PHASE 2 SUBMISSION

PROJECT TITLE: Revolutionizing Customer Support with Answer Intelligent Chatbot for Automated Assistance

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GitHub Link :htttps://gitthub.com/Bhuvaneswari476/Dattascience2.gitt

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1.Problem Statement

In today's fast-paced digital environment, businesses face challenges in delivering timely and consistent customer support. Traditional support systems often struggle with high response times, limited availability, and inconsistent query resolution. These issues can lead to customer dissatisfaction and churn. An intelligent chatbot can transform customer service by providing 24/7 instant responses, handling repetitive queries, and improving user engagement—thereby enhancing the overall customer experience and reducing operational costs.

2. Project Objectives

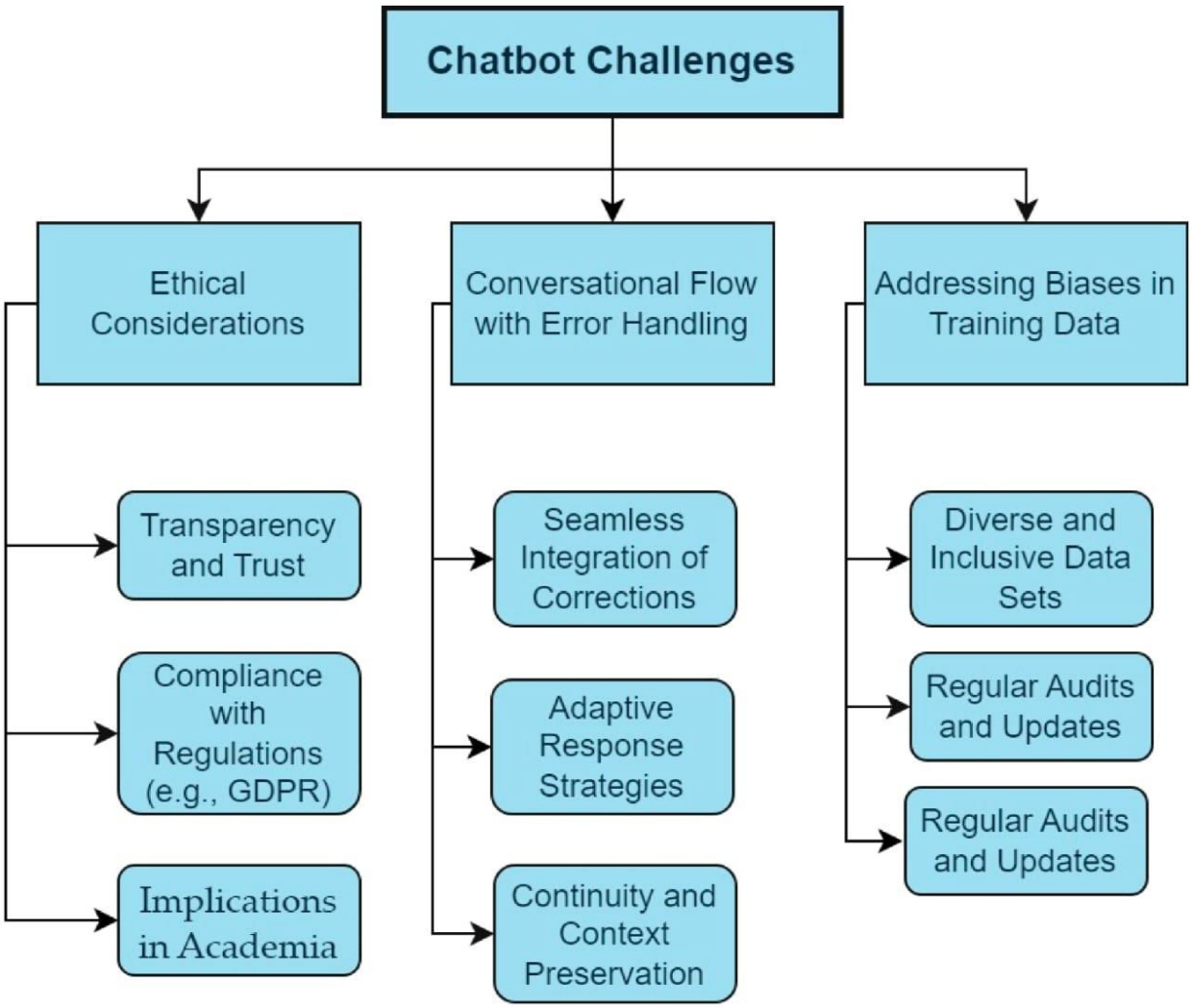
Develop an AI-powered chatbot capable of understanding and responding to customer queries in real-time.

- Improve response accuracy and reduce average response time compared to traditional support systems.

- Classify and route complex queries to human agents with appropriate context.

- Analyze customer interaction data to derive insights into frequently asked questions, customer sentiment, and support trends.

3. Flowchart of the Project Workflow



4. Data Description

Dataset: customer_support_chat_data.csv
Description: Contains chat logs, intents, customer queries, timestamps, and agent responses.
Source: Internal CRM export / open-source customer support datasets.

5. Data Preprocessing

- Removed null/duplicate entries
- Normalized text (lowercasing, punctuation removal)
- Tokenized queries and responses
- Label encoding of intents

6. Exploratory Data Analysis (EDA)

- Most frequent customer intents
- Query length distribution
- Word clouds for most common terms
- Sentiment trends over time

7. Feature Engineering

- TF-IDF vectorization
- Named Entity Recognition (NER) tagging
- - Sentence embeddings using BERT
- Intent labels for supervised learning

8. Model Building

- Baseline: Logistic Regression
- Advanced: Fine-tuned BERT for intent classification
- Response generator using seq2seq model

9. Visualization of Results & Model Insights

- Confusion matrix for intent classifier
- Accuracy and F1 score comparisons
- Chat session success rate
- Real-time dashboard demo screenshot (optional)

10. Tools and Technologies Used

Python, Pandas, Scikit-learn, NLTK, SpaCy

TensorFlow / PyTorch

HuggingFace Transformers

Streamlit (for chatbot UI demo)

Git, GitHub for version control

11. Team Members and Contributions

S.MONISHA Project Lead	Data preprocessing	EDA, Documentation
S.BHVANESWARI NLP Engineer	Model development	chatbot integration
RT.PAVITHRA Visualization Expert	Frontend demo	GitHub management