APPLICATION

Unlocking Insights into the Global Air Transportation Network with Tableau

INTRODUCTION

- The global air transportation network is a complex and dynamic system that plays a vital role in connecting people, businesses, and economies across the world. Every day, thousands of flights, millions of passengers, and countless tons of cargo traverse the skies, making the aviation industry a cornerstone of modern life and commerce.

OVERVIEW

- Unlocking insights into the global air transportation network is crucial for various industries, including aviation, tourism, logistics, and global business. Analyzing this network provides valuable information that can help optimize routes, improve travel experiences, enhance safety, and support economic development

PURPOSE

- Optimizing Operations: Airlines and airports can use insights to optimize flight schedules, staffing, and resource allocation. This can lead to more efficient operations, reduced costs, and improved customer service.

- Improving Safety: By analyzing data on flight routes, weather conditions, and aircraft performance, safety measures can be enhanced to reduce accidents and incidents in the aviation industry.

2.PROBLEM STATEMENT AND DESIGN THINKING

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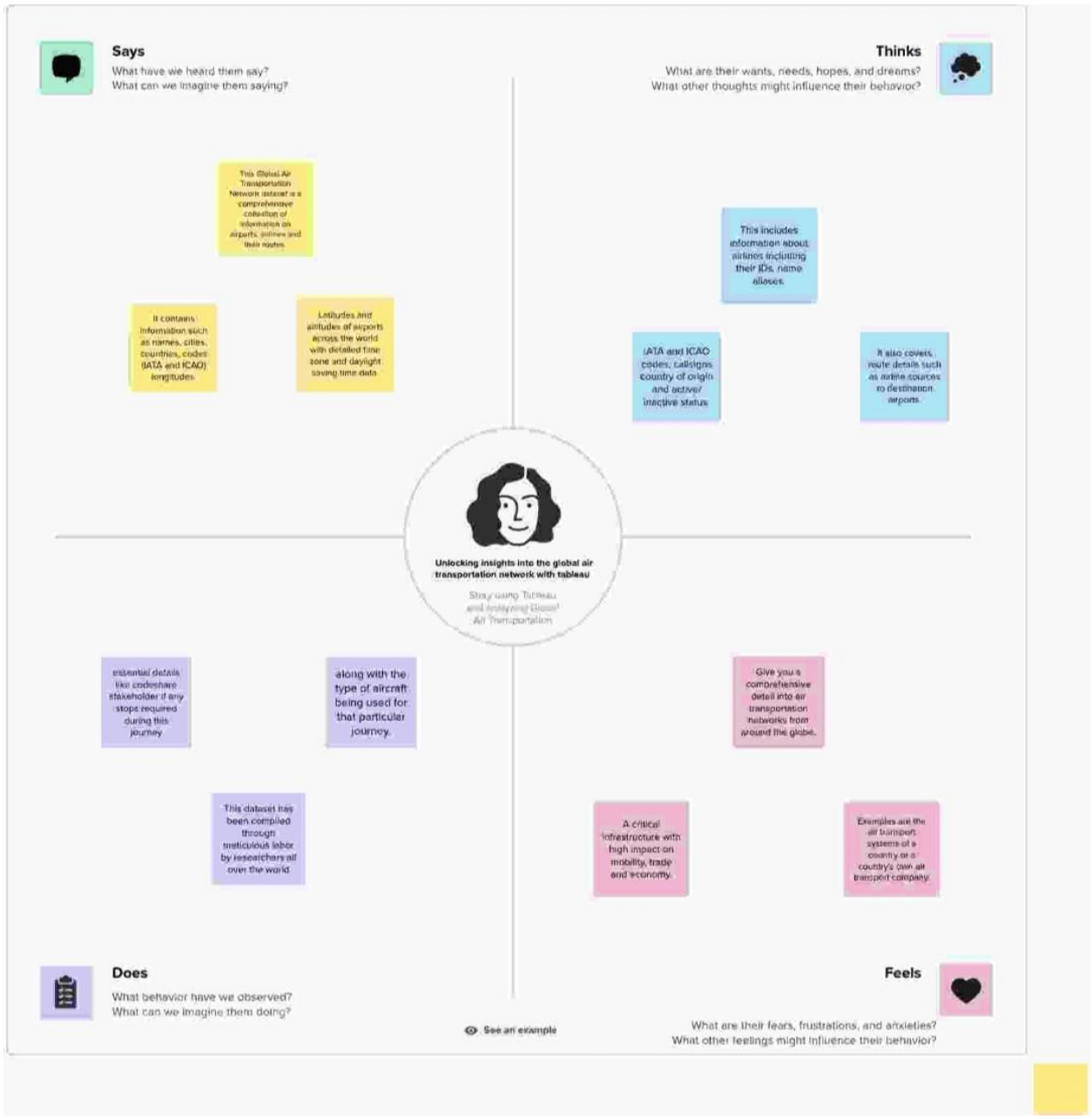
2.1.EMPATHY MAP



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2.2. IDEATION & BRAINSTORMING MAP

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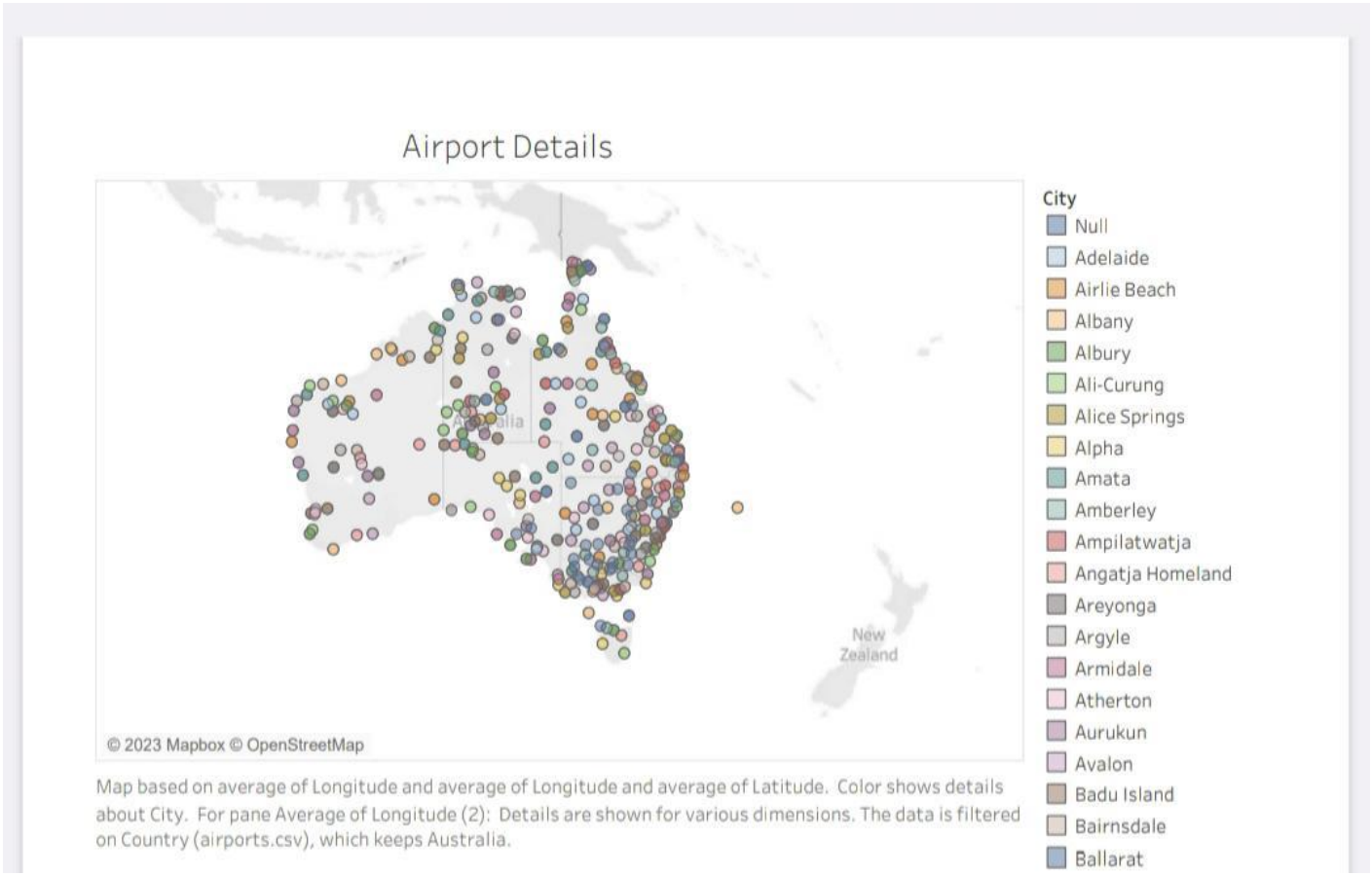
3.RESULT



Map based on average of Longitude and average of Longitude and average of Latitude. Color shows details about City. For pane Average of Longitude (2): Details are shown for various dimensions. The data is filtered on Country (airports.csv), which keeps Australia.

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Airports with higher Altitude within the country

index no.	City	Name (airports.csv)	IATA (airpo..	ICAO (airpo..	
1	Null	Ambala Air Force Station	\N	VIAM	909
		Balranald Airport	BZD	YBRN	210
		Belaya Gora Airport	BGN	UESG	118

Sum of Altitude broken down by index no., City, Name (airports.csv), IATA (airports.csv) and ICAO (airports.csv). The data is filtered on top n, which keeps True. The view is filtered on Exclusions (City,IATA (airports.csv),ICAO (airports.csv),Name (airports.csv)), which keeps 7,695 members.

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Airports with higher altitude in the world

Name (airports.csv)	City	ICAO (airpo..	
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

Sum of Altitude broken down by Name (airports.csv), City and ICAO (airports.csv). The view is filtered on ICAO (airports.csv), which has multiple members selected.

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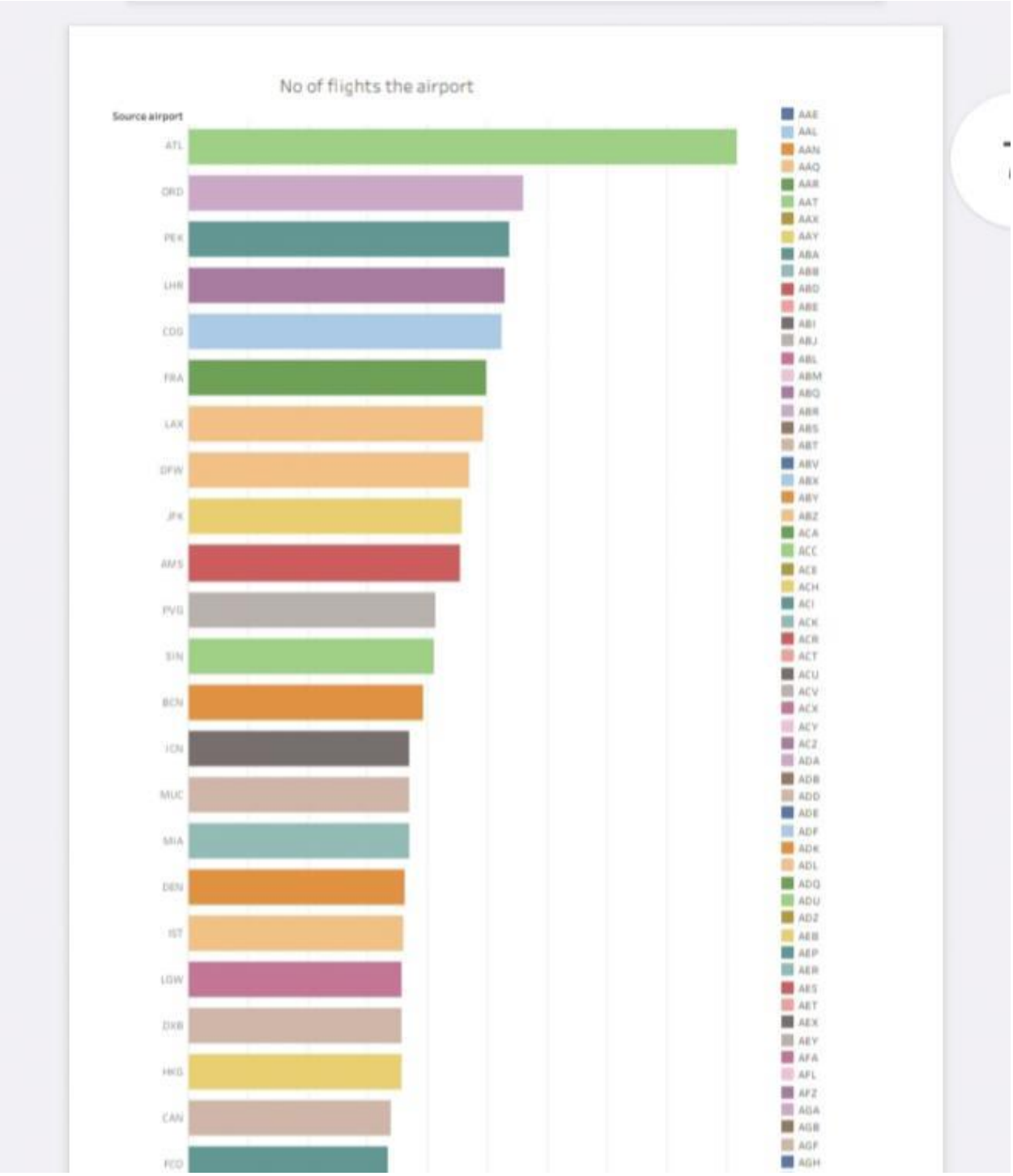

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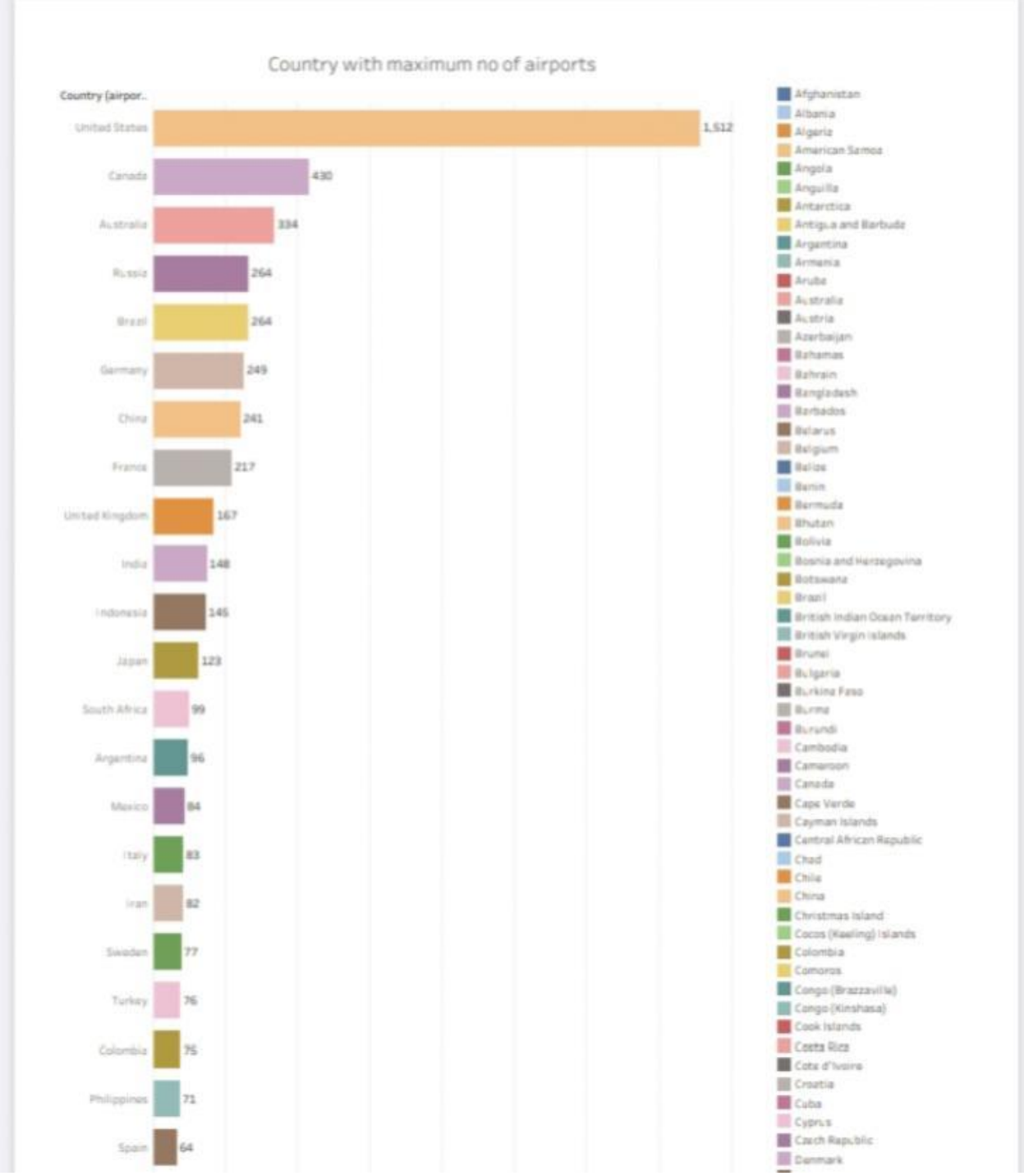

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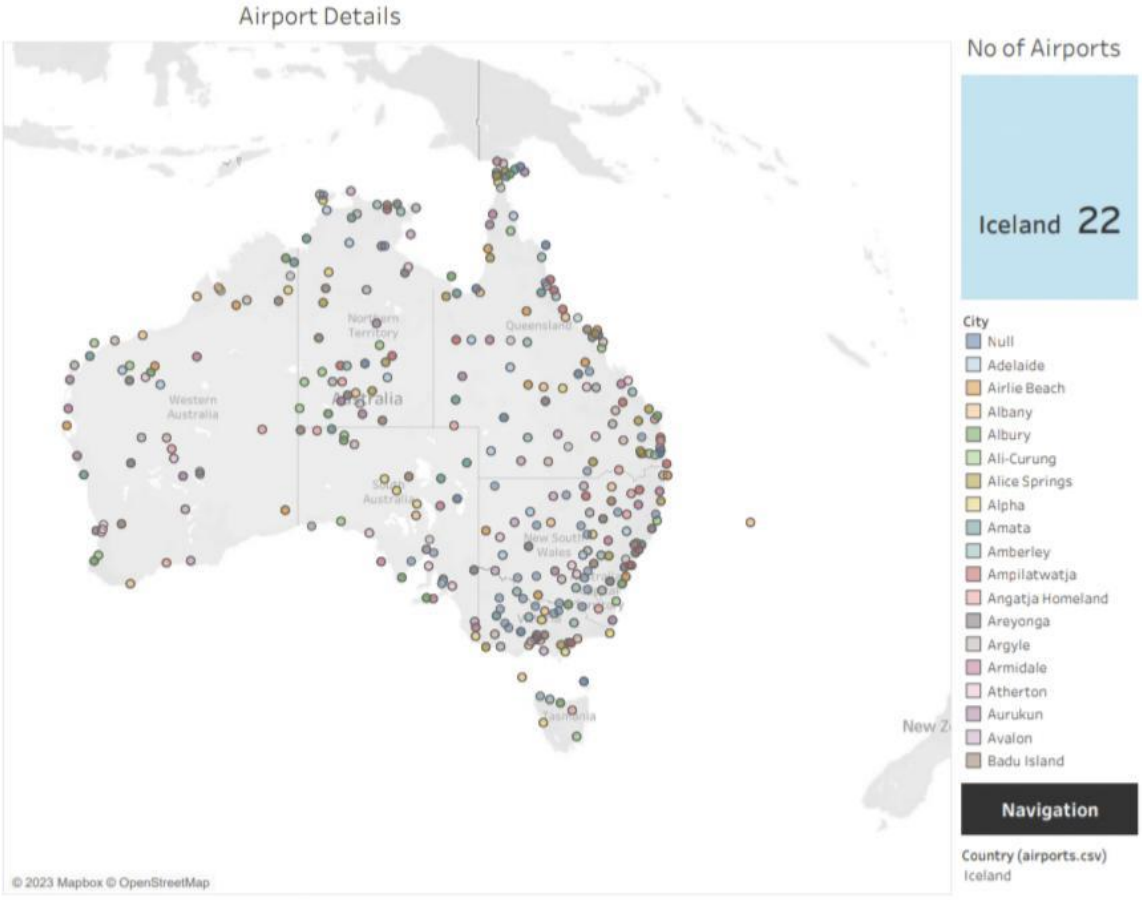

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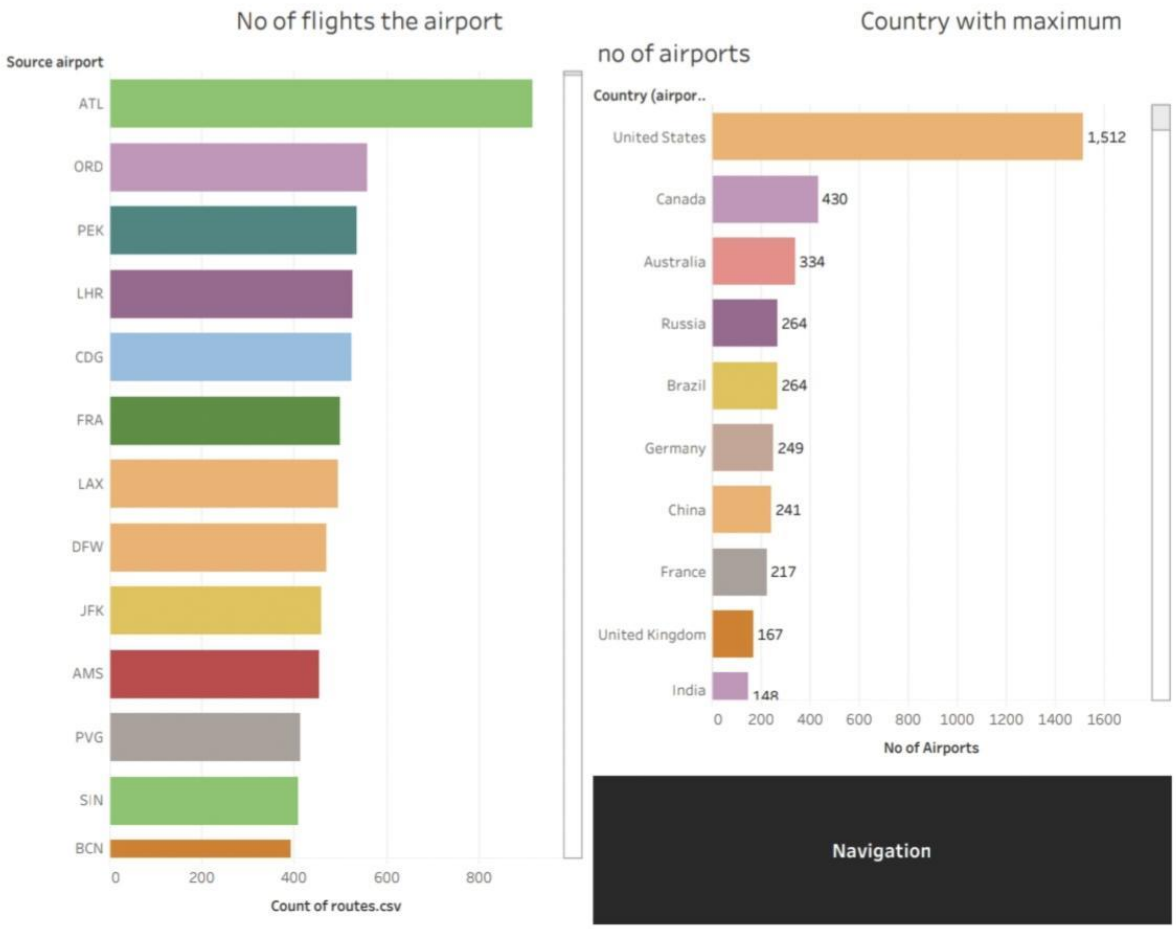

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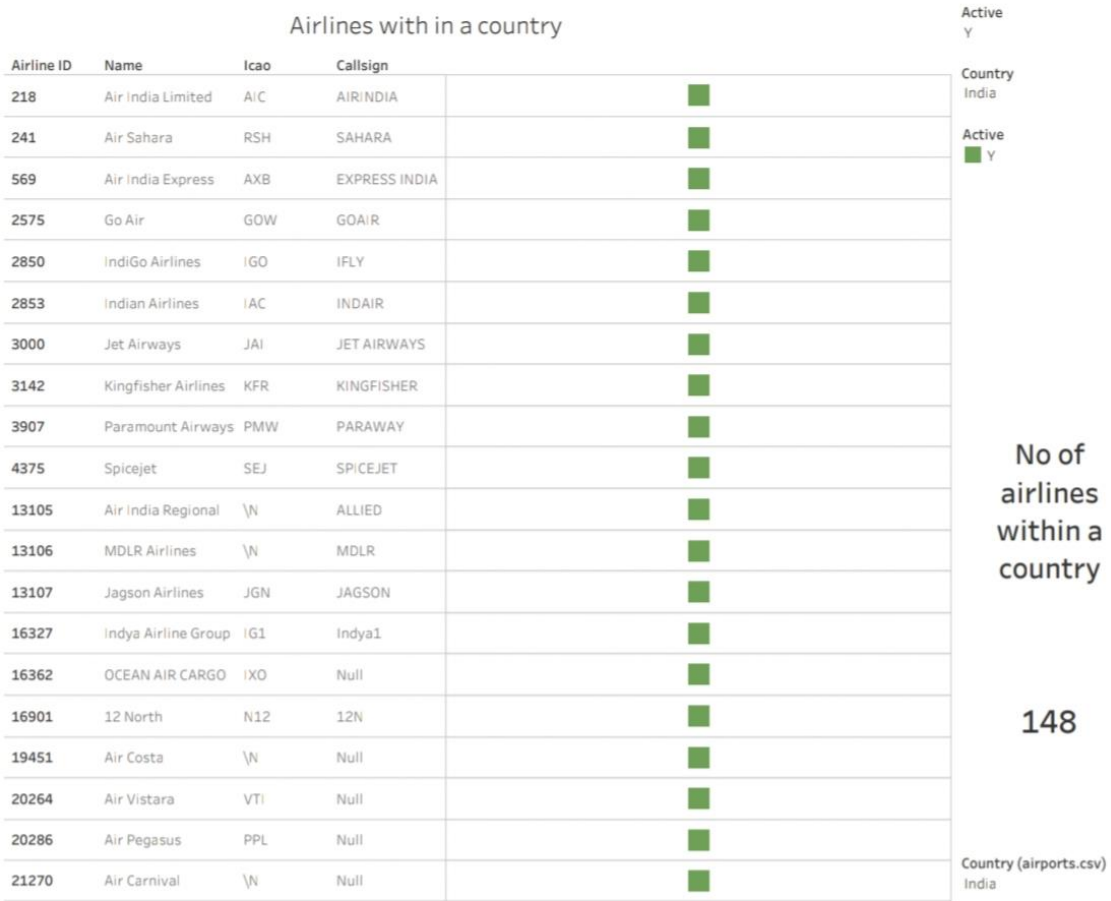

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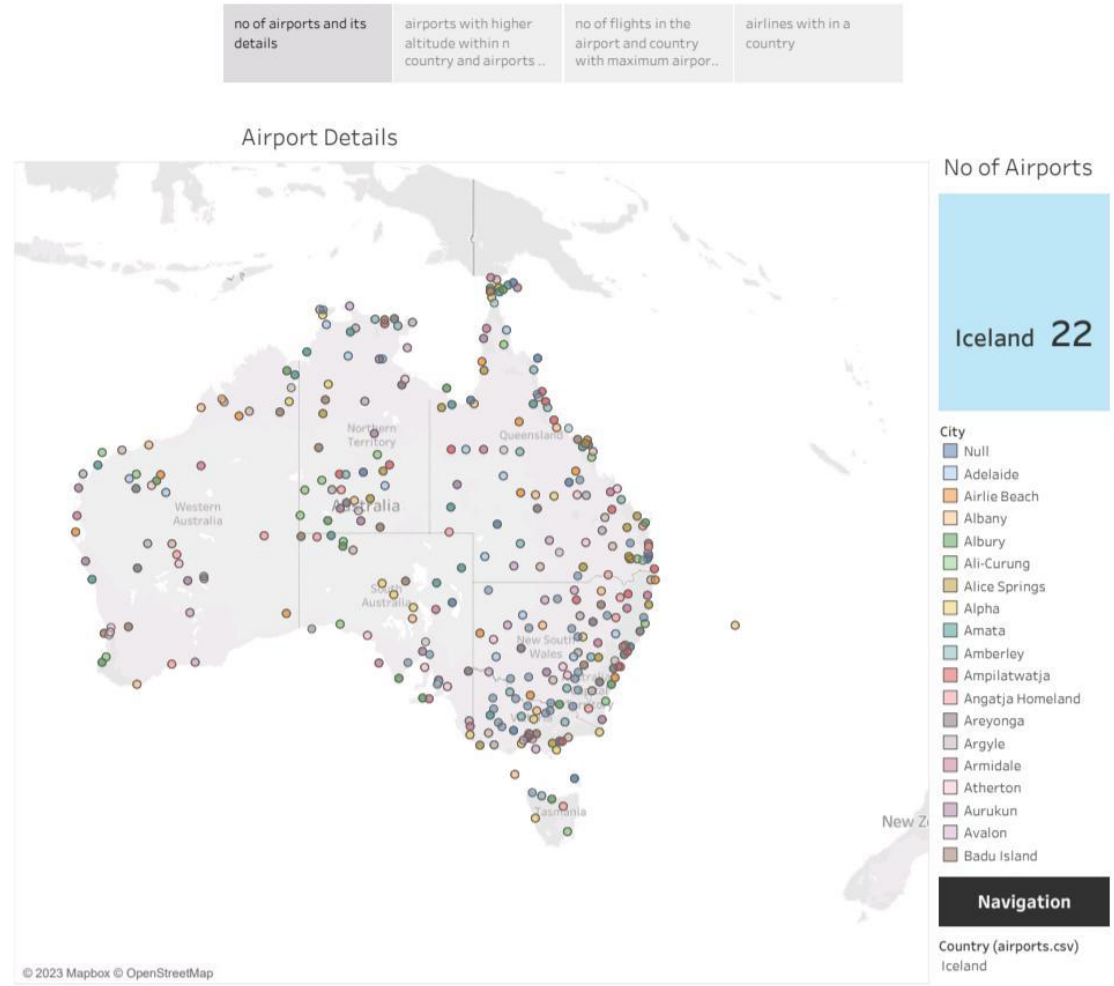
Story 1



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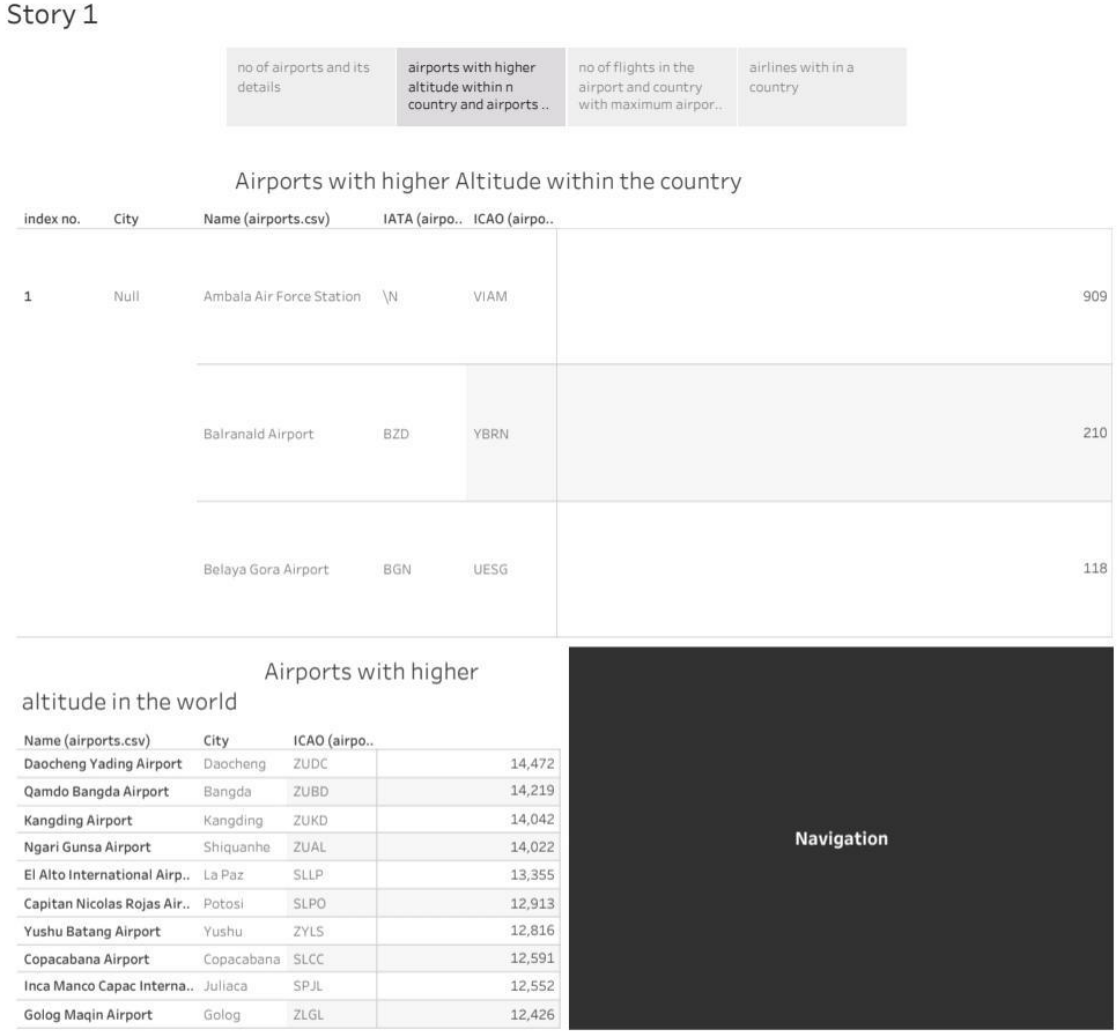

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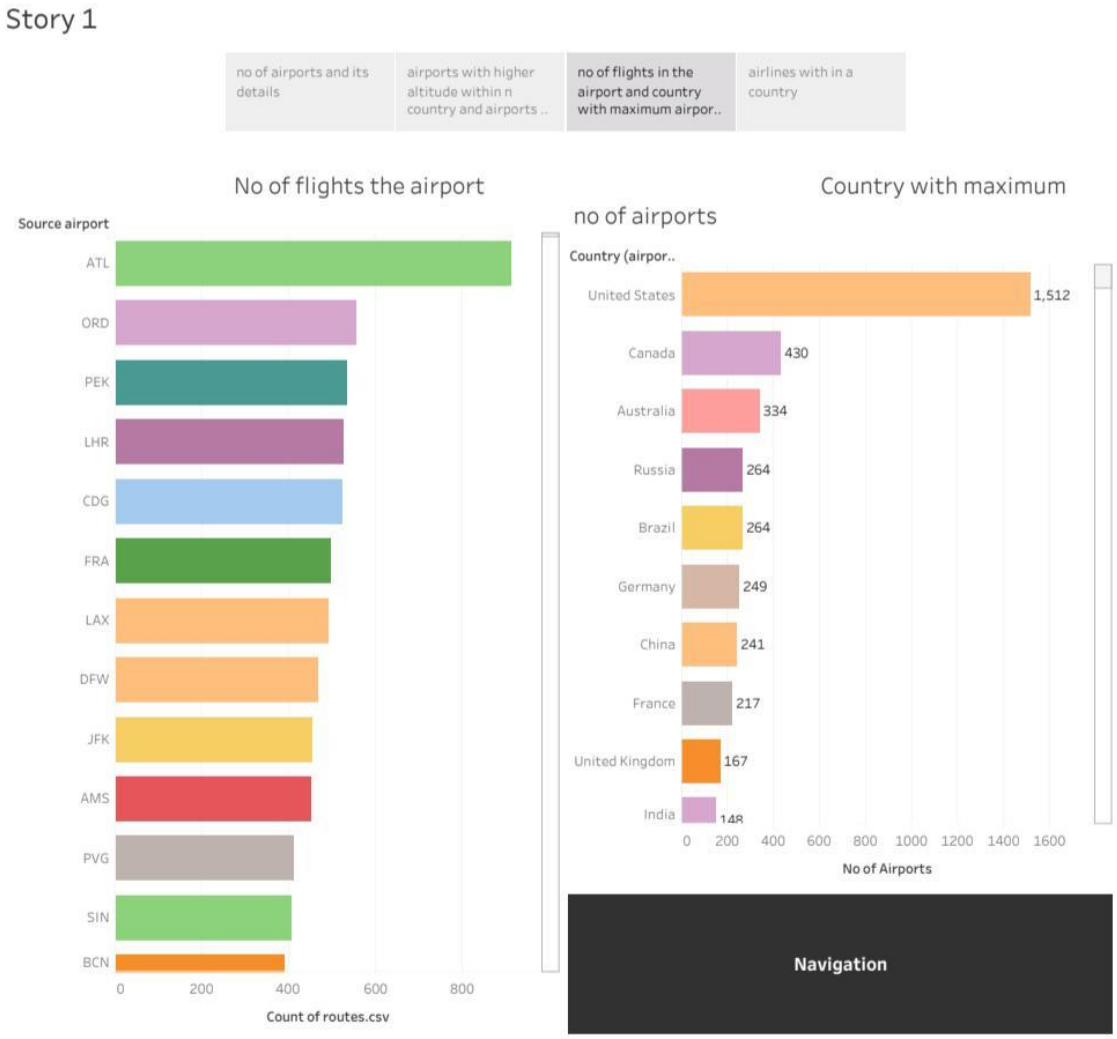

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Story 1

no of airports and its details	airports with higher altitude within n country and airports ..	no of flights in the airport and country with maximum airpor..	airlines with in a country

Airlines with in a country

Airline ID	Name	Icao	Callsign
218	Air India Limited	AIC	AIRINDIA
241	Air Sahara	RSH	SAHARA
569	Air India Express	AXB	EXPRESS INDIA
2575	Go Air	GOW	GOAIR
2850	IndiGo Airlines	IGO	IFLY
2853	Indian Airlines	IAC	INDAIR
3000	Jet Airways	JAI	JET AIRWAYS
3142	Kingfisher Airlines	KFR	KINGFISHER
3907	Paramount Airways	PMW	PARAWAY
4375	Spicejet	SEJ	SPICEJET
13105	Air India Regional	\N	ALLIED
13106	MDLR Airlines	\N	MDLR
13107	Jagson Airlines	JGN	JAGSON
16327	Indya Airline Group	IG1	Indya1
16362	OCEAN AIR CARGO	IXO	Null
16901	12 North	N12	12N
19451	Air Costa	\N	Null
20264	Air Vistara	VTI	Null
20286	Air Pegasus	PPL	Null
21270	Air Carnival	\N	Null

Active
Y

Country
India

Active
Y

No of airlines within a country

148

Country (airports.csv)
India

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4. ADVANTAGES AND DISADVANDAGES

ADVANTAGES

Resource Allocation: Airlines and airports can better allocate resources, such as staff, gates, and equipment, based on demand patterns and traffic forecasts. This can reduce congestion, enhance customer experience, and minimize delays.

Environmental Impact: Understanding the global air transportation network is crucial for mitigating its environmental impact. It allows stakeholders to work on strategies for reducing carbon emissions, improving fuel efficiency, and adopting more sustainable practices.

Demand Forecasting: Analyzing the network can help predict and respond to changes in passenger and cargo demand. This is essential for adjusting capacity, pricing, and services to meet customer needs.

Route Optimization: Airlines can identify the most profitable and efficient routes by analyzing passenger preferences, cargo demands, and market trends. This helps in route planning and market expansion.

Regulatory Compliance: Aviation authorities can use insights to enforce regulations, monitor compliance, and identify areas that may require additional oversight or safety measures.

Economic Impact: A better understanding of the air transportation network's economic impact can inform government policies and infrastructure investment decisions, ultimately benefiting the local and national economy.

Crisis Management: Insights into the global air transportation network are vital for crisis management, such as responding to natural disasters, geopolitical events, or pandemics. This helps in coordinating relief efforts and minimizing disruptions.

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DISADVANTAGE

Complex Data Integration: The global air transportation network involves numerous stakeholders, including airlines, airports, air traffic control, and government agencies. Integrating data from these disparate sources can be a complex and time-consuming process.

Data Quality and Accuracy: Ensuring the accuracy and quality of data in the aviation industry is crucial. Inaccurate or incomplete data can lead to incorrect insights and decisions, potentially impacting safety and efficiency.

Regulatory Compliance: The aviation industry is heavily regulated, and compliance with safety, security, and environmental regulations is paramount. Analyzing data within the constraints of these regulations can be challenging.

Data Volume: The volume of data generated by the global air transportation network is immense. Handling and analyzing big data can be resource-intensive, requiring powerful infrastructure and tools.

Real-Time Data: The need for real-time data in the aviation industry makes it necessary to process and analyze data quickly. Delays or bottlenecks in data processing can affect decision-making and operational efficiency.

Data Access and Ownership: Access to aviation data can be restricted due to ownership and proprietary interests. Negotiating data-sharing agreements among stakeholders can be a complex and time-consuming process.

Data Silos: Different entities within the air transportation network may have their data silos. Breaking down these silos to access comprehensive data can be a significant challenge.

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FUTURE SCOPE

Network Optimization: As air travel continues to grow, optimizing global air transportation networks will be crucial. This includes improving flight routes, scheduling, and connectivity to enhance efficiency, reduce fuel consumption, and minimize environmental impact.

Safety and Security: Enhancing safety and security measures will remain a top priority. Analyzing network data can help identify vulnerabilities and predict potential security threats, leading to improved safety protocols.

Environmental Sustainability: The aviation industry is under pressure to reduce its environmental footprint. Analyzing the air transportation network can lead to insights into more eco-friendly practices, such as optimizing flight paths and reducing emissions.

Demand Forecasting: Data-driven insights can help predict air travel demand more accurately, allowing airlines and airports to plan for future capacity and improve resource allocation.

Infrastructure Development: Analyzing the global air transportation network can guide infrastructure development decisions, such as airport expansion and the construction of new runways or terminals.

Passenger Experience: Improving the passenger experience is a focus for the industry. Data analysis can help airlines personalize services, streamline boarding processes, and enhance in-flight entertainment and amenities.

Supply Chain and Cargo: Insights into air transportation networks are vital for the efficient movement of cargo. This includes optimizing logistics, managing perishable goods, and enhancing the global supply chain.

Market Trends: Data analysis can help stakeholders identify emerging market trends, such as changes in travel behavior, new routes, or shifts in passenger preferences.

Regulatory Compliance: Compliance with aviation regulations is critical. Data insights can assist in ensuring that airlines and airports meet safety, security, and operational requirements.

APPLICATION

1. **Data Import:** Load your air transportation data into Tableau.

2. **Visualization:** Create interactive visualizations to represent routes, passenger volumes, or any key metrics.

3. **Filtering:** Use filters to focus on specific regions, airlines, or time periods for a more detailed analysis.

4. **Dashboards:** Build comprehensive dashboards to provide a holistic view of the global air transportation network.

5. **Trend Analysis:** Utilize Tableau's features to identify patterns and trends over time.

6. **Geospatial Mapping:** Leverage maps to visualize routes, hubs, and geographic patterns.

7. **Collaboration:** Share your Tableau workbook to collaborate and gather insights from others.

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