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Project:

**Generative AI-powered Customer Service Chatbot:** Design a chatbot system that uses natural language processing and machine learning to provide instant customer support and personalized recommendations.

Problem Statement and Requirements

Business Requirements:

1. Clearly define the problem the system aims to solve.
   1. This system shall provide users with instant customer support using a chatbot that uses natural language processing and machine learning for a car dealership to streamline website interactions for sales, financing, and repairs.
2. Specify the functionalities the system needs to provide.
   1. Chatbot shall connect users to the requested service, whether that be sales, financing, or vehicle servicing.
      1. Sales prompts the chatbot helps the user find a desired car based on their needs and then forwards the user to a sales representative to the most suitable car dealer with the customer’s information and car model choices.
      2. Financing prompts the chatbot to connect the user to a financing specialist.
      3. Vehicle servicing prompts the user to specify details related to servicing needs and schedule an appointment for the user.
   2. Chatbot shall track usage data and interaction data on the website to measure user engagement and effect on number of sales.
   3. Chatbot shall keep user data secure
3. Identify the target users and their needs.
   1. Informed buyer
      1. An informed buyer already knows what type of car they need and can be forwarded directly to a sales representative once they provide the make and model of the car they want
   2. Undecided buyer
      1. An undecided buyer does not know what size car they want, but knows how much money they can spend, how many people the car should seat, a brand preference, and a mileage preference.
   3. Existing Customer
      1. An existing customer either needs to contact a financing agent or the vehicle service provider. After providing their email address or phone number, along with a password, the chatbot shall recognize the customer and connect them to the appropriate service
4. Outline any business goals the system should support.
   1. The number of car price quotes should increase by 30%
   2. Increase total sales by 15%
   3. Decrease sales related phone calls by 50%

Non-Functional Requirements:

1. Define performance requirements like scalability, response time, and  
   throughput.
   1. Chatbot response time should be less than 10 seconds per query
   2. The chatbot shall be able to work with multiple customers across multiple devices at the same time
   3. Chatbot maintains performance across large and small databases
2. Specify security requirements like authentication, authorization, and  
   data encryption.
   1. Existing Customer authentication through the chatbot is encrypted
   2. Chatbot does not provide users with unauthorized information such as other customer information or employee information.
3. Outline maintainability requirements like code modularity,  
   documentation, and testing strategies.
   1. The system shall be able to handle error handling gracefully if the user gives an invalid prompt
   2. The system shall be able to schedule service appointments and email sales representatives seamlessly.
   3. The system shall be designed to accommodate future enhancements
4. Indicate any other non-functional requirements relevant to the system's  
   success
   1. The system tracks total interactions with the chatbot.
   2. The system records the number of messages per session with each user.
   3. The system tracks what percentage of conversations that users abandon before completing their desired action.
   4. The system tracks the number of successful outcomes of the chatbot and customers.