# 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
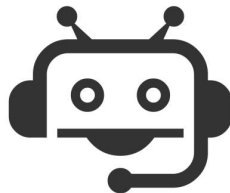


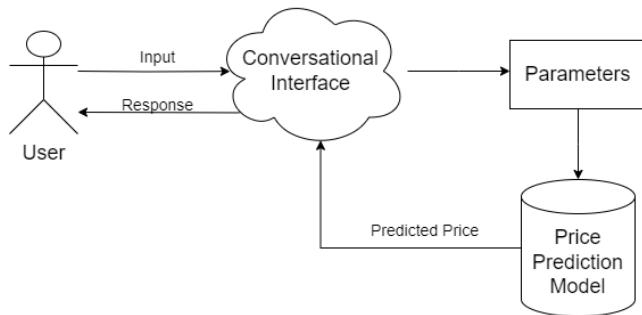**CHATBOT**

# 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.
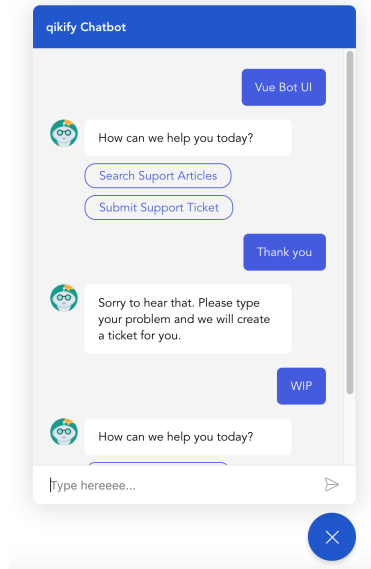
# Literature Survey

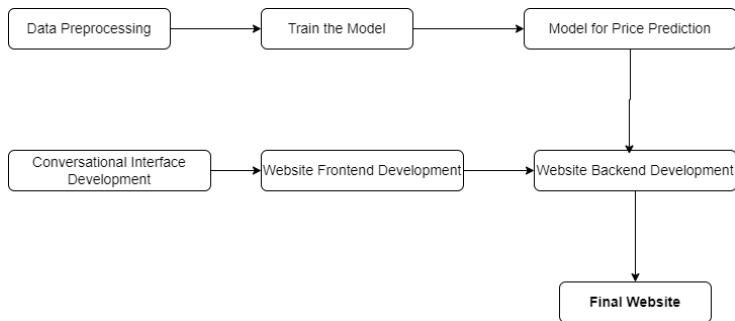| S.No. | Title | Year | Methodology |
|-------|-------|------|-------------|
| 1 | Prediction of Used Car Prices Using Artificial Neural Networks and Machine Learning | 2022 | Deep Neural Networks, Linear Regression, Random Forest Algorithm |
| 2 | Predicting the Sale Price of Pre-Owned Vehicles with 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:** A chatbot will serve as the main interaction tool, enabling users to enter car details via natural conversation instead of forms.
- **Guided Data Collection:** The chatbot will gather car details (model, year, mileage, etc.) step by step, ensuring ease of use.
- **Handling Queries:** The chatbot will also respond to general queries like "How is the price calculated?" or "What factors affect my car's value?"

# Finalized Design of Solution

- **System Architecture:**

```
Data Preprocessing  →  Train the Model  →  Model for Price Prediction
                                                      │
                                                      ▼
Conversational Interface  →  Website Frontend  →  Website Backend Development
Development                  Development
                                                      │
                                                      ▼
                                               Final Website
```

  - **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, asking for help or guidance, and asking general questions.
  - 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, returning the predicted price, and responding to general queries.
- Prediction Model: A machine learning model (such as Random Forest or another regression model) will be used to predict used car prices based on user inputs, utilizing a dataset sourced from Kaggle for training.

# Expected Outcomes

- A user-friendly conversational interface that guides users through providing necessary car details in a natural and interactive manner.
- Successful integration of the Rasa rule-based chatbot for handling user inputs, understanding intents, extracting entities such as car make, model, year, and mileage, and responding to general questions.
- A 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!**