

Unlocking Insights into The Global Air Transportation Network With Tableau

1. INDRODUCTION

1.1 Overview

Project Description:

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.

1.2 Purpose

(The use of the project):

Airlines and aviation-related organizations must adhere to various regulations and reporting requirements. Tableau can simplify the process of gathering and presenting data for regulatory compliance.

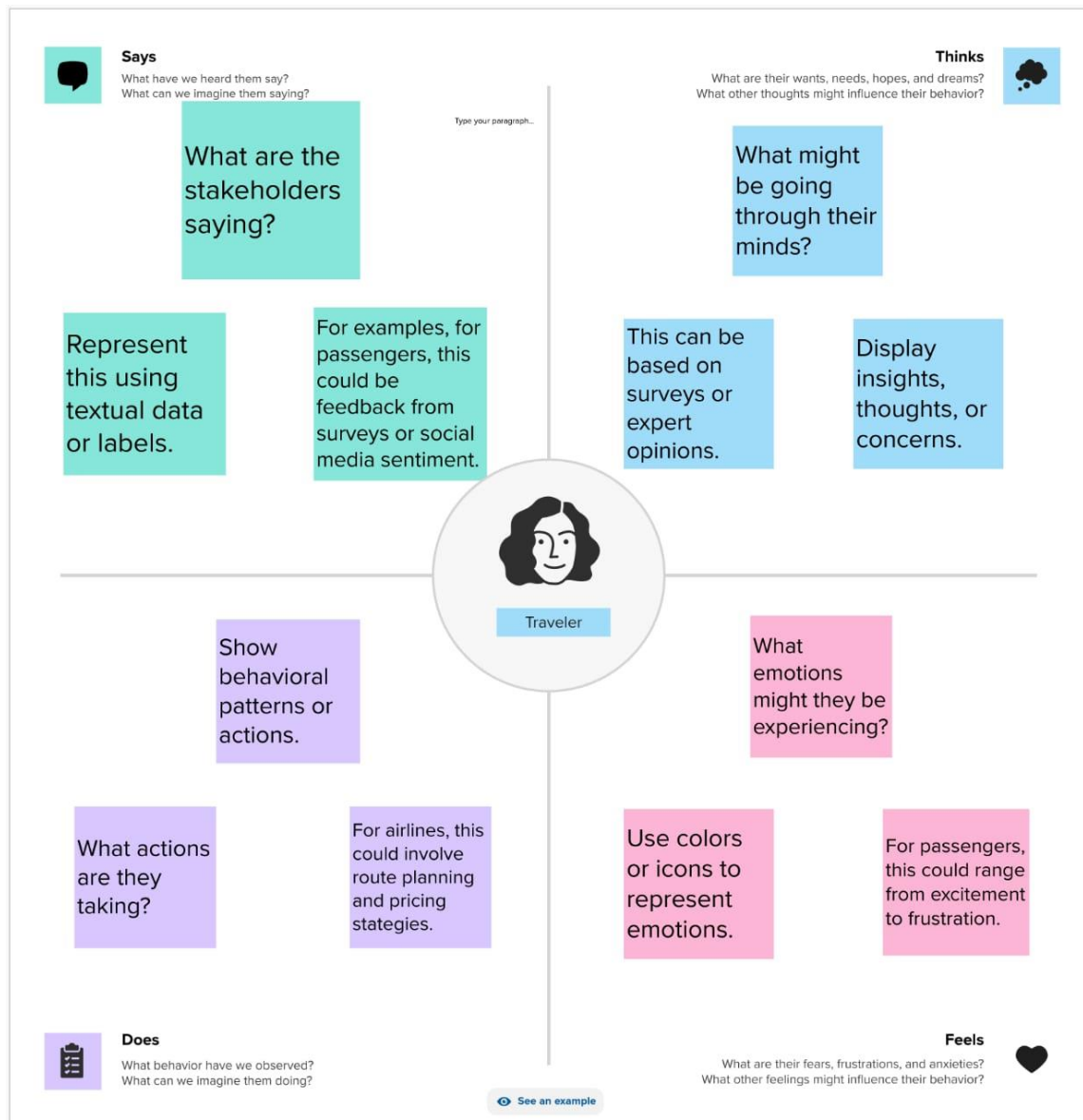
In summary, Tableau can be a powerful tool for unlocking insights into the global air transportation network, helping stakeholders make informed decisions, optimize operations, enhance the passenger experience, and address various challenges and opportunities in the aviation industry.

(What can be achieved using this):

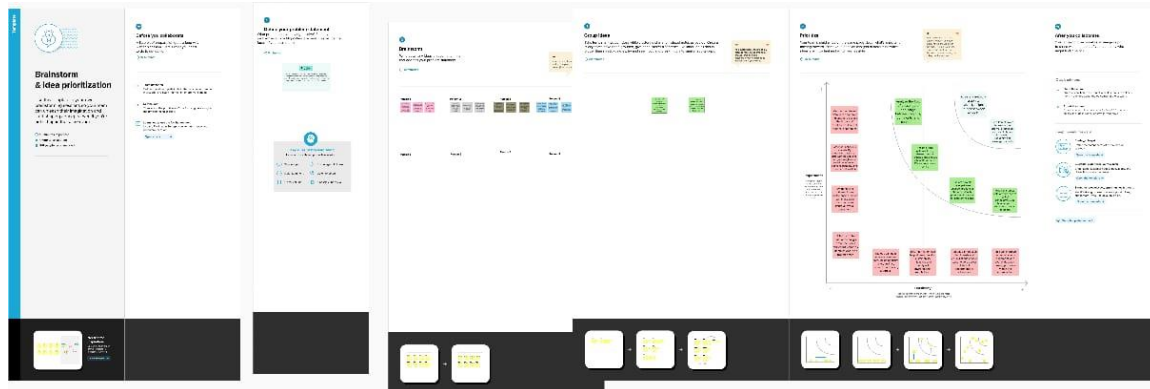
To achieve these insights, you'll need to gather relevant data from various sources, clean and prepare the data, and then create interactive dashboards and visualizations in Tableau. You may also consider using Tableau's advanced features like calculated fields, parameters, and custom mapping to enhance your analysis. Additionally, integrating Tableau with other data analysis tools or databases can provide even more robust insights into the global air transportation network.

2. Problem Definition & Design Thinking

2.1 Empathy Map

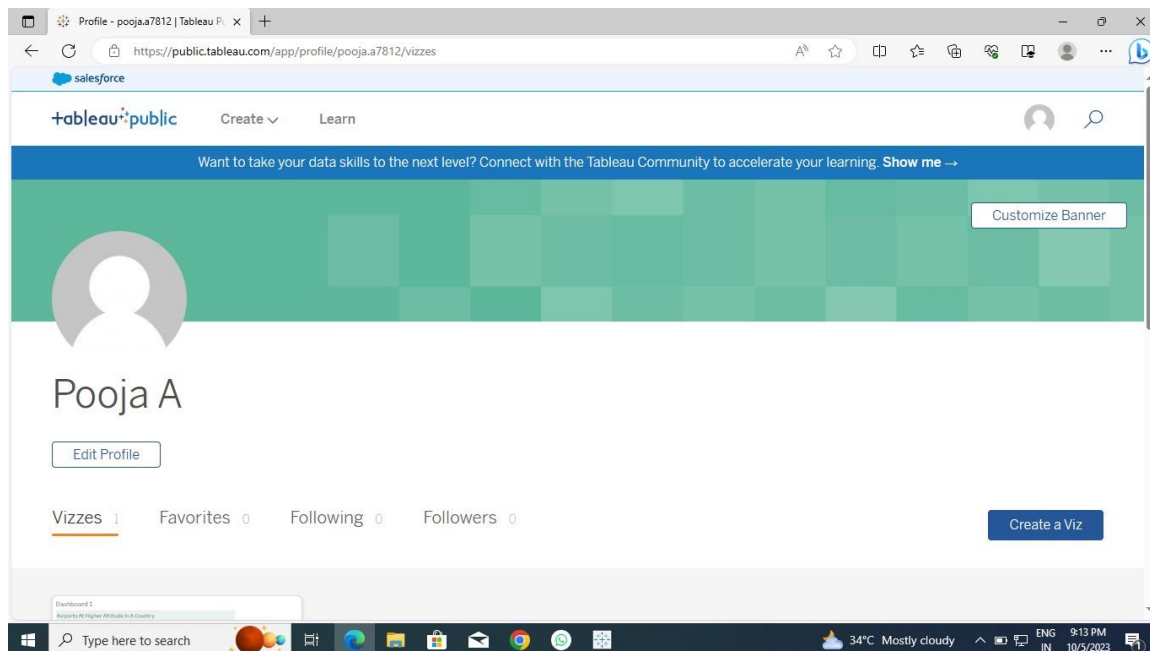


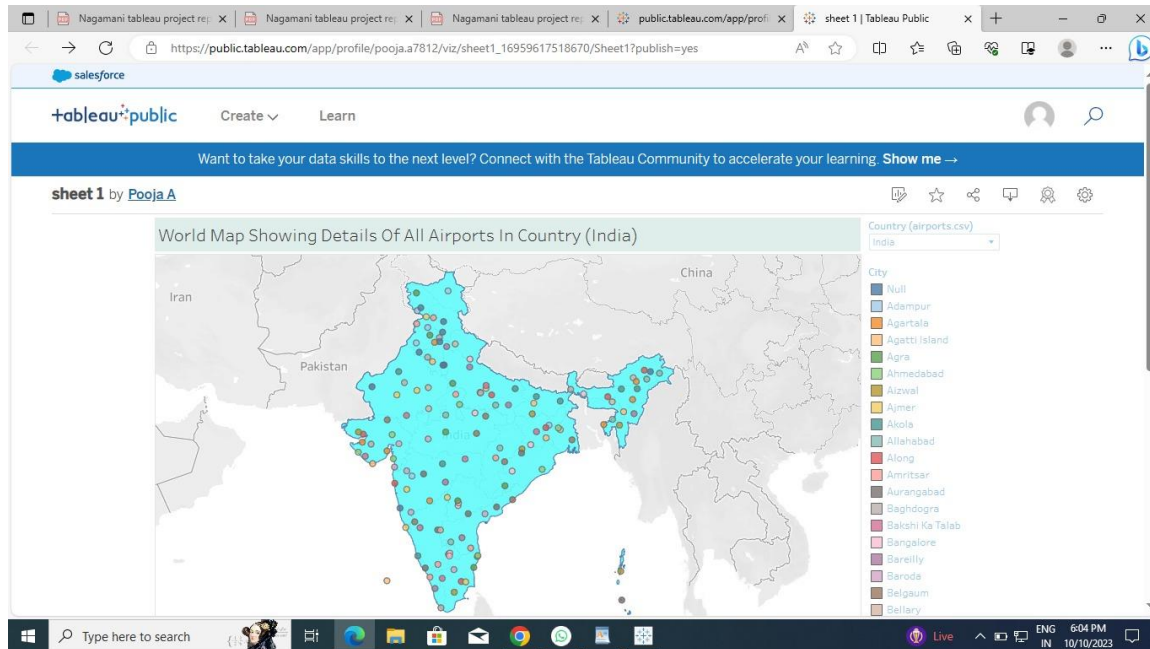
2.2 Ideation & Brainstorming map :



3. RESULT

3.1 Final findings (Output) of the project along with screenshots.





Airports At Higher Altitude In A Country

Country (airports.csv): Afghanistan

| Name (airports.csv) | City | ICAO (airports.c...) | |
|---------------------|------------|----------------------|-------|
| Sheberghan Airport | Sheberghan | OASG | 1,053 |
| Zaranj Airport | Zaranj | OAZJ | 1,572 |
| Shindand Airport | Shindand | OASD | 3,773 |
| Tarin Kowt Airport | Tarin Kowt | OATN | 4,429 |

sheet 1 by Pooja A

Airports At Higher Altitude in World

Country (airports.csv) (All)

| Name (airports.csv) | City | ICAO (airports.csv) | |
|--|---------------|---------------------|--------|
| Bar Yehuda Airfield | Metzada | LLMZ | -1,266 |
| Ein Yahav Airfield | Eyn-yahav | LLEY | -164 |
| Jacqueline Cochran Regional Airport | Palm Springs | KTRM | -115 |
| Atyrau Airport | Atyrau | UATG | -72 |
| Ramsar Airport | Ramsar | OINR | -70 |
| Privolzhskiy Air Base | Astrakhan | XRAP | -66 |
| Astrakhan Airport | Astrakhan | URWA | -65 |
| Noshahr Airport | Noshahr | OINN | -61 |
| Imperial County Airport | Imperial | KIPL | -54 |
| El Centro NAF Airport (Vraciu Field) | El Centro | KNJK | -42 |
| Sardar-e-Jangal Airport | Rasht | OIGG | -40 |
| Gorgan Airport | Gorgan | OING | -24 |
| Rotterdam The Hague Airport | Rotterdam | EHRD | -15 |
| Lelystad Airport | Lelystad | EHLE | -13 |
| Amsterdam Airport Schiphol | Amsterdam | EHAM | -11 |
| El Nouzha Airport | Alexandria | HEAX | -6 |
| [Duplicate] Illertissen see EDMI - ED-0425 I.. | Not Specified | XXXX | 0 |
| Aarhus Seaplane Terminal | Aarhus | EKAC | 0 |
| Abaiang Airport | Abaiang Atoll | NSAB | 0 |
| Adamovka | Adamovka | UWOD | 0 |

sheet 1 by Pooja A

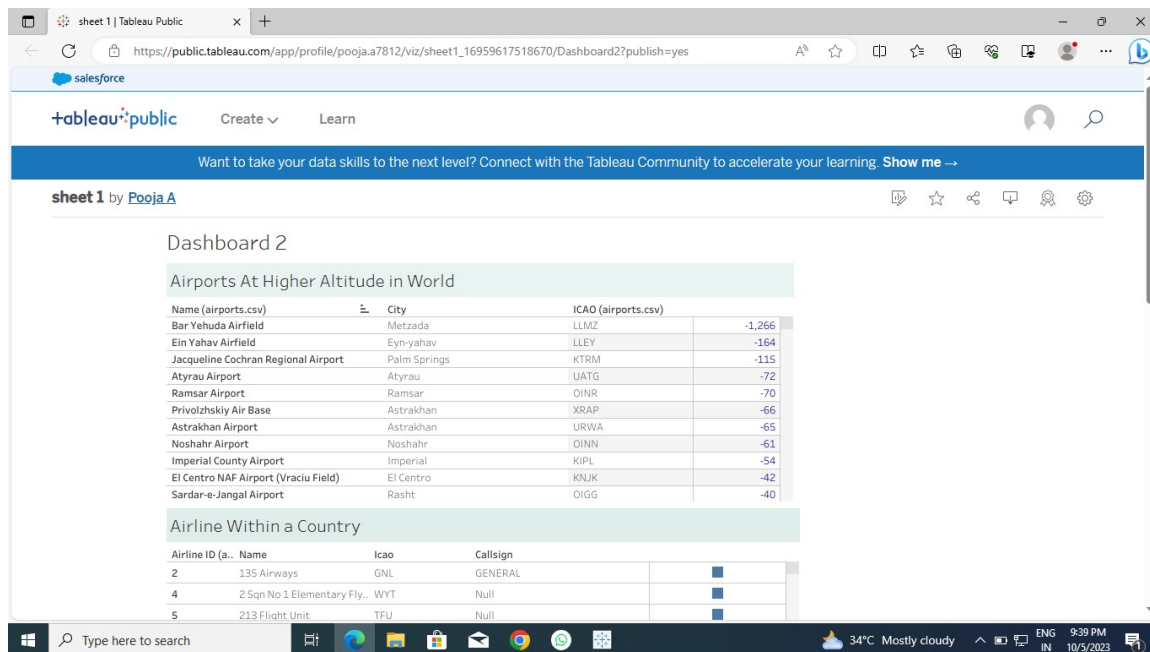
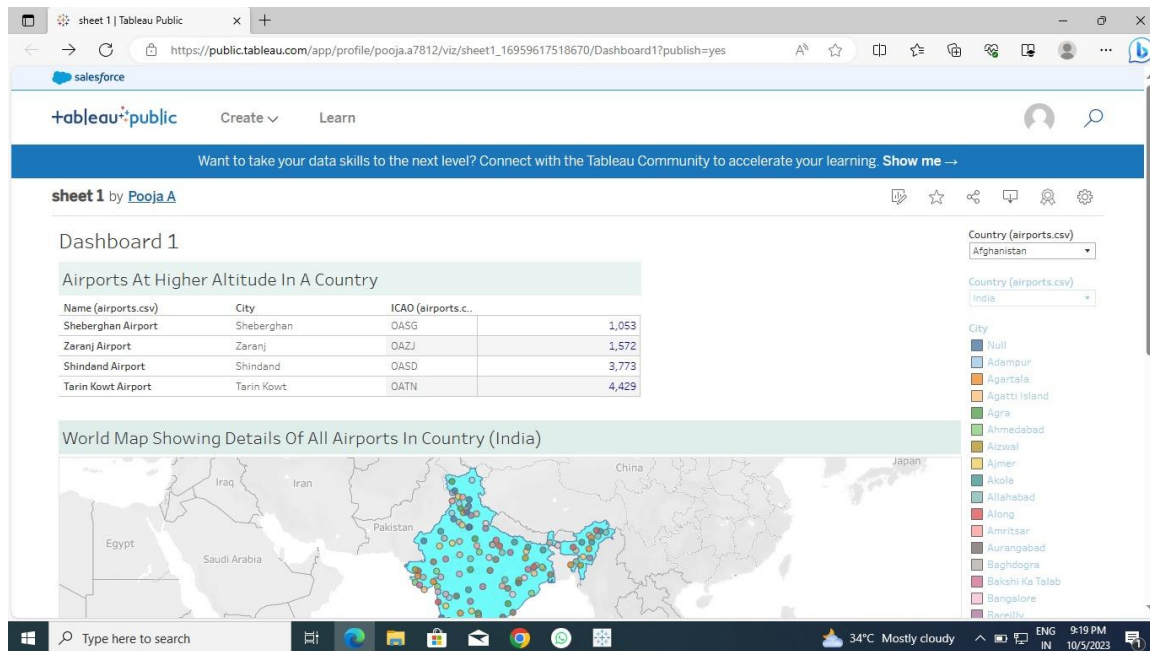
Airline Within a Country

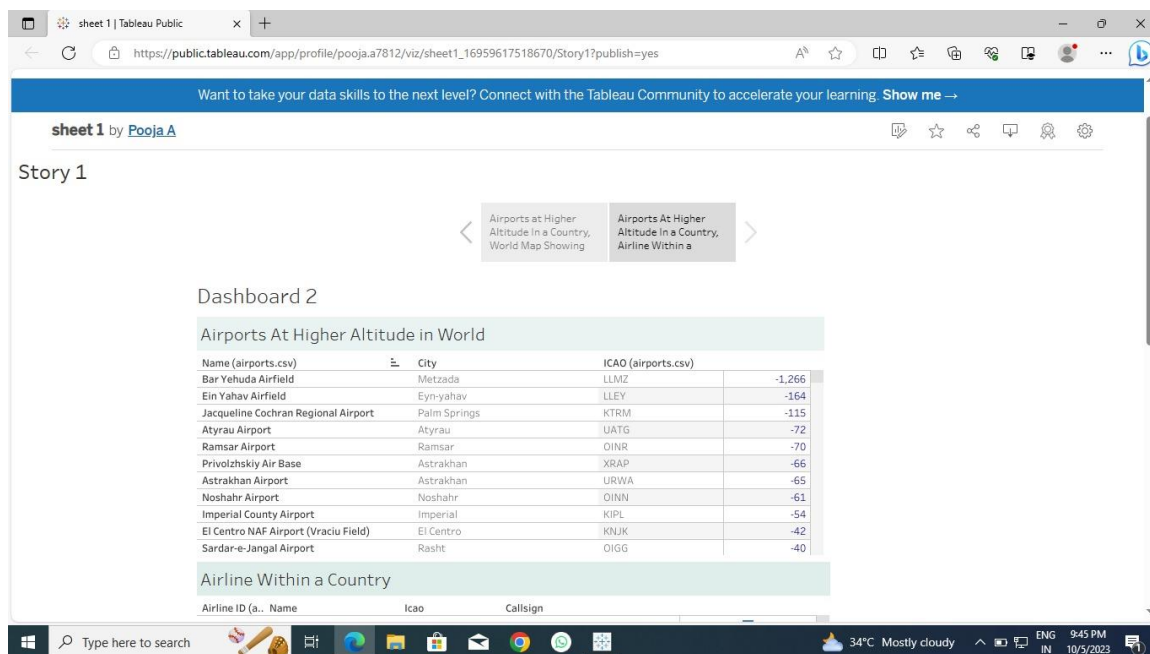
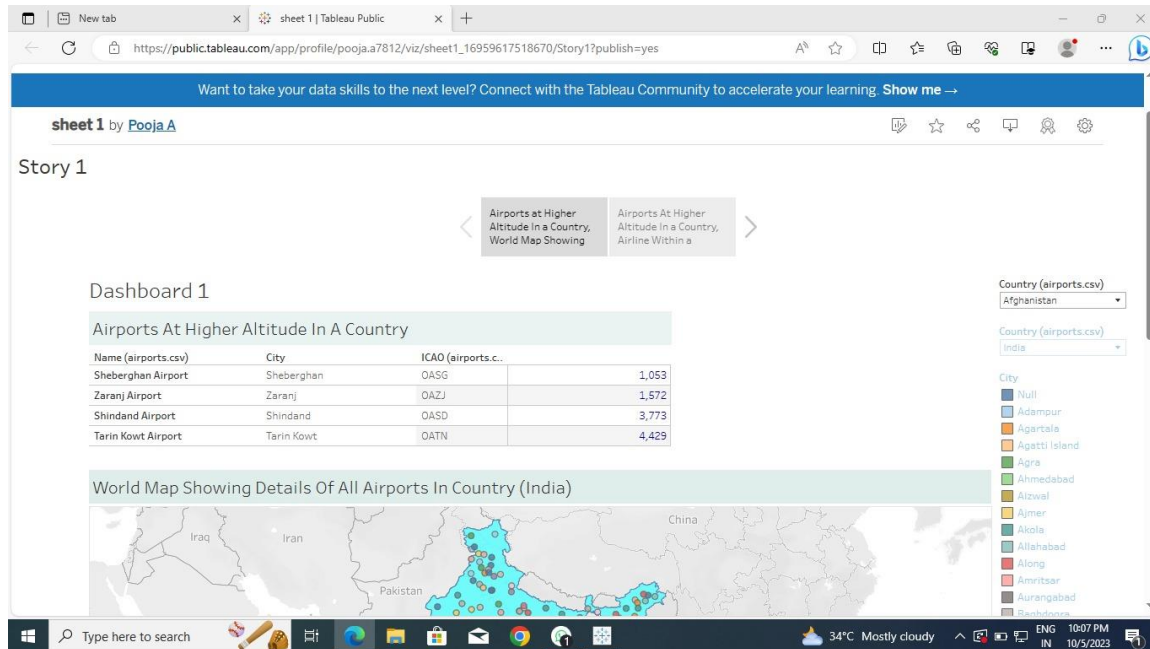
Active (All) ☐ n ☒ Y

Country (All)

Active ☒ N

| Airline ID (a.. | Name | Icao | Callsign | |
|-----------------|-------------------------------|------|-----------------|--|
| 2 | 135 Airways | GNL | GENERAL | |
| 4 | 2 Sqn No 1 Elementary Fly.. | WYT | Null | |
| 5 | 213 Flight Unit | TFU | Null | |
| 6 | 223 Flight Unit State Airli.. | CHD | CHKALOVSK-AVIA | |
| 7 | 224th Flight Unit | TTF | CARGO UNIT | |
| 8 | 247 Jet Ltd | TWF | CLOUD RUNNER | |
| 9 | 3D Aviation | SEC | SECUREX | |
| 11 | 4D Air | QRT | QUARTET | |
| 12 | 611897 Alberta Limited | THD | DONUT | |
| 15 | Abelag Aviation | AAB | ABG | |
| 16 | Army Air Corps | AAC | ARMYAIR | |
| 17 | Aero Aviation Centre Ltd. | AAD | SUNRISE | |
| 18 | Aero Servicios Ejecutivos .. | SIL | ASEISA | |
| 19 | Aero Biniza | BZS | BINIZA | |
| 20 | Aero Albatros | ABM | ALBATROS ESPANA | |
| 23 | Alaska Island Air | AAK | ALASKA ISLAND | |





4. Advantages & Disadvantages

4.1 Advantages

- Tableau enhances Travel and transportation analytics.
- Comparison between airports also for analyzing the structure on inter-country relationship.

- The differences between and betweenness centrality in the network were elucidated.
- Found that the entire network and the individual network by country were composed of different forms.
- Compare the individual networks of the various countries, which have the largest portion in the total network.

4.2 Disadvantages:

- Route data were based only on direct flight and did not include transit air because of massive volume of data from 1060 airports in 173 countries.
- Social network analysis (SNA) methodology has a specific way of calculating the direction of network centrality.
- The study acquired information based on route information, not flight schedule.
- This analysis focused mainly on international routes and did not fully include domestic routes in each country.
- Travel and transportation analytics methods tend to be slow and aren't always intuitive.

5.Application :

- This Tableau analytics study helps in the general understanding of an air transport network.
- The study helps to understand characteristics of airports and countries based on the air routes that are connected major airports around the world.
- Research on air transport networks could be based on the analysis of a particular airport or a particular country's network, depending on the subject of the study, and could include a comparison of the airport and country networks.
- The study identified the airports with high centrality in the network.
- Integrated result from the airport analysis into the national level and identified the characteristics of major countries.

6. Conclusion :

In the entire network and individual networks of the United States and China, degree centrality was dominant in different areas but betweenness centrality was highest in Asia. Therefore, in terms of betweenness centrality, Asia has a very high proportion of the intermediary role of connecting a network, and more connectivity developing in Asia can be expected.

7. Future scope :

Future studies could adopt the weighed SNA methodology using internal indicators of airport, such as traffic volume and number of flights or passengers, among others, to evaluate more effectively the competitiveness of airports or routes. The methodology can also be developed as an index of logistics competitiveness in the future.

8. Appendix :

Dashboard 1 link :

https://public.tableau.com/views/sheet1_16959617518670/Dashboard1?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

Dashboard 2 link :

https://public.tableau.com/views/sheet1_16959617518670/Dashboard2?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

Story board link:

https://public.tableau.com/views/sheet1_16959617518670/Story1?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

Google Drive video link :

<https://drive.google.com/file/d/13HbCxfNwzszZur60pA7ruF7FgJWU9fWc/view?usp=drivesdk>