# GlasgowSupportBot

GUID: 2581031a

Introducing GlasgowSupportBot: A Virtual Assistant for University of Glasgow Students

- **Overview:** GlasgowSupportBot is a cutting-edge virtual assistant designed to simplify access to various support services for students at the University of Glasgow.

- **Purpose:** In a world where information is abundant yet scattered, GlasgowSupportBot stands as a centralized platform, enabling students to find the relevant support services they need effortlessly.

- **Motivation:**

  - **Challenges for Students:** Navigating health, academic, and integration challenges in a new country.

  - **Need for Easy Access to Support Services:** With an increasing array of support services, students often struggle to find and utilize these resources efficiently.

  - **Advancement in Technology:** Leveraging the power of AI and chatbots to meet the expectations of students for quick, straightforward assistance.

- **Aims of GlasgowSupportBot:**

  - **Simplify Access to Information:** Making it easier and faster for students to find support services.

  - **Centralize Support Services Information:** Serving as a one-stop hub for all support-related queries.

  - **Offer Personalized Help:** Providing tailored responses to meet individual student needs.

  - **Increase Utilization of Support Services:** Encouraging more students to take advantage of available support, enhancing their university experience.

- **Conclusion:** GlasgowSupportBot is more than just a virtual assistant; it's a step towards creating a more inclusive, supportive, and accessible environment for all students at the University of Glasgow.

Introducing GlasgowSupportBot: A Virtual Assistant for University of Glasgow Students
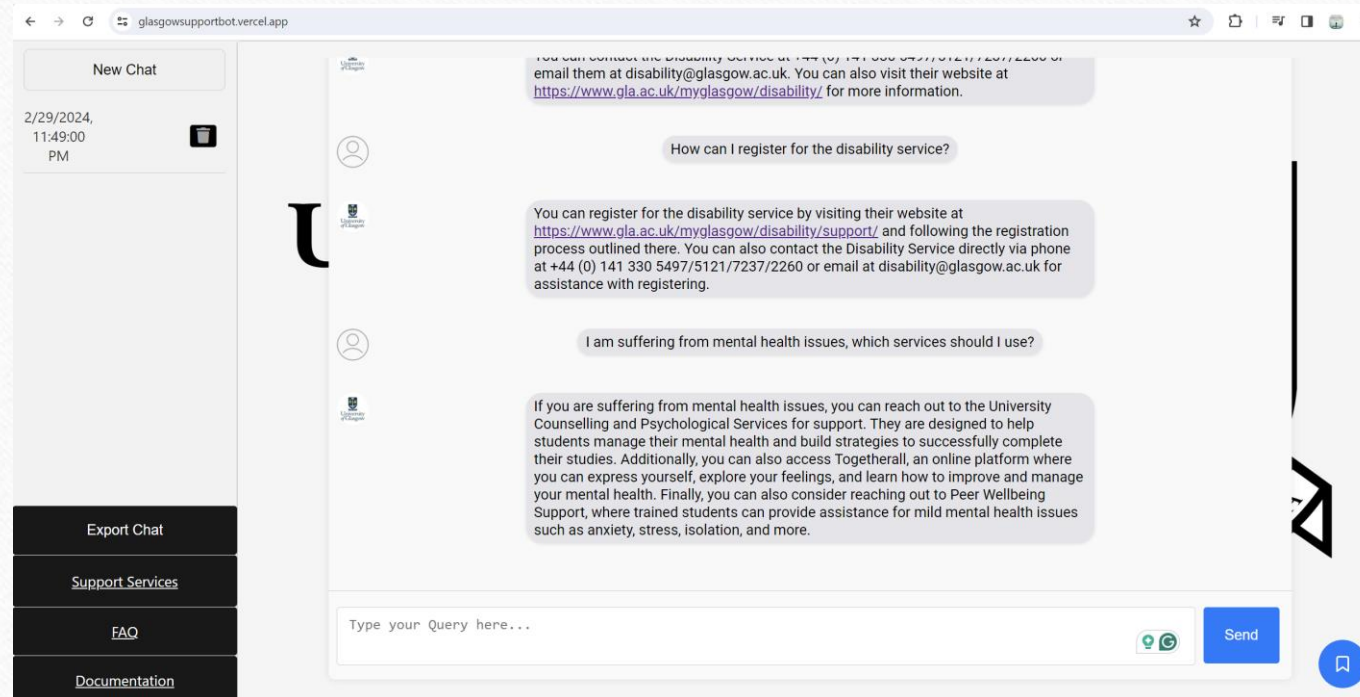
Understanding the Landscape: Chatbots and University Support Services

Technological Foundations of Chatbots:

Overview of key technologies underpinning chatbots, including domain-specific knowledge bases and natural language processing (NLP) techniques.

The importance of NLP in enabling chatbots to understand and respond to students' queries accurately.

Evolution and Impact of Chatbots in Education:

Chatbots' growing role in educational settings as tools for personalized learning and support.

Potential of chatbots to revolutionize mental health support through engaging activities and timely interventions.

Challenges in Accessing University Support Services:

International Students: Language barriers, cultural differences, and unawareness of available services.

Students with Disabilities: Limited engagement with support services, averaging minimal visits per semester.

Distance Learning Students: Challenges include poor internet connectivity and unfamiliarity with digital platforms.

General Student Body: Overwhelmed by the need to navigate multiple websites and pages to find specific services.

Academic Support and Mental Health:

The critical role of chatbots in offering tailored support, especially in mental health and academic assistance.

Studies highlighting chatbots' effectiveness in making mental health support more accessible and engaging for students.

Specific stressors for computer science students and the potential of chatbots in providing a supportive environment.

Essential Requirements for GlasgowSupportBot

- **Overview:** Utilizing user stories and personas, we refined GlasgowSupportBot's requirements, employing the MoSCoW method to prioritize functionalities essential for enhancing the student support experience at the University of Glasgow.
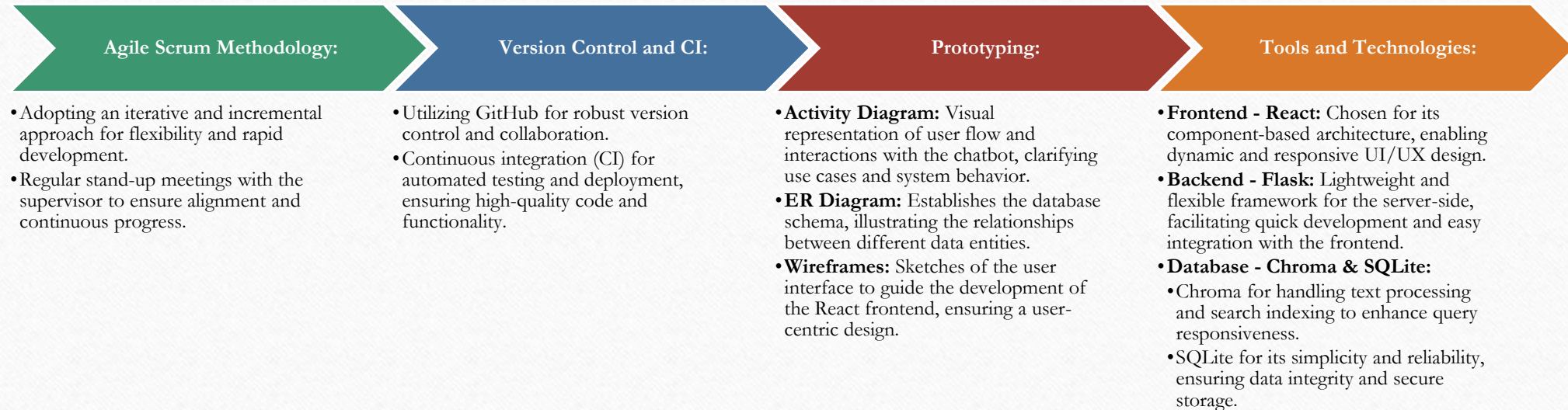
Must Have:

- **Real-time Query Processing:** Capability to receive and process user queries for immediate responses.

- **Comprehensive Support Services Information:** Present details on mental health, disability, international student advice, and academic support.

- **Persistent User Sessions:** Ability to store, manage, and resume user chat sessions.

- **Feedback Mechanism:** Features for submitting and reviewing feedback directly through the system.

- **Data Management and Security:** Secure database management for storing, retrieving, and exporting chat histories.
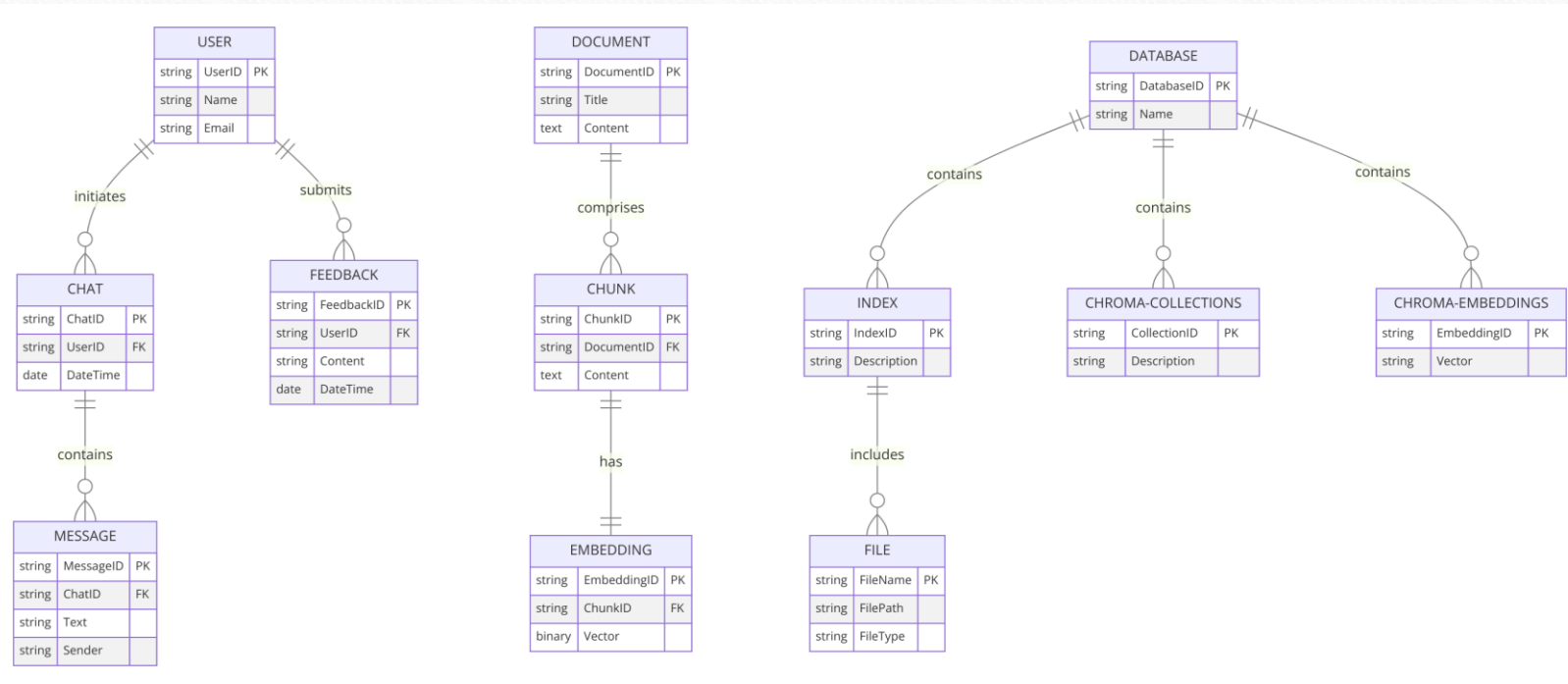
Should Have:

- **Welcome Popup:** Introduction for first-time users.

- **Multilingual Support:** To accommodate international students.

- **User Privacy:** Encryption of chat messages for privacy protection.

- **Enhanced User Experience:** Options for theme toggling, chat history search, and feedback on chatbot responses.
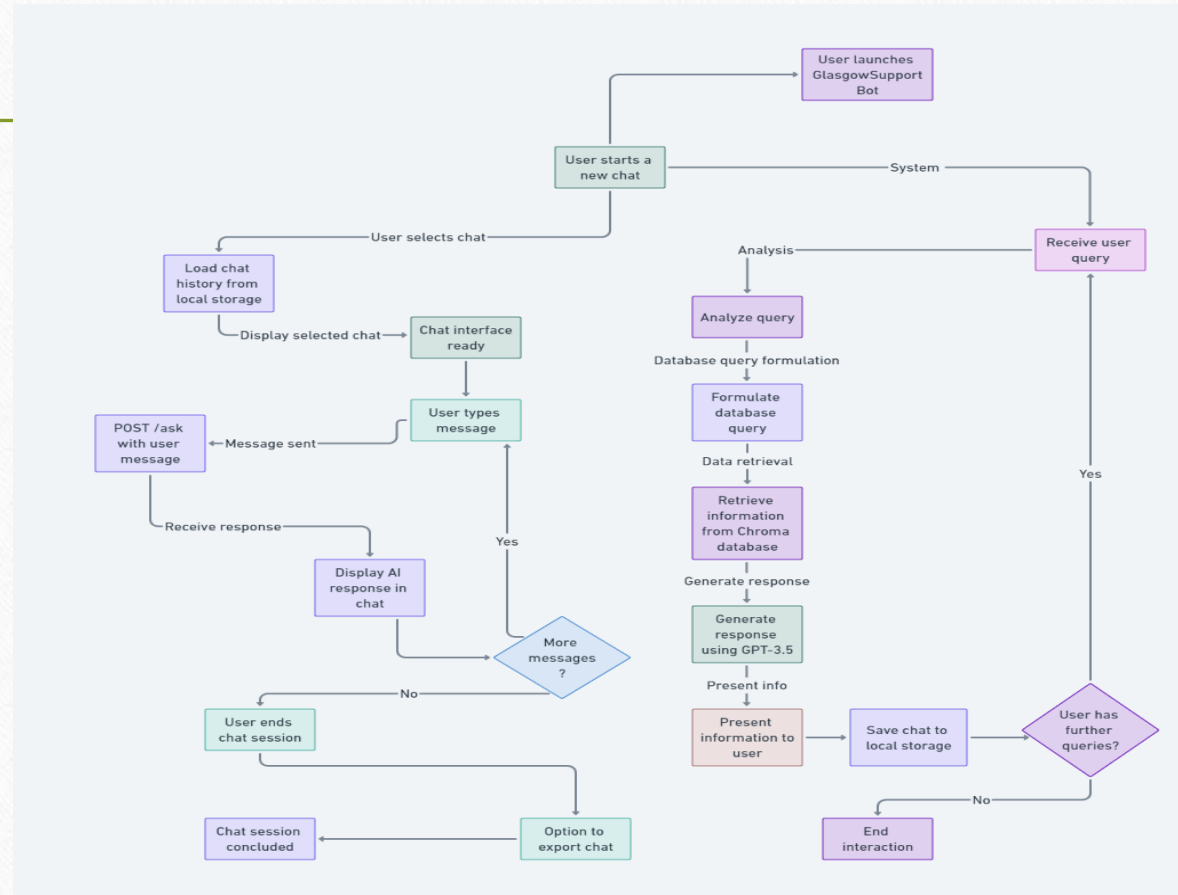
Designing GlasgowSupportBot: System Architecture and Prototyping

Agile Scrum Methodology:

- Adopting an iterative and incremental approach for flexibility and rapid development.
- Regular stand-up meetings with the supervisor to ensure alignment and continuous progress.

Version Control and CI:

- Utilizing GitHub for robust version control and collaboration.
- Continuous integration (CI) for automated testing and deployment, ensuring high-quality code and functionality.

Prototyping:

- **Activity Diagram:** Visual representation of user flow and interactions with the chatbot, clarifying use cases and system behavior.
- **ER Diagram:** Establishes the database schema, illustrating the relationships between different data entities.
- **Wireframes:** Sketches of the user interface to guide the development of the React frontend, ensuring a user-centric design.

Tools and Technologies:

- **Frontend - React:** Chosen for its component-based architecture, enabling dynamic and responsive UI/UX design.
- **Backend - Flask:** Lightweight and flexible framework for the server-side, facilitating quick development and easy integration with the frontend.
- **Database - Chroma & SQLite:**
  - Chroma for handling text processing and search indexing to enhance query responsiveness.
  - SQLite for its simplicity and reliability, ensuring data integrity and secure storage.

ER Diagram

Activity Diagram

Wireframe Example

Designing GlasgowSupportBot: System Architecture and Prototyping
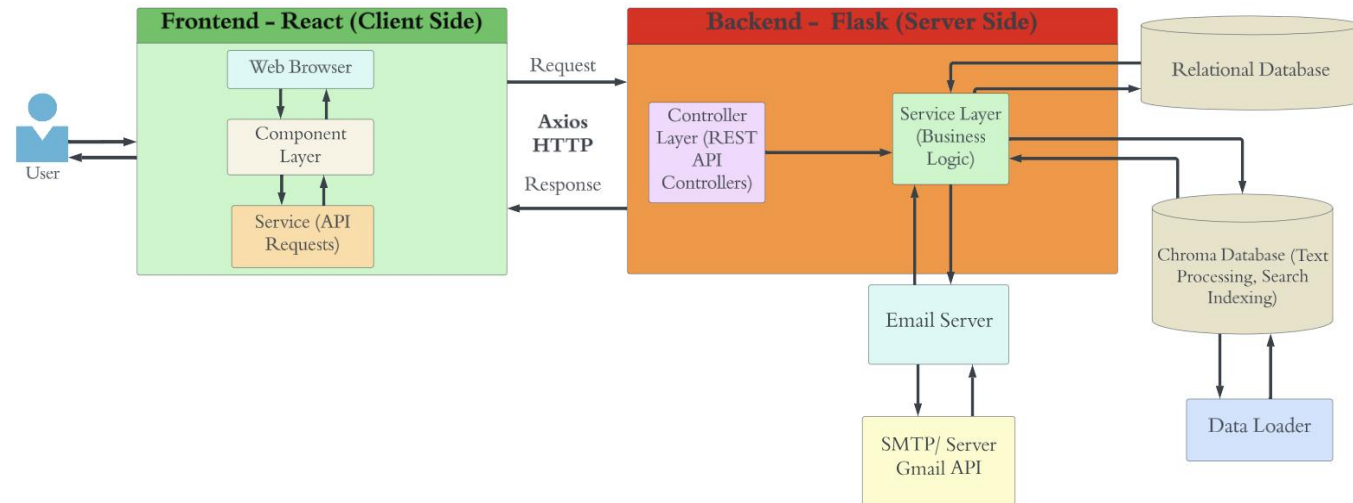
Implementing GlasgowSupportBot: From Concept to Reality

Receiving and Processing User Queries:

- Implementation of an intuitive input interface for users to submit queries.
- Backend processing using Flask to handle and interpret user input with NLP techniques.

Real-Time Conversations and Immediate Responses:

- Utilizing Axios for a real-time communication channel between the client and server.
- Ensuring the system is optimized for low-latency responses to create a conversational experience.

Support Services Information Retrieval:

- Integrating a search functionality that taps into the Chroma and SQLite databases.
- Presenting relevant university support services information in response to user queries.

Feedback Submission System:

- Designing a user-friendly feedback form within the interface.
- Connecting the form to the backend to capture and manage user feedback efficiently.

Deployment:

- Back-end deployment on Render for its simplicity and seamless integration with databases and other backend services.
- Front-end deployment on Vercel for its high performance and scalability, ensuring the user interface is accessible and reliable.

Testing and Evaluating GlasgowSupportBot
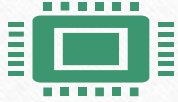
Unit Testing:

Utilization of Jest for React front-end testing, ensuring interface robustness.

Implementation of Pytest for back-end testing in Flask, validating service reliability.

28 unit tests conducted to examine the internal code logic and functionalities.

Continuous Integration and Continuous Deployment (CI/CD) practices with GitHub, automatically running tests for every update, maintaining code integrity.

User Evaluation:

Methodology: Deployment of a Google Form survey to gather user feedback on usability and experience, with a System Usability Scale (SUS) for quantitative analysis.

Initiation of User Interaction: Positive reception with over 60% finding it very easy to initiate a conversation with the chatbot.

Informational Reliability: 100% accuracy rating by participants for the information provided by the chatbot.

Concurrent Query Management: Identified as an area for improvement, with the majority of feedback suggesting enhancements in handling multiple queries.

Preference for Chatbot: A clear preference for the chatbot over traditional website navigation for information retrieval.

Analysis of Responses:

Quantitative Data: The SUS score average was 88.5, indicating a high level of usability and user satisfaction.

Qualitative Data: Suggestions for improvements include better follow-up question handling, UI/UX enhancements, and expansion of the knowledge base.

Wrapping Up: GlasgowSupportBot Journey

Future Directions:

User feedback calls for a more engaging design and improved context recognition for follow-up queries.

Expansion of knowledge base and enhanced information presentation.

Address technical constraints related to hosting and query limits to manage costs.

Final Reflections:

The project reflects a bridge from academic concepts to real-world application.

Key learnings include software development skills, time management, and the value of user feedback.

GlasgowSupportBot has laid a foundation for continuous learning and professional growth.

GlasgowSupportBot Web App

- https://glasgowsupportbot.vercel.app/