Phase-2

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GithubRepositoryLink:[https://github.com/7906182/Revolutionizing-customer-support-with-an-intelligent-chabot-for-automated-assistace.git]

REVOLUTIONIZING CUSTOMER SUPPORT WITH AN INTELLIGENT CHATBOT FOR AUTOMATED ASSISTANCE

1.Problem Statement

Design an intelligent chatbot for customer support that provides automated, personalized, and empathetic assistance, resolving customer queries efficiently and effectively, while reducing support costs and improving customer satisfaction.

1. Answering frequently asked questions

2. Resolving simple issues (e.g., password resets, order tracking)

3. Routing complex issues to human agents

4. Providing product recommendations and troubleshooting

2.Project Objective:

1. *Customer satisfaction (CSAT) scores*

2. *First contact resolution (FCR) rates*

3. *Average handling time (AHT)*

4. *Deflection rate (percentage of issues resolved by chatbot*

5. *Escalation rate (percentage of issues transferred to human agents)*

3.Flow chart of the Project Workflow
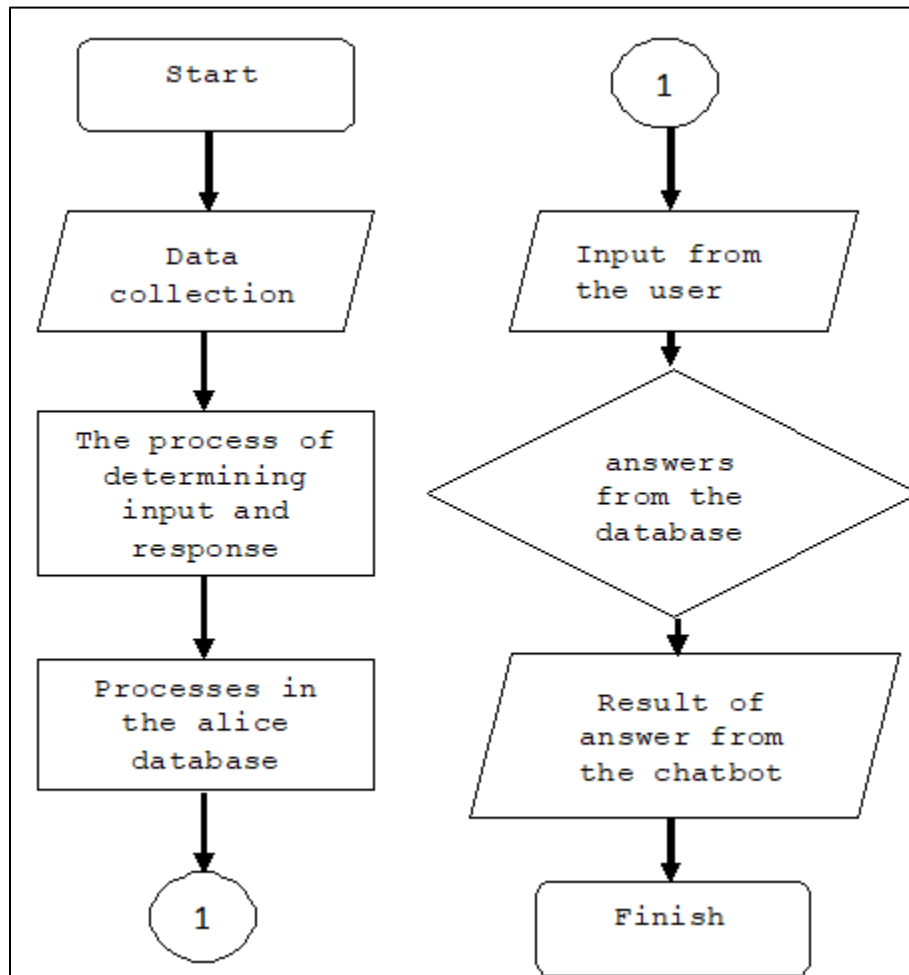
4. Data Description

    1. Textual Data: Chat logs, knowledge articles, and customer feedback.

    2. Categorical Data: Issue types, product categories, and customer segments.

    3. Numerical Data: Resolution rates, time-to-resolution, and customer satisfaction scores

    4. Feedback Mechanisms: Surveys, feedback forms, and review platforms.

    5.Consistency: Ensuring data is consistent across different systems and platforms.

    By leveraging this data, the intelligent chatbot can provide more effective

and personalized support, improving customer satisfaction and reducing support costs.

5. Data Preprocessing

Data preprocessing is a crucial step in building an intelligent chatbot for customer support. Here's an overview of the data preprocessing steps:

1. Data Cleaning: Remove irrelevant, duplicate, or noisy data.

2. Tokenization: Split text into individual words or tokens.

3. Stopword Removal: Remove common words like "the," "and," etc.

4. Stemming or Lemmatization: Reduce words to their base form.

6.Feature Engineering

Feature engineering is the process of selecting and transforming raw data into features that are more suitable for modeling.

1. Text Features: Extract features from text data, such as sentiment, entities, and topics.

2. Categorical Features: Encode categorical variables, such as product categories or issue types.

3. Numerical Features: Extract numerical features, such as response times or customer satisfaction scores.

4. Intent Identification: Identify the intent behind customer queries.

5. Entity Extraction: Extract relevant entities, such as names, locations, or products.

6. Sentiment Analysis: Determine the sentiment of customer feedback.

7. Model Building

Model building is a critical step in developing an intelligent chatbot for customer support. Here's an overview:

Model Building Techniques:

1. Natural Language Processing (NLP): Use NLP techniques to understand customer queries and generate responses.

2. Machine Learning (ML): Train ML models to classify customer queries, identify intent, and predict responses.

3.Deep Learning (DL): Use DL techniques, such as recurrent neural networks (RNNs) and transformers, to improve

8.Visualization of Results&Model Insights

1. Customer Query Analysis: Visualize customer query topics, sentiment, and intent.
2. Chatbot Performance: Visualize response times, accuracy, and resolution rates.
3. Customer Satisfaction: Visualize customer satisfaction scores and feedback.
4. Model Performance: Visualize model accuracy, precision, recall, and F1-score.
5. Tableau: A data visualization tool for creating interactive dashboards.
6.. Power BI: A business analytics service for creating interactive visualizations.
7. D3.js: A JavaScript library for producing dynamic, interactive data visualizations.
8. Matplotlib and Seaborn: Python libraries for creating static and interactive visualizations.

9.Tools andTechnologies Used

1. NLTK (Natural Language Toolkit): A popular Python library for NLP tasks.

2. spaCy: A modern NLP library for Python and Cython.

3. Stanford CoreNLP: A Java library for NLP tas

4. TensorFlow: An open-source ML framework developed by Google.

5. PyTorch: An open-source ML framework developed by Facebook.

6. scikit-learn: A popular Python library for ML tasks.

10.Team Members and Contributions

Datacleaning-R.Yamuna

EDA-N.Gayathri

Featureengineering-M.Kaviya

Modeldevelopment-**B.Keerthana**

Documentationandreporting-N.Abinaya