**Phase 5**

**PROJECT DOCUMENTATION & SUBMISSION**

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| **Date** | **31-10-2023** |
| **Team ID** | **3918** |
| **Project Name** | **Create a Chatbot using Python** |

**Problem Statement :**

Artificial intelligence chatbot is a technology that makes interactions between man and machines using natural language possible. A chatbot can give different responses from the same input given by the user according to the current conversation issue". By using our "Intelligent ChatBot" you can overcome all the above-given issues, you do not need humans to do manual work, your clients will be happy.A chatbot is a conventional agent that is capable to communicate with operators by using natural languages. As numerous chatbot platforms already exist, there are still some problems in building data-driven system because a huge amount of data is required for their development.

**Design Thinking Process:**

1. Empathize:

- Understand the pain points of the existing customer support system.

- Analyze customer feedback, support ticket data, and user needs.

- Identify the need for 24/7 support and quick query resolution.

2. Define:

- Define the primary goals: improve customer support and engagement.

- Specify key features: chatbot, knowledge base, FAQ, and real-time chat support.

- Determine target users: customers seeking information and support.

3. Ideate:

- Brainstorm solutions to meet the defined goals.

- Consider integrating a chatbot for quick responses.

- Plan the architecture and user interface for the web application.

4. Prototype:

- Create a mockup of the web application's user interface.

- Design the chatbot's conversational flow.

- Develop a knowledge base and FAQs.

5. Test:

- Gather feedback from potential users on the prototype.

- Adjust the user interface and chatbot's flow based on user feedback.

- Ensure usability and performance.

**Phases of Development:**

1. Backend Development:

- Here we use python stack

- And Develope a database for storing product information and user data.

- Implement a RESTful API for the web application.

2. Chatbot Development:

- Here we use library like Rasa, Dialogflow, or Microsoft Bot Framework.

- Then train the chatbot using NLP techniques and the company's FAQ.

- By using NLP technique we can implement natural language understanding for complex queries.

- Integrate chatbot with the web application via API.

3. Web Application Development:

- Design the user interface for the web application.

- Implement real-time chat support with the chatbot.

- Develop a knowledge base and FAQ section.

- Ensure a responsive and user-friendly design.

4. **NLP Integration:**

- Utilize libraries like spaCy, NLTK, or transformers for NLP tasks.

- Implement sentiment analysis for customer feedback.

- Integrate entity recognition for product-related queries.

- Continuously improve chatbot's language understanding using machine learning.

**Innovative Techniques and Approaches:**

1. Multi-step Conversations:

Enable the chatbot to handle multi-turn conversations for complex queries.

- Store context and user preferences to provide relevant responses.

2. Sentiment Analysis:

- Implement sentiment analysis to understand customer satisfaction and detect issues requiring human intervention.

3. Dynamic FAQ Generation:

- Develop a system to dynamically generate FAQs based on user interactions to continuously improve the knowledge base.

4. A/B Testing:

- Continuously improve the chatbot's responses by A/B testing different conversation flows and NLP models.

5. Integration with E-commerce Data:

- Connect the chatbot to e-commerce data sources to provide real-time product information and inventory status.

**Interaction with Users:**

- Users access the web application and engage with the chatbot via a chat interface.

- The chatbot provides responses, information, and suggests relevant FAQ articles.

- Users can switch to human customer support if the chatbot can't resolve their issues.

- The chatbot uses NLP to understand and respond to user queries naturally.

The development process outlined above should lead to an effective chatbot-integrated web application that significantly improves customer support and engagement for the e-commerce company while utilizing innovative NLP techniques and approaches.

**A chatbot interacts with users and a web application as follows:**

Users engage with the chatbot through a chat interface, entering text or voice queries.The chatbot uses NLP algorithms to understand and interpret user input.

The chatbot identifies the user's intent and extracts relevant information from their query.Based on the intent and extracted data, the chatbot generates a response.Users receive the chatbot's response and can provide feedback or request further information.The chatbot communicates with the web application via APIs to access data or perform actions.The chatbot fetches information or processes user requests from the web application's database or services.The chatbot triggers actions within the web application, such as form submissions or data updates.The chatbot provides users with relevant information or updates from the web application.The chatbot can improve over time by learning from user interactions and web application data, enhancing its ability to assist users. Top of Form

**Literature and Survey papers**

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| SURVEY PAPER NAME | YEAR OF THE PAPER | ALGORITHM USED |
| Design and Development of CHATBOT | April 2021 | ML Algorihtm |
| An overview of chatbot technology | May 2020 | NLP(Natural language processing )  NLU() |
| A Survey on Evaluation Methods for Chatbots | March 2019 | ML & NLP(Natural language processing ) |
| A Survey on Chatbot Implementation in Customer Service Industry through  Deep Neural Networks | October 2018 | Template-based model |

**Conclusion:**

Creating a chatbot in Python is an exciting journey that involves various components and requires an understanding of NLP, data management, and user experience design. This documentation serves as a valuable resource for both building a chatbot from scratch and enhancing an existing one. By following the guidelines, developers can create intelligent and engaging chatbots to meet various user needs.