Car rating system

**Vehicle Rating & Recommendation Prediction System** using AI that:

* Takes **vehicle features** (brand, model, year, mileage, damage, etc.).
* Predicts a **rating (1–5 stars)**.
* Classifies if the vehicle is **Salvage / Good Condition**.
* Recommends a **3rd party company** for acceptance.

Here’s a **detailed User Requirement Specification (URS)** you can use 👇

**User Requirement Specification (URS) – Vehicle Rating Prediction System**

**1. Introduction**

The Vehicle Rating Prediction System (VRPS) will use Artificial Intelligence (AI) to analyze vehicle features and automatically predict the condition, assign a star rating, and recommend suitable third-party companies for vehicle acceptance.

**2. Objectives**

* Provide accurate **vehicle condition assessment** using AI.
* Generate a **vehicle rating (1–5 stars)** based on input features.
* Classify vehicles as **“Good Condition” or “Salvage”**.
* Suggest suitable **third-party companies** (insurance firms, salvage yards, dealers).
* Assist buyers, sellers, and evaluators in decision-making.

**3. Users & Stakeholders**

* **Car Owners/Sellers** – Want to know the estimated condition and rating.
* **Buyers/Dealers** – Need quick evaluation before purchase.
* **Insurance Companies** – For salvage and claim assessments.
* **Third-party Companies** – Accept or reject vehicles based on condition.
* **System Administrator** – Manages AI models, company database, and system settings.

**4. Functional Requirements**

**4.1 Vehicle Data Input**

* The system shall allow users to enter vehicle details, such as:
  + Brand & Model
  + Manufacturing Year
  + Mileage (km)
  + Accident/Damage history
  + Engine condition
  + Transmission type
  + Fuel type
  + Exterior & Interior condition
  + Market value (optional)
  + Images (optional – for advanced AI vision model)

**4.2 Vehicle Rating Prediction**

* The system shall predict a **rating from 1–5 stars**:
  + 1–2 stars → Poor / Salvage condition
  + 3 stars → Average condition
  + 4–5 stars → Good condition

**4.3 Vehicle Condition Classification**

* The system shall classify each vehicle as:
  + **Good Condition** – Can be sold directly to customers.
  + **Salvage Condition** – Needs repair or suitable for salvage yard.

**4.4 Recommendation of Third-Party Companies**

* The system shall recommend at least **3 companies** from a database based on classification:
  + **Good Condition** → Car dealers, online car platforms.
  + **Salvage Condition** → Salvage yards, scrap dealers, insurance partners.

**4.5 AI/ML Features**

* The system shall use **Machine Learning models** trained on historical car data.
* The system shall continuously improve predictions with more data.
* Optionally, integrate **Computer Vision** (image analysis) to detect external damage.

**4.6 Reporting & Export**

* The system shall generate a **Vehicle Report** containing:
  + Input details
  + Predicted Rating (1–5 stars)
  + Condition (Good/Salvage)
  + Recommended Companies
* Report can be exported as **PDF/CSV**.

**5. Non-Functional Requirements**

**5.1 Performance**

* The system should give prediction results within **5 seconds** of input.

**5.2 Accuracy**

* Prediction accuracy should be at least **85%** based on test datasets.

**5.3 Security**

* User data must be stored securely with **authentication & encryption**.

**5.4 Scalability**

* The system should support **large datasets** and multiple concurrent users.

**5.5 Usability**

* The UI must be simple, user-friendly, and mobile-responsive.

**6. User Interface Requirements**

* **Input Form** – Vehicle details entry.
* **Result Page** – Shows rating, condition, and recommendations.
* **Dashboard** – For admin to manage models, companies, and reports.

**7. Integration Requirements**

* Integration with **vehicle datasets** (Kaggle, car auction sites).
* API to connect with **insurance and dealer platforms**.

**8. Future Enhancements**

* AI-based **image damage detection**.
* Predict **resale value** of the car.
* Support for **voice input**.
* Chatbot assistant for quick evaluation.

**Vehicle Rating Prediction System (VRPS)**.

Here’s a **detailed UI Requirement Specification** 👇

**UI Requirements – Vehicle Rating Prediction System**

**1. General UI Requirements**

* The system must provide a **clean, modern, and responsive UI** accessible from web & mobile.
* UI should follow **minimal steps**: Enter details → Predict → View Results.
* Clear **visual indicators** (stars, badges, colors) for ratings and condition.
* Accessibility standards: readable fonts, contrast, and screen reader compatibility.

**2. Pages & Components**

**2.1 Home Page / Dashboard**

* A welcome page with:
  + **System overview** (what it does).
  + **Login/Register buttons** (if authentication is required).
  + **Quick Start button** – "Evaluate My Vehicle".
* Optional **dashboard cards** for:
  + Recent evaluations.
  + Statistics (number of vehicles rated, salvage vs good condition %).

**2.2 Vehicle Input Form Page**

* **Form fields** for vehicle details:
  + Dropdown: Brand
  + Text field: Model
  + Number field: Year
  + Number field: Mileage
  + Dropdown: Fuel Type (Petrol, Diesel, Electric, Hybrid)
  + Dropdown: Transmission (Manual, Automatic, CVT, etc.)
  + Radio buttons/slider: Exterior condition (Poor–Excellent)
  + Radio buttons/slider: Interior condition (Poor–Excellent)
  + Text/number: Accident history (Yes/No + details)
  + File upload: Vehicle images (optional)
* **Submit Button** → "Evaluate Vehicle".
* **Clear Form Button**.

**2.3 Prediction Results Page**

* Display the **AI output in a visually clear way**:
  + **Star Rating (1–5)** – Show stars (★).
  + **Condition Badge** – Green (Good Condition) or Red (Salvage).
  + **Confidence Score (%)** – AI model prediction confidence.
  + **Recommended Companies List** – Cards showing:
    - Company Name, Logo
    - Type (Dealer, Salvage Yard, Insurance)
    - Contact/Link (optional).
* **Download Report Button** → Export as PDF/CSV.
* **Evaluate Another Vehicle Button**.

**2.4 Admin Panel (For System Administrator)**

* **Login Page** – Admin credentials.
* **Dashboard**:
  + Vehicle evaluations log (sortable, filterable).
  + Manage company database (add/update/delete companies).
  + Manage AI model version & retraining.
  + Reports & analytics (No. of vehicles, Good vs Salvage trend).

**3. UI Behavior & Interactions**

* **Form validation**:
  + Required fields must show error if left empty.
  + Year & mileage must allow valid numbers only.
* **Real-time feedback**:
  + While typing, system may show suggestions (e.g., brand → model autocomplete).
* **Loading Indicator**:
  + While AI processes input, show a spinner with "Evaluating vehicle...".
* **Responsive Design**:
  + Works on desktop, tablet, and mobile.
* **Color codes**:
  + Green → Good condition.
  + Red → Salvage.
  + Yellow → Average.

**4. UI Examples (Concept)**

🔹 **Vehicle Input Form Example**

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| Vehicle Rating Prediction System |

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Brand: [Dropdown] Model: [Text Input]

Year: [2020] Mileage: [45000]

Fuel: [Petrol] Transmission: [Auto]

Exterior: [Slider Poor → Excellent]

Interior: [Slider Poor → Excellent]

Accident History: [Yes/No]

Upload Images: [Choose File]

[Submit] [Clear]

🔹 **Prediction Result Example**

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| Vehicle Evaluation Result |

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★★★★☆ (4.5/5 Stars)

Condition: ✅ Good Condition

Confidence: 92%

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Recommended Companies:

- CarTrade (Dealer)

- Spinny (Dealer)

- HDFC Ergo (Insurance)

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[Download Report] [Evaluate Another]