Portfolio Project Overview:

British Airways (BA), one of the world's leading airlines, has a rich history of providing air travel services to millions of passengers each year. The airline has grown to become a major player in the aviation industry, known for its extensive network, quality service, and commitment to passenger comfort and safety. As the airline industry becomes increasingly competitive, maintaining high levels of customer satisfaction is essential for retaining customers and fostering loyalty. In recent years, the proliferation of digital communication channels has led to an explosion in customer feedback. Passengers now share their experiences through various platforms, including in-flight surveys, online reviews, social media, and direct communications with customer service. This feedback contains valuable insights into passengers' experiences, preferences, and expectations. Analyzing this feedback effectively allows British Airways to identify strengths and weaknesses in their services, respond to customer needs more efficiently, and make data-driven decisions to enhance overall customer satisfaction. By leveraging data analysis and science techniques, we can transform raw customer feedback into actionable insights that can drive strategic improvements and ensure a superior travel experience for its passengers. The global airline company has lots of CSAT (Customer Satisfaction) and Survey (Customer Ratings Reviews) data available which was gathered from passengers using survey applications/tools. The Airline PR (public relations) department wants to analyze this data and present meaningful and actionable recommendations to other airline management teams. As a data analyst, I created this end-to-end portfolio project for data visualization with an interactive dashboard.

- End users of this dynamic and interactive dashboard will be able to pick the metrics they would like to see with a simple click, so they can change between average overall CSAT ratings or food ratings etc.
- End users would also have other useful filters to find exactly the data points they are looking for.
- Each of the filters are dynamic themselves so users can pick the date or specific country they are interested in. Passengers were chosen for this survey across various countries, flight routes, aircraft types, and passenger classes, to provide their satisfaction ratings in various service categories such as overall rating, seat comfort, cabin staff service, food, ground service, value for money, and entertainment.

Business Problem Scenarios, Objectives and KPIs:

The airline management team would like to analyze and get data insights into this collected CSAT reviews data and identify some actionable recommendations for continuous improvements in flight operations.

- Detect patterns and unveil insights to gauge overall sentiment and identify common issues related to passenger satisfaction and dissatisfaction.
- Develop effective flight operations using customer satisfaction data based on flight plans, such as cabin staff service, ground service, type of traveler, and seat type etc.

Target Stakeholders:

This dynamic analysis dashboard will be used for the following job roles to increase their productivity and achieve business goals.

- VP and Managers – Flight Operations
  - Manages the day-to-day activities of the airline, including flight scheduling, flight dispatchers, ground crews, pilots, and flight attendants.
  - Flight planning, dispatch, flight watch, operations control, and maintenance planning.
- VP and Managers – Maintenance
  - Aircraft maintenance.
- Business Analysts

Skills and Applications used:

• SME (Subject Matter Expertise)
- Business requirement gathering skill and techniques.
- UI/UX – Guidelines that define how a user interface should look, feel, and behave. They help ensure that users have consistent and predictable experience when interacting with a dashboard.
- Data cleaning, pre-processing.
- Tableau – Desktop and Public.
  - Data Import as 'Tableau tables' – data source (CSV data file, Database Tables)
  - E-R (Entity-Relationship) diagram – Relationship between 'BA_Reviews' and 'Countries' tables. This is used for filters on the dashboard.
  - Data Visualization - Interactive Dashboard Filters which allows one to toggle between various metrics.
- Microsoft Excel
  - Knowledge of formulae and functions to be used in any typical data analytical solutions.

Solution Approach and Process to build this project:

- After receiving the datasets, I interacted with business users from the customer experience team to understand their business requirements and expectations.
- Worked on datasets for data cleaning and pre-processing based on business requirements.
- Built the Tableau dashboard and worked hand-in-hand with business users for UAT (User Acceptance Testing).
- Data Imported as 'Tableau tables' – data source (CSV data file, Database Tables).
- E-R (Entity-Relationship) diagram – Relationship between 'BA_Reviews' and 'Countries' tables. This is used for filters on the dashboard.
- Interactive Dashboard Filters – Allow toggling between various metrics
- Summary Metrics on top for quick data insights.

Dataset Overview: Data Preparation Process (Data gathering, Data Cleaning, Data Transformation):

- Data Gathering – The Dataset (Microsoft Excel/ CSV File).
    - Data Sheet: 2 CSV files ('ba_reviews.csv' and 'Countries.csv')
    - Data is loaded onto the Tableau Drop-down list of all income/expense categories which can be modified as per future needs.
- Data Cleaning (Common cleaning):
    - Data type conversion. Ensuring proper data types for each value to facilitate analysis.
    - Handling Missing Values. Identifying and addressing missing data points to maintain data integrity.
    - Dealing with Duplicate Entries. Detecting and removing duplicate records to maintain dataset uniqueness.
    - Handling Outliers. Frequency analysis has been utilized to identify outliers in ordinal data. The analysis did not show significant evidence that less frequent levels should be considered as outliers.
- Data Pre-Processing and Transformation.
    - Cell formatting, spelling correction

Data Analysis & Visualization – Dashboard, Reports, Charts, Key findings, Data Insights:

- Standard UI/UX experience for business users.
- Created a very dynamic and interactive dashboard using advanced features; when end users pick a metric from the filter list, the selected metric becomes a 'filter' itself, to show all relevant data on dashboard charts. All maps and charts on the dashboard change dynamically to show the user selected metric values in them. This is what makes the user experience very useful for them.
- Tableau Sheet - Map.
  - Provides data on the dashboard map with zoom in and zoom out features to drill-down analyze.
  - Created a 'Geographic Role --> Country/Region' header from an existing column (place) to use as geographical location for the Tableau map generation.
  - Created List type 'Parameter' (Pick a Metric) for the filter.
  - Created 'Calculated field' (Metric Selected) with a CASE formula. This is used to show the average ratings values as 'color marks' in the geographical map.
  - Customization of the map for best UI/UX such as background map, background layers, coastlines, and color schemes.
  - Dynamic 'Title' values based on 'Parameter: Pick a Metric' values (Filters). This will change the chart titles interactively for end users.
  - Created new 'Filter Fields' such as month, seat type, aircraft, etc. to use as filters on the dashboard and applied to all data in the dashboard.
  - Customized the 'Tool-Tip' for Tableau Maps for data visualizations.
- Tableau Sheet - Summary Metrics.
  - Created 'Measure Names' to show ratings average values on top of the dashboard.
- Tableau Sheet - Line Chart (Trending).
  - Created a continuous month column and selected metrics for the trending line chart. This shows the trending line chart for the average value chart for a user selected metric (i.e. filter).
- Tableau Sheet – Bar Charts.
  - Cutomized a bar chart for UI/UX standards and data sorting.
  - Dynamic 'color scaling' on the bar charts based on the metric values.
- Tableau Dashboard – The final dashboard.
  - Combined all visualization components created above (filters, map, line chart, bar chart etc.) into a single dashboard.
  - Created a 'Floating' dashboard object for the best user experience across various devices.
  - Formatted the layout of organization and visual customization (look and feel, UI/UX color schemes,).

○ Published and shared on my Tableau Public account (my portfolio projects).
● Refer to the screenshots below for the Tableau Dashboard for this solution.
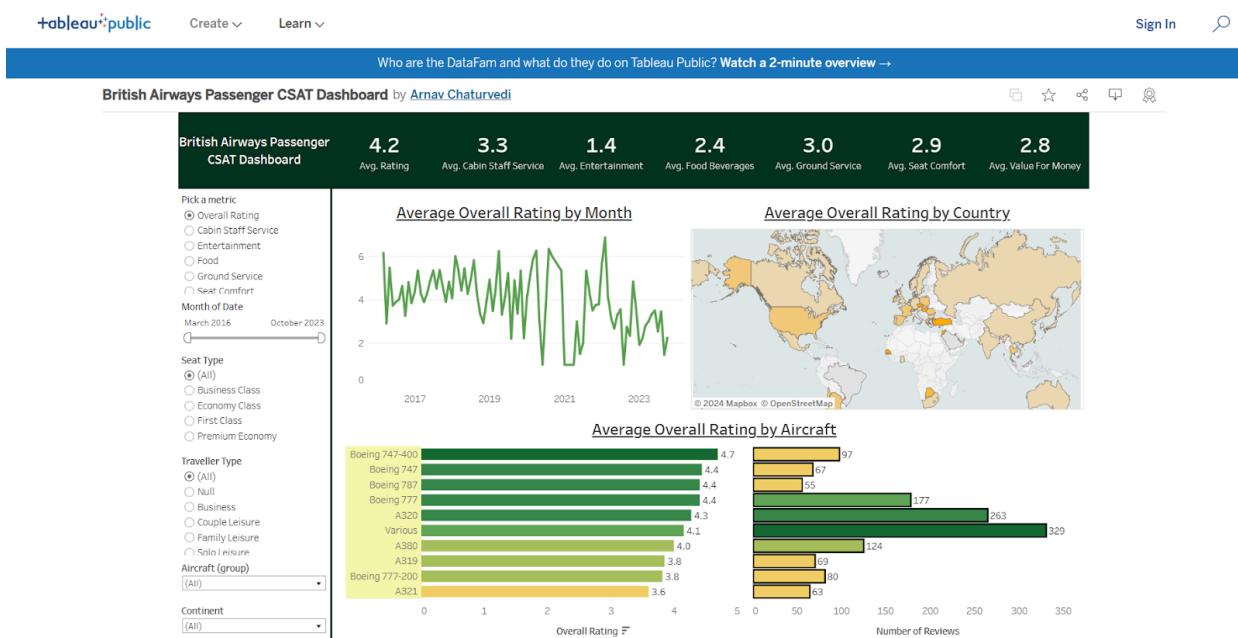
Portfolio Project Documentation (Final Conclusion):

Documentation:

● ReadMe-Data Analysis-Passenger-CSAT-Dashboard.docx

Output File (Published on my Tableau Public account):

● Data Analysis-Passenger-CSAT-Dashboard.twbx

Sceenshot: Dynamic and Interactive Dashboard.

Sceenshot: Dataset (CSAT Reviews).

header	author	date	place	content	aircraft	traveller_t	seat_type	route	date_flown	recommen	trip_verifie	rat
service was medi	Gary Storer		3/10/2023	United Kingdom	Just returned from Chicago,	A380	Couple Lei	Economy Class	Chicago to Manches	1/10/2023	no	Not Verifie
BA standards con	A Jensen		2/10/2023	United Kingdom	BA standards continue to d	A320	Business	Business Class	London Heathrow to	1/9/2023	no	Verified
won the race to th	John Rockett		2/10/2023	United Kingdom	Awful. Business class chec	A320	Couple Lei	Business Class	Heathrow to Istanbu	1/9/2023	no	Not Verifie
Not a reliable airli	Tatiana Bobrovs		2/10/2023	United Kingdom	Not a reliable airline. You c	A320	Business	Economy Class	London to Geneva	1/10/2023	no	Verified
Very disappointec	Tom Slowbe	28/09/2023		United States	The airplanes and the loung	777-300 ar	Couple Lei	First Class	Dallas to Dubrovnik	1/9/2023	no	Verified
the service was sl	E Anderson	28/09/2023		United Kingdom	One of the worst experienc	A321	Business	Business Class	London to Seville	1/9/2023	no	Verified
not a single feedb	Selcuk Benter	20/09/2023		Germany	My initial flight was cancell	A350	Business	Premium Economy	Hamburg to Las Veg	1/8/2023	no	Not Verifie
Club Europe does	41 reviews	18/09/2023		United Kingdom	Check in and security clear	A320	Couple Lei	Business Class	London Heathrow to	1/9/2023	yes	Verified
service on board	Peter Costello		11/9/2023	United Kingdom	Despite boarding being the	Boeing 787	Couple Lei	Business Class	London to Santiago	1/9/2023	yes	Verified
a national disgrac	Brent Davies		10/9/2023	United Kingdom	Flight cancelled, no crew! S	A320	Couple Lei	Business Class	London Heathrow to	1/9/2023	no	Not Verifie
Cannot recomme	E Durken		6/9/2023	Germany	4/4 flights we booked this h	A320	Couple Lei	Economy Class	London to Munich	1/9/2023	no	Verified
less than a premi	73 reviews		4/9/2023	Iceland	London Heathrow to Keflavi	A321	Couple Lei	Business Class	London to Keflavik	1/8/2023	yes	Verified
good, but not spe	73 reviews		4/9/2023	Iceland	Mumbai to London Heathro	Boeing 777	Couple Lei	Business Class	Mumbai to London	1/8/2023	yes	Verified
avoid BA like the p	R H		2/9/2023	Australia	Flying A380 business class	A380	Solo Leisu	Business Class	London to Miami	1/9/2023	no	Verified
British Airways ab	May Porter		1/9/2023	United Kingdom	British Airways absolutely d	Boeing 777		Economy Class	Los Angeles to Lond	1/8/2023	no	Verified
they are the worst	Rich Glasier	30/08/2023		United Kingdom	I flew London to Malaga on	A320	Solo Leisu	Business Class	London to Malaga	1/8/2023	no	Verified
appalling custom	C Hill	28/08/2023		United Kingdom	Filthy plane, cabin staff ok,	A320	Couple Lei	Business Class	Tenerife to Gatwick	1/8/2023	no	Verified
standards are wor	E Michaels	27/08/2023		United Kingdom	Ä Ä Chaos at Terminal 5 witl	A320	Business	Business Class	London Heathrow to	1/8/2023	no	Verified
Nice flight, good c	6 reviews	26/08/2023		United States	Nice flight, good crew, very	Boeing 777	Couple Lei	Business Class	LHR to LAX	1/8/2023	yes	Verified
ravioli pasta had c	24/08/2023			United Kingdom	Ground and cabin crew alw	A320neo	Solo Leisu	Business Class	Larnaca to London H	1/7/2023	yes	Verified
Great customer s	S Brydon	19/08/2023		United States	My family flew from Washin	A380	Family Lei	Economy Class	Washington to Lond	1/8/2023	yes	Verified
Cabin crew were	E Smyth	13/08/2023		United Kingdom	Easy check in T5. Gallerie	A380	Family Lei	Business Class	London to Miami	1/8/2023	yes	Verified
superior to mainli	S Deynal		8/8/2023	United Kingdom	Good domestic flight opera	Embraer-1	Couple Lei	Economy Class	Edinburgh to London	1/7/2023	yes	Verified
They lost my bagg	G Maysev		8/8/2023	Poland	They lost my baggage in a v	A380 / A32	Business	Economy Class	San Francisco to Wa	1/7/2023	no	Verified
leaving two hours	2 reviews		5/8/2023	United Kingdom	Ä Ä Late boarding led to a on	Embraer	Business	Economy Class	Frankfurt to London	1/8/2023	no	Verified
Couldn't recomm	Andrew Ling		1/8/2023	Hong Kong	I had the most fantastic BA	Boeing 777	Solo Leisu	Business Class	London to Hong Kong	1/7/2023	yes	Verified
a very comfortabl	73 reviews	31/07/2023		Iceland	London Heathrow to Mumb	Boeing 787	Couple Lei	Business Class	London to Mumbai	1/7/2023	yes	Verified
good onboard ser	73 reviews	31/07/2023		Iceland	KeflavÄ-k, Iceland to Londo	A320	Couple Lei	Business Class	Keflavik to London	1/7/2023	yes	Verified
lives in their past	Alwaleed Althan	26/07/2023		Qatar	An airline that lives in their	A321	Family Lei	Business Class	Madrid to London	1/7/2023	no	Verified

ba_reviews +

Sceenshot: (Dataset) Countries.

🔍 Key Insights from "Average Overall Rating by Aircraft"

1️⃣ Passenger Satisfaction ≠ Popularity

- **Boeing 747-400** has the **highest rating (4.7)**
  👉 But reviews (~97) are **moderate**, not the highest.
- **Insight:**
  Older, iconic aircraft deliver **excellent experience**, but are **less frequently used today**.

📌 *Teaching point:*
High rating doesn't always mean high usage.

2️⃣ A320 & Boeing 777 = Industry Workhorses

- **A320**
  - Rating: **4.3**
  - Reviews: **~250+ (highest)**
- **Boeing 777**

- Rating: **4.4**
- Reviews: **~177**

Insight:

These aircraft balance **comfort + efficiency + operational scale**, which is why airlines use them heavily.

📌 *Business takeaway:*
Airlines prioritize **reliable + scalable aircraft**, even if ratings are slightly lower than premium planes.

3️⃣ Newer ≠ Always Better (Example: A321)

- **A321**
  - Rating: **Lowest (3.6)**
  - Reviews: **~63**

Insight:

Passengers often feel **more cramped** in high-density narrow-body aircraft on longer routes.

📌 *Real-world reason:*
Airlines configure A321s for **cost efficiency**, sometimes at the cost of passenger comfort.

4️⃣ A380: Premium Feel but Limited Reach

- **A380**
  - Rating: **4.0**
  - Reviews: **~124**

Insight:

Passengers love the space, but limited routes + high operating cost reduce adoption.

📌 *Strategic insight:*
Great customer experience ≠ sustainable business model.

5️⃣ "Various" Category Has High Volume but Lower Rating

- Rating: **4.1**
- Reviews: **Very high**

Insight:

Mixed aircraft types lead to **inconsistent passenger experience**.

📌 *Analytics lesson:*
Aggregated categories hide **experience variance** — always segment data further.

📊 Executive Summary (One-Line Insights)

- ⭐ **Best Experience:** Boeing 747-400
- 🚀 **Most Used Aircraft:** A320
- ⚖️ **Best Balance:** Boeing 777
- ⚠️ **Comfort Concerns:** A321
- 💰 **Luxury but Costly:** A380

🎯 How to Use This Insight in Interviews / Projects

You can say:

"Passenger ratings are highest for wide-body, older aircraft like the 747-400, but airlines favor A320 and 777 due to operational efficiency. This shows the classic trade-off between **customer satisfaction and business scalability**."

If you want, I can also:

- Convert this into **Power BI dashboard insights**
- Write **resume-ready project bullets**
- Frame **case-study questions for students**
- Add **KPI recommendations for airlines**

Just tell me 👍

	A	B	C	D	E
1	Country	Code	Continent	Region	
2	Afghanistan	AFG	Asia	Southern Asia	
3	Åland Islands	ALA	Europe	Northern Europe	
4	Albania	ALB	Europe	Southern Europe	
5	Algeria	DZA	Africa	Northern Africa	
6	American Sam	ASM	Oceania	Polynesia	
7	Andorra	AND	Europe	Southern Europe	
8	Angola	AGO	Africa	Middle Africa	
9	Anguilla	AIA	North America	Caribbean	
10	Antarctica	ATA	Antarctica	Antarctica	
11	Antigua and Ba	ATG	North America	Caribbean	
12	Argentina	ARG	South America	South America	
13	Armenia	ARM	Asia	Western Asia	
14	Aruba	ABW	North America	Caribbean	
15	Australia	AUS	Oceania	Australia and New Zealand	
16	Austria	AUT	Europe	Western Europe	
17	Azerbaijan	AZE	Asia	Western Asia	
18	Bahamas	BHS	North America	Caribbean	
19	Bahrain	BHR	Asia	Western Asia	
20	Bangladesh	BGD	Asia	Southern Asia	
21	Barbados	BRB	North America	Caribbean	
22	Belarus	BLR	Europe	Eastern Europe	
23	Belgium	BEL	Europe	Western Europe	
24	Belize	BLZ	North America	Central America	
25	Benin	BEN	Africa	Western Africa	
26	Bermuda	BMU	North America	Northern America	
27	Bhutan	BTN	Asia	Southern Asia	
28	Bolivia (Plurina	BOL	South America	South America	
29	Bonaire, Sint E	BES	North America	Caribbean	
30	Bosnia and He	BIH	Europe	Southern Europe	

Countries +