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Assignment Title: - Data visualisation assignment

Date of Submission: 04/12/2023   **Word Count: - 1000 WORDS**

Signed:

Contents

Introduction to the Dataset

In this visualization dashboard we have utilizes a comprehensive and real use case dataset on airline passenger satisfaction. which is publicly available on Kaggle, was shared by Tj Klein which consists of over 103K+ records of customers with more than 25 variables capturing in a wide range of factors in related to airline service and customer feedback.

The data includes multiple dimensions of the flight experience, which includes some of the key details such as in-flight services, seat comfort, customer service interactions, ease of online booking, flight distance, age and this overall satisfaction. Categorized as satisfied or dissatisfied which will acts aa a key matric for analysis.

The main characteristic of this dataset is its cleanliness and with no missing or empty values noted across all records. This quality of data is exceptional and provides a solid foundation for meaningful analysis without the need for cleaning or preprocessing, which often burdens analytics projects.

With this kind of dataset helps us to develop a interactive dashboard aimed at dissecting and understanding the factors that give customer satisfaction in the airline industry. It offers a substantive basis to generate actionable insights that can empower airline manager and customer service teams to enhance the flying experience and improve operational efficiencies.

Below are the details more detailed attributes.

Attributes	Description
Sl.no	A unique sequential number assigned to each record in the dataset.
id	The identifier for each passenger or flight instance.
Gender	The gender of the passenger.
Customer Type	Classification of the customer based on loyalty (e.g., Loyal, Disloyal).
Age	The age of the passenger.
Type of Travel	The travel purpose, such as Business or Personal travel.
Class	The class of service the passenger has booked (e.g., Economy, Business).
Flight Distance	The total distance of the flight travelled.
Inflight Wi-Fi service	Passenger rating for the inflight Wi-Fi service.
Departure/Arrival time convenient	Passenger rating on the convenience of flight times.
Ease of Online booking	Passenger rating for the ease of booking online.
Gate location	Passenger rating on the convenience of the gate location.
Food and drink	Passenger rating for the quality of food and drinks.
Online boarding	Passenger rating for the online boarding process.
Seat comfort	Passenger rating for the comfort of their seat.
Inflight entertainment	Passenger rating for the entertainment options available.
On-board service	Passenger rating for the service provided on board.
Leg room service	Passenger rating for the legroom available.
Baggage handling	Passenger rating for the handling of their luggage.
Check-in service	Passenger rating for the check-in process.
Inflight service	Passenger rating for the overall inflight service.
Cleanliness	Passenger rating for the cleanliness of the aircraft.
Departure Delay in Minutes	Length of the flight's departure delay in minutes.
Arrival Delay in Minutes	Length of the flight's arrival delay in minutes.
satisfaction	Overall satisfaction of the passenger, typically binary (satisfied/dissatisfied).

Insights:

1.Delay Impact on Satisfaction:
2. Satisfaction by Travel Type
3.Gender-Based Rating Distribution
4.Satisfaction Across Age Groups:
5. Service Ratings by Category

Intended User

This Dashboard is primarily designed for airline operational managers. Specifically, those who are responsible for looking into monitoring and enhancing passenger satisfaction. These members are responsibility for improving services. The oops managers are tasked with optimizing the end-to-end travel experience, from booking to arrival, and rely on data-driven insights to inform their strategies.

These are the factors that significantly affect passenger satisfaction, identify service pain points, and understand the correlation between different service aspects and overall customer sentiment. These managers also focus on operational metrics, such as flight delays and their impact on the CX, and efficiency of various services like check-in and onboard amenities.

Finally, with the help of this dashboard, operational managers can swiftly gauge performance across key services areas, helping them to address and solve the issues and improve CX. This dashboard also helps them to enhance customer loyalty and maintain a competitive edge in the airline industry.

Data Transformations:

While preparing the comprehensive analysis, we have taken several pivotal steps in transformations of the data. The datasets were excellent, exhibiting no missing values, which is a rarity in real-word data scenarios.to tailor the data to the specific analytical needs for airline operational managers, the following transformations were done.

Date Type: alter the data type of Flight Distance from text to whole numbers to facilitate accurate numerical analysis.

DAX Calculations:

1. **Average Online Services Rating**: to calculate the average rating of online services team we have taken average from online booking and check-in.
2. **Flight Distance Play Axis:** to visually the track, how flights distance changes the rating over time. Created a rule-based group for the distance.
3. **Average Customer Services Rating:** To calculate the average rating of the customer service team, we have taken avg from Dep/Arrival time convenient, check-in services and Gate location.
4. **Average Inflight Service Rating:** To calculate the average rating services provided during the flight

5. **Departure Delay / Arrival Delay Category**: To classify the flights based on their time delay

6. **Flight Distance Category:** to classify the flight based on their distance to Short, Medium and Long.

7. **Age Group:** To Classify the passenger into age groups and analyze the demographic trends

8. **Average Rating:** To measure the overall average rating of the customer

Justifications:

Dataset Choice: While this dataset immediately stood out due to its relevance in today's customer-centric travel industry. It offers an insightful overview of the various factors that influence a passenger's journey and experience.in today era customers feedback plays a vital role in airline's reputation and business, this dataset gives us a rich ground for analysis and formulation of strategy.

Software Selection: though we have multiple visualization software in today's world. I preferred to go ahead with Power BI for its capabilities and user-friendly interface. Its ability to handle large datasets efficiently and create a dynamic, interactive dashboard makes it an best choice for this kind task and for further scalability.

Column Selection: Satisfaction: Among the numerous columns, **"Satisfaction"** stood out and was frequently utilized in the dashboard. This is pivotal as it directly reflects the main results of all services aspects combined with analyzing the data helps in pinpointing what passengers feels.as its ultimate measure of an airline's performance from a customer's perspective.

Favorite Chart -: Among the various charts, "Passenger Satisfaction Segmentation" stood out as my favorite.as this chart effectively demonstrates how change in customer segments and travel type perceive their travel experience. This visualization not only offers insights into diverse customers' expectations and experience but also guides tailored service strategies for different passenger groups.

Insights from the Dashboard:

1. Longer Flights Lead to Increased Satisfaction: "The Flight Distance and satisfaction by Age" charts give us an interesting trend where satisfaction ratings appear to increase with the flight distance. Passengers on longer flights give us the higher rating with the length of the flight they travel. Passengers on longer flights give higher ratings for satisfaction. Which may suggest that the airline's long-haul services offerings, such as in-flight entertainment and comfort, are meeting the passenger expectations. This insight could guide the airline to replicate successful long-haul service features on shorter flights.
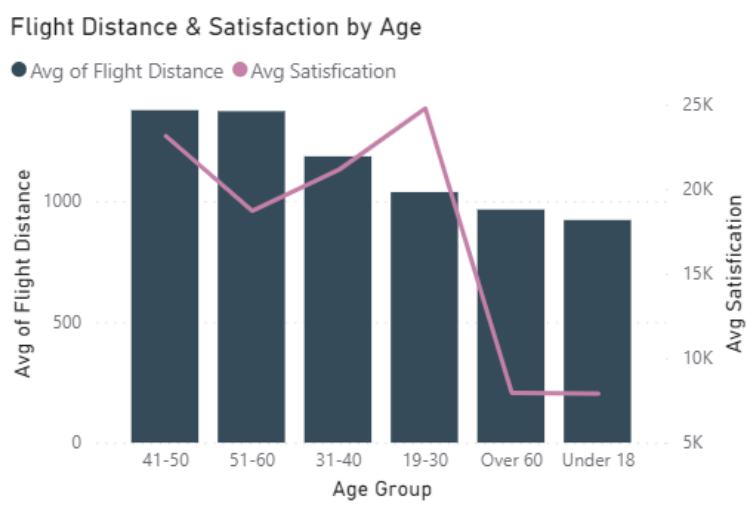
2. Insights from Delay Satisfaction Analysis: The Comparative analysis of departure and arrival charts give us a compelling insight into the passenger tolerance levels. It is evident that passengers; satisfaction takes a higher hit when faced with delays, with most dissatisfaction occurring when there is a delay exceeding 2 hours. This gives us the pain point of passenger discomfort and inconvenience likely peak.to resolve these issues might not only need punctuality bit also enhancing communication strategies and pricing compensatory services to overcome passenger frustration during such delays. This insight can be instrumental for the airline in making importance for operational improvements and refining customers services protocols, especially in this where delay is not unavoidable.
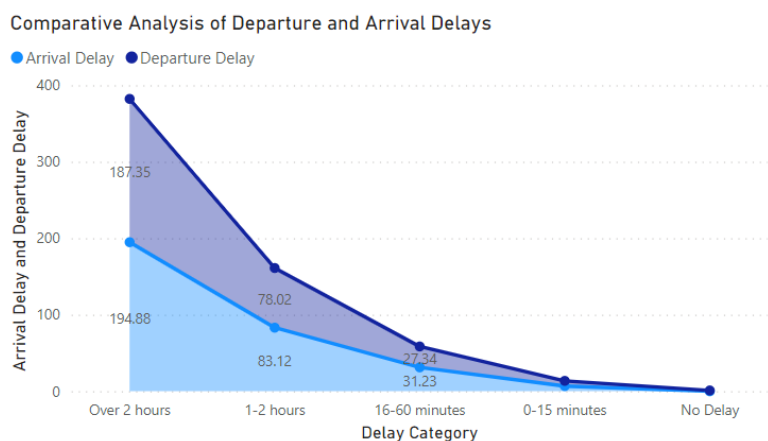
Reflective Learnings:

Enjoyable Aspects of the Project:

Transforming complex datasets into clear, visual narratives was the most enjoyable part. Visual detail was the most enjoyable part for me. It was also rewarding to see how the data transformed into to insightful and meaningful stories. And exploring the hidden trends and patterns from the data was fascinating.it was also to understand how the factors like flight distance and service rating influenced passenger satisfaction.

Challenging Aspects:

Conversely, grappling with DAX was bit hard at the beginning, it took time to get on it and understand the use case, though had some frustrating moments. In hindsight a deeper initial analysis of the dataset would have been beneficial, as it would have saved time and effort later.

Mistakes and Lessons for Future Projects:

Working on with DAX was a bit logical and a couple of mistakes were made at that stage i.e.: calculating the overall average across entire dataset in the place of calculating average for each individual row. And categorizing delay data required multiple time to resolve. On the other side of the learning curve, I felt like I could have planned the task in a more structured way and executed it.

If I were to start over, I'd focus more on mastering DAX early on, perhaps through additional tutorials, All In all, this project was a great ride. It pushed me out of my comfort zone, and I have come out the other side with a bunch of new skills and a better appreciation for what can tell us.

Appendix:

References:

1. Dataset Source: Klein, T.J. (2019). Airline Passenger Satisfaction Dataset. Retrieved from Kaggle: [https://www.kaggle.com/datasets/teejmahal20/airline-passenger-satisfaction]
2. DAX Concepts: Kevin Stratvert YT Channel
3. Key Dax Concepts You Should Know: https://foresightbi.com.ng/microsoft-power-bi/key-dax-concepts-you-should-know-part1/

DAX Statements:

1. Departure Delay Category

```
Departure Delay Category =
SWITCH(
    TRUE(),'train'[Departure Delay in Minutes] <=0, "No Delay",
    'train'[Departure Delay in Minutes] <=15, "0-15 minutes",
    'train'[Departure Delay in Minutes] <=60, "16-60 minutes",
    'train'[Departure Delay in Minutes] <=120, "1-2 hours",
    "Over 2 hours"
)
```

2 Age Group.

```
Age Group =
SWITCH(
    TRUE(),
    'train'[Age] < 18, "Under 18",
    'train'[Age] <= 30, "19-30",
    'train'[Age] <= 40, "31-40",
    'train'[Age] <= 50, "41-50",
    'train'[Age] <= 60, "51-60",
    "Over 60"
)
```

3.Average Rating:

```
Average Rating =
(
    'train'[Inflight wifi service] +
    'train'[Departure/Arrival time convenient] +
    'train'[Ease of Online booking] +
    'train'[Gate location] +
    'train'[Food and drink] +
    'train'[Online boarding] +
    'train'[Seat comfort] +
    'train'[Inflight entertainment] +
    'train'[On-board service] +
    'train'[Leg room service] +
    'train'[Baggage handling] +
    'train'[Checkin service] +
    'train'[Inflight service] +
    'train'[Cleanliness]
) / 14
```

4.Age Groups:

```
Age Group =
SWITCH(
    TRUE(),
    'train'[Age] < 18, "Under 18",
    'train'[Age] <= 30, "19-30",
    'train'[Age] <= 40, "31-40",
    'train'[Age] <= 50, "41-50",
    'train'[Age] <= 60, "51-60",
    "Over 60"
)
```

5.Average Rating:

```
Average Rating =
(
    'train'[Inflight wifi service] +
    'train'[Departure/Arrival time convenient] +
    'train'[Ease of Online booking] +
    'train'[Gate location] +
    'train'[Food and drink] +
    'train'[Online boarding] +
    'train'[Seat comfort] +
    'train'[Inflight entertainment] +
    'train'[On-board service] +
    'train'[Leg room service] +
    'train'[Baggage handling] +
    'train'[Checkin service] +
    'train'[Inflight service] +
    'train'[Cleanliness]
) / 14
```

6. Flight Distance Category

```
Flight Distance Category =
SWITCH(
    TRUE(),
    'train'[Flight Distance] < 500, "Short-Haul",
    'train'[Flight Distance] <= 1500, "Medium-Haul",
    "Long-Haul"
)
```

7. Arrival Delay Category

```
Arrival Delay Category =
SWITCH(
    TRUE(),'train'[Arrival Delay in Minutes] <=0, "No Delay",
    'train'[Arrival Delay in Minutes] <=15, "0-15 minutes",
    'train'[Arrival Delay in Minutes] < 60, "16-60 minutes",
    'train'[Arrival Delay in Minutes] < 120, "1-2 hours",
    "Over 2 hours"
)
```

8. Average Inflight Services Rating

```
Average Inflight Services Rating =
(
    'train'[Inflight wifi service] +
    'train'[Inflight entertainment] +
    'train'[Food and drink] +
    'train'[Seat comfort] +
    'train'[On-board service] +
    'train'[Leg room service] +
    'train'[Cleanliness] +
    'train'[Inflight service]
) / 8
```

9. Average Customer Service Rating

```
Average Customer Service Rating =
(
    'train'[Departure/Arrival time convenient] +
    'train'[Checkin service] +
    'train'[Gate location]
) / 3
```

10. Flight Distance Play Axis

```
Flight Distance Play Axis =
SWITCH(
    TRUE(),
    'train'[Flight Distance] <= 100, "100",
    'train'[Flight Distance] <= 200, "200",
    'train'[Flight Distance] <= 300, "300",
    'train'[Flight Distance] <= 400, "400",
    'train'[Flight Distance] <= 500, "500",
    'train'[Flight Distance] <= 600, "600",
    'train'[Flight Distance] <= 700, "700",
    'train'[Flight Distance] <= 800, "800",
    'train'[Flight Distance] <= 900, "900",
    'train'[Flight Distance] <= 1000, "1000",
    'train'[Flight Distance] <= 1100, "1100",
    "1100+"
)
```

11. Average Online Service Rating

```
Average Online Service Rating =
(
    'train'[Ease of Online booking] +
    'train'[Online boarding]
) / 2
```