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REVOLUTIONIZING CUSTOMER SUPPORT WITH AN INTELLIGENT CHATBOT FOR AUTOMATED ASSISTANCE

1. Problem Statement

Customer support is often overwhelmed with repetitive queries that delay resolution time and reduce customer satisfaction. Traditional support systems are costly and lack scalability. This project addresses the need for an intelligent, automated Chabot that can handle common customer queries 24/7, improving efficiency and user experience.

2. Objectives of the Project

- Design and implement an AI-powered Chabot capable of handling customer support queries.
- Achieve a high query resolution rate with minimal human intervention.
- Provide real-time, context-aware responses using NLP.
- Enable multi-channel deployment (web, mobile, etc.).

3. Scope of the Project

Features to Build:

- Natural Language Understanding (NLU) for customer queries

- Context tracking and response generation

- Integration with a knowledge base or FAQ database

- Multilingual support (if time permits)

Limitations:

- Limited to predefined intents and datasets during development

- Deployment restricted to a demo web interface

- Use of open-source or publicly available tools and models only

4. Data Sources

- **Dataset**: Customer support query datasets (e.g., Kaggle's customer support tickets, Dialog datasets)

- **Source**: Public datasets and/or synthetic data generation

- **Type**: Static datasets, with possible augmentation using generated dialogues

5. High-Level Methodology

● **Data Collection**
- Download public datasets (e.g., from Kaggle) or generate synthetic Q&A pairs.

● **Data Cleaning**
- Remove duplicates, fix formatting issues, normalize text (lowercase, punctuation removal).

● **Exploratory Data Analysis (EDA)**
- Use word clouds, frequency plots, and intent distribution analysis.

● **Feature Engineering**
- Tokenization, lemmatization, TF-IDF or word embeddings (e.g., BERT-based features).

● **Model Building**
- Use classification (e.g., intent detection via logistic regression, SVM) and sequence models (e.g., RNN, Transformer-based like BERT or DistilBERT).

● **Model Evaluation**

- Metrics: Accuracy, Precision, Recall, F1-Score; Confusion Matrix for multi-class classification.

● **Visualization & Interpretation**

- Charts showing performance metrics, example dialogues, and system flowcharts.

● **Deployment**

- Deploy as a web application using Streamlit or Flask for demonstration.

6. Tools and Technologies

- Programming Language: Python

- Notebook/IDE: Jupyter Notebook / Google Colab

- Libraries: pandas, numpy, sklearn, matplotlib, seaborn, nltk, TensorFlow, Hugging Face Transformers

- Optional Tools for Deployment: Streamlit, Flask, Gradio , Github

7. Team Members and Roles

- DHINAKARAN K - Data Collection & Cleaning

- RAMESH - NLP Model Building & Evaluation

- VENKATACHALAGANAPATHI S - Deployment & Visualization and Documentation & Presentation

Preparation