Ola Cab Booking Data Analysis and Dashboard Project

Project Overview

The cab booking analysis and dashboard project is a comprehensive exploration of a one-month cab booking dataset. The project's focus is to identify key operational metrics, uncover customer behaviour patterns, and present insights in an interactive and navigable dashboard. By leveraging advanced SQL querying techniques, DAX formulas, and Power BI's powerful visualization and data transformation capabilities, the project showcases a holistic approach to data analysis and business intelligence.

Project Objective

The main objectives of the project include:

1. Analysing the cab booking data to derive actionable insights into operational efficiency, customer satisfaction, and revenue trends.

2. Utilizing advanced BI tools and techniques to design a highly interactive dashboard that simplifies data exploration.

3. Demonstrating expertise in data preparation, analysis, and visualization using industry-standard tools and practices.

Data Details

- **Source:** A dataset covering a one-month period (01-07-2024 to 31-07-2024).

- **Content:** Detailed information on bookings, including vehicle types, payment methods, ride distances, booking statuses, customer and driver ratings, and cancellation reasons.

- **Volume:** Over 100,000 bookings, providing a robust dataset for analysis.

Tools and Technologies

1. **SQL (MySQL):**

   o For efficient data storage and management.

   o To clean, preprocess, and analyse data using advanced SQL queries.

2. **Power BI:**

   o Used for creating dynamic and visually appealing dashboards.

   o Leveraged Power BI's advanced visualization capabilities, including:

     ▪ **Slicers and Filters**: For enabling data drill-down and exploration.

     ▪ **Custom Visuals**: Used to highlight key metrics in engaging formats.

     ▪ **Bookmarks and Navigation Buttons**: To design an intuitive user experience with seamless transitions across pages.

3. **DAX (Data Analysis Expressions):**

   o Created custom measures and calculated columns for advanced metrics, such as:

- Total revenue from successful bookings.

- Average customer ratings segmented by vehicle type.

- Dynamic KPIs like cancellation rates and success percentages.

4. **Power Query:**

   o Utilized to perform data transformation and cleaning, including:

   - Merging and appending datasets for comprehensive analysis.

   - Handling missing values and standardizing data formats.

   - Creating custom columns for enhanced analysis.

5. **Excel (Optional):**

   o Used for quick exploratory data analysis and validation during initial stages.

Walkaround of the Dashboard

The dashboard is organized into five primary sections, each addressing specific analytical needs:

1. Overall Page

- **Purpose:** Provides a high-level summary of the cab operations.

- **Key Features:**

   o Total bookings and revenue.

   o Booking status breakdown: Successful, Cancelled by Driver, Cancelled by Customer, and Driver Not Found.

   o Line graph showing booking trends over the month.

- **Insights:** Enables stakeholders to assess the overall health of operations and booking trends quickly.

2. Vehicle Page

- **Purpose:** Highlights the performance of various vehicle types.

- **Key Features:**

   o Total bookings, revenue generated, and average ride distances per vehicle type.

   o Bar charts comparing vehicle performance metrics.

   o Interactive slicers to filter data by vehicle type and time period.

- **Insights:** Helps identify high-performing vehicle types and provides actionable insights for fleet optimization.

3. Revenue Page

- **Purpose:** Explores revenue trends and customer contributions.

- **Key Features:**
    - Revenue breakdown by payment methods: Cash, UPI, Credit Card, and Debit Card.
    - Top 5 customers based on total booking value, calculated using DAX.
    - Daily revenue trends visualized through line graphs.
    - Custom visuals showcasing revenue growth over the month.
- **Insights:** Offers a clear understanding of revenue streams and customer value segmentation.

4. Canceled Page

- **Purpose:** Examines ride cancellations to identify improvement areas.
- **Key Features:**
    - Total cancellations and cancellation rate, dynamically calculated using DAX.
    - Breakdown of cancellations by reason, such as driver-related or customer-related issues.
    - Pie charts and bar graphs illustrating the distribution of cancellations.
    - Filters to explore cancellations by time or vehicle type.
- **Insights:** Highlights operational inefficiencies and uncovers reasons behind cancellations, enabling targeted improvements.

5. Ratings Page

- **Purpose:** Tracks customer satisfaction trends.
- **Key Features:**
    - Average customer ratings over time.
    - Distribution of ratings by vehicle type, calculated using DAX measures.
    - Scatter plots and trend lines to identify patterns or anomalies in ratings.
    - Filters to segment ratings by time, vehicle, or payment method.
- **Insights:** Provides a deep understanding of customer satisfaction and areas requiring service quality enhancements.

SQL Analysis and Data Insights

The SQL queries addressed the following key business questions:

1. Retrieve all successful bookings to analyse operational success rates.
2. Calculate the average ride distance per vehicle type to understand usage patterns.
3. Determine the total number of rides cancelled by customers and analyse reasons.
4. Identify the top 5 customers with the highest number of bookings.

5. Evaluate driver-related cancellations due to personal and car-related issues.

6. Find the maximum and minimum driver ratings for Prime Sedan bookings.

7. Retrieve all rides paid via UPI to analyse payment trends.

8. Calculate average customer ratings per vehicle type for satisfaction analysis.

9. Compute the total booking value of successful rides to assess revenue performance.

10. List all incomplete rides with reasons to pinpoint operational inefficiencies.

Key BI Features and Skills Demonstrated

1. **Data Transformation with Power Query:**

   o Efficiently cleaned and transformed raw data to make it analysis-ready.

   o Created custom columns to enrich the dataset and simplify reporting.

2. **Advanced DAX Calculations:**

   o Developed complex measures for dynamic KPIs.

   o Implemented calculations for growth rates, averages, and cumulative metrics.

3. **Interactive Dashboard Design:**

   o Leveraged bookmarks and buttons to create a seamless user navigation experience.

   o Incorporated dynamic slicers and filters for granular data exploration.

4. **Custom Visualizations:**

   o Used advanced Power BI visuals to highlight key metrics attractively.

   o Applied conditional formatting to emphasize critical insights.

Conclusion

This project demonstrates expertise in end-to-end data analysis and visualization. By combining SQL's analytical power with Power BI's visualization capabilities, the project delivers actionable insights into cab booking operations. The effective use of tools like Power Query, DAX, and advanced visuals underscores the ability to use the right tools at the right time. The interactive dashboard provides stakeholders with a comprehensive tool to monitor performance, improve customer satisfaction, and optimize operations efficiently.