

# **CAR CHECKMATE**

## **MANAGING CAR PRICE FOR USED CAR**

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### **ABSTRACT**

Buyers and sellers often struggle to find a fair price as there are many factors that influence a car's value, thereby navigating the car market becomes tricky. It's crucial to get the pricing right for smooth transactions, but it is challenging. Sellers frequently miss out the benefits of pre-sale inspection, which can make their cars more appealing to buyers and help them get a better price.

Our website can make things simple. Using machine learning, we can offer accurate price predictions and personalized recommendations for pre-sale inspections, making the process easier and more transparent for everyone involved.

### **1. PROBLEM STATEMENT**

Due to misinformation and uncertainty regarding the fair market value of vehicles. As there is a struggle to arrive at an accurate price point, there could be a potential financial loss and prolonged negotiation periods. As the sellers are usually unaware of the importance of pre-sale inspection as they can boost their car's value and also give reassurance to the buyers.

### **2. MARKET/ CUSTOMER/ BUSINESS NEED ASSEMENT**

Globally this market for selling used cars is huge, many people are selling and buying cars every year. When it comes to understanding the perspective of an individual, they would like to make sure that the car is being bought or sold at the fair price, therefore there comes a need for reliable source. Mechanics and service providers are always looking for new customers. They need a way to connect with people who require inspection to sell the cars. Our objective is to make the used car market more efficient and transparent.

### **3. TARGET SPECIFICATIONS AND CHARACTERIZATION**

Car owners and buyers in age category of 20 to 60 ,appreciate clear and honest information. Dealerships also need reliable pricing tools to stay in this competitive market that helps to provide better deals. Mechanics would like to grow their business by connecting with more customers. Based on whether you have a luxury or standard car, we offer pre sale inspections advise. The platform is designed to be simple and easy to use, requiring minimal input from the user.

#### **4. EXTERNAL SEARCH**

The sources used for references for the product used car price prediction and for understanding the sales and marketing are mentioned below:

- <https://www.forbes.com/sites/bernardmarr/2023/10/12/the-impact-of-digital-transformation-on-business-models-opportunities-and-challenges/>
- [https://www.researchgate.net/profile/A-Chandak/publication/335799148\\_Car\\_Price\\_Prediction\\_Using\\_Machine\\_Learning/links/61c46128c48a3d26b74b3c6e/Car-Price-Prediction-Using-Machine-Learning.pdf](https://www.researchgate.net/profile/A-Chandak/publication/335799148_Car_Price_Prediction_Using_Machine_Learning/links/61c46128c48a3d26b74b3c6e/Car-Price-Prediction-Using-Machine-Learning.pdf)
- <https://blog.hubspot.com/marketing/affiliate-marketing-guide>
- <https://towardsdatascience.com/used-car-price-prediction-using-machine-learning-e3be02d977b2>

#### **5. BENCHMARKING ALTERNATE PRODUCTS**

Platforms like Edmunds, CarGurus and Kelly Blue Book offer valuable services but does not provide a complete solution. Edmunds provides and insightful price information but misses out in recommending inspection services. CarGurus gives customers satisfying price for the cars but they also do not connect the customers with the mechanics for the pre sale inspections. Kelly Blue Book also is known for their reliable car valuation like others it also lacks providing the details of the mechanics

Our platform not only helps to deliver accurate price predictions but also offers actionable pre sale inspection recommendations, based on whether the car is a luxury or standard model

#### **6. APPLICABLE CONSTRAINTS**

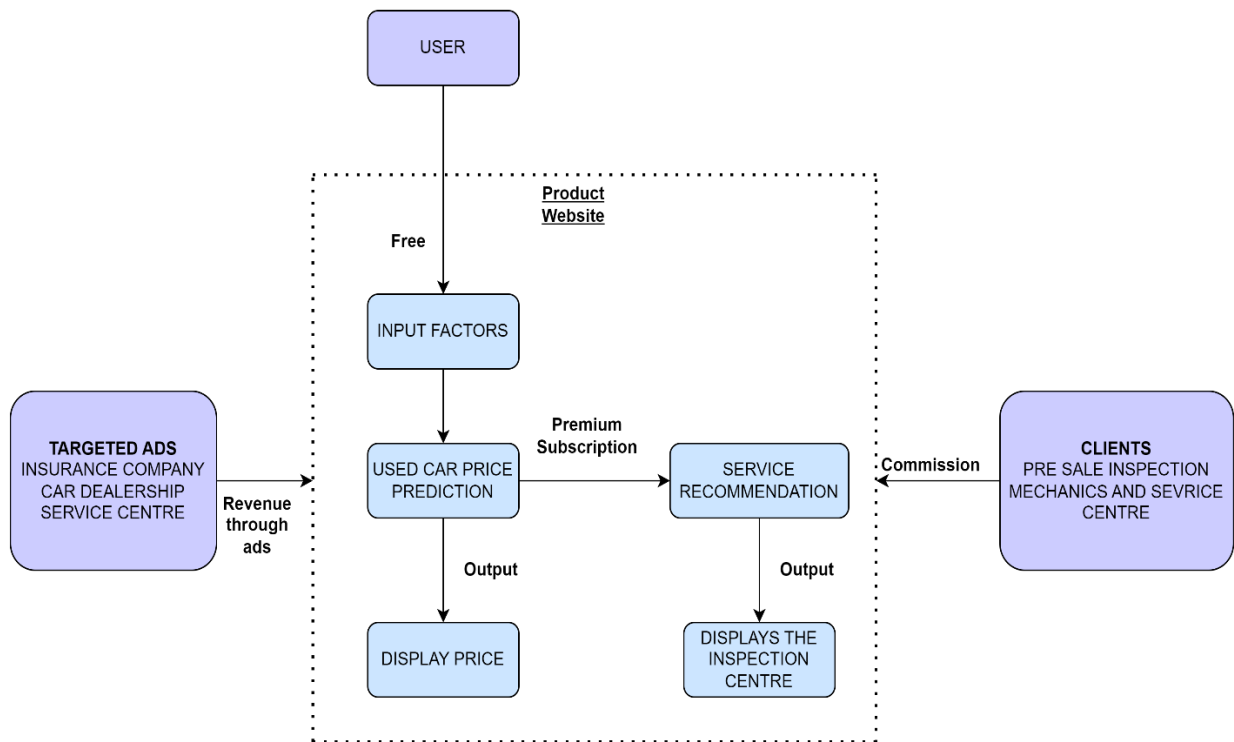
There is no requirement for a large office or storage facilities, as everything is web based and they operate online. This makes it efficient and accessible from anywhere.

Building a platform requires a diverse set of skills , that is experts in machine learning to develop prediction models , web developers, to create an intuitive and responsive interface, and people with deep understanding of the automotive market providing relevant recommendations.

Forming partnership with car inspection services and mechanics

#### **7. BUSINESS MODEL**

Our website has an approach where the basic predictions are free, and to access the recommendation feature the user have to go for subscription. Revenue can be attained from partnerships with the mechanics and targeted ads, and also through commissions from the transaction's facilitated by the platform



## 8. CONCEPT GENERATION

The idea emerged from observing significant gaps in the used car market. One such observation is that the buyers and sellers struggle to obtain an accurate price prediction. Sellers are unaware of the boost in price that can be obtained by the pre sale inspection and also can give reassurance to the buyers. Our solution to this comprises of combining precise price predictions with personalized pre sale inspection recommendations.

## 9. CONCEPT DEVELOPMENT

Name : Car CheckMate

This is a web based platform providing predictions that are AI – powered and also personalized pre sale inspection recommendations.

- Core Features:

User friendly interface for entering the car details, instant accurate used car price predictions using our machine learning models. Recommendations for nearby mechanics and inspection services tailored the cars type

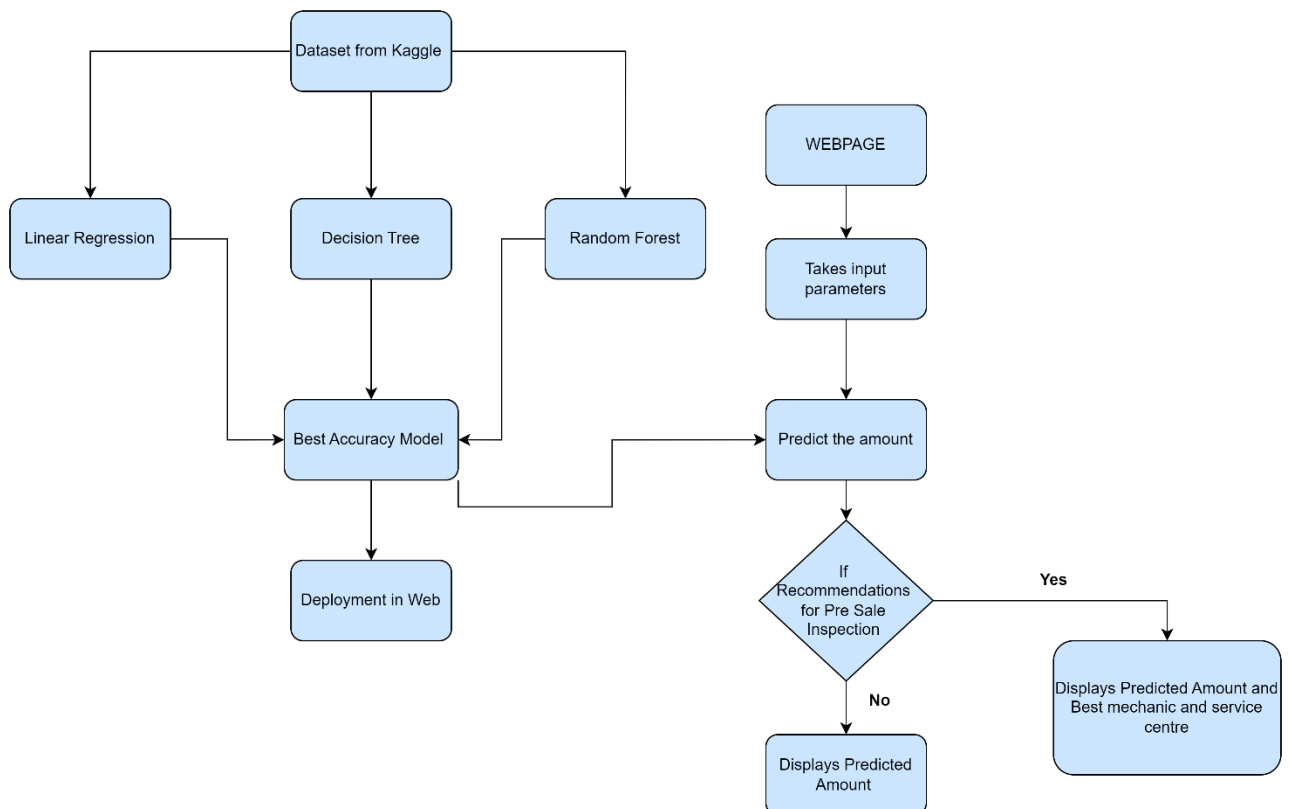
- Development Plan:

- Data Collection and Preprocessing, collecting relevant data points like make, model, year, mileage. Clean the data by handling missing values. Normalize the numerical features.
- Machine Learning Model Development : using Linear regression, decision trees, random forest algorithms, we can generate a model.

- Using frameworks like react we can build the UI that inputs car details and displays price and recommendations.

## 10. FINAL PRODUCT PROTOTYPE

- This product is in the form of a web page where the user finds the price of their car by inputting the parameters. The accurate model from the training using linear regression, decision tree and random forest can be taken to predict the best value for the car. The web page displays the value of the used car and also recommends few pre sale inspection centres.



## 11. PRODUCT DETAILS

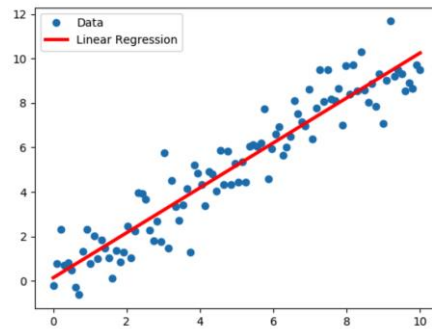
The product is designed to predict accurate car prices and also gives recommendations for the pre sale inspection.

User enters the basic details about the used car, make , model, year, mileage etc. the platform processes this information using machine learning model trained vastly on the dataset provided by Kaggle for used car sales. Within seconds the platform generates an accurate price prediction, giving users a reliable estimate of their car's value.

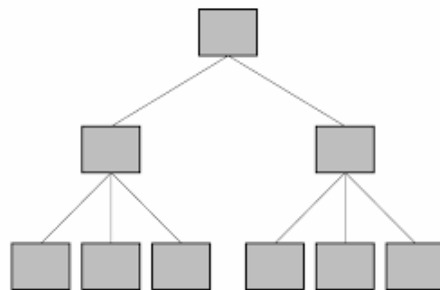
Based on the car's details, the platform suggests nearby mechanics and inspection services for those who are subscribed.

- **ALGORITHM**

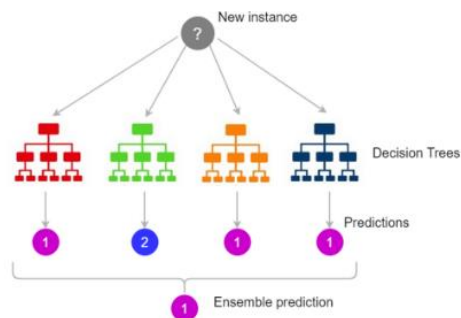
- **Linear Regression:** It is one of the simplest and commonly used algorithm for predictive modelling. This works by basically finding the best fit line from the given data points. The idea is to establish a linear relationship between the car features



- **Decision Tree:** Splits the data into branches based on feature values creating a tree-like model for making right decisions. Each branch will represent a possible decision based on a specific feature, and the end node will represent the predicted car price.



- **Random Forest:** This uses ensemble method that builds multiple decision trees and merges their predictions. Each tree is built from a random subset of the data and features, and the final prediction will be the average of all the trees' predictions.



## **12. CONCLUSION**

This is designed to revolutionize the used car market by combining cutting edge technology with practical user friendly features. By offering accurate price predictions and tailored pre sale inspection recommendations, we aim to bring clarity and efficiency to both buyers sellers.