

Uber Supply–Demand Gap Analysis

Exploratory Data Analysis (EDA) | SQL | Excel Dashboard

1. Business Problem

Uber faces a recurring supply–demand imbalance where customer ride requests are not always fulfilled.

A significant number of requests fail due to unavailability of cars or cancellations, especially during certain time slots and locations.

This project aims to identify when and where these gaps occur so that Uber can improve driver allocation and reduce failed trips.

2. Dataset Overview

The dataset used in this project contains Uber ride request data for a specific time period.

It includes details such as request ID, pickup point, driver ID, request and drop timestamps, ride status, request hour, and derived time slots.

After data cleaning using Python, the final dataset consists of 4,095 records and 8 columns, which were used for further analysis in SQL and Excel.

3. Tools & Technologies Used

- Python (Pandas, Matplotlib, Seaborn) – Used for data cleaning and exploratory data analysis
- MySQL – Used to store data and perform analytical queries
- Microsoft Excel – Used to create interactive dashboards and visualizations
- Jupyter Notebook – Used to execute Python EDA
- Microsoft Word – Used for documenting insights and conclusions

4. Key Analysis & Insights

1. Overall Request Distribution

The analysis shows that a large number of Uber ride requests were successfully completed. However, a significant portion of requests failed due to either cancellations or unavailability of cars, indicating a supply–demand gap.

2. Time Slot Analysis

Morning and Evening time slots have the highest number of ride requests. The Evening and Night time slots show a higher number of failed requests, mainly due to “No Cars Available”. Early Morning has the lowest demand and fewer failures.

3. Pickup Point Analysis

Airport pickup points experience a high number of failed requests due to unavailability of cars, whereas City pickup points show a higher number of cancellations. This indicates location-based supply challenges.

4. Status-wise Analysis

Most completed trips occur during Morning and Evening hours. Failed requests are more frequent during peak demand periods, suggesting insufficient driver availability during those times.

5. Key SQL Insights

SQL analysis confirms that Morning time slot has the highest number of total requests. Airport locations face more supply shortages, while City locations face more cancellations, reinforcing the findings from Python and Excel analysis.

5. Solution to Business Objective

Based on the analysis, Uber should focus on improving driver availability during peak demand periods, especially during Morning, Evening, and Night time slots. Providing incentives to drivers for operating during these high-demand hours can help reduce the number of failed requests.

Additionally, special attention should be given to Airport pickup points where unavailability of cars is high. Implementing better demand forecasting and dynamic driver allocation strategies can improve trip completion rates. Reducing cancellations in City areas through improved driver assignment can further enhance customer satisfaction.

6. Conclusion

This project successfully analyzed Uber ride request data to identify supply-demand gaps using Python, SQL, and Excel. The analysis highlighted peak demand time slots and location-based challenges that lead to failed ride requests. By improving driver allocation and demand forecasting, Uber can reduce failures, improve customer satisfaction, and increase operational efficiency.