Assignment 5

Solution Requirement Document

|  |  |
| --- | --- |
| Group # | CP 5 |
| Student Name | Rakesh Mahendranath, Govind Kala Raveendran, Charumathi Satish, Aiswarya Raj, Het Chandubhai Patel, Vignesh Ramasubramanian |
| Course | INFO8686 – Information Technology Business Analysis Capstone Project |
| Section | 5 |
| Professor | Prof. Nilesh Deshmukh |
| Due Date | March 05, 2024 |

Catalyst Driving Business Excellence

Kitchener, Ontario

Generative AI Powered Voice Assistant Customer Service at Rogers

Table of Contents

[1. Introduction 3](#_Toc160570481)

[2. Objectives 3](#_Toc160570482)

[3. Functional Requirements 3](#_Toc160570483)

[3.1 Natural Language Processing (NLP) 3](#_Toc160570484)

[3.2 Generative Models 3](#_Toc160570485)

[3.3 Context Awareness 3](#_Toc160570486)

[3.4 Multimodal Capabilities 4](#_Toc160570487)

[3.5 Personalization 4](#_Toc160570488)

[3.6 Knowledge Base Integration 4](#_Toc160570489)

[3.7 Security and Privacy 4](#_Toc160570490)

[3.8 Feedback Mechanism 4](#_Toc160570491)

[3.9 Error Handling 5](#_Toc160570492)

[4. Non-Functional Requirements 5](#_Toc160570493)

[5. Constraints 5](#_Toc160570494)

[6. Assumptions 5](#_Toc160570495)

[7. Glossary 5](#_Toc160570496)

[8. References 7](#_Toc160570497)

# Introduction

The Generative AI-powered voice Assistant for Customer Care Service is a cutting-edge solution aimed at revolutionizing customer support by leveraging advanced natural language processing (NLP) and generative AI technologies. This document outlines the requirements and specifications of the proposed solution.

# Objectives

* Develop a voice assistant capable of understanding and responding to customer queries in natural language.
* Provide personalized and context-aware assistance to enhance the customer experience.
* Integrate with existing systems and databases for seamless access to relevant information.
* Ensure security, privacy, scalability, and compliance with regulatory standards.
* Implement mechanisms for continuous improvement through feedback analysis and model retraining.

# Functional Requirements

## Natural Language Processing (NLP)

* The system shall be capable of processing voice inputs from customers.
* Speech recognition accuracy shall exceed 95% under normal operating conditions.
* Speech processing algorithms shall accurately identify intents and entities in customer queries.

## Generative Models

* The system shall utilize a pre-trained generative model architecture such as GPT for response generation.
* Model fine-tuning shall be performed on a dataset of customer queries and responses to optimize relevance and coherence.
* Response generation latency shall not exceed 2 seconds per interaction.

## Context Awareness

* The system shall maintain context across conversations to provide coherent and relevant responses.
* Dialogue state tracking accuracy shall exceed 90% in identifying the current state of the conversation.
* Contextual understanding mechanisms shall be employed to handle multi-turn dialogues effectively.

## Multimodal Capabilities

* The system shall support voice input modalities.
* Speech-to-text and text-to-speech conversion accuracy shall meet industry standards.

## Personalization

* The system shall utilize customer data to provide personalized recommendations and assistance.
* User profiling algorithms shall accurately capture user preferences and history.
* Personalized responses shall be generated based on individual user profiles.

## Knowledge Base Integration

* The system shall integrate with existing knowledge bases and databases for information retrieval.
* Query processing mechanisms shall enable efficient access to relevant data.
* Knowledge graph representations shall be employed to capture relationships between different pieces of information.

## Security and Privacy

* The system shall encrypt sensitive data in transit and at rest using industry-standard encryption algorithms.
* Access control mechanisms shall restrict access to customer data based on role-based permissions.
* Anonymization techniques shall be employed to protect personally identifiable information (PII).

## Feedback Mechanism

* The system shall incorporate feedback prompts or surveys to collect user feedback on interaction quality.
* Feedback analysis algorithms shall identify patterns and areas for improvement.
* Model retraining mechanisms shall be employed to continuously improve response quality based on user feedback.

## Error Handling

* The system shall provide fallback responses or suggestions when unable to confidently address customer queries.
* Error detection mechanisms shall identify misunderstandings or misinterpretations in user input.
* Protocols shall be defined for escalating complex or sensitive issues to human agents for resolution.

# Non-Functional Requirements

* Usability: The system shall have an intuitive user interface accessible to users of all technical levels.
* Reliability: The system shall have a minimum uptime of 99.9%.
* Maintainability: The system shall be modular and well-documented to facilitate easy maintenance and updates.
* Security: The system shall adhere to industry-standard security practices to protect customer data.
* Scalability and Performance:
  + The system shall be designed with a scalable, distributed architecture to handle a large volume of concurrent interactions.
  + Load balancing mechanisms shall distribute incoming requests evenly across server instances.
  + Performance monitoring tools shall be implemented to optimize resource utilization and ensure low latency responses.

# Constraints

* Budget constraints may impact the selection of hardware and software components.
* Regulatory constraints such as GDPR may impose limitations on data processing and storage practices.

# Assumptions

* Sufficient computing resources will be available to support the deployment and operation of the system.
* Access to relevant data sources and APIs for integration will be provided by stakeholders.
* The quality of the data obtained from Rogers will be reliable, indicating its dependability and adherence to strict guidelines.

# Glossary

* NLP: Natural Language Processing
* AI: Artificial Intelligence
* GPT: Generative Pre-trained Transformer
* CRM: Customer Relationship Management
* GDPR: General Data Protection Regulation
* PII: Personally Identifiable Information

# References

* Heltewig, P. (2022, July). *Council Post: Transforming Customer Service Starts With Voice AI*. Forbes. <https://www.forbes.com/sites/forbesbusinesscouncil/2022/07/29/transforming-customer-service-starts-with-voice-ai/?sh=6ceee11e4836>
* Asana. (n.d.). *Software requirement specification (SRS) document template Project name: Date: Version*. https://assets.asana.biz/m/6ac2683dd6006280/original/software-requirement-document-template.pdf