Phase-2

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Date of Submission: 02/05/2025

Github Repository Link: https://github.com/Harishragav0508/naan-mudhalvan.git

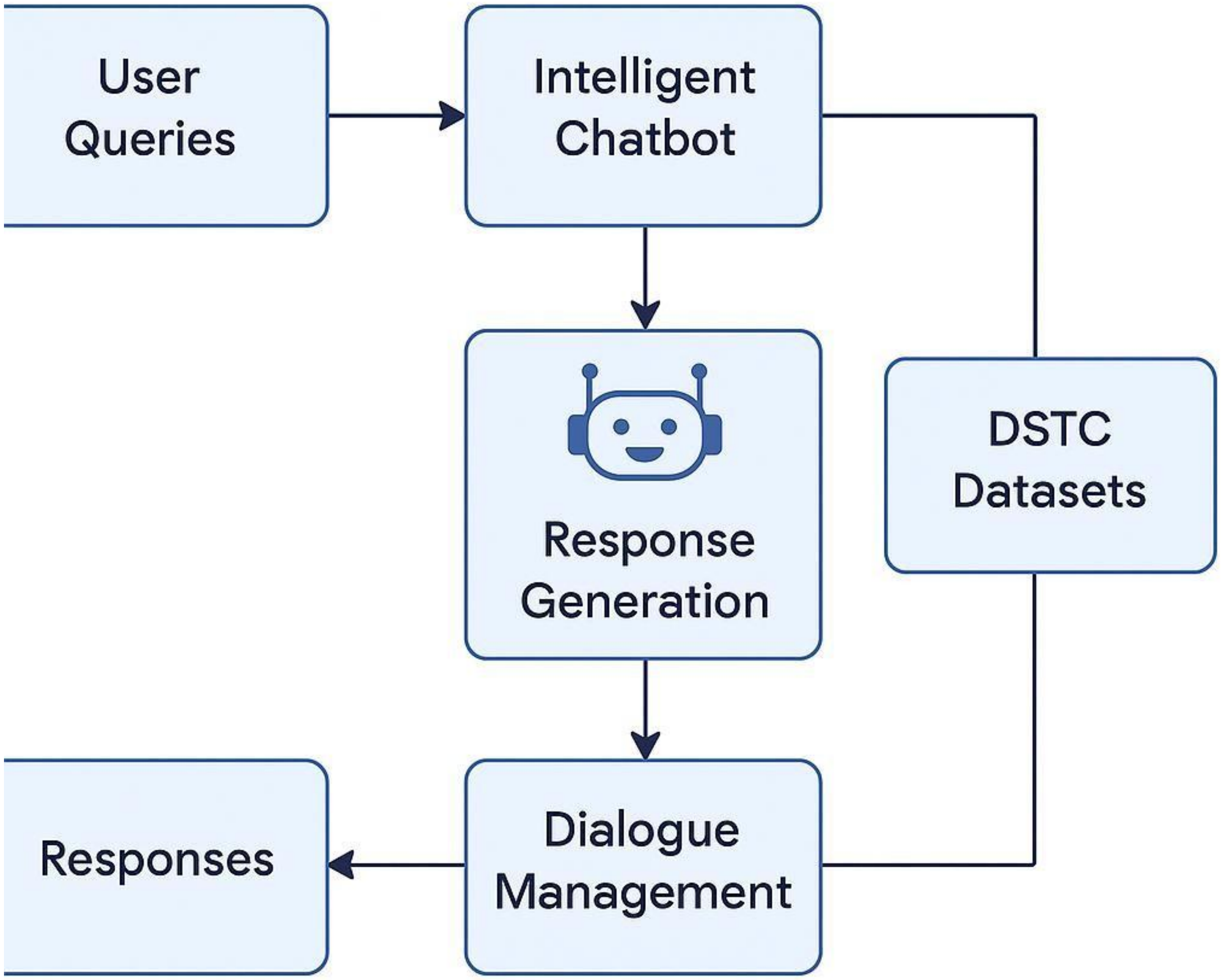
1. Problem Statement

The project aims to build a smart chatbot that can automatically answer their questions, and solve common problems making customer support faster and more efficient.

2. Project Objectives

- ***Develop an intelligent chatbot*** *that can understand and respond to user queries in natural language.*
- ***Automate common customer support tasks*** *to reduce the need for human agents.*

3. Flowchart of the Project Workflow



4. Data Description

- ***Dataset Name***: *DSTC (Dialog State Tracking Challenge)*
- ***Source***: *Official DSTC challenge repository*

- ***Type of Data***: *Text (dialogues, intents, responses)*
- ***Records***: *Thousands of labeled dialogue sessions*
- ***Features***: *Speaker, utterance, intent, slots, context*

- ***Nature***: *Static dataset*
- ***Target Variable***: *Intent / Dialogue state*

5. Data Preprocessing

- *Removed incomplete and irrelevant dialogues*
- *Converted timestamps and structured text*

- *Encoded categorical data (intent, slots)*
- *Normalized text (lowercasing, punctuation removal)*
- *Tokenization using nltk and spaCy*

6. Exploratory Data Analysis (EDA)

- *Univariate Analysis:*
  - *Distribution of features Common intents, frequent words*

- *Bivariate/Multivariate Analysis:*
  - *Analysis Intent vs. response time*

7. Feature Engineering

- *Extracted keyword-based features from user utterances*
- *Created conversation history sequences*
- *Encoded speaker roles and context window*
- *Removed highly sparse features*

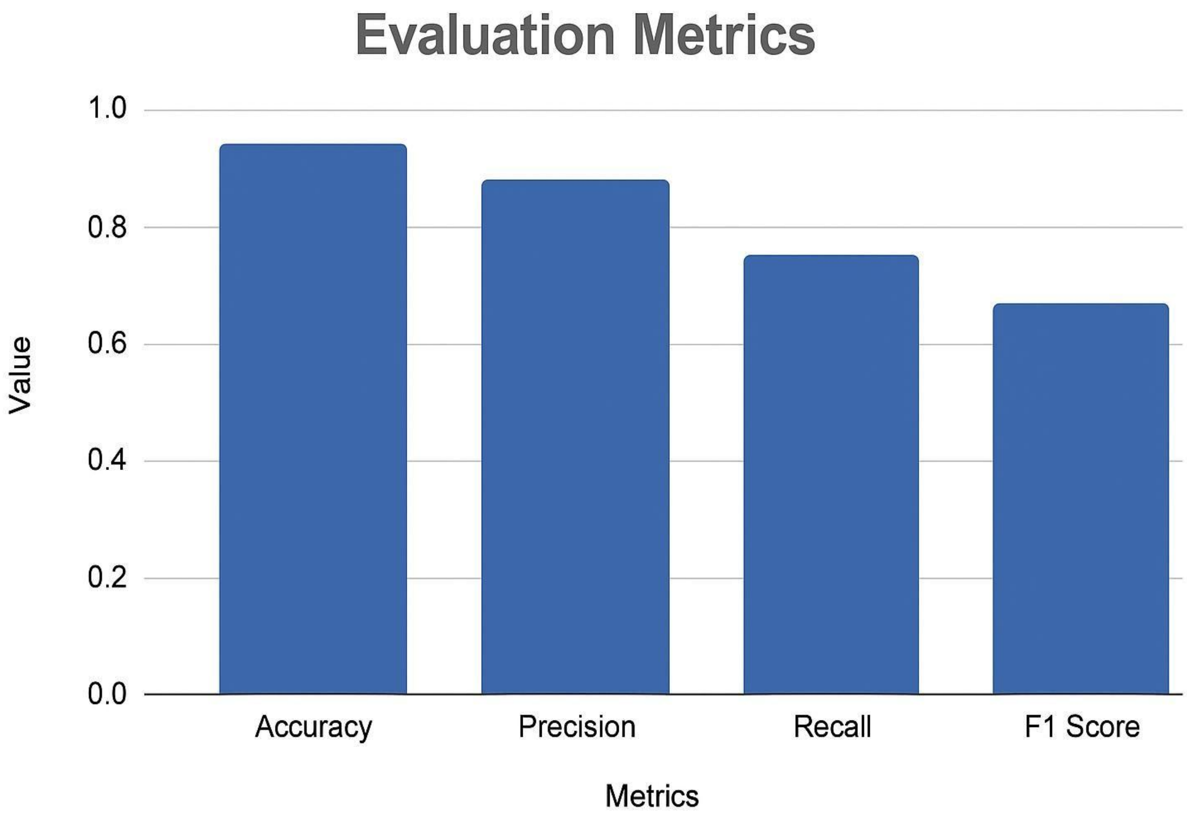
8. Model Building

- *Train models*
  Train-Test Split: 80-20
  Evaluation Metrics: Accuracy, F1-Score, Confusion Matrix

- *Models used:*
  RNN (Recurrent Neural Network) with attention
  Logistic Regression for baseline intent classification

9. Visualization of Results & Model Insights.

- *Evaluation Metrics*



10. Tools and Technologies Used

- *Programming Language: Python*

- *Development Environment –Google Colab*

- *Libraries: pandas, numpy*
- *Visualization Tools: Plotly, Tableau, Power BI.]*

11. Team Members and Contributions

- ***S.*** *Harish ragavendra : Experiment with new ideas or models.*
- *P.Charan babu : Understand and explore the DSTC dataset.*
- *R.kirutheesh : Focus on interpreting user input.*