eBay Car Sales

Team Members:

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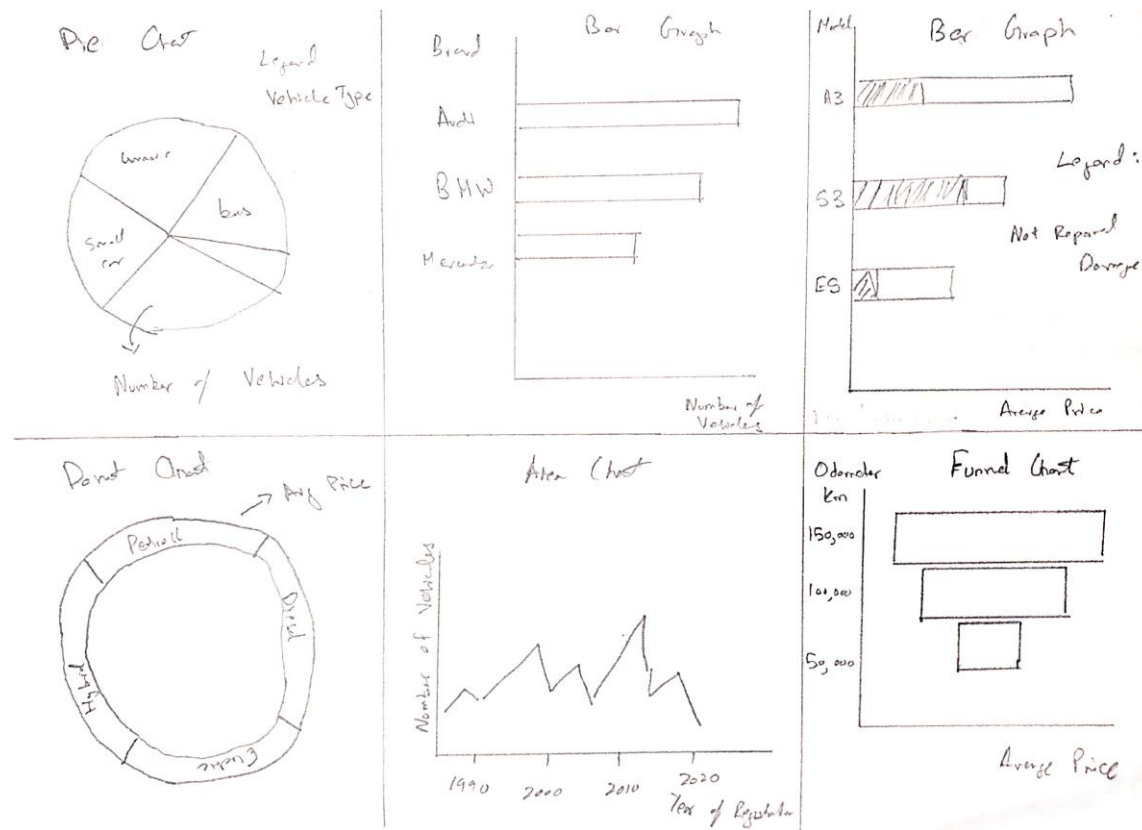# Exploratory Data Analysis, Missing Value Analysis, and Data Wrangling

Collab Notebook Link:
https://colab.research.google.com/drive/1_0GnFCK9T00PkXhBEfXw2LAe0yrYAhPf#scrollTo=b5Q9yMmy-PUO
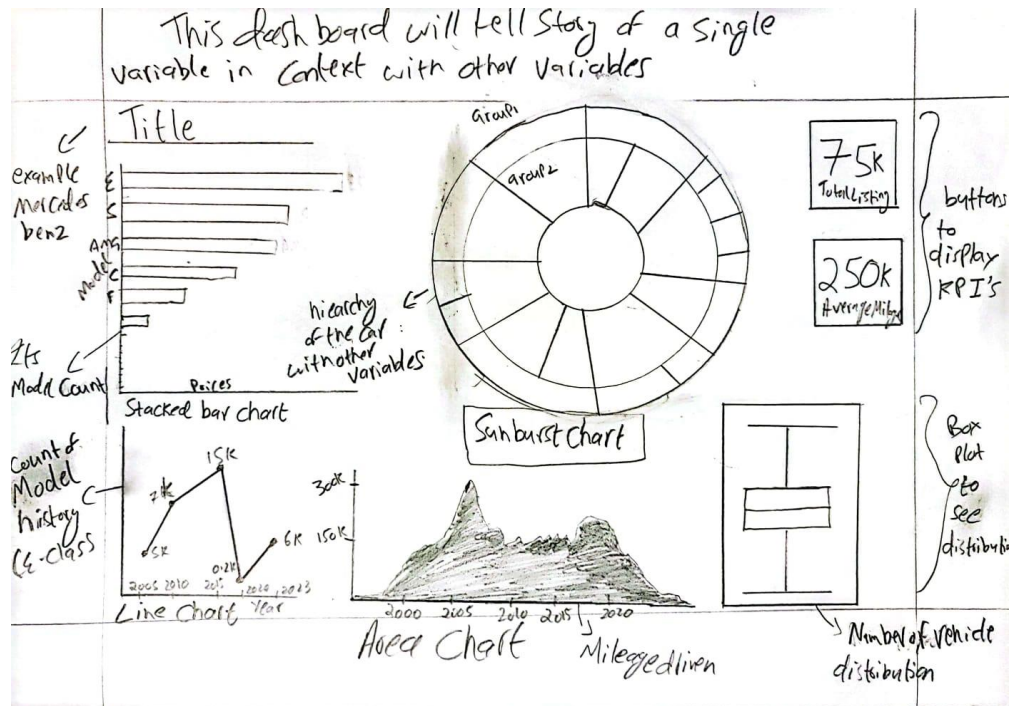
Business Problem Statement

Enhancing Trust, Buyer Satisfaction, and Fraud Detection in eBay Vehicle Listings. eBay, as an online marketplace for vehicle listings, faces several challenges related to trust, buyer satisfaction, and fraudulent listings. These challenges impact the overall customer experience, hinder business growth, and pose risks to the reputation of the platform. It is crucial for eBay to address these challenges and implement solutions that build trust, improve buyer satisfaction, and enhance fraud detection capabilities.
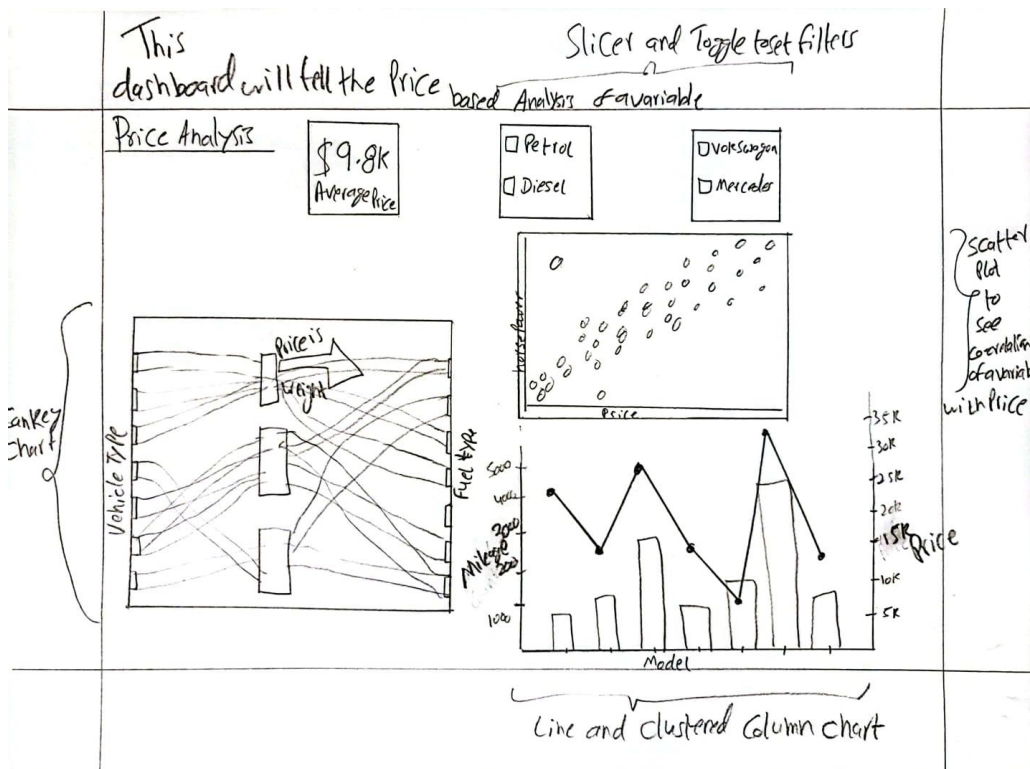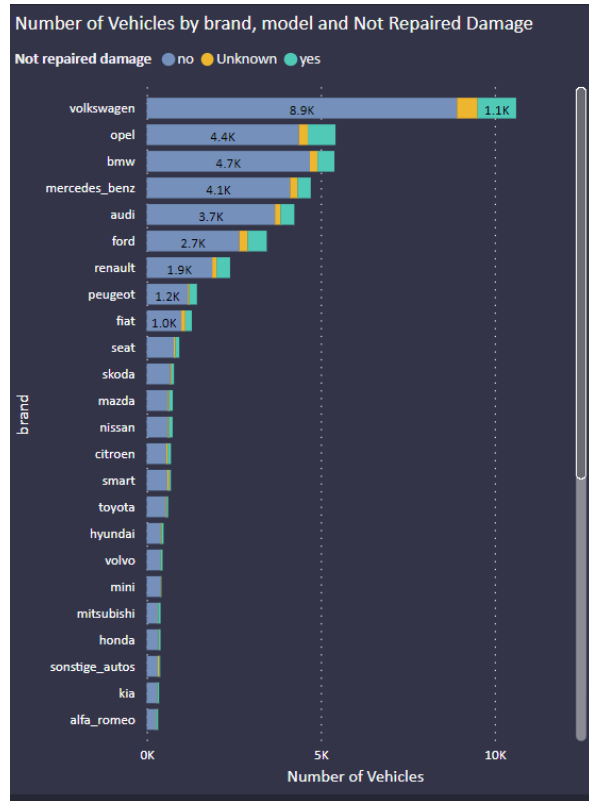
Paper Chart

Vehicle Count Analysis

This dashboard will tell Story of a single variable in context with other variables

Title

example Mercedes benz

A-class model

Its Model Count

Prices

Stacked bar chart

Count of Model history (E-class

Line Chart, Year

15k
2k
5k 0.2k
6k 150k
2005 2010 205 2010, 2013

Group1
group2

hierarchy of the car with other variables

Sunburst Chart

30k

2000 2005 2010 2015 2020

Area Chart   Mileage driven

75k Total Listing

250k Average Mileage

buttons to display KPI's

Box Plot to see distribution

Number of vehicle distribution

Vehicle Price Analysis

This dashboard will tell the Price based Analysis of a variable

Slicer and Toggle to set filters

Price Analysis

$9.8k Average Price

☐ Petrol
☐ Diesel

☐ Volkswagen
☐ Mercedes

Sankey Chart

Vehicle Type

Price is high

Fuel type

Mileage
5000
4000
2000
200
1000

Horsepower

Price

Model

35k
30k
25k
20k
15k Price
10k
5k

Scatter Plot to see correlation of variable with Price

Line and clustered Column chart

Single Chart Analysis

**Vehicle Count Analysis Dashboard Visuals**

Stacked area chart showing count of vehicles by brand and model (drill down) and in legend nor repaired damage, Volkswagen is quite ahead with over 10K+ vehicles listed. Most vehicles listed here are manual, except for Mercedes Benz which obviously is a top tier Luxury brand. We can also see that German cars are quite popular in our dataset compared to Japanese brands
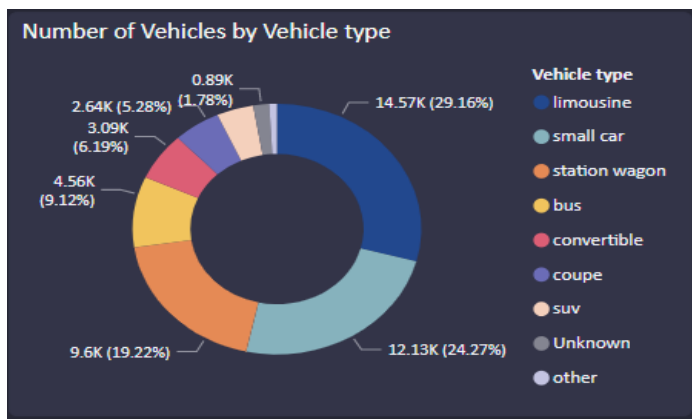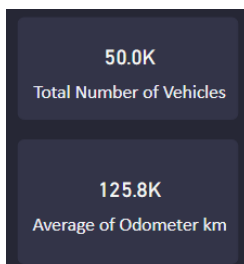
A pie chart showing count of vehicles by vehicle type, we can see small car and limousine are very close to each other at around 25-30%
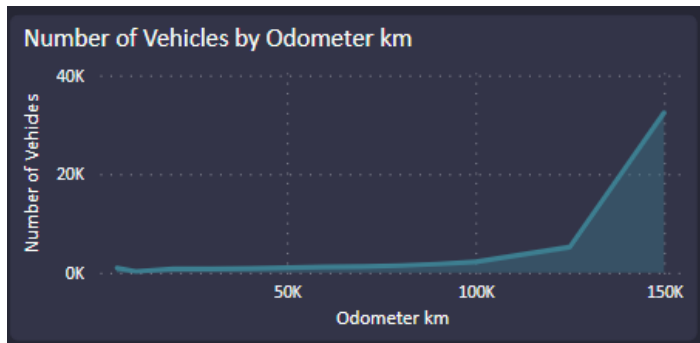
Area chart showing count of vehicles by Odometer/Distance Driven which we can clearly see is around 125k+
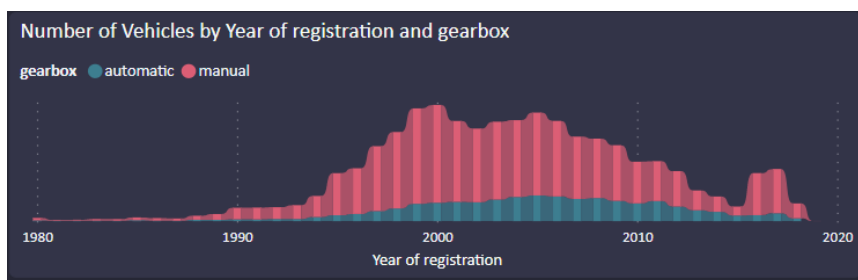
Above ribbon chart shows, count of Vehicles by year of registration and in legend gearbox, we can see most cars are registered in 2000's and early 2010's no wonder why most cars are having manual transmission

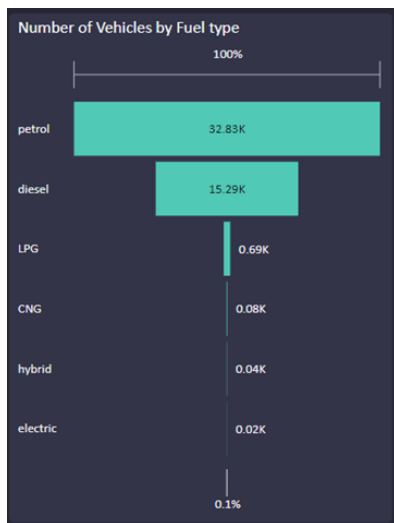Cards Show Total Number of Vehicles and the average distance traveled on the odometer
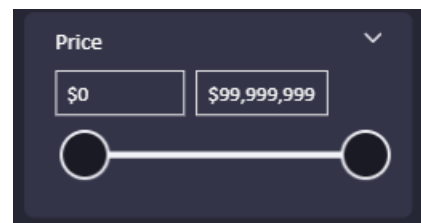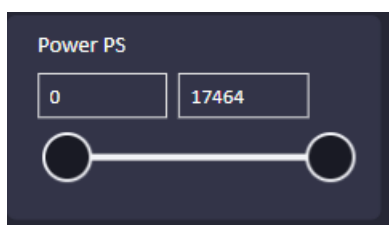
Chart showing count of vehicles by Fuel type, we can see the clear winner by miles! Petrol

Vehicle Price Analysis Dashboard Visuals:

This card just shows the average price of cars to be sold which is $9.8K.
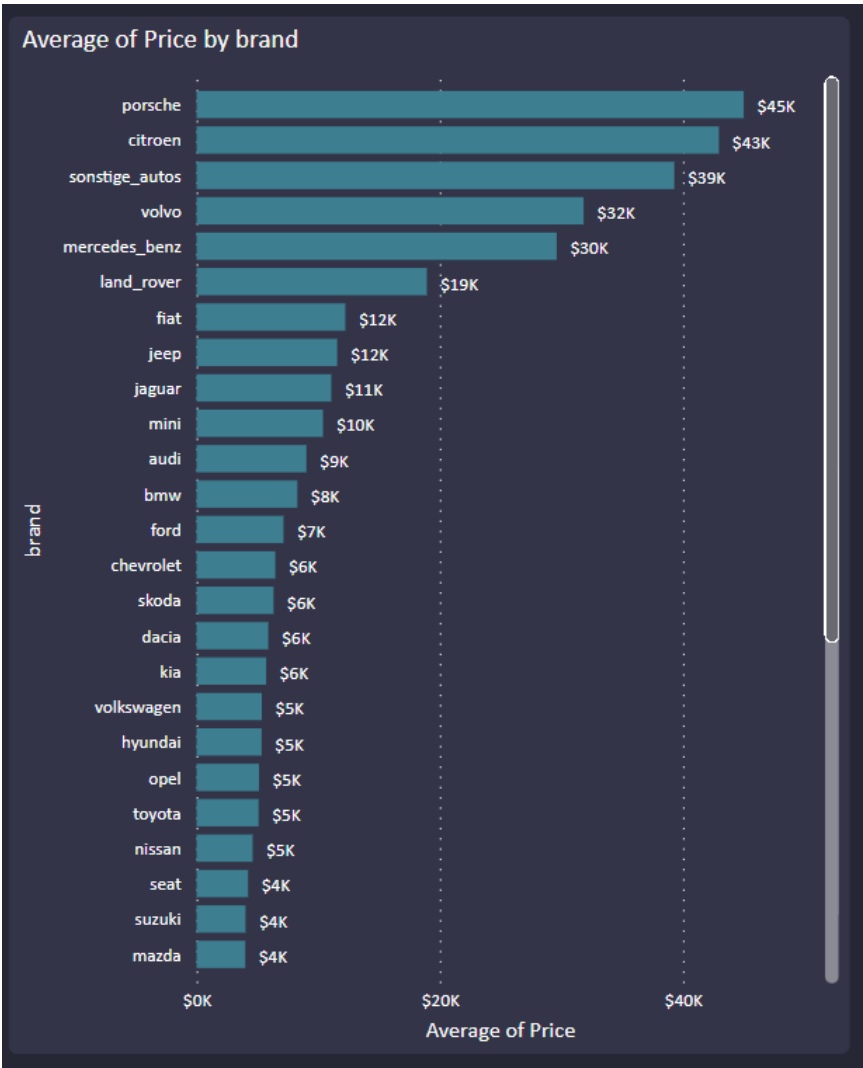

These slicers can take the input of starting and ending values of Power PS and Price which can change the data shown on the graphs by slicer movement.

These slicers are for the column gearbox and not repaired damage with their unique values which can change the data and stats shown on the dashboard with different combinations of options chosen on the slicers.


Above stacked bar chart shows that at an average price of $44,996.99, Porsche has the highest Average Price and was 4,191.72% higher than Daewoo, which had the lowest Average Price at 1,048.46. Meanwhile, Citroen has the second-highest Average Price which is around $42,950.

Across all 40 brands, the Average Price ranged from $1,048.46 to $44,996.99.

Average of Price by Odometer km and gearbox

gearbox ● automatic ● manual ● Unknown
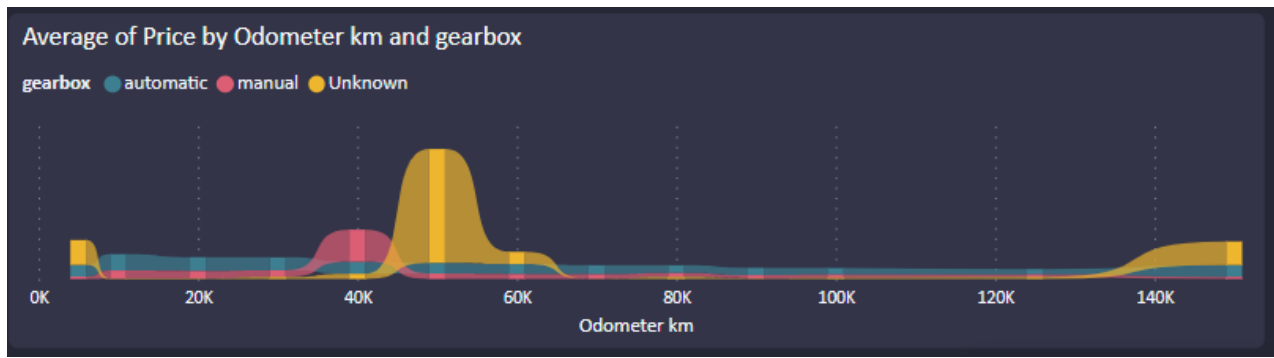
Above ribbon chart shows that at odometer value of 50,000 km had the highest Average Price that is $248,614, amongst the gearbox category Unknown had the most contribution leading towards a fraud flag.

Across all 13 Odometer, the average price ranged from $6,179.94 to $248,614.

Average of Price by Vehicle type and Fuel type
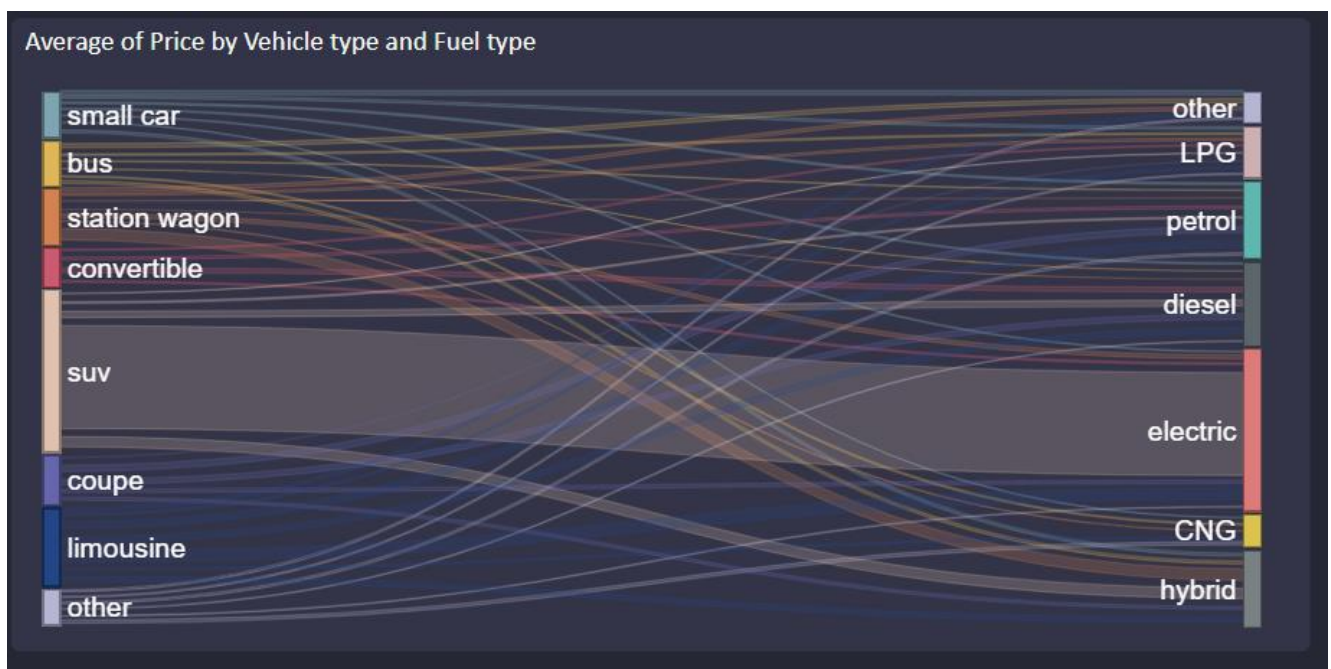
The above Sankey chart shows the average price analysis by every vehicle type combination with its according to Fuel type. The most significant and highest Average Price is $0.15M between the vehicle type SUV with the fuel type electric.

Dashboard Analysis
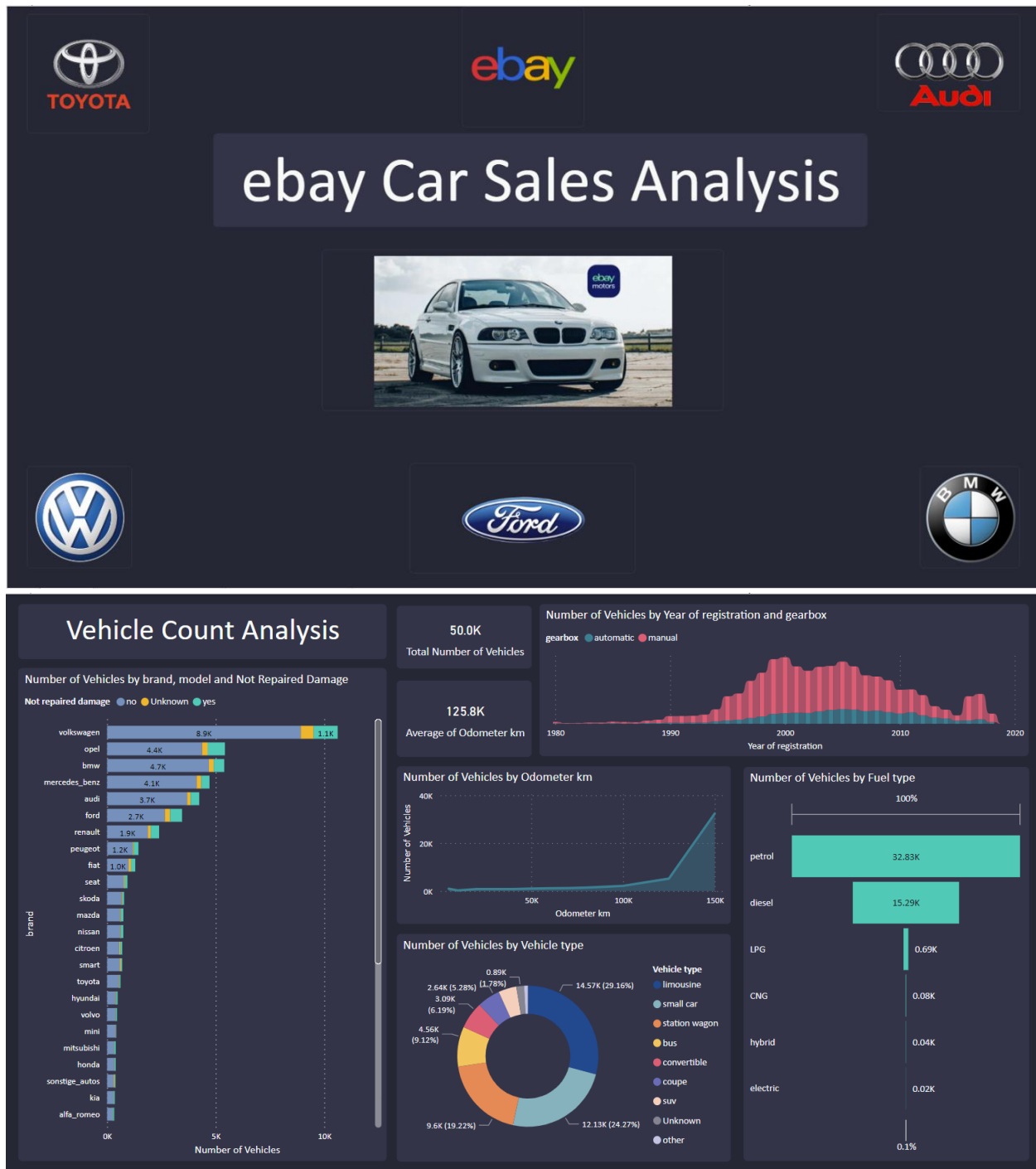
This dashboard is essentially counting our variables. It gives us mainly the popularity and choice analysis like what car brand is mostly listed, what is the mileage of cars listed at EBAY. We have utilized various charts to showcase the distribution of important variables like fuel type, vehicle category etc. to give our readers a 360 view of the data frame.
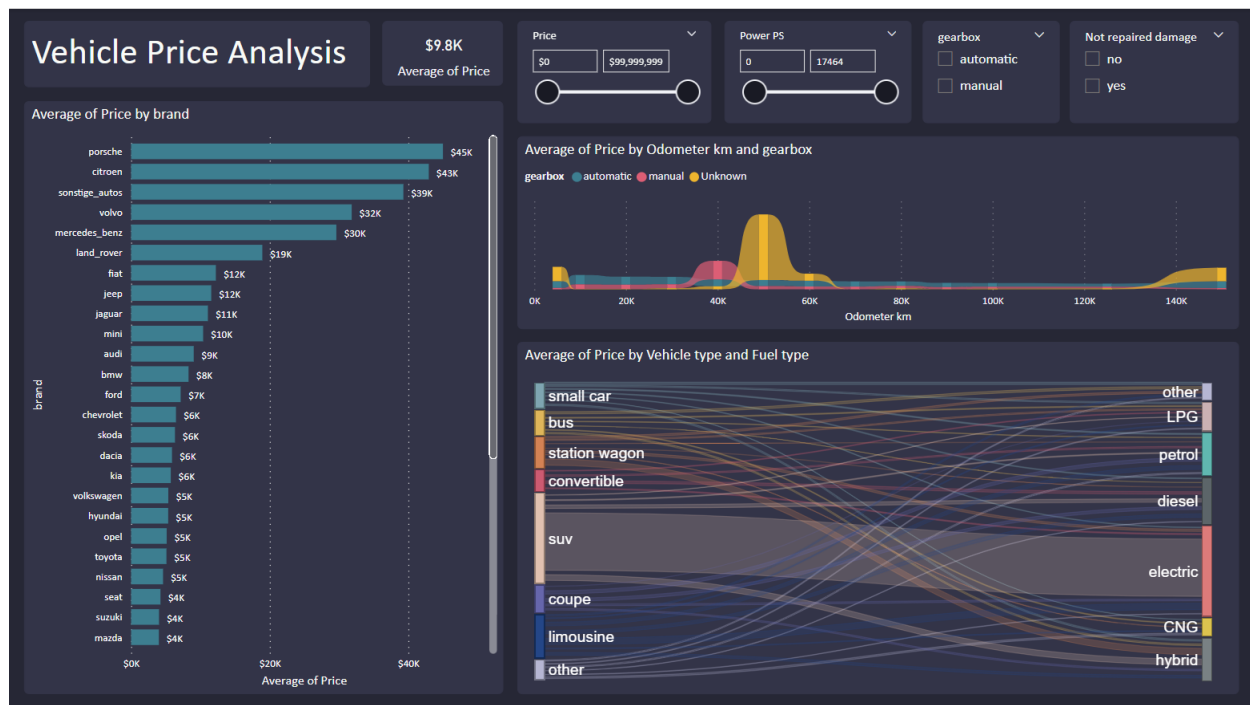
Whereas this dashboard is looking after all the price and all cost variables associated with it. In this dashboard we have a slicer and buttons to toggle the dynamic variables such as Horsepower, transmission type etc. Here we can see the cost in context of other variables such as fuel type, brand, mileage and then use the slicer to further dig down into our dataset.

Business Solution

eBay aims to improve customer relations with both sellers and buyers by addressing key challenges related to trust, buyer satisfaction, and fraudulent listings. To achieve this, a comprehensive dashboard will be developed, providing essential vehicle listing information to both sellers and buyers. The dashboard will serve as a reliable reference for estimating vehicle prices and market demand, enabling sellers to set competitive prices and helping buyers make informed purchasing decisions.

Benefits and Impact:

Fraud Detection: The dashboard will include key metrics and features of vehicle listings, allowing eBay to identify and mitigate fraudulent transactions. High or low price outliers can be easily flagged, enabling proactive measures to combat fraud and maintain the integrity of the platform.

Trust Building: By providing sellers with access to aggregated data on average prices and key features of similar listings, the dashboard instills confidence in sellers that they are setting fair

and competitive prices. Buyers, on the other hand, gain trust in the platform by comparing listings with the average prices and features displayed on the dashboard.

Buyer Satisfaction: With access to market rates and demand indicators through the dashboard, buyers can make more informed decisions when purchasing a vehicle. This transparency fosters buyer satisfaction, as they can trust that the listed prices align with market standards, and they are not overpaying for their desired vehicle.

Business Growth: The improved trust, buyer satisfaction, and fraud detection capabilities provided by the dashboard contribute to eBay's overall business growth. The platform attracts more buyers, resulting in increased vehicle listings and transactions. Moreover, eBay becomes a preferred choice for buyers, who find assurance in the transparency and reliability of the platform's vehicle listings.

By leveraging this dashboard, eBay strengthens its customer relationships, enhances trust between sellers and buyers, and fosters growth in its vehicle listing business.

Team Member Contribution

Team Member	Background Knowledge	Business Problem Generation	Exploratory Data Analysis	Data Wrangling	Paper Charting	Power BI Charts	Making Report	Presentation Preparation
Muhammad Mujtaba Khan	25	35	35	50	35	40	30	20
Sarmad Ahmed Usmani	40	30	40	30	20	30	35	40
Rahman Ahmed Awan	35	35	25	20	45	30	35	40