# Conversational Used Car Price Predictor

CS702 - Computing Lab

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Introduction

- Conversational interfaces enhance interaction with technology.
- With the advancements in Natural Language Processing (NLP) and conversational interfaces, chatbots have become an effective way to improve user experience and interaction by providing a more natural, engaging, and flexible platform.
- By integrating a chatbot into a used car price prediction system, users can interact in a more conversational way
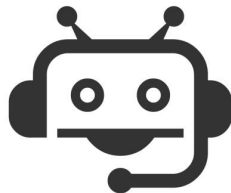
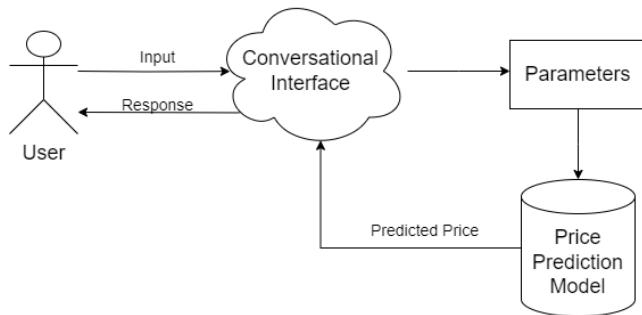**CHATBOT**

Problem Statement and Objectives

- Predicting used car prices requires multiple parameters such as manufacturer, model, year, mileage, etc.

- Traditional methods require users to interact with a web form or mobile app input fields to submit the necessary car details,which are often less interactive and user-friendly.

- This project aims to develop a chatbot integrated with a price prediction model for a more intuitive user experience.
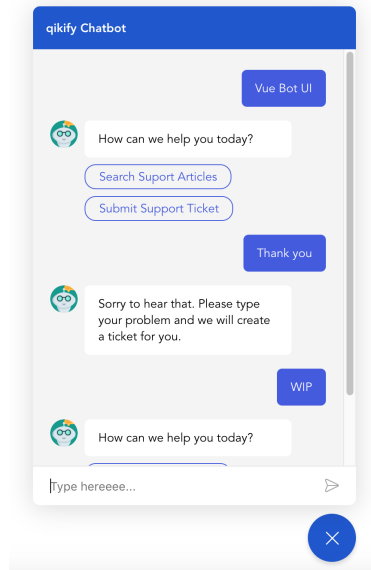
Literature Survey

| S.No.	Title	Year	Methodology
1	Prediction of Used Car Prices Using Artificial Neural Networks and Machine Learning	2022	Deep Neural Networks, Linear Regression, Random Forest Algorithm
2	Predicting the Sale Price of Pre-Owned Vehicles with the Ensemble ML Model	2023	Linear Regression Model, Random Forest Regression, Gradient Boosting Tree (GBT) Regression Model
3	An Overview of Chatbot Technology	2020	Rule-Based Model Chatbots, Generative Models. Development platforms can be open-source, such as RASA.
4	Conversational AI Unleashed: A Comprehensive Review of NLP-Powered Chatbot Platforms	2023	Rule-Based Systems, Generative Models.
5	Framework for Design and Implementation of Chat Support System using Natural Language Processing	2023	The chatbot is developed in Django web framework and spaCy NLP library for Python.

Proposed Methodology

- Conversational Interface: The proposed system will integrate a chatbot that will act as the primary interface for user interaction. Instead of filling out forms, users will engage in a natural language conversation to provide the necessary details about their car.
- Guided Data Collection: The chatbot will guide users step by step, asking questions about the car's make, model, year, mileage, condition, and other relevant factors in a user-friendly, conversational manner.

Finalized Design of Solution

- **System Architecture:**
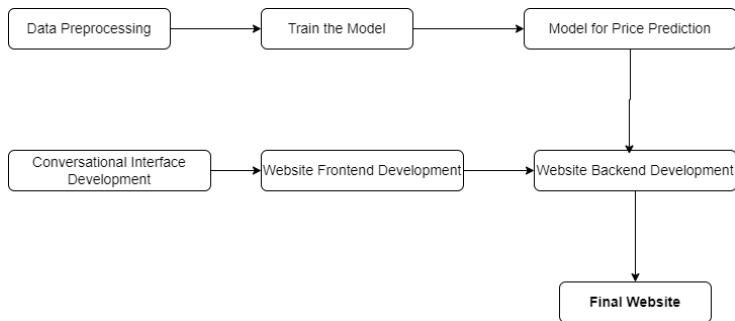
- **NLP Engine:** Processes natural language inputs, extracts intents and entities, and manages conversation flow.
- **Prediction Model:** A machine learning model that predicts the price of the car based on the extracted data from user inputs.
- **Frontend:** A website providing a chat interface for users to interact with the system.
- **Backend:** A server that processes user inputs, communicates with the NLP engine and the prediction model, and handles responses.

Experimental Setup

- Frontend: HTML, CSS, JavaScript for creating a responsive chat interface.
- Backend: Python framework (Flask or Django) to handle interactions between the frontend, Rasa NLP engine, and the prediction model.
- NLP Engine: Rasa will be used to implement a rule-based chatbot. It will process natural language inputs to extract intents and entities, and trigger predefined actions.
  - **Intents:** User intents include providing car details, requesting price prediction, and asking for help or guidance.
  - **Entities:** The chatbot will extract entities such as car make, model, year, mileage, and kilometers driven from the conversation.
  - **Actions:** Actions include validating user input, passing car details to the prediction model, and returning the predicted price.
- Prediction Model: Machine learning model (random forest or any other regression model) for predicting used car prices based on user inputs.
- Dataset: The dataset for training the prediction model will be sourced from Kaggle.

Expected Outcomes

- A user-friendly conversational interface that will guide users through the process of providing necessary car details in a natural and interactive manner.
- Successful integration of the Rasa rule-based chatbot for handling user inputs, understanding intents, and extracting entities such as car make, model, year, and mileage.
- An accurate machine learning model capable of predicting used car prices based on the extracted details.
- Seamless communication between the frontend, backend, and prediction model to provide real-time price estimates to users.

Conclusion and Future Work

- This project successfully integrates a conversational interface with a used car price prediction model, making the user experience more interactive and efficient.
- **Future Work:**
  - Introduce voice command functionality for hands-free user interaction.
  - Add support for multiple languages using translation functionality.

References

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Thank You!