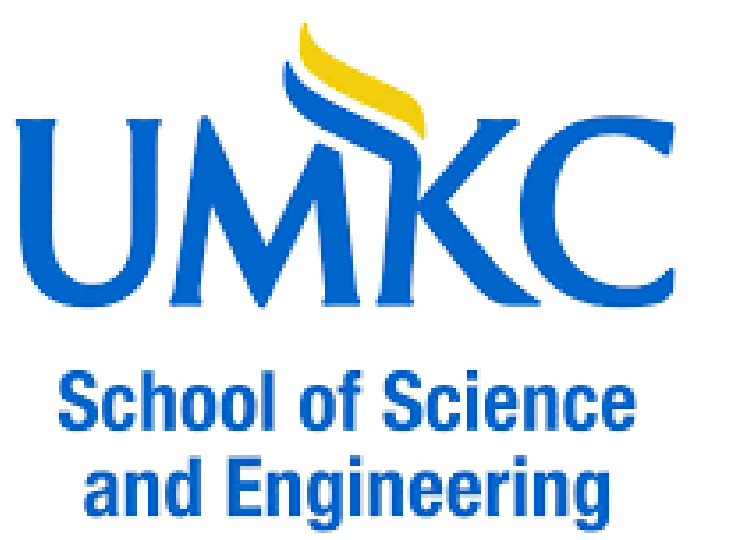


# UniBuddy: The Virtual Assistant



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## Abstract

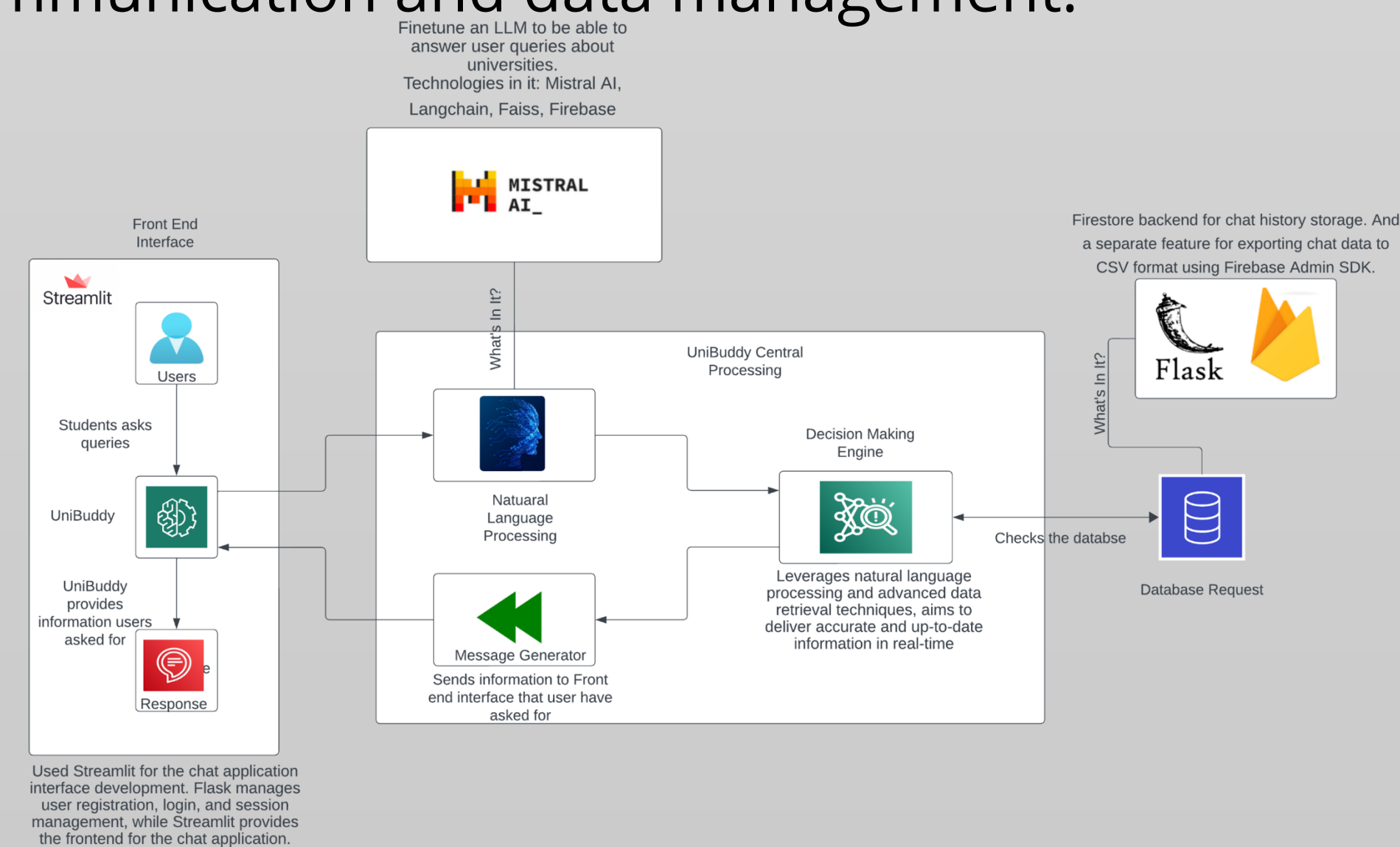
UniBuddy is a revolutionary virtual assistant designed to revolutionize the way students navigate the complexities of university life. Through seamless integration of cutting-edge technologies like natural language processing (NLP), Firebase authentication, and Streamlit interface, UniBuddy offers students an intuitive platform to access comprehensive information about universities. This abstract outlines the key components and methodologies employed in the development of UniBuddy, highlighting its potential to empower students and enhance their educational journey.

## Methodology

The development of UniBuddy is underpinned by a multi-faceted methodology that combines technological innovation with user-centric design principles.

**User Authentication and Registration System:** Implementing secure login, registration, and logout functionalities using Flask and Firebase, ensuring user data privacy and authentication integrity.

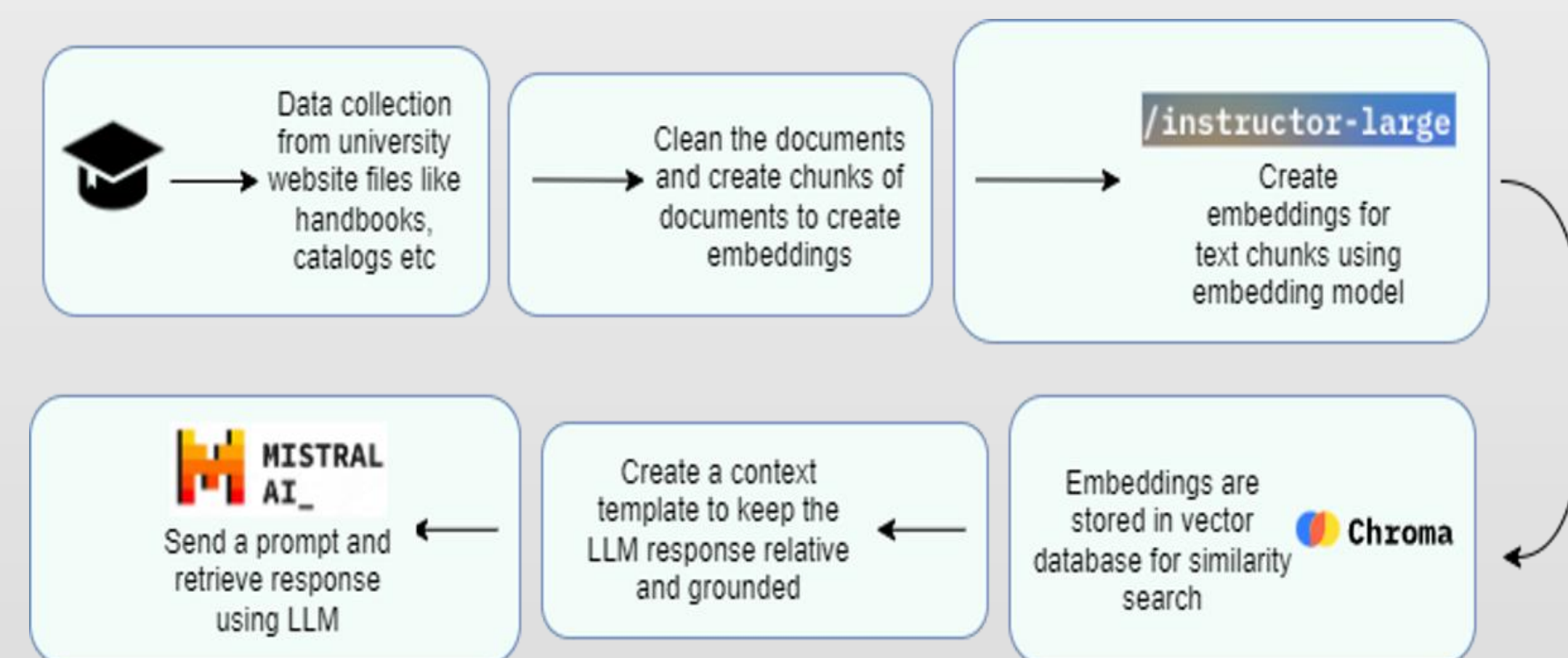
**Integration of Firebase with Streamlit for Chat Application and Data Export:** Utilizing Streamlit for the chat interface, Firebase for real-time data storage, and Firebase Admin SDK for exporting chat data to CSV format, facilitating seamless communication and data management.



**User Authentication and Chat Application Development:** Leveraging Flask, Firebase Authentication, Firestore, and Streamlit to develop a user authentication system and chat application, ensuring secure communication and user engagement.

## Why UniBuddy?

UniBuddy addresses a critical need in the realm of higher education by offering a comprehensive and intuitive platform for accessing university information. Traditional methods of research often involve navigating multiple websites, contacting various departments, and sifting through extensive documentation. UniBuddy simplifies this process by centralizing information and providing personalized assistance through its chatbot interface. With UniBuddy, students can access accurate and up-to-date information in real-time, enabling them to make confident decisions about their educational journey.



**Embeddings:** Created embeddings from text chunks using appropriate embeddings models. “instructor-large” is used based on its rating on embeddings of large files. Created embeddings stored in vector database for similarity search. ChromaDB is used for storing created embeddings.

**Natural Language Processing:** Fine-tuning an NLP model using Mistral AI, LangChain, Faiss, and Firebase to comprehend user queries and generate human-like responses, enhancing the effectiveness and intelligence of the virtual assistant.

**Ingestion Module Development:** Developing an efficient document loading module with multithreading and multiprocessing techniques, error handling mechanisms, and logging systems for seamless data ingestion and processing.

**Local GPT Module Development:** Creating a module for retrieval question-answer tasks using Language Chain's RetrievalQA pipeline, integrating embeddings and vector stores for efficient text representation and retrieval, and optimizing performance and resource utilization for enhanced user experience.

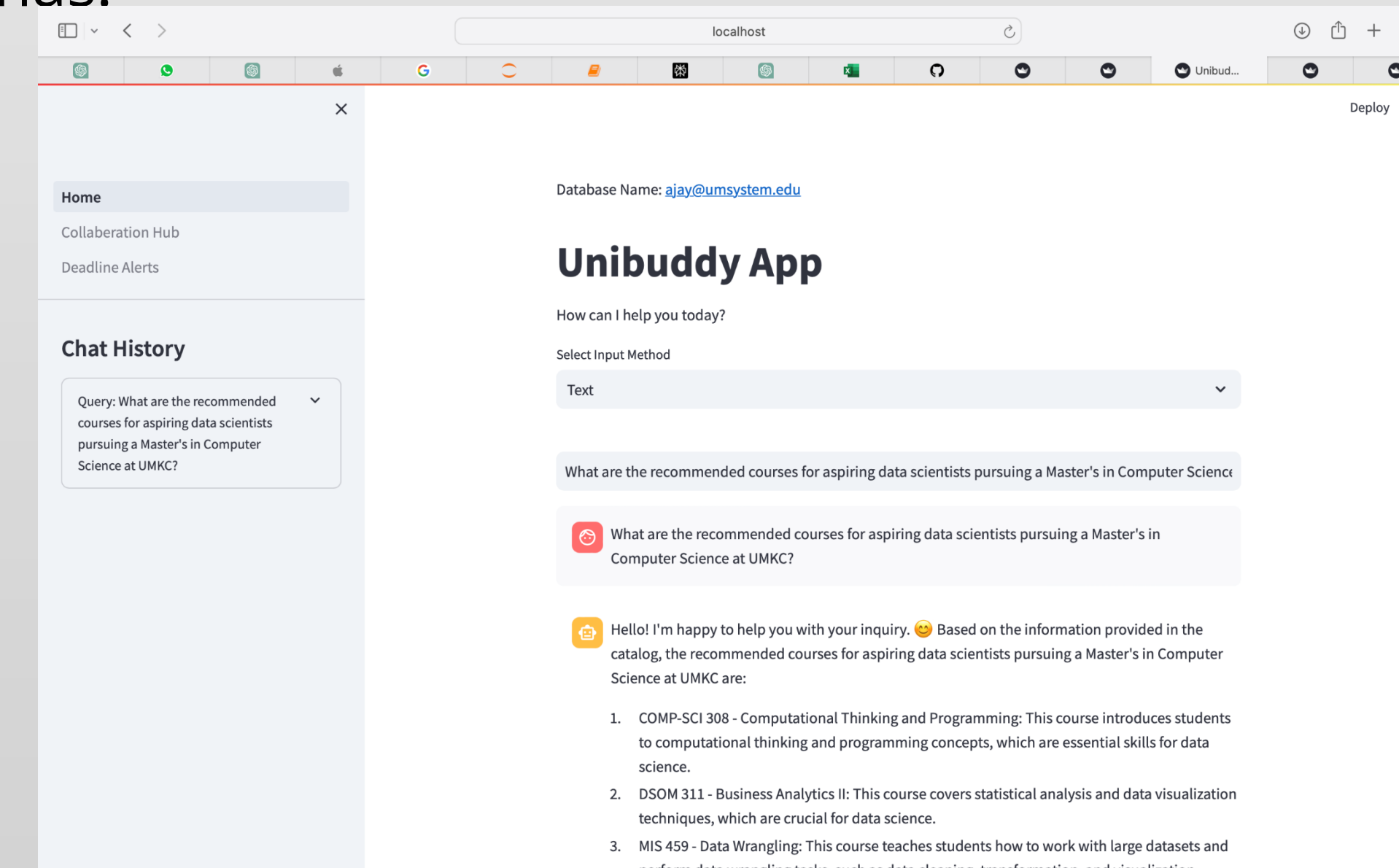
Successfully implemented UniBuddy: The Virtual Assistant. The application successfully allows user to register (if they don't have an existing account)

## Introduction

Navigating the vast landscape of university options can be daunting for students seeking the ideal educational experience. UniBuddy emerges as a solution to this challenge by providing a user-friendly virtual assistant that consolidates all pertinent university information into a single, accessible platform. By leveraging advanced technologies and methodologies, UniBuddy aims to streamline the process of university exploration and decision-making, ultimately empowering students to make informed choices about their academic futures.

## Results

If user have an account, it allows user to login into his personal account. After successful login, user can ask UniBuddy any kind of query that he/she has.



It can be observed that, UniBuddy successfully saves the chats of the user (on the left). This is the complete way of personalization. Moreover, UniBuddy allows user to ask queries through voice option.

## Evaluation

Aspect	UniBuddy	GPT 3.5	Gemini	Perplexity
Relevance to Question	10	10	10	6
Coverage of resources and support	8	8	10	4
Clarity and Coherence	10	8	10	6
Additional Information	8	8	10	4
Overall Score	9	8.5	10	5

This indicates that UniBuddy is better equipped to understand and address user queries effectively, providing relevant and comprehensive responses with clear and coherent explanations. Additionally, UniBuddy offers valuable additional guidance and information, enhancing the user experience and overall satisfaction.

The comparison suggests that UniBuddy's fine-tuned model already outperforms existing LLMs in the market. Moreover, the statement implies that with further advanced fine-tuning, UniBuddy has the potential to surpass all other available products, indicating promising prospects for continued enhancement and innovation.

## Revenue Generation and Future work

UniBuddy possesses significant potential for revenue generation through its evolution into a Software as a Service (SaaS) model. By offering subscription-based access, UniBuddy can provide users with comprehensive tools and resources to enhance their academic standing, career planning, and personality development. Converting UniBuddy into an user oriented SaaS product that can tailor responses based on the user preferences. Reduce response time of LLMs by using better processors.

## Conclusion

The implementation of UniBuddy has demonstrated its effectiveness in providing students with a comprehensive and intuitive platform for accessing university information. Through secure authentication, efficient data management, intelligent natural language processing, and performance optimization, UniBuddy empowers students to navigate the university experience confidently and successfully, paving the way for a brighter future in education.

## References

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