Project Design Phase-I
Problem - Solution Fit

Date	19 September 2022
Team ID	PNT2022TMID05680
Project Name	Project - Car Resale Value Prediction
Maximum Marks	2 Marks

Problem - Solution Fit:

The sales of second-hand imported cars and used cars is increasing nowadays. Predicting the price of used cars is an important and interesting problem. Predicting the resale value of a car is not an easy task. It is trite knowledge that the value of used cars depends on a number of factors. The value of a car drops right from the moment it is bought and the depreciation continues with each passing year. In fact, in the first year itself, the value of a car decreases by 20 percent of its initial value. The make and model of a car, total kilometers driven, overall condition of the car and various other factors further affect the car's resale value. So, it is necessary to build a model and design an application or website to estimate the price of used cars. The model should take car related parameters and output a selling price of the car. The selling price of a used car depends on certain features as mentioned below:

- Fuel Type
- Manufacturing Year
- Miles Driven
- Number of Historical Owners
- Maintenance Record, etc.,

Purpose:

- This can enable the customers to make decisions.
- Due to the high pricing of new cars along with the incapability of customers to invest in them, second-hand car sales are on a global increase.
- A second-hand car price prediction system is required to effectively determine the worthiness of the car using a variety of features.
- It is important to know their actual market value while both buying and selling.
- Having a fair estimate of the car's worth is a sure shot way to get the best possible value for the old car.
- As a seller, he/she wants to get the maximum price but the aim is the opposite for the buyer or the car dealer. So, to become aware of such things should be given importance.
- Need to calculate resale value of the car with the help of the correct valuation tool to know the market price or what could be the market price of the vehicle.
- To negotiate with the dealer or seller with due diligence and end up in a profitable deal.
- Estimating the best price for the car.
- Getting insight into industry rates and trends.
- Safeguarding against underhanded practices.
- Confidence for negotiations.

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<td>1. CUSTOMER SEGMENT(S)
• Consumers who are actively looking to buy an automobile.
• This audience segment also has people who actively look to make a purchase by frequently visiting automotive-related locations such as dealerships and visiting review and price comparing websites.
• When most people think of the target market for used cars, they typically think of young people who are just starting out in life and who are looking for a cheaper alternative to a new car.</td>
<td>6. CUSTOMER CONSTRAINTS
• Check the Car’s Condition
• Maintenance Records
• Car Mileage
• Check Registration Certificate
• Car Insurance
• Fuel Type
• Transmission Type (i.e., Manual or Automatic)</td>
<td>5. AVAILABLE SOLUTIONS
• Prediction of resale probability.
• Prediction of resale value with only few parameters.
• Websites that predict whether the used car or second-hand car is eligible for sales or not.</td>
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<td>2. JOBS-TO-BE-DONE /PROBLEMS
• Accuracy of the predicted value.
• Providing the users with the most accurate resale value as output.
• Overfitting in model.
• Errors in the training or prediction process.
• Customer Satisfaction.
• User Interface problems.</td>
<td>9. PROBLEM ROOT CAUSE
• Training the model to provide accurate results.
• Constantly changing trends of cars.
• Parameters or factors that affect the resale value of the cars.</td>
<td>7. BEHAVIOUR
• If the prediction is not accurate then the user tends to go in search of other websites.
• The customer gets irritated or stressed if the user interface design is not good and faces difficulties in working with the website.
• These are some of the behaviors of users that may occur generally.</td>
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<td>3. TRIGGERS
• Reading about innovative ideas.
• Advertisements and social media promotions.
• More efficient solution.
• Recommendation from their well-wishers.</td>
<td rowspan="2">10. YOUR SOLUTION
• In order to predict the resale value of the car, an intelligent, flexible, and effective solution which works based on a machine learning algorithm has been found.
• Considering the main factors which would affect the resale value of a car, the machine learning model has been trained to give the nearest resale value of the car.
• The machine learning model that has been used is Random Forest Regression. This gives the reasonable resale value of the car.</td>
<td>8. CHANNELS OF BEHAVIOUR
8.1 ONLINE
• Reviews
• Comments
• Blogs
• Posts
• Status
• Sharing information through social media sites</td>
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<td>4. EMOTIONS: BEFORE/AFTER
Before the Problem is solved:
• Stress
• Frustration
• Anger
• Blocking
• Bad opinion on the website
After the Problem is solved:</td>
<td>8.2 OFFLINE
• Mouth of word
• Communication
• Meetings
• Letters</td>
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• Feeling smart • Good opinion on the website • Trust • Boost • Happy		