AVS ENGINEERING COLLEGE
We Create Responsible Engineers
ISO 9001:2015 Certified Institution
Military Road, Ammapet, Salem - 636 003.

PROJECT REPORT

PROJECT TITLE : Car Resale value Prediction

TEAM ID : PNT2022TMID30912

TEAM MEMBERS : Risitha K (TEAMLEAD)

Saranya M

Revathi M

Rajalakshmi R

1.INTRODUCTION

1.1 Project overview

The Car Valuation Tool is a free tool designed to help you get the estimated resale value of your car within seconds.Our automobile valuation algorithm is real-time updated, so it keeps up with the most recent modifications and market trends. However, the amounts displayed during the online assessment are only estimates and might alter when the retailer inspects your automobile. You don't even need to register to have your automobile valued; all you need to do is provide some basic information about it, such as its make, model, amount of miles driven, city of residence, and contact information.

1.2 Purpose

In 2019, the Indian used automobile resale industry was valued at $24.2 billion USD. There is a critical need to close this gap between sellers and buyers due to the enormous demand for used automobiles and the shortage of professionals who can evaluate the proper valuation. The goal of this research is to create a system that can impartially forecast a car's resale value based on little information such as the number of miles travelled and the year of

purchase.The process of determining the current used automobile pricing in a certain location is known as used car value. By selecting the brand, model, year, trim, and the number of kilometers travelled, a user of OBV may quickly determine the used car's price. The value of a used automobile is based on a number of variables, including its state right now, when it was bought, etc. Used automobile valuation will never have a precise price; instead, it will always fall within a reasonable price range.

2.LITERATURE SURVEY

2.1Existing problem

Car Resale value prediction is one of the best to sell our in this market for an best and better price.Rather than giving our car to an less price , the customer those who uses the car will be benifitted and the seller will also be benefitted.The goal of this research is to create a system that can impartially forecast a car's resale value based on little information such as the number of miles travelled and the year of purchase.You don't even need to register to have your automobile valued; all you need to do is provide some basic information about it, such as its make, model, amount of miles driven, city of residence, and contact information.

2.2 References

[1] Pudaruth Sameerchand , Pudaruth Sameerchand , Predicting the price of Used Car Using Machine Learning Techniques

[2] Enis gegic, Becir ,Isakovic, Dino Keco, ,Zerina Masetic,Jasmin Kevric Car Price Prediction Using Machine Learning

[3] Ning sun,Hongxi Bai,Yuxia Geng,Huizhu Shi Price Evaluation model in second hand car system

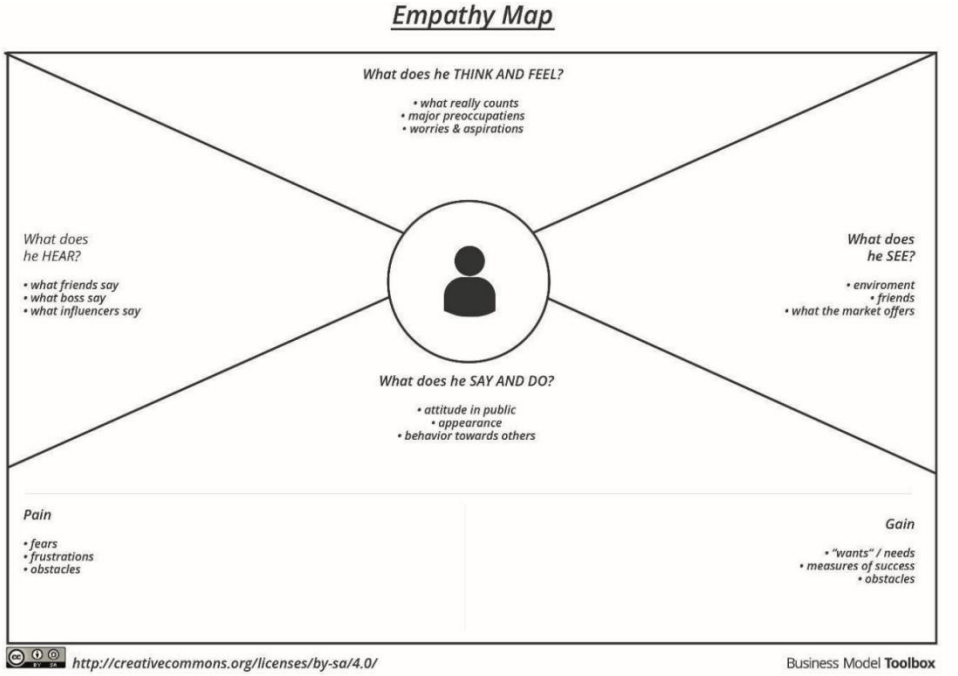
[4] Doan Van Thai, Luong Ngoc Son, Pham Vu Tien, Nguyen Nhat Anh, Nguyen Thi Ngoc Anh Prediction car prices using qualify qualitative data and knowledge-based system

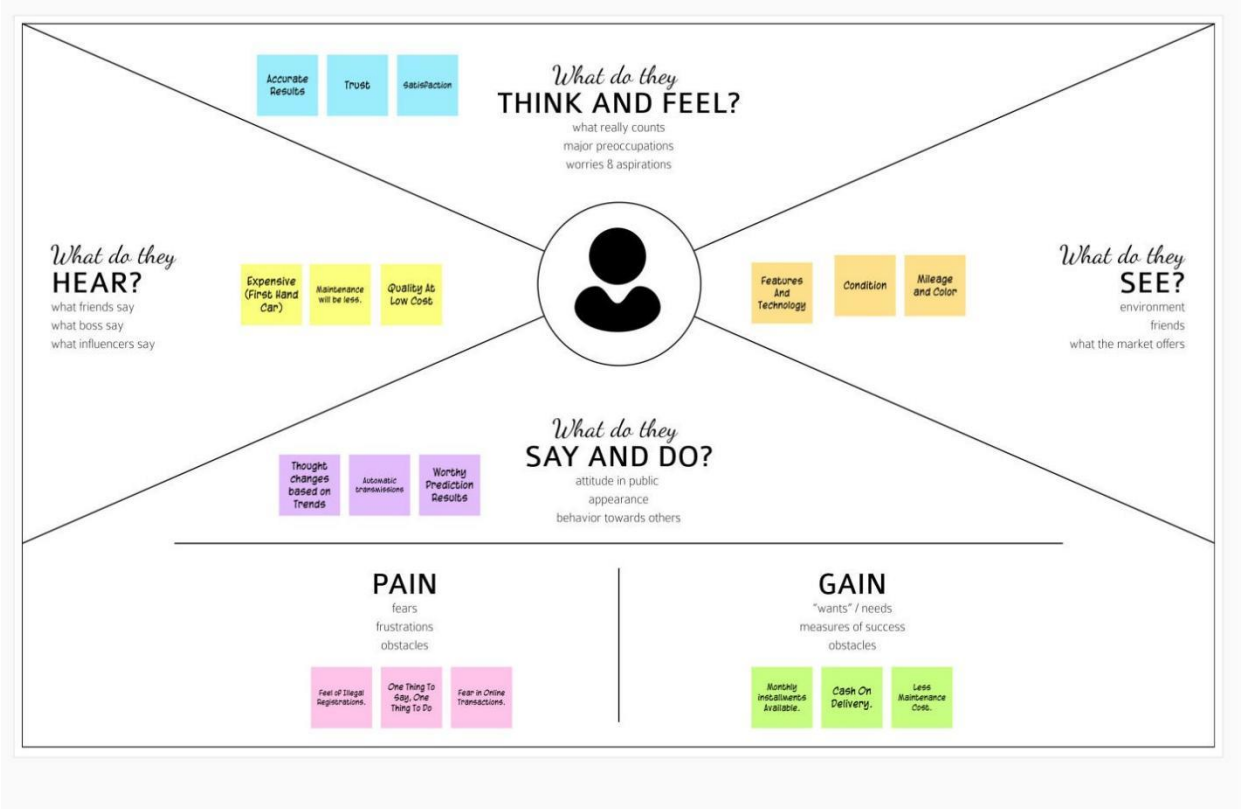
2.3 Problem Statement Definition

Car Resale value prediction is used to predict the value of the used cars to an reasonable price which satisfies the customer.

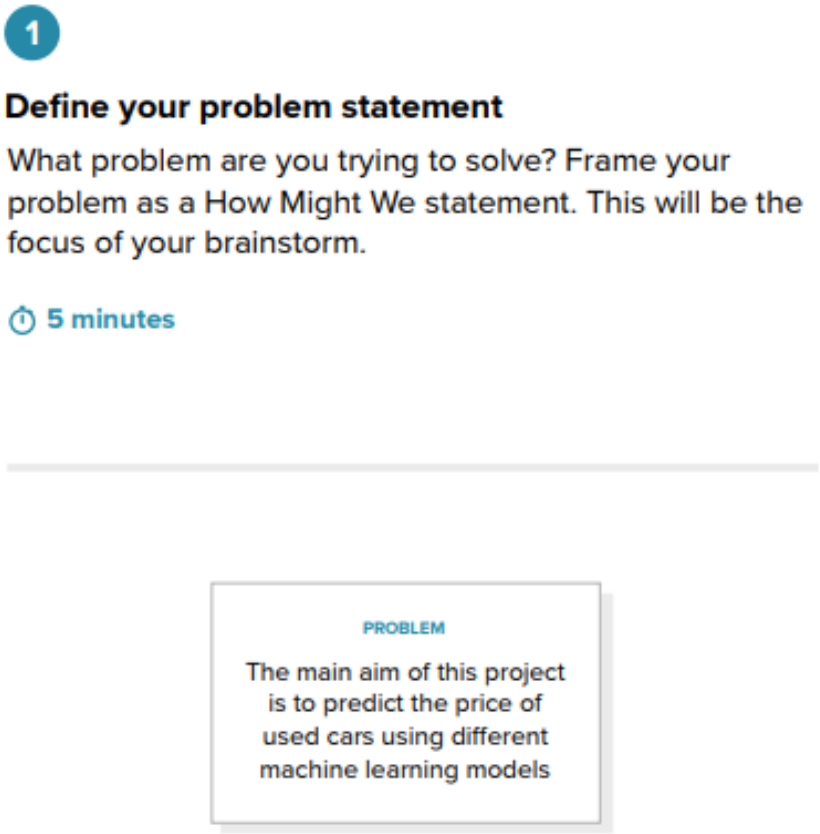
3 IDEATIOIN AND PROPOSED SOLUTION

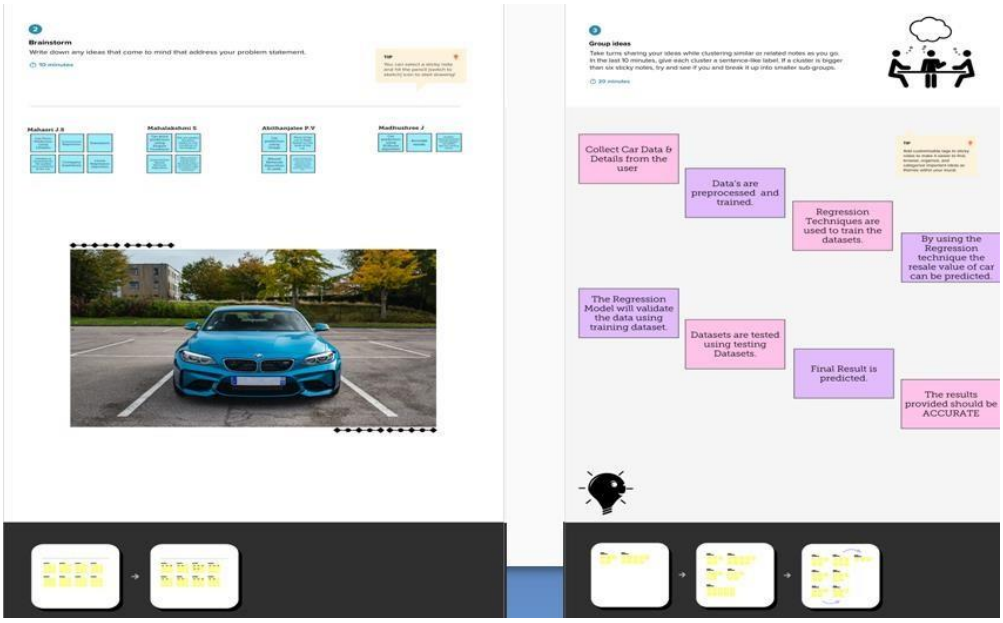
3.1 Empathy Map Canvas



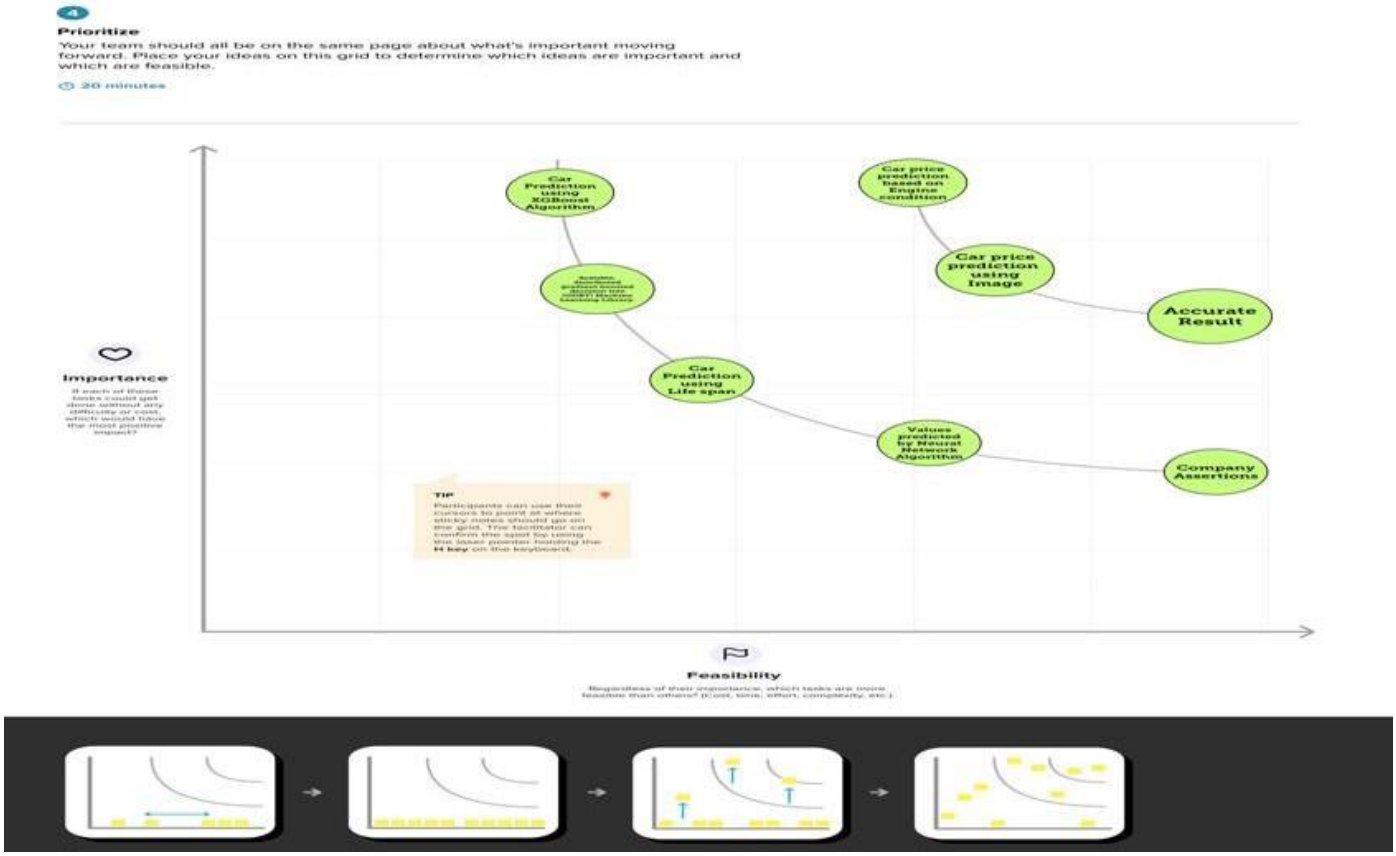


3.2 Ideation & Brainstroming





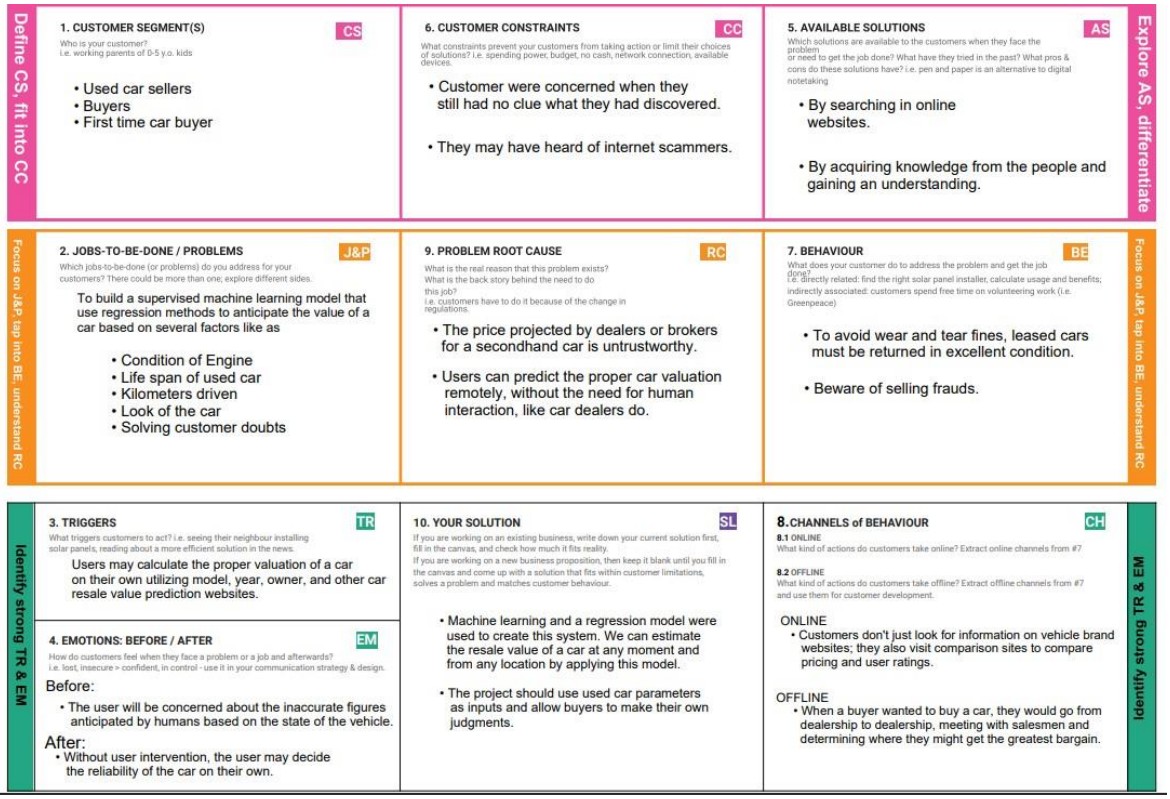
Idea prioritation :



3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	To predict the resale value of second hand car or used car considering its features.
2.	Idea / Solution description	To develop a Machine learning algorithm which predicts the resale value of any used car which is shown in web design.
3.	Novelty / Uniqueness	The model predicts the resale value of car with high accuracy.
4.	Social Impact / Customer Satisfaction	A good platform with more reliability and portability.
5.	Business Model (Revenue Model)	The model deployed in cloud so anyone can access it anywhere and anytime.
6.	Scalability of the Solution	It is a web page model so it can be viewed and accessed in both computer as well as mobile phones.

3.4 Problem Solution Fit



4 REQUIREMENT ANALYSIS

4.1 Functional requirement

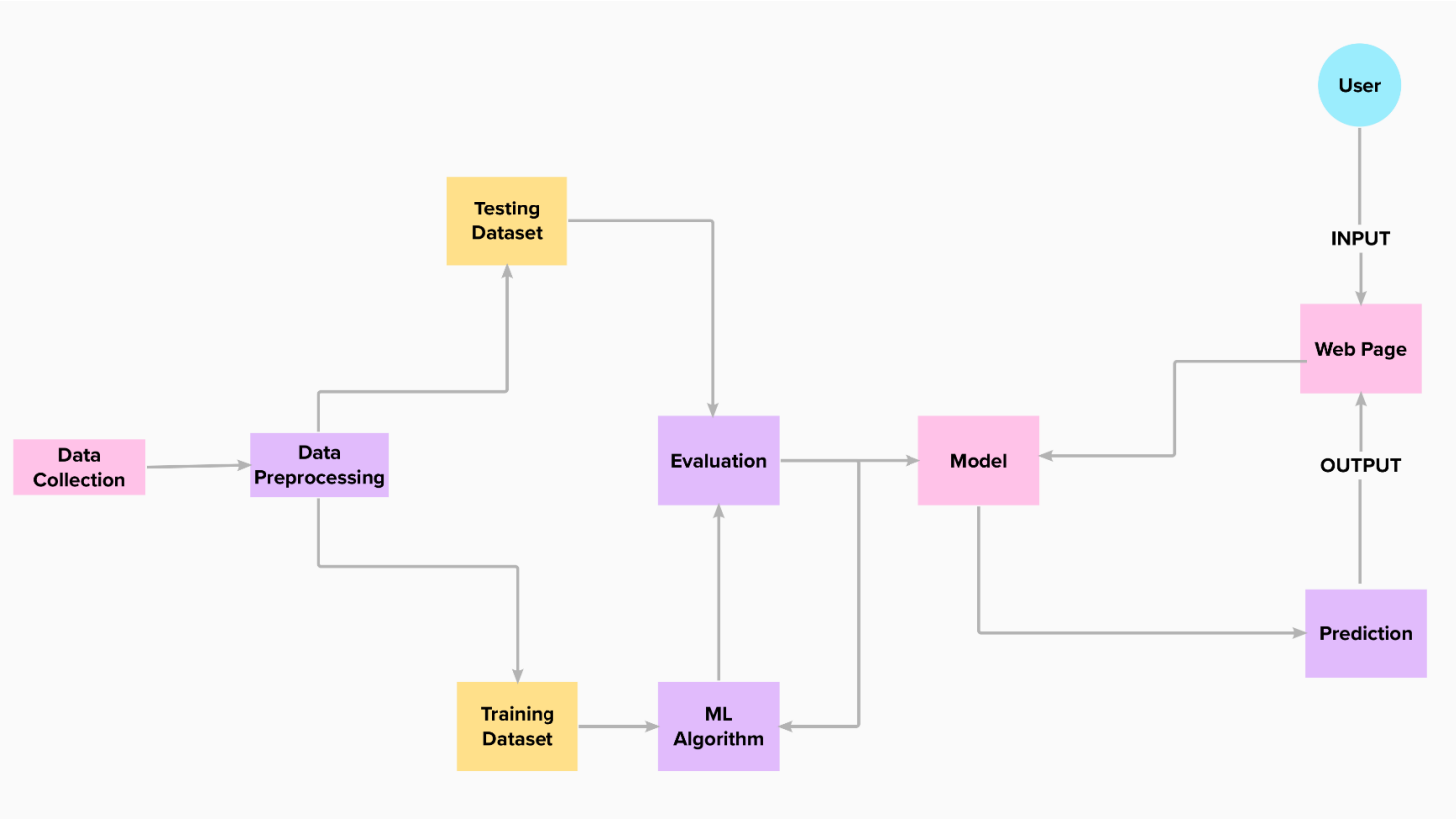
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Website
FR-2	User Confirmation	Confirmation via Website
FR-3	Car Registration	Registration through Website
FR-4	Car Information	Getting the car details through Website
FR-5	Value Prediction	Shows the resale value of the car through website

4.2 Non-Functional requirement

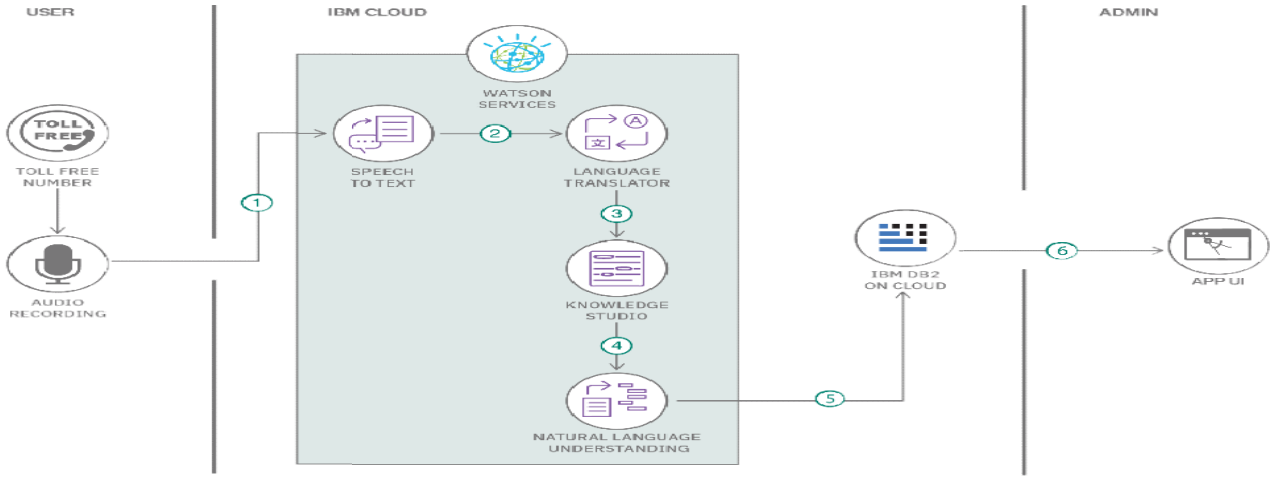
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The model predicts the resale value of the car with more accuracy.
NFR-2	**Security**	Protect the user information as well as their car details.
NFR-3	**Reliability**	The model performs consistently well and also it begins trust to the user.
NFR-4	**Performance**	The model performance has high accuracy and with portable from one machine to another machine.
NFR-5	**Availability**	The model can be available anywhere at anytime.
NFR-6	**Scalability**	The model can be viewed and accessed in both computer as well as mobile phone.

5 PROJECT DESIGN

5.1 Data Flow Diagram



5.2 Solution & Technical Architecture



User Stories

User Type	Functional requirement	User story number	User story/task	Acceptance criteria	Priority	Release
Customer (Mobile user, Web user, Care executive, Administrator)	Registration	USN-1	As a user, I can register for the application by entering my mail, password, and confirming my password	I can access my account/ dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
	Dashboard	USN-3	As a user, I can register for the application through internet	I can register & access the dashboard with Internet login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail	I can confirm the registration in Gmail	Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password	I can login with my id and password	High	Sprint-1

6 PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Resources Initialization	We have to create and initialize accounts in various public APIs like OpenWeatherMap API.	1	LOW	Risitha K Saranya M Revathi M Rajalakshmi R
Sprint-1	Local Server/Software Run	Write a Python program that outputs results given the inputs like weather and location through the software	1	MEDIUM	Risitha K Saranya M Revathi M Rajalakshmi R
Sprint-2	Push the server/software to cloud	Push the code from Sprint 1 to cloud so it can be accessed from anywhere	2	MEDIUM	Risitha K Saranya M Revathi M Rajalakshmi R
Sprint-3	Hardware initialization	Integrate the hardware to be able to access the cloud functions and provide inputs to the same.	2	HIGH	Risitha K Saranya M Revathi M Rajalakshmi R
Sprint-4	UI/UX Optimization & Debugging	Optimize all the shortcomings and provide better user experience.	2	LOW	Risitha K Saranya M Revathi M Rajalakshmi R

6.2 Sprint Delivery Schedule

Sprint	Functional Requirement(Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-3	Home Page	USN-1	Description about car resale process	2	Low	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-3	Registration/Login	USN-2	As a user, I can register for the application by entering my username, email, phone number, and password and verify it. As a user, I can log in to the web application by entering my Username &password.	5	Medium	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-3	Form Page	USN-3	As a user, I submit my car details.	5	Medium	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-3	Result	USN-4	The predicted resale price for the given car model will be displayed.	9	High	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-1	Data collection andData preprocessing	USN-5	Collect the required data and read the data.	6	High	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-1	Data collection andData preprocessing	USN-6	Clean and analyse the data to avoid duplications	9	High	Risitha K Revathi M Saranya m Rajalakshmi R

Sprint-1	Data collection andData preprocessing	USN-7	Split the data into Dependent and Independent variables	6	High	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-2	Model Building	USN-8	Build the model using a Random Forest regression to classify the data.	9	High	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-2	Model Building	USN-9	Check the metrics	7	High	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-2	Model Building	USN-10	Save the model	5	High	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-4	Deploy the model	USN-11	Deployment of ML model using IBM Watson Studio, object storage.	13	High	Risitha K Revathi M Saranya m Rajalakshmi R
Sprint-4	Integrate the webapp with the IBM model	USN-12	Use flask for the integrationpurpose.	8	Medium	Risitha K Revathi M Saranya m Rajalakshmi R

7 CODING & SOLUTIONING

7.1 Feature 1

- IoT device
- IBM Watson Platform
- Node red
- Cloudant DB
- Web UI
- MIT App Inventor
- Python code

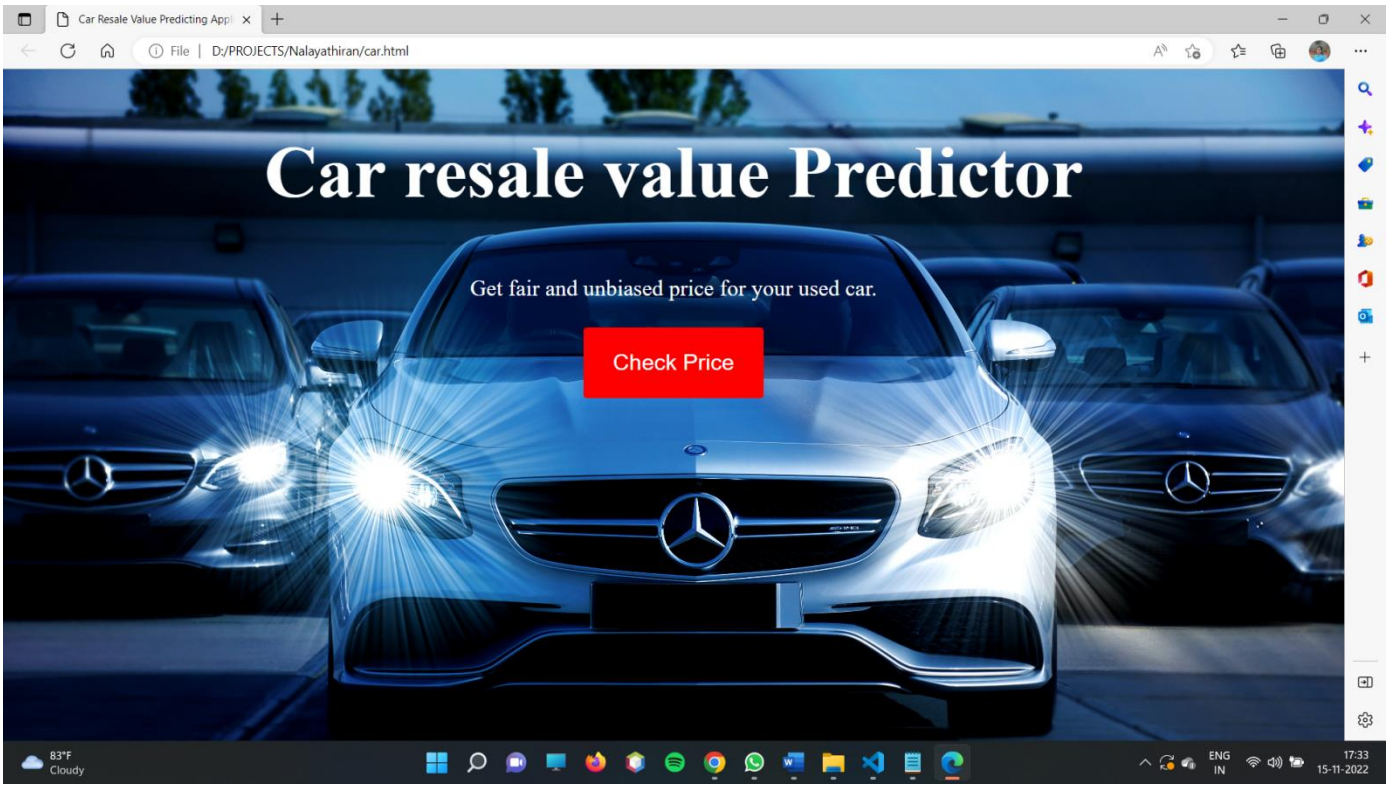
7.2 Feature 2

- Login
- Wokwi

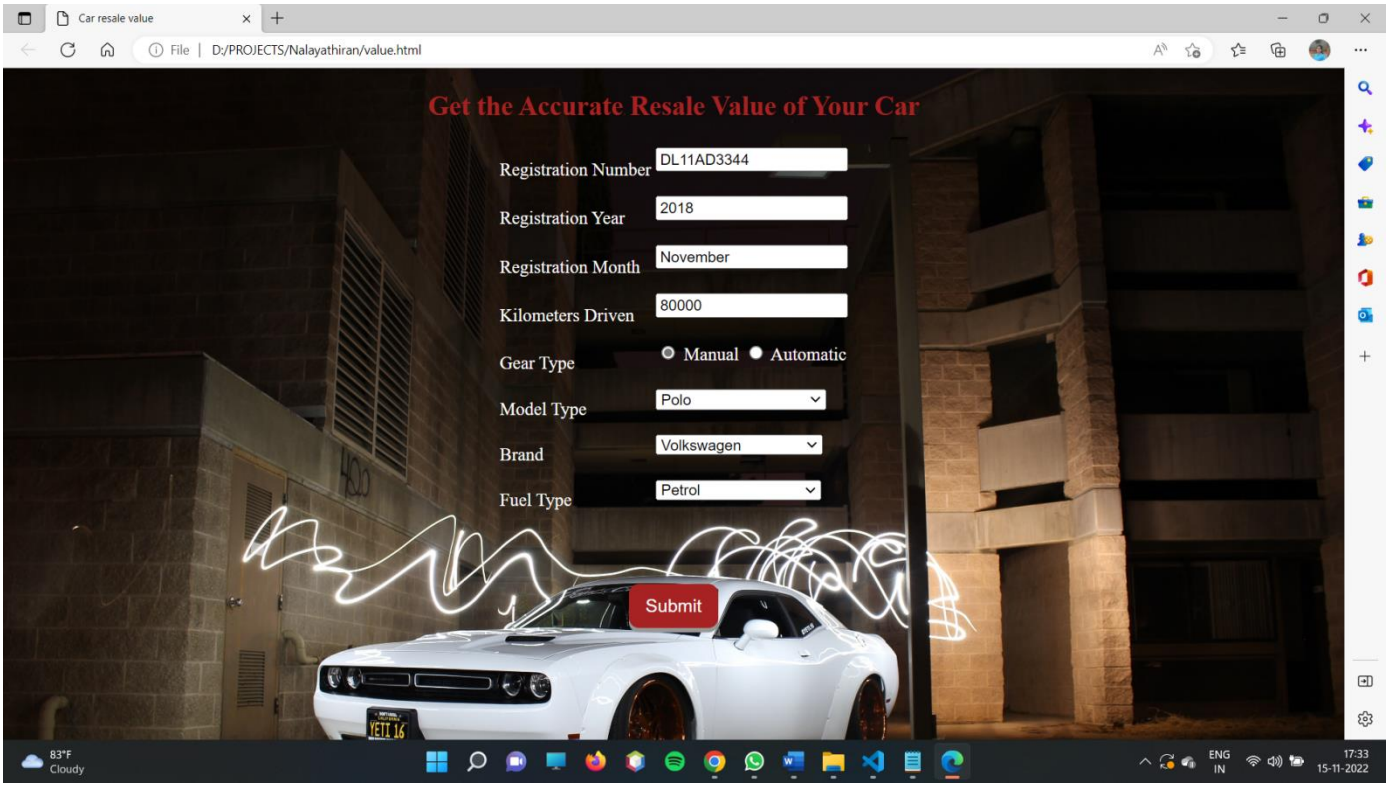
8 TESTING AND RESULTS

8.1 Test Cases

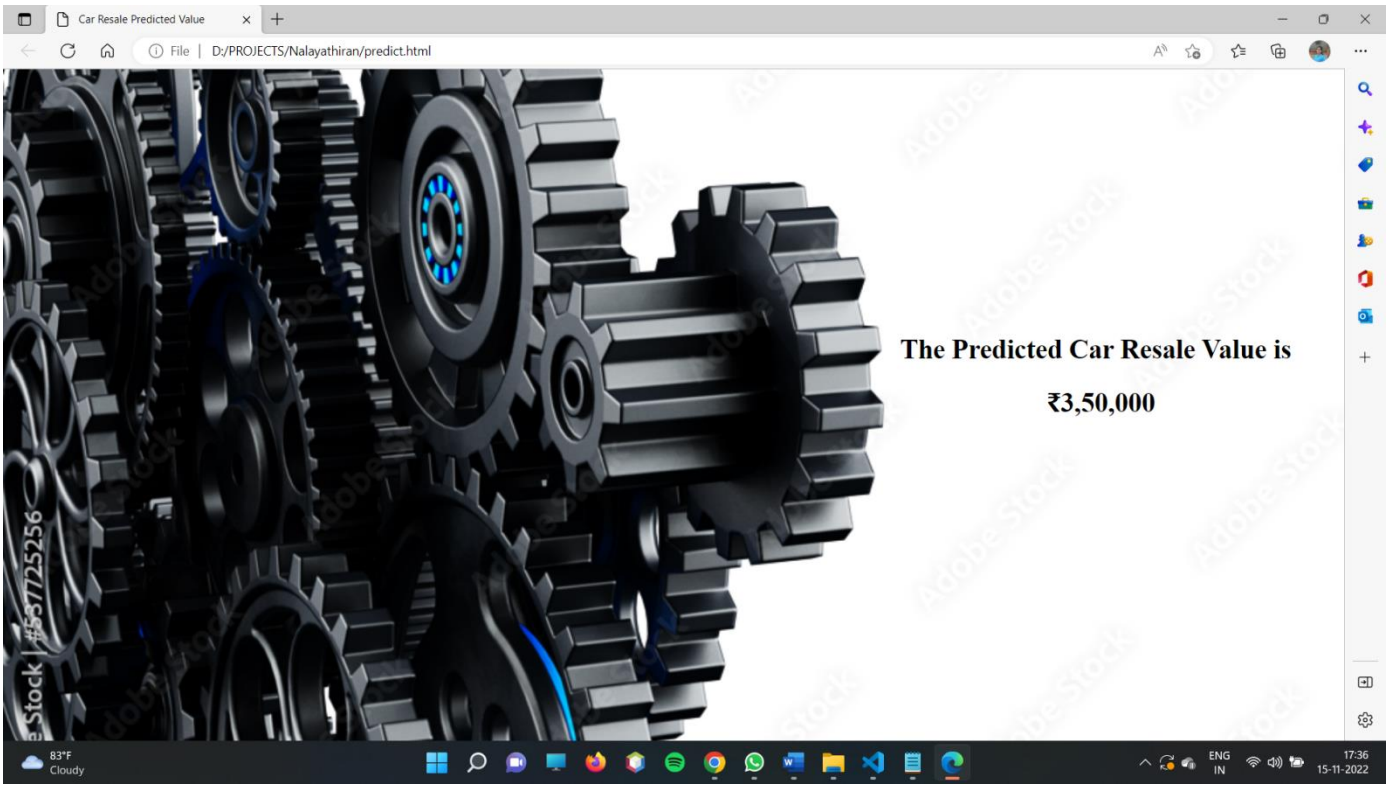
Test case 1:



Test case 2:



9 Result



10.

10.1 ADVANTAGES

- This will reduced installation cost.
- It will monitor 24/7.
- Very useful to sale the car for reasonable price

10.2 DISADVANTAGES

- Car Resale value can not be used by the person who doesn’t have access to the internet.
- Very hard to use for targeted range of people

11 CONCLUSION

Price prediction analyses a good or service based on its attributes, demand, and current market trends using an algorithm. The pricing is then adjusted by the programme at a level that it believes would both draw people and optimise sales. The method is known as price forecasting or predictive pricing in some quarters.

12 FUTURE SCOPE

When compared to February 2020, average prices were up 42.5% in September 2022. While it's possible that used vehicle prices have peaked, new car prices are expected to be high through the end of 2022. Prices are anticipated to drop for both new and used automobiles in 2023, by 2.5% to 5% for new cars and 10% to 20% for used cars.

13 APPENDIX

13.1 Source Code

STYLE

```
<!DOCTYPE html>
<html lang="en" dir="ltr">
  <head>
    <meta charset="utf-8">
    <title>Car Resale Value Predicting Application</title>
    <link rel="icon" type="image/x-icon" href="../static/Images/favicon.ico">
    <link rel="stylesheet" href="../static/css/style.css">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
awesome/4.7.0/css/font-awesome.min.css">
  <style>
h1 {
  font-size: 65px;
  top:40px
}
p {
  font-size: 20px;
}
```

```
.button {
  display: inline-block;
  border-radius: 3px;
  background-color: red;
  border: none;
  color: white;
  text-align: center;
  font-size: 20px;
  padding: 20px;
  width: 160px;
  transition: all 0.5s;
  cursor: pointer;
  margin: 3px;
}
.button span {
  cursor: pointer;
  display: inline-block;
  position: relative;
  transition: 0.5s;
}

.button span:after {
  content: '\00bb';
  position: absolute;
  opacity: 0;
  top: 0;
  right: -20px;
  transition: 0.5s;
}

.button:hover span {
  padding-right: 20px;
}

.button:hover span:after {
  opacity: 1;
  right: 0;
}

body {
  background-image: url('car4.jpg');
  background-repeat: no-repeat;
  background-attachment: fixed;
  background-size: cover;

}
</style>
  </head>
```

```
  <center>
  <body>
    <section class="header">
      <nav>

      </nav>
        <div class="text-box">
          <center><h1 style="color:white;">Car resale value Predictor</h1><center>
          <center><p style="color:White;">Get fair and unbiased price for your used
car.</p><center>
          <button class="button" style="vertical-align:middle"><span>Check Price
</span></button>

        </div>
    </section>

  </body>
 </center>
</html>
```

PREDICT

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <link rel="stylesheet" href="../static/css/predict.css">
    <title>Car Resale Predicted Value</title>
<style>
body {
  background-image: url('car10.png');
  background-repeat: no-repeat;
  background-attachment: fixed;
  background-size: cover;

}
h1{
text-align: right;
margin-right: 39px;
}
h2{
text-align: right;
margin-right: 160px
```

```
}
</style>
</head>
<body>
<right>
        <section class="header">
     <br>
      <br>
      <br>
      <br>
      <br>
      <br>
       <br>
      <br>
       <br>
      <br>


       <div class="text-box">

         <h1 style="color:Black;"><br>The Predicted Car Resale Value is </h1>
                  <h2 style="color:black;">₹3,50,000</h2>
       </div>
   </section>

</right>
</body>
</html>
```

VALUE

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta http-equiv="X-UA-Compatible" content="IE=edge">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <link rel="stylesheet" href="../static/css/predict.css">
   <title>Car Resale Predicted Value</title>
<style>
body {
  background-image: url('car10.png');
  background-repeat: no-repeat;
  background-attachment: fixed;
  background-size: cover;

}
h1{
```

```
text-align: right;
margin-right: 39px;
}
h2{
text-align: right;

margin-right: 160px
}
</style>
</head>
<body>
<right>
        <section class="header">
     <br>
      <br>
      <br>
      <br>
      <br>
      <br>
       <br>

<br>
       <br>
      <br>

       <div class="text-box">

         <h1 style="color:Black;"><br>The Predicted Car Resale Value is </h1>
                  <h2 style="color:black;">₹3,50,000</h2>
       </div>
   </section>

</right>
</body>
</html>
```

13.2 GitHub & Project Demo Link:

https://github.com/IBM-EPBL/IBM-Project-27341-1660054386

Demo link :

https://github.com/IBM-EPBL/IBM-Project-27341-1660054386/blob/main/Final%20Deliverables/demovideo.mp4