Intelligent chatbot for automed assistance

Phase-1 Submission

Student Name :S.Santhiya

Register Number :732323106043

Institution :SSM College of Engineering

Department :Electronics and Communication Engineering

Date of Submission :April 23, 2025

1.Problem Statement

In today's fast-paced digital environment, customer support teams face increasing pressure to provide quick and effective responses. However, managing large volumes of queries manually leads to delays, inefficiencies, and inconsistent service quality. This project addresses the need for an intelligent, automated chatbot system that can streamline customer support, reduce response time, and operate 24/7 with minimal human intervention.

2.Objectives of the Project

- Develop an intelligent chatbot capable of handling common customer queries.
- Implement automated support to reduce response time and increase customer satisfaction.
- Integrate natural language understanding (NLU) for more human-like interactions. - Provide analytics on user queries to continuously improve service quality.

3.Scope of the Project

- Features to be built: chatbot with predefined and dynamically generated responses, feedback capture system, and basic analytics dashboard.

Intelligent chatbot for automed assistance

- Constraints: limited to English language support, initially trained on a static dataset, and deployed via web interface only

4.Data Sources

- Primary dataset: public customer support datasets (e.g., Kaggle Customer Support Chat Dataset).
- Type: public, static datasets.
- Supplemented by synthetic data to simulate additional use

5.High-Level Methodology

- Data Collection: Data will be downloaded from public repositories such as Kaggle.
- Data Cleaning: Remove duplicates, handle missing values, normalize text formats.
- Exploratory Data Analysis (EDA): Use bar plots, word clouds, and heatmaps to analyze query types and response effectiveness.
- Feature Engineering: Tokenization, lemmatization, sentiment scoring, and query type categorization.
- Model Building: Use NLP models like BERT or LSTM for intent recognition; rule-based and ML-based response generators.
- Model Evaluation: Evaluate using accuracy, F1-score, confusion matrix, and user feedback.
- Visualization & Interpretation: Display insights via interactive charts (Streamlit/Dash).
- Deployment: Deploy as a Streamlit app or via Flask with Gradio interface

6.Tools and Technologies

- Programming Language: Python

Intelligent chatbot for automed assistance

- Notebook/IDE: Google Colab, VS Code
- Libraries: pandas, numpy, seaborn, matplotlib, scikit-learn, TensorFlow/Keras, NLTK, transformers
- Optional Tools for Deployment: Streamlit, Gradio, Flas

7.Team Members and Roles

1. B. Sanjeev – Project Lead

Responsibllities: Oversaw data collection, led model building, integrated the chatbot system, and managed final deployment.

2. G.Rithish kumar– Data Engineer

Responsibilities: Handled dataset acquisition, data cleaning, and preprocessing, including tokenization and lemmatization.

3.M.Samuvel – NLP Specialist

Responsibilities: Focused on model selection and training using BERT/LSTM, performed intent recognition, and fine-tuned response generation.

4. S.Santhiya– Frontend and Analytics Developer

Responsibilities: Developed the web interface using Streamlit or Flask, created the analytics dashboard, and implemented user feedback capture mechanisms.