Airline Analysis - 2024

1 Introduction

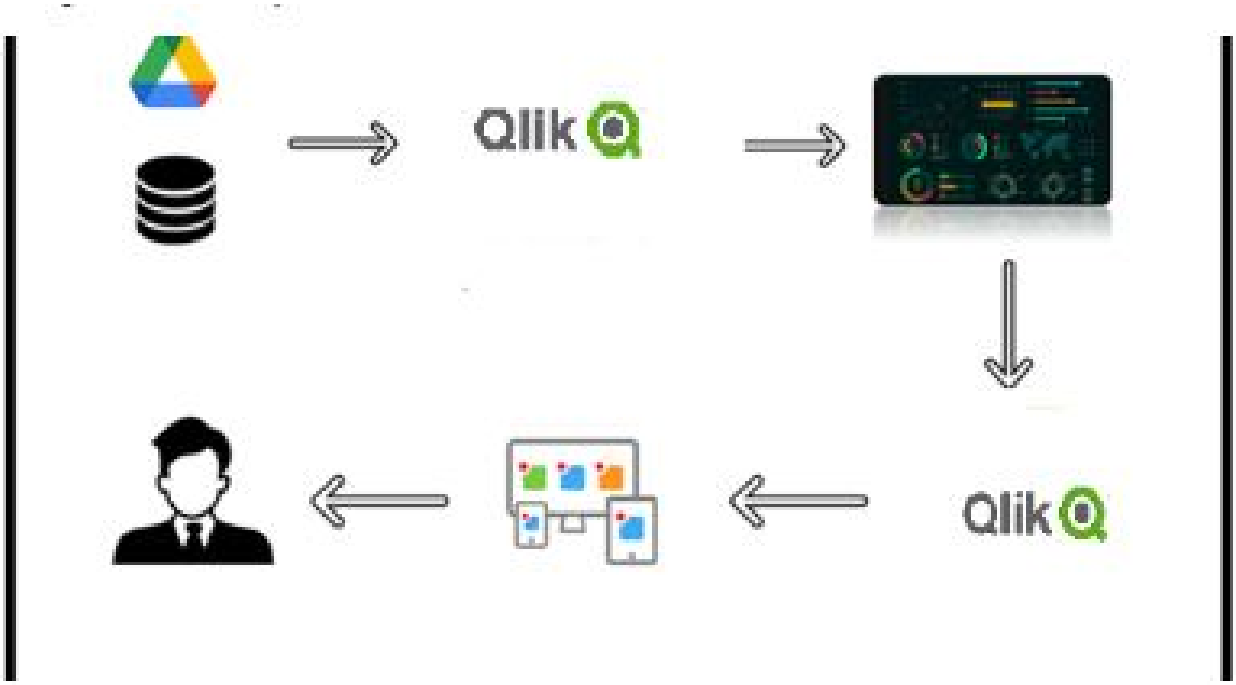
1.1 Overview

The Airline Analysis Project aims to analyze and disclose trends inside the air carrier manufacturing using a dataset that contains itemized information on air carrier leaving dates for the old age 2022. This project involves diversified stages of data conversion, imagination, and interpretation to determine litigable judgments for stakeholders inside the manufacturing. The air carrier industry is a complex and vital area, heavily affected by miscellaneous determinants such as migratory demand, financial environments, geopolitical events, and mechanics progress. Understanding these determinants through data reasoning can specify valuable insights for functional adeptness, clever planning, and client delight.The dataset in focus includes airline leaving dates for the old age 2022. It contains critical news to a degree:Departure Date: The particular date on which each departure departs.Origin and Destination: Each departure's starting point and goal.Flight Status: Indicates either the departure was on occasion, postponed, or canceled. This dataset is an important resource for resolving miscellaneous currents and patterns within the air carrier manufacturing. By checking departure dates, we can reveal intuitions related to peak travel periods, the impact of extrinsic occurrences, and operational depiction.

1.2 Purpose

Identify Travel Trends,Operational Efficiency,Impact of External Events,Route Analysis,Identify Bottlenecks: By resolving dossier on departure departures, delays, and cancellations, airlines can define functional incompetences and fields that demand bettering.Data-Driven Decisions: Insights from the reasoning allow airlines to make cognizant clever conclusions. For example, route celebrity dossier can guide airlines in optimizing departure schedules, presenting new routes, or ceasing underperforming one, eventually reconstructing appropriateness and consumer vindication.Mitigate Impacts of External Events: Analyzing by means of what extrinsic occurrences like geopolitical conflicts or financial changes influence movements helps airlines evolve possibility plans and adapt more fast to disruptions

1.3 Technical Architecture



2.Define Problem/ Problem Understanding

2.1 Specify the business problem

the following are the business problems which need to be solved:

- Revenue Optimization
- Operational Efficiency
- Customer Experience Enhancement

2.2 Business Requirements

1. Data Collection and Integration(dataset)

2. Data Storage and Management Scalable Data Storage:

3. Analytical Capabilities

4. Operational Efficiency Analysis

5. Customer Insights and Personalization

6. Revenue Management and Pricing Strategies

7. Impact Analysis of External Factors

2.3 Literature Survey

Based upon the provided data it is understood that we have to enhance

3.Data Collection

3.1 Collect the Dataset

The data have been extracted from the airline dataset available at kaggle in the following link:

https://www.kaggle.com/datasets/iamsouravbanerjee/airline-dataset/data

3.2 Connect Data with Qlik Sense

Data has been connected with qlik sense by loading the data which is done by creating a new app and then adding data by load data as an option and then selecting the data which is in the excel form in the file manager

4.Data Preparation

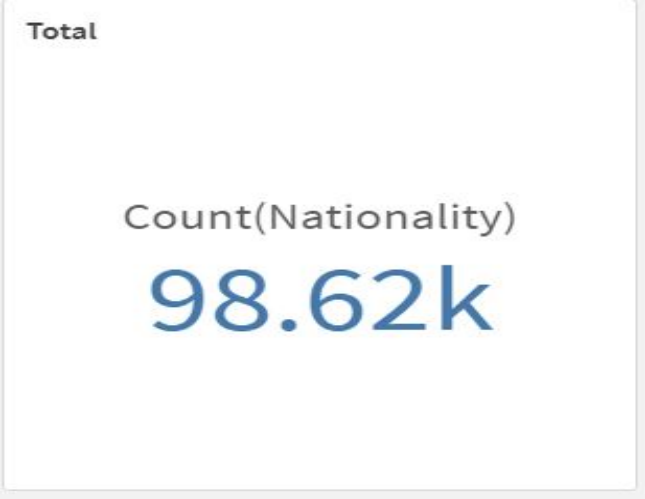
4.1 Prepare the data for Visualization

the data preparation has been carried out by formatting and making sure that null values are identified and corrected.Ensuring that analyses are accurate, reliable, and insightful. This preparation will enable you to create compelling visualizations that reveal key trends and insights, ultimately supporting better decision-making within the airline industry.

5.Data Visualizations

5.1 Visualizations

5.1.1 Total Observations



this KPI shows entire number of entries present in the dataset

5.1.2 Status

This pie chart consists of all the flights data present in the data set (airline) which shows the flights in total that are on time, cancelled and delayed, out of which

On time flights : 33.2%

Delayed : 33.4%

Cancelled: 33.4%

5.1.3 Passenger Details

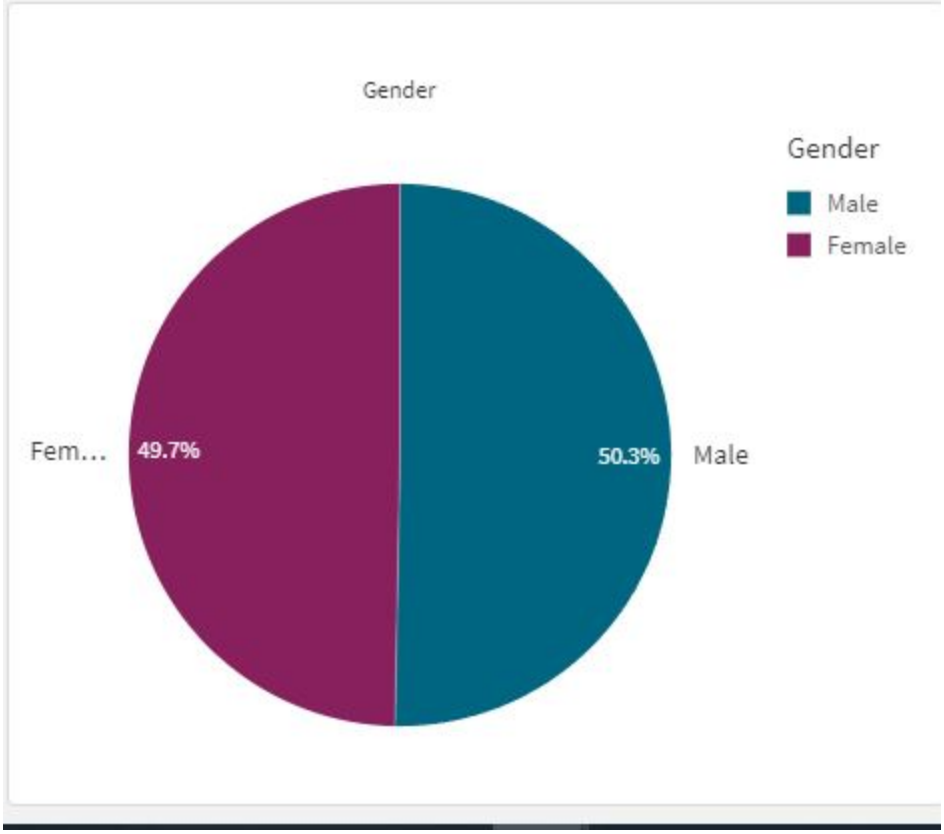
This table consist of Passenger details that is departure month, First name, Last name , Nationality and country which he/she is heading to.this will help us in understanding the month wise data and flights scheduled in a month and the number of people taking that flight or to know whether this flight is also scheduled in any other months and the number of passengers travelling

Passenger details

Departure Date.Month	First Name	Last Name	Nationality	Country Name
Jan	Aarika	Waterson	Bangladesh	Bolivia, Plurinational State of
Jan	Abagael	Stiller	Philippines	Norway
Jan	Abbey	Butchers	Vietnam	United States
Jan	Abbi	Hiorn	Portugal	Timor-Leste
Jan	Abbie	Bess	Philippines	Chad
Jan	Abbie	Lehrian	Japan	Colombia
Jan	Abbie	Pashenkov	Mexico	Indonesia
Jan	Abbie	Pickin	Brazil	Brazil
Jan	Abeu	Tapley	Portugal	United States
Jan	Abie	Herkess	Brazil	United States
Jan	Abie	Keywood	Japan	Papua New Guinea
Jan	Abigael	Gilburt	Argentina	New Zealand
Jan	Abigael	Mattock	Brazil	Iran, Islamic Republic of
Jan	Abigail	Skelton	Philippines	Congo
Jan	Abra	Rainville	China	France
Jan	Abrahan	Lomond	China	Canada
Jan	Adah	Perree	Canada	United States
Jan	Adams	Jurewicz	Poland	United States
Jan	Adan	Semmens	France	United States
Jan	Addie	Jouen	Brazil	Canada
Jan	Ade	Cornelleau	Bangladesh	Argentina
Jan	Adela	Huskisson	China	Brazil
Jan	Adelaida	Oganian	Russia	Norway
Jan	Adelaide	Burchett	France	Canada
Jan	Adele	Lawrey	Thailand	Uzbekistan
Jan	Adelheid	Christophers	Indonesia	United States
Jan	Adelina	Haucke	Netherlands	United States
Jan	Adelind	Hamelyn	Philippines	New Zealand
Jan	Adey	Treamayne	Malaysia	United States
Jan	Adham	Wilford	Canada	Solomon Islands
Jan	Adlai	Fricke	Philippines	Kiribati
Jan	Adlai	Powdrell	Ghana	Australia
Jan	Adlai	Snoddy	Vietnam	United States

5.1.4 Gender

Gender in the total dataset which vary based on selection. as it is interactive visualizations they vary upon selecting a country to define the number of male and female passengers from each country can be classified



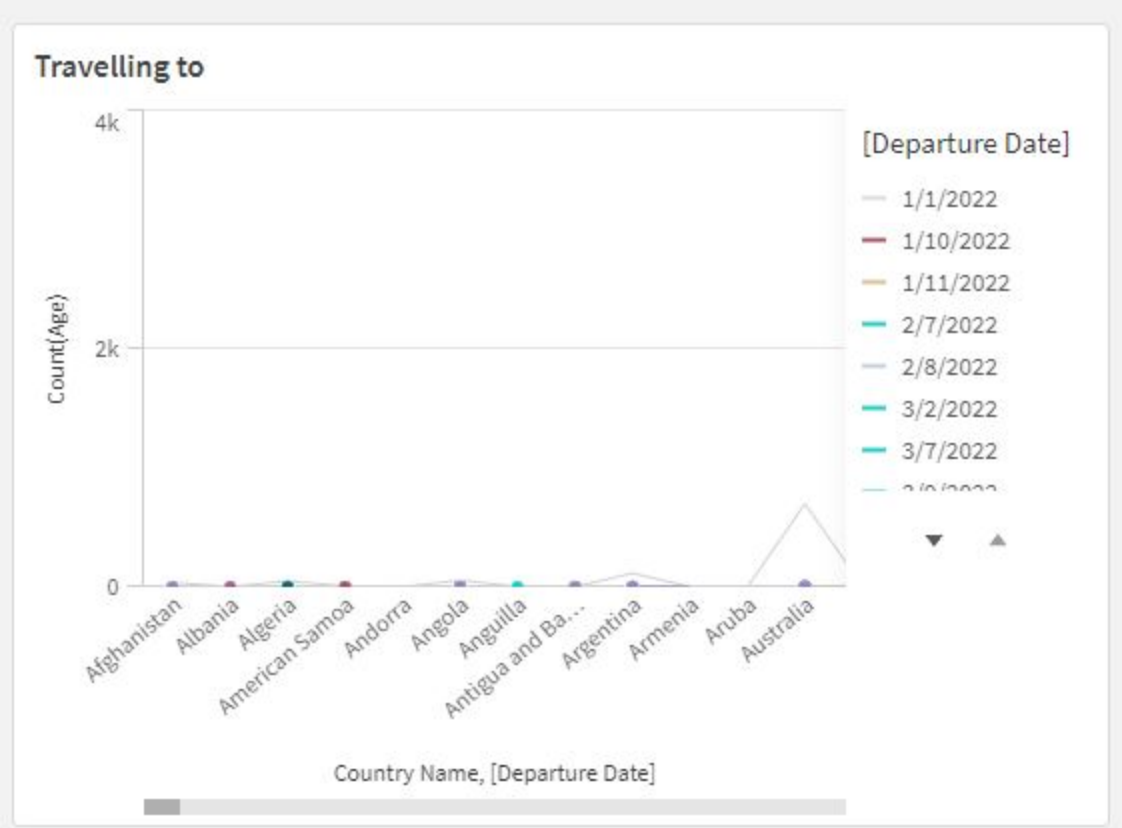
5.1.5 Pilot Details

Pilot Details

Pilot Name	Gender
Aaren Cheesman	Male
Aaren Enterle	Male
Aaren Franssen	Male
Aaren Govan	Female
Aaren Haydney	Male
Aaren Laffin	Male
Aaren Lau	Male
Aaren Ledgard	Male
Aaren Parsonson	Female
Aaren Petts	Female
Aaren Thirlwall	Male
Aarika Comino	Female
Aarika How	Female
Aarika Levings	Male

Pilots details and the gender is clearly seen in the above table and upon selecting a pilot we will have the details of number of flights(Delayed,cancelled,On time)

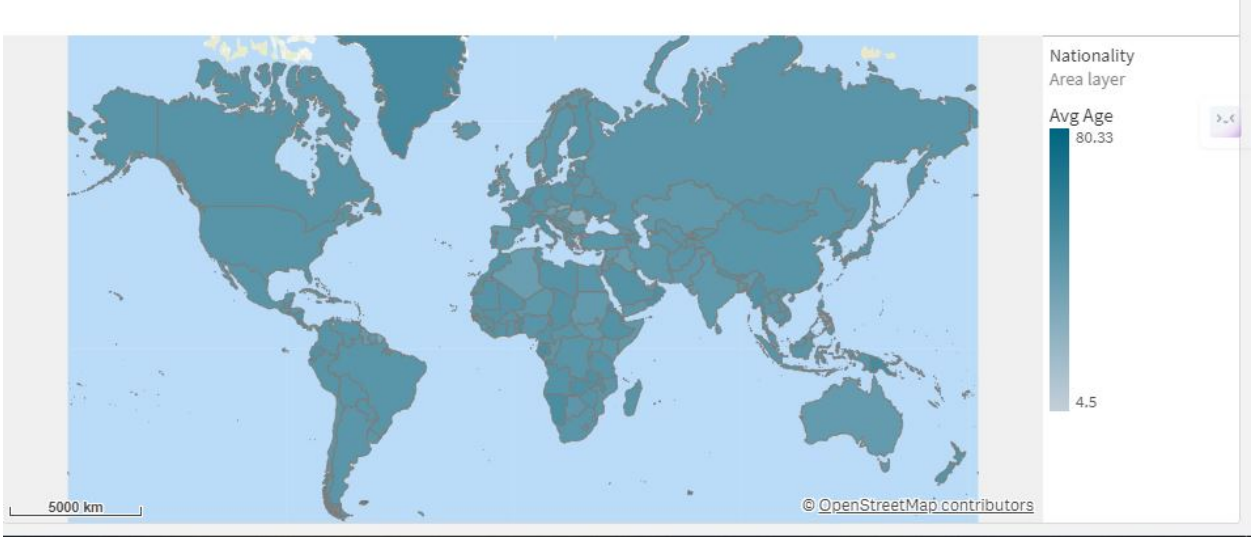
5.1.6 Traveling to



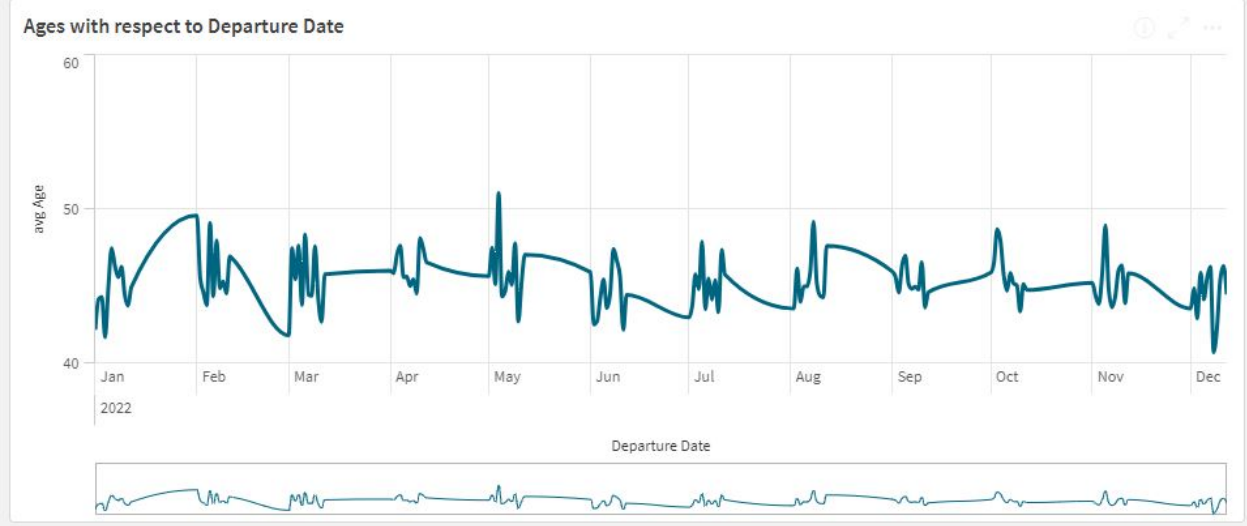
the above line chart shows the dates and the number of passengers travelling to each country with respect to date

5.1.7 Age

The age upon the map shows the avg age of its national with respect to country. upon selecting the country all the visualizations align accordingly to the country depicting all the possible values that a country holds, here china is the highest in terms of passengers travelling around the globe with more date scheduled in a month the airline company can use this to assign or schedule more aircrafts to this region making sure their is a flow of passengers



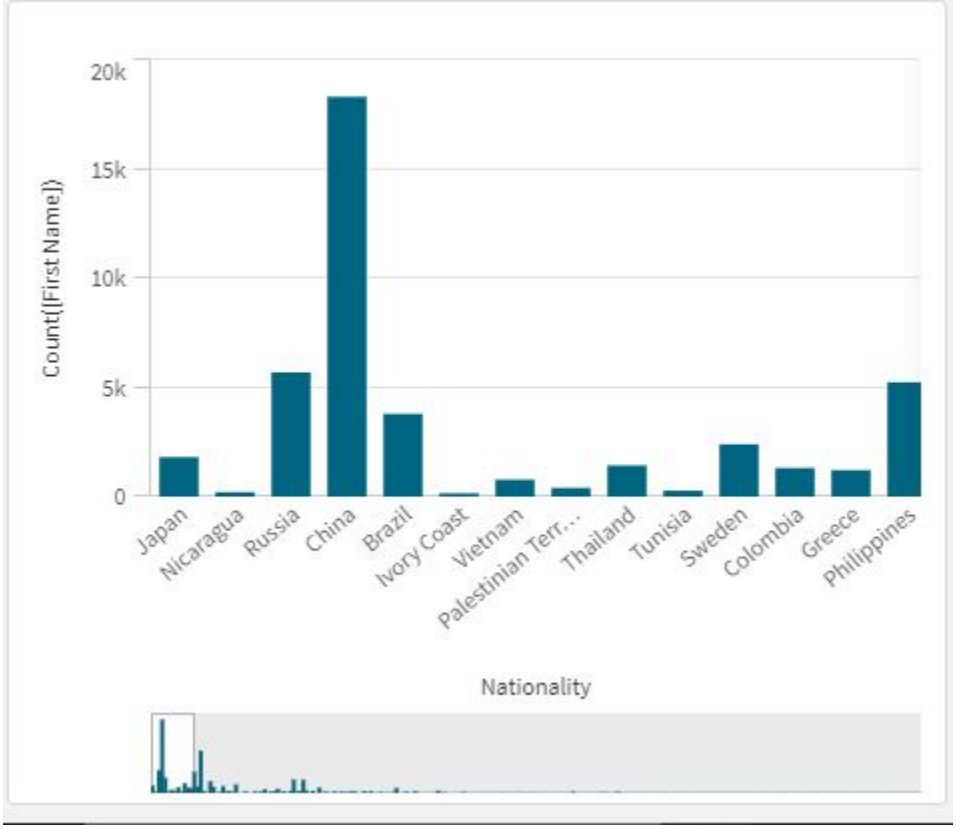
5.1.8 Age and Departure dates



The above graph shows the age as well as their preference of travel upon zooming each month can further be classified into days as well as time example: in the month of January the people with age 43 - 45 prefer travelling which means upon noticing the age criteria of different ages the airline industry can enhance real life example:Indian Students for education move abroad mostly during the month of September and January which varies from country to country understanding this influx will surely

increase the airline value as well as the profit it makes

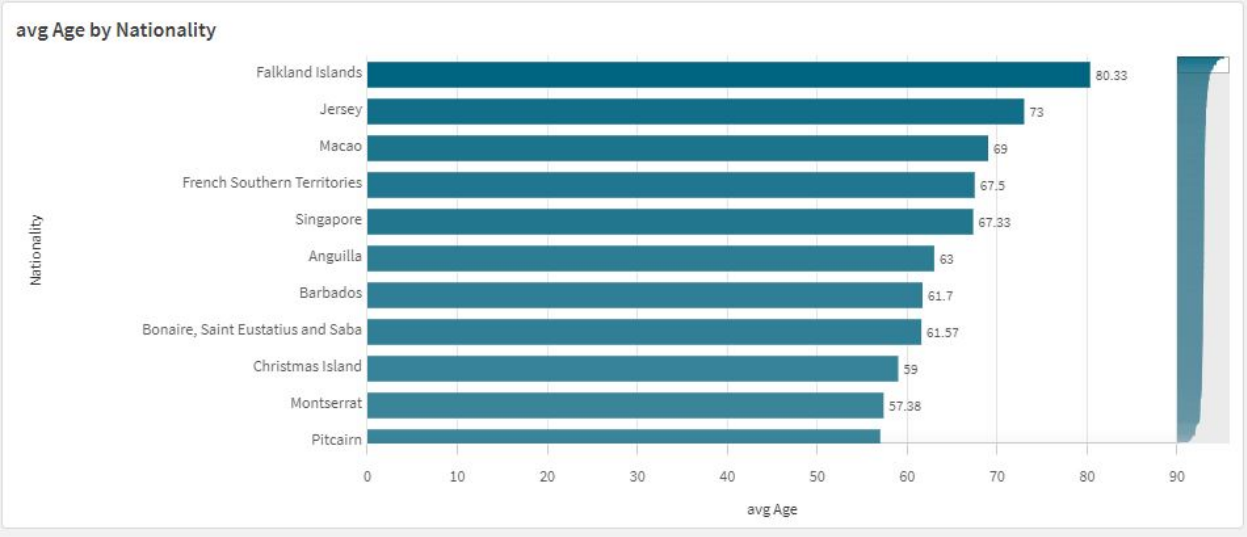
5.1.9 Passengers and their Nationality



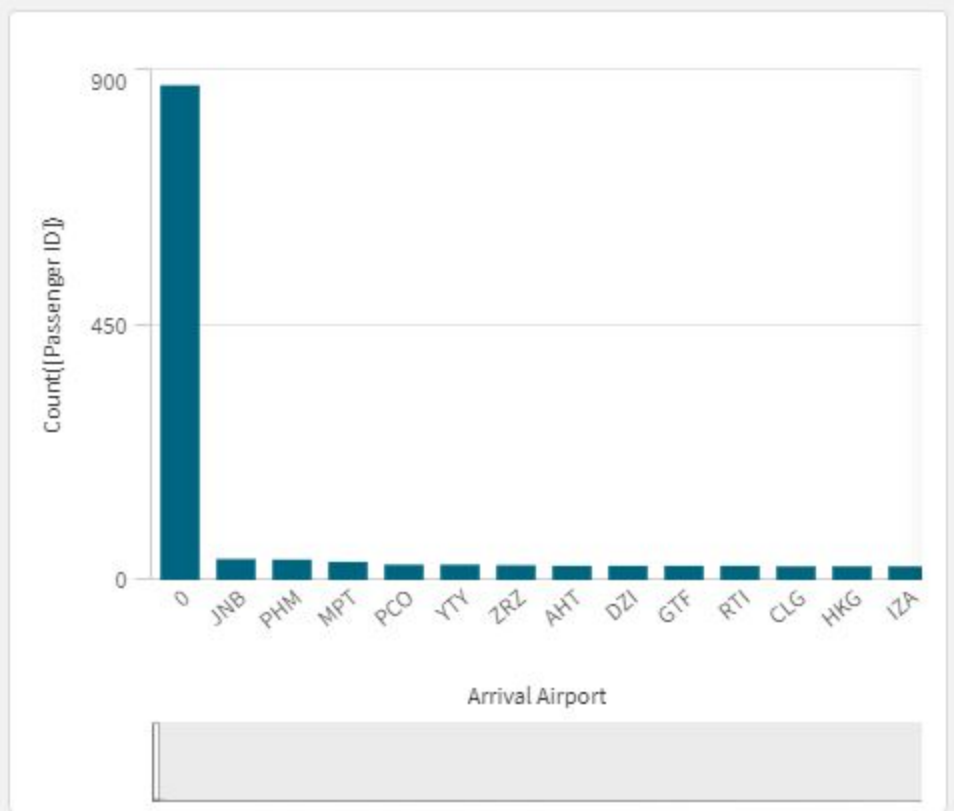
it is observed that the dataset contains the highest level of Chinese nationals followed by U.S

5.1.10 Highest Age average Nationality

Which means the nationals of Falkan islands are of the highest in terms of age among the rest of the passengers according to airline data 2022.in this Bar chart various other countries can also be observed showcasing the age of their nationals which still prefer travelling

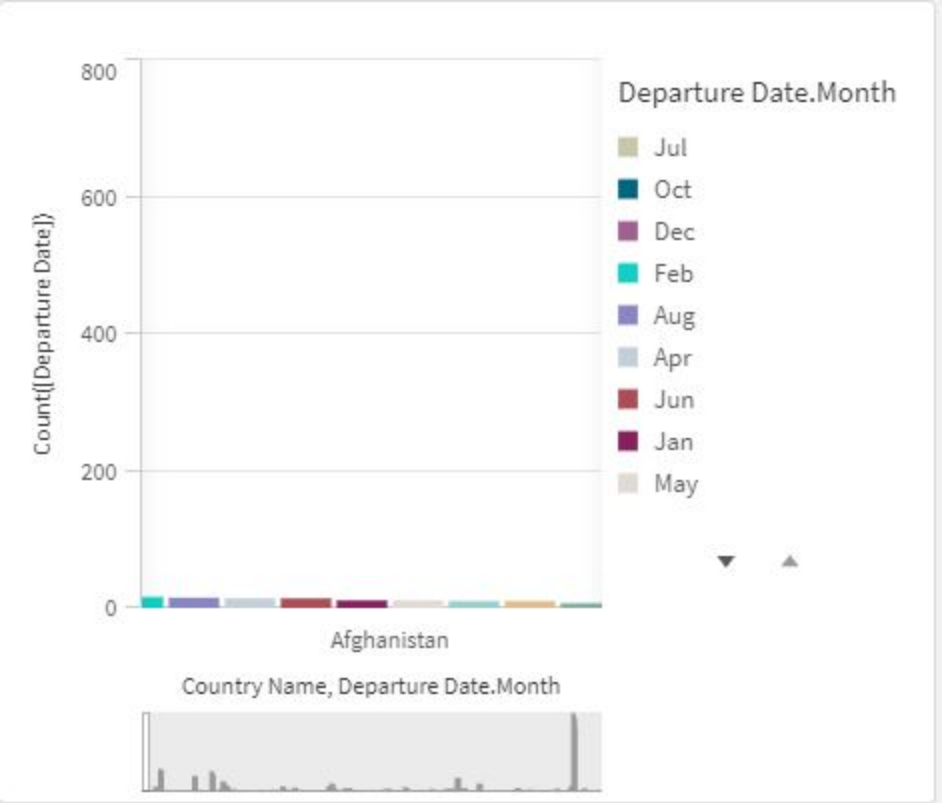


5.1.11 Arrival Airport



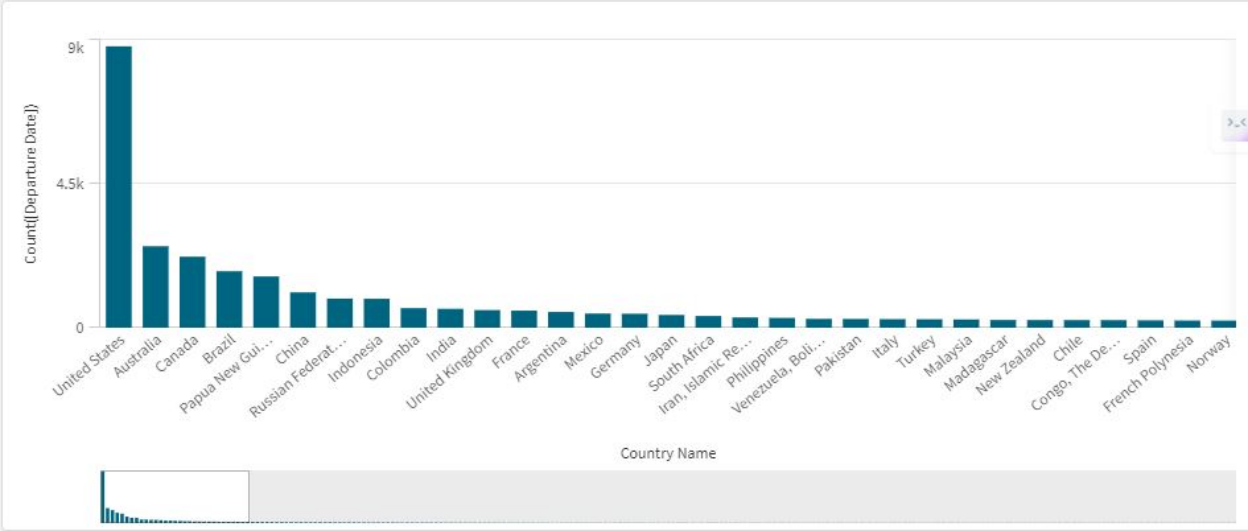
Here the missing information is replaced by Zero in order to deal with void/ Null values. it tells us the number of passengers arriving to this airport. based on which arrangements can be made

5.1.12 Month wise departure date



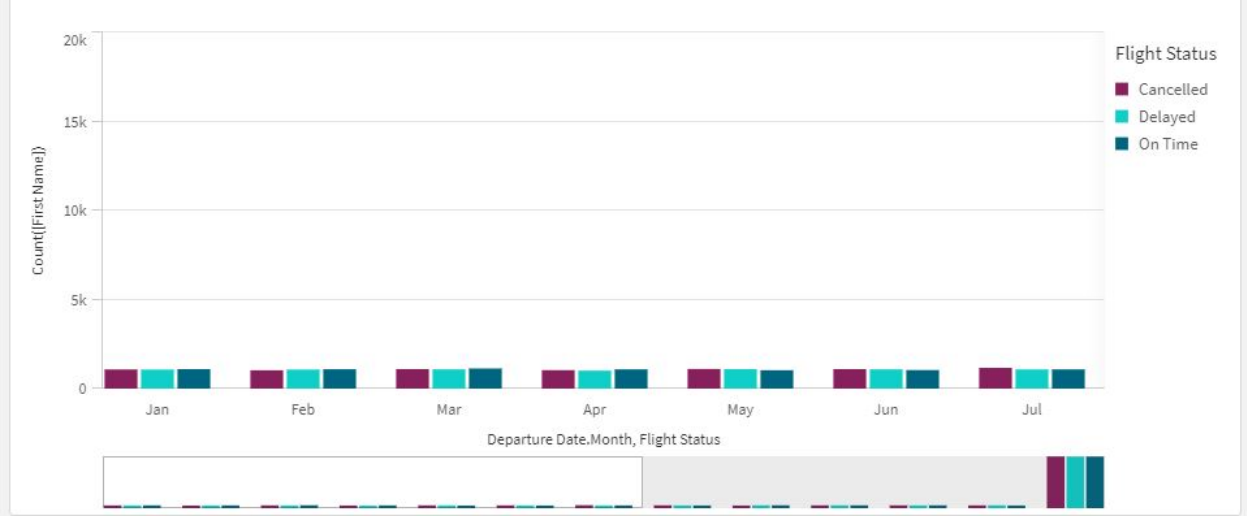
this shows us the amount of flights scheduled with respect to country and in which month can be clearly seen here.

5.1.13 Country wise flights



this shows us which country is widely connected with the world based on their dates allotted by the airlines.

5.1.14 Passenger Impact

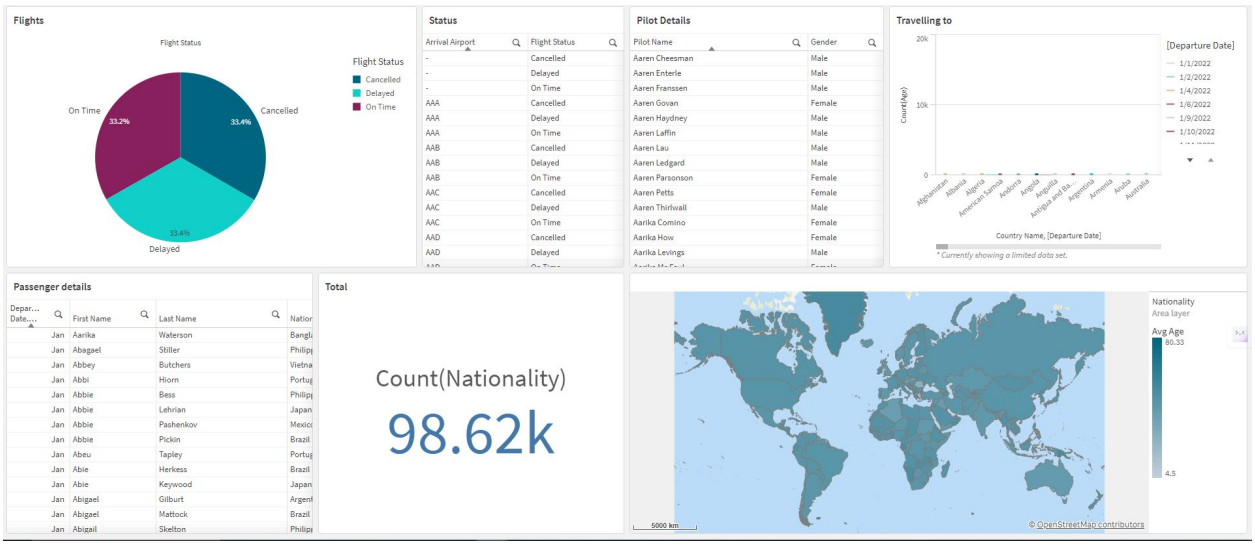


this shows us the flights that are being used by how many passengers and loss impact analysis can be done here by taking down the passengers whose flights have been delayed or cancelled.

6.Dashboard

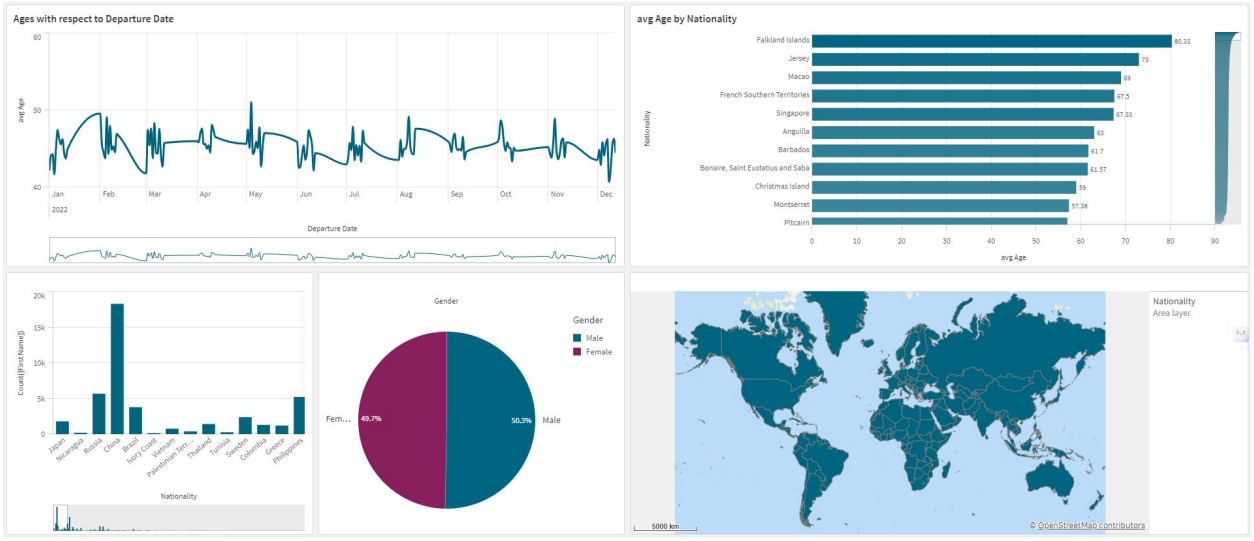
6.1 Responsive and Design of dashboard

The response of dashboard is improved explicilty by handling missing data or by preprocessing it give user a smoother and effecient experience. It automatically enhances according to the selection of the user



Sheet - 1 : It is the combination of all the possible answers we can find on a single screen as it is interactive visualizations upon selecting a country the entire demographics (information) of that country is displaced

Sheet - 2 :



This sheet consists of gender classification with respect to different countries and ages and the time which is most considered by the passengers to travel.

Sheet - 3:

This is mainly used for impact analysis and growth monitoring basis

7.Report

7.1 Report Creation

From above visualizations, of airline 2022 dataset the possible problems an airline may face are

1.Flight delays and cancellations

2.Financial Challenges

3.Safety Regulations

4.Competition

5.Technological Challenges

6.Customer/Passenger Satisfaction Challenges

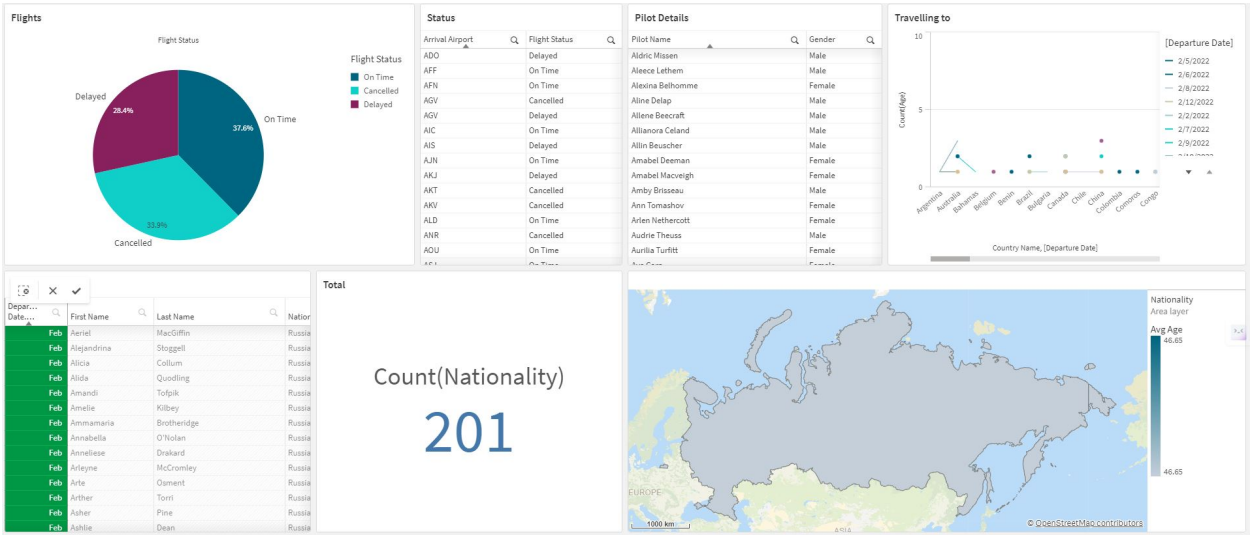
7.External Factors

8.Labor shortages/disputes

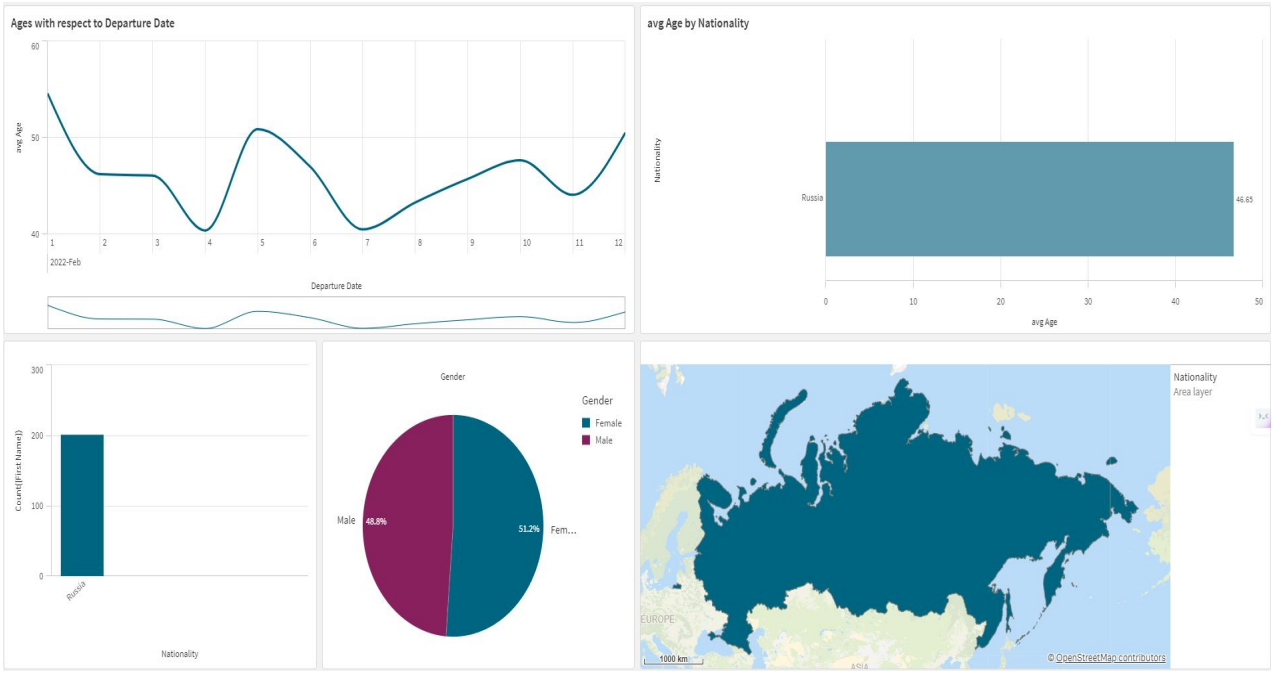
Solution: In order to overcome these Challenges based on the provided data Each country has its own demographics and different bioms and lies on different latitude and longitude having a unique pattern of weather. Understanding the weather pattern would have a plus point in operating flights

Which is an important factor for maintaing a safe and secure movement of passenger. this will avoid the delay and cancellation.some of the factors which can be a reason for delay or cancellation can be financial challenges or external factors. In the world of extreme competition, it is crucial operating an airline needs to focus on all the possible paths.Financial challenges ma appear due to lack of customer satisfaction and quality of hospitality and maintenance. Let us Consider few cases of External factor and a general/neutral Case

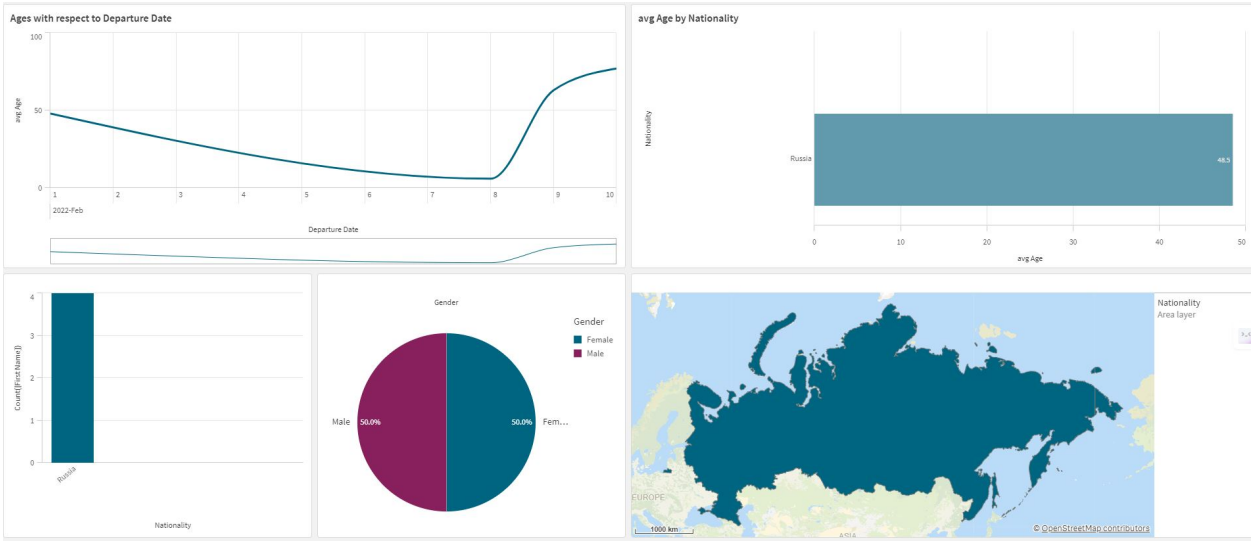
7.2 External Factors



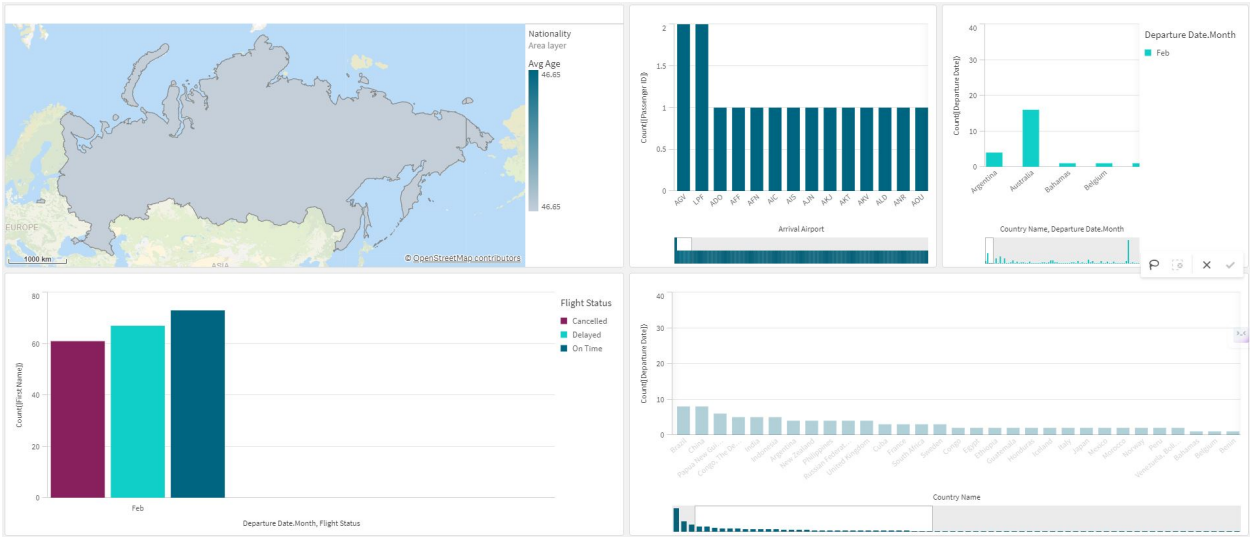
The Russia Ukraine war begin in February 2022 here is what the data has to say. During this period 201 Nationals have left the country. Mostly to Neighboring countries or much far in-order to avoid the impact of war on their lives. During the war period, which is a danger for civilians, many flights have either been cancelled or delayed to avoid the losses.The brave pilots that have been working in such a situation their names can be seen clearly out of which the gender can be clearly seen in the next image with the dates and their ages respectively



the above visual is of flights in total leaving Russia now looking at passengers flying in Russia has been drastically reduced to only 4 fights



which means only 4 flights have been functioning and two of them were delayed and the other two were cancelled : This war had an impact on the entire world, including the airline industry in terms of fuel cost and closing of airspace which will increase the cost of going around and unable to pass through the Russian airspace.Though their was a



post covid surge in travelers but their was also labor shortages and conflicts in maintaining proper supply and demand chain.The above image is for all 201 flightsThis information is helpful in understanding the timings and functioning of the flights during such situation : questions that are helpful such as

1.Situation of civilians.

2.Flights with their dates that are functioning

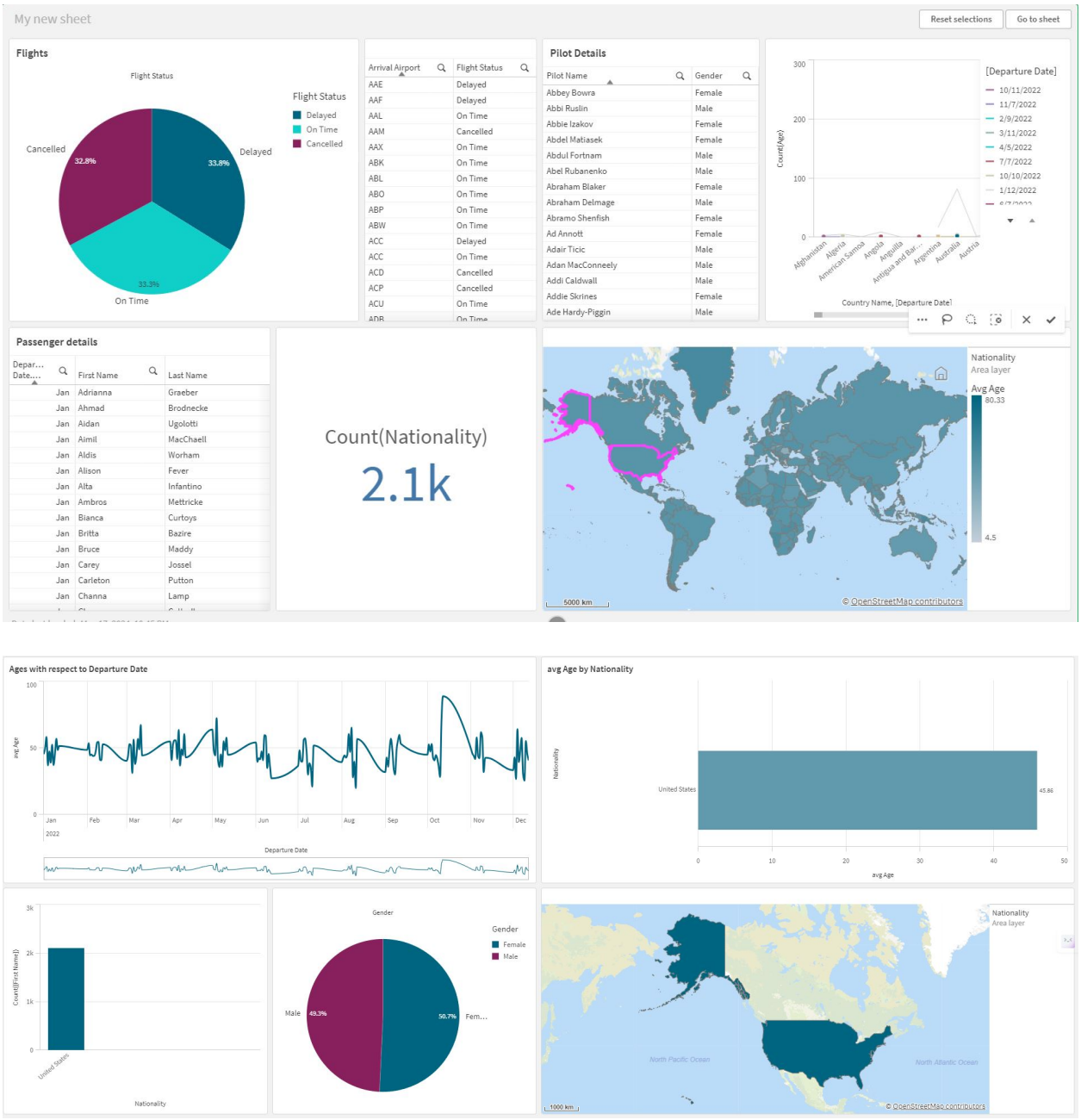
3.What is the age criteria

4.Cost per person, allowances etc

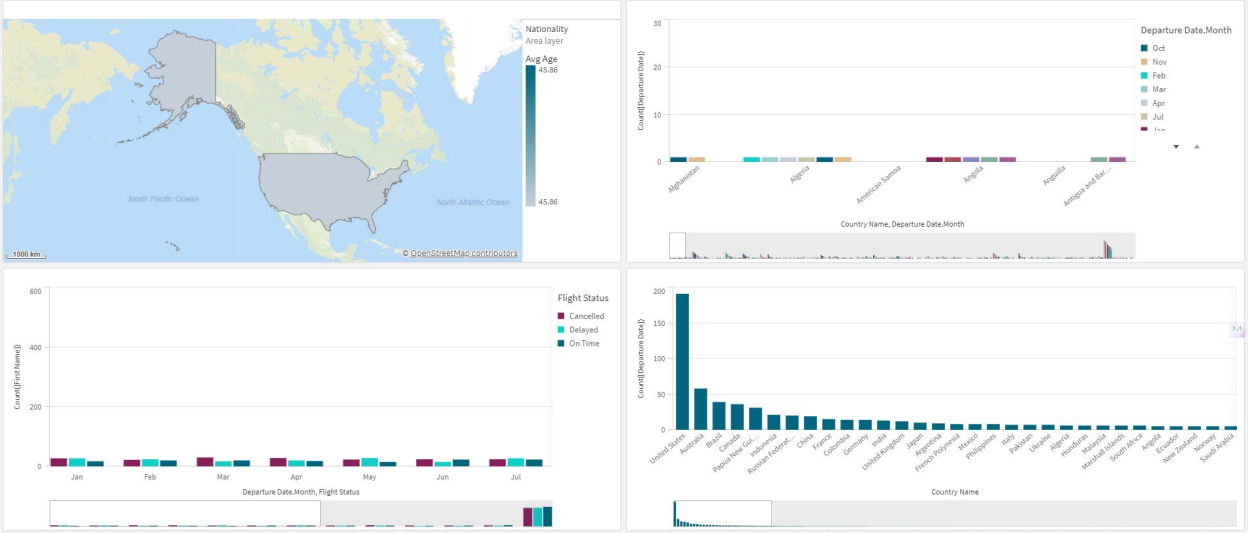
This type of information can also be helpful to perform rescue operations.

7.3 General/Neutral Case

Considering the US in this example, the following visual are as follows:The flights, passengers, heading too, how many times a year, first name & Last name, maximum flights to 'Australia', within the country, age criteria. etc all these can be known to modify the according to the perspective of age as well providing resources accordingly with the need. and the favorite country which most Americans prefer enhancing the route and scheduling more flights on that route with better customer service such as in flight entertainment , more options while selecting food , Drinks etc . Giving a wide range of options to the passengers and with minimal to no compromising.



During the summer or winter break people around the globe make a short visit during these times. which can again be helpful for flights as it varies from country to country and various festivals or occasions such as olympics etc can be helpful



Actions :

Look up the age criteria and provide accessibility resources and other perks accordingly, understand the financial reach and increase the fleet by understanding the customer responses. Trends in their needs, for example US nationals prefer travelling to Australia according to this data, which means keeping frequent flights can be helpful.

Understanding the reason for delay. Having strict norms can be helpful. Encouraging proper and professionalism among the crew and ground teams can be helpful

Reducing the consumption of fuel and optimizing the efficiency from time to time can be cost saving as well as efficient in terms of climate impact

Provide quality care to passengers will work as a marketing for more trips. This itself will help in getting more customers and providing offers upon various occasions can be beneficial too.

8.Performance Testing

8.1 Amount of data Rendered

The variety of data that have been collected, processed and prepared includes the

dataset airline 2022 which consist of 98,620 rows of data consisting of first name, last name,passenger ID, age, gender, arrival airport, Pilot names, departure dates and flight status. Now the amount of data that has been loaded into qlik sense is 15 columns and 98,619 Rows. out of which their was missing data which was later replaced by null value similarly date formatting has also been carried out on the data.

8.2 Utilization of Data Filters

Data filters played a crucial role in tuning themselves with various properties. such as narrowing to specific segments or criteria making it easier to focus on relevant information.it helps in improving performance by filtering out the unnecessary data, reducing time and leading to faster response time and smoother experience. it also makes the entire visualizations more interactive and engaging experience. provides better insights.