

https://github.com/suria-1907/air_transportation_NM2023TMID01666

Dashboard 1:

https://public.tableau.com/app/profile/geethanjali.b3366/viz/dashboard1_16972022434970/Dashboard1?publish=yes

Dashboard 2:

https://public.tableau.com/app/profile/geethanjali.b3366/viz/dashboard2_16972026295670/Dashboard2?publish=yes

Dashboard 3:

https://public.tableau.com/app/profile/geethanjali.b3366/viz/dashboard3_16972027197120/Dashboard3?publish=yes

Dashboard 4:

https://public.tableau.com/app/profile/geethanjali.b3366/viz/dashboard4_16972028530840/Dashboard4?publish=yes

Story 1:

https://public.tableau.com/app/profile/geethanjali.b3366/viz/story1_16972030459140/Story1?publish=yes

Video demonstration link:

https://drive.google.com/file/d/14nzUcO4TSRPPHSnOSBGh4nKrYb_E-EBQ/view?usp=drivesdk