

Software Requirements Specification

Background:- As a part of industry Academia Community(IAC)activities,many students and freshers participate in the online internship program every year to get a job ready in time.The students come up with Queries which need to be answered almost instantly.

Project Overview:- 1.Build a unified chatbot that is linked to facebook,instagram,linkedin,Whatsapp and SMS as sources where the users can communicate to cloud counsalage pvt Ltd and gift a career foundation for our industry Academia Community Program. 2.FAQ's and thier answers are to be fed into the chatbot backend. 3.Try to make it speech driven chatbot along with text chat.Building a generative AI would attract the highest point or credit.

Hardware Requirements:- RAM-512 GB,processor-AMD,Hardware disk space-70-80 GB,server:Microsoft Windows server 2019 Base ami04a0ee204b44cc91a Microsoft Windows 2019 Datacenter edition.[English]Ec2-t2.micro(Variable ECUs,1vCPUs,2.5 GHz,intel xeon Family,1GB memory,EBS only.Root Volume=30 GB General-purpose solid-state Drive,100/3000 IOPS

Software Requirements:- framework-Microsoft Bot framework, NLP libraries,APIs and SDKs provided by Facebook, Instagram, LinkedIn, WhatsApp, and SMS gateways to enable communication through these channels.DBMS-MYSQL, speech recognition and synthesis-Google Cloud Speech-to-Text, Amazon Transcribe,web development tools-HTML, CSS, and JavaScript.

Constraints:- 1. Limited budget and resources allocated for the development and maintenance of the AI chatbot, potentially affecting its scope and capabilities. 2. Technical constraints, such as system compatibility and infrastructure limitations, may impact the chatbot's performance and integration with existing customer support systems.

Assumptions:- 1. Assumption that the chatbot's natural language processing capabilities will accurately understand and interpret customer queries in various languages and dialects. 2. Assumption that the availability of up-to-date knowledge base information and continuous training will enable the chatbot to provide accurate and relevant responses to a wide range of customer queries.

Functional Requirements:- 1.Unified Chatbot Integration,2.FAQ Handling,3.Speech-Driven and Text Chat,4.Generative AI, 5.User Experience, 6.Analytics and Reporting, 7.User Support

Non-Functional Requirements:- 1.Performance, 2.Reliability and Availability, 3.User Experience, 4.Compliance and Ethics, 5.Compliance with Platform Policies

External Interface Requirements:- Integration with Social Media and Messaging Platforms,FAQ Database Integration,Speech Recognition and Synthesis Interfaces,Generative AI Model Integration,User Data Handling,Monitoring and Debugging Interfaces

Technology Used:- Building a unified chatbot with the features you've described requires a combination of various technologies, including programming languages, frameworks, and tools. Here's a list of the technologies commonly used for such a project:1. Programming Languages: - Python: Python is a popular choice for building chatbots due to its extensive libraries for natural language processing (NLP) and machine learning. 2. Chatbot Development Frameworks: - Dialogflow: A Google Cloud service that offers a user-friendly interface for building chatbots and provides integration with various platforms. - Microsoft Bot Framework: Allows you to create chatbots that can be integrated into multiple messaging platforms. - Rasa: An open-source framework that provides tools for building conversational AI applications. 3. Natural Language Processing (NLP) Libraries: - spaCy: A powerful NLP library for text processing and entity recognition. - NLTK (Natural Language Toolkit): A comprehensive library for working with human language data. - Hugging Face Transformers: Provides pre-trained models and libraries for state-of-the-art NLP tasks. 4. Speech Recognition and Synthesis: - Google Cloud Speech-to-Text: Offers speech recognition capabilities. - Google Cloud Text-to-Speech: Provides natural-sounding speech synthesis. - Amazon Transcribe: Another option for speech recognition. - Amazon Polly: Offers text-to-speech capabilities. 5. Generative AI Model: - GPT-3 (Generative Pre-trained Transformer 3): An AI model developed by OpenAI that can be used for

generating human-like text responses.

6. Database Management:
 - PostgreSQL: A robust open-source relational database management system.
 - MongoDB: A NoSQL database suitable for storing unstructured data like FAQs.
7. Web Development Tools:
 - HTML, CSS, JavaScript: For creating the front-end interface of your chatbot.
8. Server and Hosting:
 - AWS (Amazon Web Services), Azure, or Google Cloud: Popular cloud platforms for hosting chatbot servers and databases.
9. Version Control:
 - Git: Essential for tracking and managing changes to your chatbot's codebase.
10. Communication APIs and SDKs:
 - For integrating with external platforms like Facebook, Instagram, LinkedIn, WhatsApp, and SMS, you'll need the respective APIs and SDKs provided by these platforms.
11. Monitoring and Analytics Tools:
 - Prometheus, Grafana, and ELK (Elasticsearch, Logstash, Kibana): Monitoring and analytics tools for tracking the performance and user interactions of your chatbot.
12. Security Tools:
 - SSL/TLS certificates: For securing communication channels.
 - Firewalls, Intrusion Detection Systems: To protect against cyber threats.
13. Backup and Disaster Recovery Tools:
 - Backup and recovery mechanisms to prevent data loss in case of system failures.
14. Containerization and Orchestration:
 - Tools like Docker and Kubernetes for containerization and orchestration of your chatbot's components.
15. Development Environments:
 - Jupyter Notebook, PyCharm, or Visual Studio Code: Popular development environments for Python-based projects.
16. User Authentication and Authorization:
 - Technologies like OAuth 2.0 for securing user data and authorizing access to external platforms.
17. User Feedback and Support Tools:
 - Implement user feedback collection mechanisms and integrate customer support channels for user assistance.

These technologies, when used effectively together, can help you build a unified chatbot with speech-driven capabilities and generative AI to achieve your project goals. The specific choices may vary based on your team's expertise, project requirements, and budget considerations.